



**Division of Surface Water  
Response to Comments**

**Project:** Maumee Watershed Nutrient Total Maximum Daily Load (TMDL) Loading Analysis Plan  
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Ohio EPA held a comment period on From August 31 to October 22, 2021, regarding the Maumee Watershed Nutrient TMDL Loading Analysis Plan (LAP). This document summarizes the comments and questions received during the associated comment period, which ended on October 22, 2021.

Ohio EPA reviewed and considered all comments received during the public comment period. By law, Ohio EPA has authority to consider specific issues related to protection of the environment and public health.

There were many overlapping themes and references linking comment letters submitted. In an effort to streamline this document, the comments are grouped by topic with the name of the commenter in parentheses. Responses are provided organized by topic.

**Commenters**

- Alliance for the Great Lakes, Ohio Environmental Council, Freshwater Future (AGL, OEC, FWF)
- Association of Ohio Metropolitan Wastewater Agencies (AOMWA)
- City of Toledo
- Environmental Law & Policy Center (ELPC)
- Peter Hess
- Lake Erie Foundation (LEF)
- Lake Erie Waterkeeper Inc. (LEW)
- Maumee Watershed Coalition (MWC)
- National Wildlife Federation and Ohio Conservation Foundation (NWF, OCF)
- Ohio Manufacturers' Association (OMA)
- Jeff Reutter
- Toledo Metropolitan Area Council of Governments (TMACOG)
- U.S. EPA Region 5

## Comments on TMDL Process

Several comments were received that referenced what the TMDL development process is, where Ohio EPA is in the process, and how feedback is provided to the agency.

**Comment 1:** Also, it seems that the framework for the TMDL is being built with these modules but the key part of this Maumee/West Erie TMDL is defining the reduction goals in terms of best management practices and source reductions. But we the public are held in suspense of the final execution but asked to comment on the details before knowing what it is this TMDL is to accomplish and how. (LEW)

**Comment 2:** This requires a more significant stakeholder engagement process than any TMDL Ohio has developed before. Ohio Environmental Protection Agency (OEPA) will benefit from having a robust stakeholder engagement process that yields high quality, diverse and relevant feedback. (AGL, OEC, FWF)

**Comment 3:** A robust interactive stakeholder process should be initiated immediately. This was previously requested by the Maumee Watershed Coalition (see August 28, 2021, comments), and we understand that the agency is working on an outreach plan. However, the importance of the matter cannot be overstated.

The Coalition recognizes the pressures on the agency to complete the total maximum daily load (TMDL) in an expedited manner and the likely implications of the pending Consent Decree on the timeline. Nevertheless, we urge Ohio EPA to take the time needed to ensure that the TMDL process is comprehensive and the resulting TMDL is scientifically sound and fair. To accomplish these objectives, the agency must arrange for the stakeholders to have an opportunity to have detailed conversations with the agency (both the scientists and the policymakers) and with each other regarding all the issues, including but not limited to those identified in these comments. In the long run, involving stakeholders in the development of the TMDL will result in more expedient implementation of a functional and scientifically sound TMDL that enjoys stakeholder support and buy-in. (MWC)

**Comment 4:** A 30-day outreach period on the draft Preliminary Modeling Results is too short unless the agency conducts meaningful stakeholder involvement as the report is developed.

The modeling results will play a critical role in developing equitable nutrient load allocations, thirty days is not nearly enough time to study, understand, evaluate, and prepare feedback on this important step. As noted in Comment #1 and in prior correspondence with OEPA, a robust stakeholder process is the best approach to this type of complicated and high-stakes effort. (MWC)

**Comment 5:** The OMA looks forward to the opportunity for discharger stakeholder input on the upcoming modeling phase of the TMDL project. We also look forward to additional public comment periods as Ohio EPA undertakes Stages 4 and 5 of the TMDL process. Stakeholder involvement in the planning process will play a critical role in ensuring a

**fair, cost-effective, workable and informed TMDL that those most impacted can support and that does not unnecessarily impose significant financial burdens on the business community. (OMA)**

**Comment 6: As Ohio EPA develops the Maumee Nutrient TMDL, TMACOG and others across the state have been following the effort closely. While TMACOG commends OEPA on its aggressive timeline for TMDL development, we see this process moving forward quickly with little regard for the input provided by stakeholders or the needs of western basin communities. This TMDL will be the basis for developing all future implementation actions, funding allocations, and regulatory actions. Throughout each stage of TMDL development and implementation, Ohio EPA must listen to the voices of stakeholders impacted by these future changes and community members whose drinking water supplies and recreational access to the lake are continually threatened by ongoing harmful algal blooms. A lack of response to public input disenfranchises communities, will hinder implementation of water quality improvements, and makes the TMDL vulnerable to legal challenges.**

**In June, Ohio EPA requested that public comments on phases 1&2 of the Maumee Nutrient TMDL development be submitted by July 9, a deadline that was later extended to August 9. In total, 36 letters and emails were submitted to Ohio EPA by individuals, organizations, and professional associations representing local governments, industries, and agriculture, advocacy groups, scientists, and other interested parties. Many of these letters pointed to significant flaws in the Maumee Nutrient TMDL process that will present barriers to the end goal of addressing HABs in the western basin and removing the impairment designations for drinking water and recreation. Resoundingly, stakeholders also expressed concern and frustration with what they view as inadequate public outreach efforts to date. The table below summarizes the main themes of the comments submitted for phases 1&2.**

Comments	Number of respondents (out of 36)
<b>Public involvement</b>	
<i>Inadequate public involvement process</i>	10
<i>Provide opportunities for interactive and meaningful public input</i>	9
<i>Info provided inadequate/difficult to understand</i>	8
<i>Provide written documentation rather than video as sole outreach</i>	5
<b>Parameters to include in analysis and TMDL</b>	
<i>Include sediment</i>	21
<i>All point/nonpoint nutrient sources and respective contributions</i>	10
<i>Dissolved reactive phosphorus</i>	10
<i>Nutrients from CAFOs/manure</i>	5
<i>Financial analysis of plant upgrades, BMPs, etc.</i>	3
<i>Climate change</i>	1
<i>Dredging</i>	1
<i>Nitrate</i>	1
<b>Other comments</b>	
<i>Will not address recreational impairment</i>	16
<i>Voluntary programs (e.g. H2Ohio) do not provide reasonable assurances/will not produce results</i>	8
<i>Need for accountability framework</i>	8
<i>Proportion of burden placed on municipalities/treatment plants is too high</i>	7
<i>TMDL should be developed as multi-state</i>	6
<i>Provide justification for impairment at low cyanobacterial density</i>	1

OEPA did not publish a response to the comments on phase 1&2 before proceeding to phase 3 of the TMDL Development process, releasing the draft loading analysis plan (LAP) for public comment. The phase 1&2 public comments were clearly not addressed in the draft LAP, which states only that “Stakeholder feedback from these modules have been considered in this LAP document and will be used to inform subsequent TMDL development.” (p 4) No explanation was given for which specific feedback was used to inform the LAP or how this feedback will inform future phases of development. (TMACOG)

**Comment 7:** In a joint letter to OEPA on October 7, TMACOG, Alliance for the Great Lakes, Freshwater Future, Lake Erie Foundation, and Environmental Law and Policy Center requested that Ohio EPA develop an equitable structure for meaningful public participation for the remaining phases of the Maumee Nutrient TMDL development. Below is a summary of this request

**1. Provide a written response document addressing phases 1&2 comments, explaining what stakeholder and public comments were incorporated into the draft LAP; what**

feedback will be addressed in this and future TMDL development phases; and the decision process and rationale used by Ohio EPA to determine what feedback will or will not influence the LAP and future TMDL development.

2. Publish transcripts of all previous and future video modules for which Ohio EPA is requesting comments TMDL Public Engagement

3. Improve draft documents and outreach materials for public comment. The public should be provided written documents that utilize techniques such as plain language, glossaries, and links to supporting information for each phase of TMDL development

4. Collaborate with local and regional organizations, schedule a series of webinars and targeted stakeholder meetings with workgroups, user groups, and stakeholders, including downstream communities and their residents across the Maumee River basin.

5. Ensure that all communities and sectors upstream, downstream, urban, and rural have equal opportunities and supportive materials to participate in the TMDL development process.

6. Provide adequate time between public meetings and comment due dates.

7. Provide an outline for when and how Ohio EPA will be developing both the preliminary and final Maumee TMDL Implementation Plans as required by Ohio Administrative Code 3745, Chapter 3745-2-12 (Attainment and Protection of Surface Water Quality Standards).

8. Hire a consulting firm specialized in equitable public engagement to coordinate the remainder of the public engagement for Maumee Nutrient TMDL process. (TMACOG)

**Comment 8:** The TMDL process must be coordinated with funding sources and other supporting groups and agencies, such as the Great Lakes Restoration Initiative.

The TMDL process should include input, expert support, and funding from the GLRI and include steps to review and incorporate as appropriate the findings of the GLAB, which is addressing these same issues on a parallel (but seemingly not coordinated) path. In particular, the GLAB has issued proposed findings and recommendations that would help Ohio EPA draft a TMDL that targets the right sources (such as legacy phosphorus) in the right areas. Given the role of legacy phosphorus and the need for wetlands restoration and sediment removal, the GLAB also recommends coordination for support and funding from the US Army Corps of Engineers. These types of collaborations will be critical in implementing a successful, scientifically sound and cost effective TMDL. (MWC)

**Comment 9:** It is critical that the TMDL process include input, expert support and funding from the many experts and organizations committed to improving Lake Erie, including the Great Lakes Restoration Initiative (GLRI). The TMDL documents must establish the steps Ohio EPA will take to review and incorporate as appropriate the findings of the GLAB, which is addressing these very critical issues through its Nutrient Workgroup. This work should also target all available funding mechanisms as well as action items proposed by GLAB's experts to ensure that the TMDL addresses the Lake Erie impairments in a scientifically sound and cost-effective manner. (OMA)

Response to comments on the TMDL development process:

Ohio EPA is following the TMDL development process per ORC 6111.562 (<https://codes.ohio.gov/ohio-revised-code/section-6111.562>), starting with the Loading Analysis Plan (LAP), which is Step 3 of Ohio EPA's new 5-step TMDL process. Ohio EPA used the modules 1-3 to set the background on Ohio EPA's new TMDL development process and summarize the pertinent work that led up to the development of the LAP. The intent of the outreach modules was to 1) provide background on Ohio EPA's TMDL process, 2) identify the information that Ohio EPA is using to form the basis for the TMDL's LAP, and 3) explain current implementation efforts already happening to address nutrient reduction. Ohio EPA has posted the modules 1, 2, and 3 presentations with the transcripts on the Agency's website and made videos with closed captioning available on Ohio EPA's YouTube channel.

Many of the comments received to date pertain to management decisions that are not addressed in the LAP. Ohio EPA acknowledges that most stakeholders are interested in the content of the Preliminary Modeling Results (Step 4), which will include the allocations and an implementation framework in the next step in this process.

The Agency acknowledges requests for additional stakeholder outreach and involvement. Ohio EPA has contracted with TetraTech to assist the Agency with planning and facilitating outreach events. In November, the Agency held listening session events with stakeholder groups. In December, the Agency began regular public webinars to provide updates on the TMDL project. The Agency is also planning additional stakeholder meetings and workgroups leading up to the draft Preliminary Modeling Results (Step 4).

Several commenters suggested the TMDL process should include input, support, and funding from many experts and organizations committed to improving Lake Erie. Ohio EPA coordinates regularly with federal and state partners on nutrient reduction efforts. This includes active participation on the Great Lakes Water Quality Agreement's Annex 4 Subcommittee on Nutrients, U.S. EPA's GLRI State Advisory board/State Forum, the Western Lake Erie Partnership, Great Lakes Executive Committee, and U.S. EPA's 319 Nonpoint Source Pollution Program. We are connected to ongoing research efforts including having an advisory role on Ohio's Harmful Algae Bloom (HAB) Research Initiative, U.S. Army Corps of Engineer's Engineer Research and Development Center HABS focused studies, and others.

## Comments on Documents Listed in the LAP

There were several comments on the lists of documents in the LAP that supported its development and have been suggested as resources for the Agency to consider as the TMDL is developed.

**Comment 10: There are eleven documents listed for the 'Study Plan' in Step One and four documents listed in Step Two. Other documents are listed in Project Outreach but appear not to be part of the decision making for the final plan. Why? Also, there is no listing of the TMDL's that have been performed in the Maumee and West Erie watersheds, and there is no listing of the nine element plans. Why? Also the ELPC/EWG study of CAFO's and manure in the Maumee watershed is not listed in outreach or anywhere else. Why? (LEW)**

**Comment 11:** As referenced from TMACOG’s comments: “OEPA states that the Maumee Nutrient TMDL builds on numerous other pieces that serve as the previous steps. Indeed, significant work has been done by many partners in research, state and federal government, but these studies themselves do not serve as previous steps in the TMDL process. The LAP does not provide a detailed explanation of how these documents are informing the development of the LAP and which specific elements from each document are being utilized.” (AGL, OEC, FWF)

**Comment 12:** Page 5 - OEPA also provides a list of documents that were referenced in stakeholder comments. However, OEPA has provided no explanation for how these documents and data sources will be incorporated into the LAP. Stakeholders who requested OEPA use these documents did so because they provide valuable data that identify the sources of NPS pollution and distinguish between several important sources of nutrients – manure, commercial fertilizer, legacy sources, dredge materials, and natural sources. A detailed summary of the contributions of each of these sources is vital to targeting future implementation actions including funding allocations and regulatory programs. OEPA’s LAP must detail the methods to compile these datasets so they can be built into the modeling that will determine load allocations for all point and non-point sources and will drive future implementation. (TMACOG)

Response to comments on documents listed in the LAP:

Documents listed in the introduction were those cited for the Study Plan (Step 1) and Alternative Biological and Water Quality Report (Step 2) – data collection and water body impairment assessment. This information built the basis that informed the need for the LAP (Step 3). The information from Steps 1 and 2 that inform the LAP include: identification of the waters that are impaired, where the reductions need to occur, and what the TMDL target should be to bring the impaired waters into attainment with water quality standards.

Ohio EPA received a considerable amount of feedback during outreach leading up to the public notice of the LAP. Documents submitted to the Agency associated with the outreach module 2 are listed in the Project Outreach section of the draft LAP. As mentioned in the draft, these documents will be used to inform subsequent steps in the TMDL process – Preliminary Modeling Results (Step 4) and Draft TMDL Report (Step 5). Ohio EPA included in the list of documents under Public Outreach those that were specifically referenced in comments. We have added the following from EWG and ELPC: “Manure From Unregulated Factory Farms Fuels Lake Erie’s Toxic Algae Blooms – Environmental Working Group and Environmental Law & Policy Center”.

Comments on Waters Included

There were several comments that conveyed concern about how Ohio EPA communicated the scope of the project, both the area where impairments exist and where reductions would be sought.

**Comment 13:** The strange process for the Maumee/Lake Erie TMDL continues to be convoluted and confusing. It is hard to know if what is being proposed is for the Ohio portion of the

**Maumee watershed, the Ohio portion of the Western Lake Erie watershed or both. It would be helpful to clearly define these in the future. (LEW)**

**Comment 14: Is this a Maumee TMDL as the Fact Sheet Title says or is it a Maumee/Western Lake Erie TMDL? The documents discuss near shore Lake Erie assessment units (which is not the Maumee as the Fact Sheet states) which are thought to be part of this TMDL. This is confusing and needs to be clarified. (LEW)**

**Comment 15: The assessment units HUCS boundary cannot be commented on because it cannot be determined what the HUC 8 boundary is from the documents provided. Also, Maumee Bay is neither in Lake Erie nor in the Maumee River watershed, and is not listed or defined in the Lake Erie Assessment Legend or the Maumee Assessment Legend. How is Maumee Bay assessment being considered and where is the description etc.? The description discusses far field sources. Is this to assume that near field sources are not part of this TMDL? Another wards, this TMDL is only for the Maumee watershed, far field sources? (LEW)**

**Comment 16: The City of Toledo does not have a comment on the assessment units other than there is no clear description in the LAP of what those unit are, other than by reference to other documents. (City of Toledo)**

**Comment 17: Page 4 of the Draft LAP references seven 8-digit hydrologic unit codes (HUCs). EPA did not find these seven HUCs identified in the Draft LAP. EPA suggests that the HUCs could be included on Figure 1 and add a statement referencing Figure 1 to the sentence referencing the HUCs on page 4 of the Draft LAP. (U.S. EPA Region 5)**

**Comment 18: Page 5-6 – TMACOG has no comments on the assessment units chosen for analysis. However, in the interest of providing a descriptive, self-contained document that can be easily understood by stakeholders without the need to search through separate documents, TMACOG requests that OEPA summarize the rationale and methods used for delineating these assessment units within the LAP document itself, rather than simply referring to other documents. (TMACOG)**

**Comment 19: “The Targets document provides spring season load targets for other Western Basin of Lake Erie tributaries. The Targets document explains that these targets are to address the HABs in the mouths of these tributaries and, “adjacent nearshore water”. This Maumee Watershed Nutrient TMDL is focused on addressing the three impaired Lake Erie assessment units outlined above in this document. Therefore, this project is focused on the phosphorus load exclusively from the Maumee River watershed and does not include other priority tributaries in Ohio. Actions to address targets for the other tributaries are outlined in the Ohio Domestic Action Plan.”**

**This statement is disappointing but understandable. However, we must encourage language that prevents manure spreaders from leaving the Maumee watershed and**

**spreading Maumee manure in adjacent watershed (Portage and Sandusky River Watersheds, for example). (Reutter)**

Response to comments on waters included:

Ohio EPA has revised the final LAP to make the connection between the waters that are impaired (three Lake Erie assessment units) and the waters where the reductions will be allocated (the seven 8-digit HUCs that make up the Maumee Watershed).

There was also a concern raised that the geographic scope of the project, being limited to the Maumee Watershed, may move potential pollutants into adjacent watersheds. Nearfield TMDLs exist for many adjacent watersheds, including the Portage and Sandusky watersheds, that already require nutrient reductions from nonpoint sources.

Comments on Target Selection

There were several comments on the targets that were identified in the LAP.

**Comment 20:** The development and the inclusion of a phosphorous target for the region downstream of the Waterville Monitoring station and the terminus of the Maumee River is a fine addition to the plan. The inclusion will be able to include phosphorous (TP and DRP) /nitrogen (TN) excursions from the various point sources (PS) and non-point sources (NPS) into the lower watershed. This action is heartily encouraged following the information about the Maumee STP. The use of calculated versus measured phosphorous readings should be thoroughly vetted. My colleagues have recommended a solar powered monitoring station located at Grassy Island or at the Coast Guard station close to Cullen Bay.

A prerequisite for the 'target' is a margin of safety as discussed earlier. This is vital to reflect the uncertainty of the available information used in the decision-making. That adjustment factor will be controlled by the degree of certainty of the data. Also, the incorporation of self- effectuating contingency measures will be necessary for the TMDL. Therefore, the development of a list of contingency measures, the establishment of RFP milestones should be part of the targets in the LAP. Likewise, the same will need to be evaluated as any measure. (Hess)

**Comment 21:** "To include the area downstream of Waterville in this TMDL's target, the Annex 4's total phosphorus target must be extrapolated. The Targets document noted that the 860 metric tons target for Waterville is "approximately a 40% reduction" from the 2008 baseline spring season used for target calculations. The exact load at Waterville for the 2008 spring season is 1,414.1 metric tons (National Center for Water Quality Research, personal communication, 2020). The 860 metric tons target is a 39.2% reduction from that baseline. Ohio EPA utilized nutrient mass balance methods, discussed in the section above and documented in Ohio Lake Erie Commission, 2020a (see Appendix A), to determine that the load downstream of Waterville in the 2008 season contributed an additional 89.5 metric tons. This equates to a combined full Maumee 2008 spring season load of 1503.6 metric tons. Applying the 39.2% reduction

from the Targets document results in a full Maumee watershed total phosphorus target of 914.4 metric tons.”

It is incorrect to say that the Annex 4 targets were a 40% reduction. The Annex 4 targets were spring loads of 860 MT TP and 186 MT DRP and spring FWMC of 0.23 mg/l TP and 0.05 mg/l DRP. Those numbers turned out to be approximately 40% reductions from the load and FWMC of 2008. I was the US Co-Chair of the Annex 4 Objectives and Targets Task Team, and we used the 40% number to describe the targets and help non scientists understand, and to help everyone understand how much the load needed to be reduced.

2008 was selected as the base year because we had good basin-wide data from that year, and because it was a very wet spring. If my memory is correct, the Maumee discharge from 2008 had only been exceeded on two occasions over the 20-year period ending with 2014. That meant that if we could get the 2008 load and FWMC down enough to produce a bloom that looked like 2004 or 2012, we should be able to do it 90% of the time.

The mass balance description of loads, and including the area downstream from Waterville, is exactly what the Annex 4 group did and exactly how loads have been calculated by USEPA from the Maumee and all tributaries feeding into the Great Lakes, going back to the setting of our targets in the 1970s. For years these estimates were calculated by David Dolan for all of the Great Lakes. After his death, the Annex 4 group worked with Matt Maccoux and Russell Kreis to update Dolan’s estimates to 2013 with assistance from USEPA and Environment and Climate Change Canada.

It is also important to note that DRP loads from the Maumee River are driving Western Basin HABs. Those loads have increased significantly since 1995. When determining how the 40% reduction should be applied to the area below Waterville, it is important to note that loads from that area are likely to have gone down since the mid-90s due to improvements in sewage treatment plants, reductions in CSOs, storm water separation and reduction plans, etc. It is the loads upstream from Waterville that have increased. The activities that have already occurred to reduce loads below Waterville should reduce or eliminate the need for a 40% reduction in that area.  
(Reutter)

**Comment 22:** Areas downstream of the Waterville sampling point should be analyzed using a nearfield TMDL approach rather than the farfield mass balance approach applied to upstream areas. OEPA acknowledges the infeasibility of using the Waterville sampling point to track progress of implementation actions downstream of the Waterville sampling point. The agency also acknowledges the urbanized land use and large number of POTWs that begin at this same point. OEPA plans to include the area downstream of Waterville in the farfield TMDL but has not illustrated a justifiable modeling approach for these mostly urban areas and has not shown how the agency will track progress toward meeting these load reductions.

Rather than apply a farfield load analysis to watersheds that cannot be assessed and monitored using the same methods as the upstream portion of the watershed, TMACOG recommends that OEPA build upon the existing near-field TMDL process for the HUC 12s downstream of the Waterville sampling point. NPDES permit holders in this portion of the watershed already are meeting effluent limits based on wasteload allocations in existing nearfield TMDLs. Each of the watersheds downstream of Waterville either has a completed nearfield TMDL or has had water quality data collected and analyzed at a much finer scale to justify utilizing a nearfield approach over the much coarser scale farfield approach. Using the existing nearfield TMDL process downstream of Waterville allow OEPA to more accurately assign wasteload allocations to the vast majority of NPDES permit holders (wastewater and MS4) in the Maumee watershed and will avoid holding downstream wastewater and stormwater ratepayers responsible for reducing P loads attributable to upstream NPS.

The LAP makes several statements that support the need to use a nearfield TMDL approach for the watersheds downstream of Waterville-

- “Tracking of nutrient reduction progress will not be accomplished through modeling, rather measured through continuous monitoring by USGS and Heidelberg University’s National Center for Water Quality Research (NCWQR) through the Lake Erie Tributary Monitoring Network” (p. 9)
- “It is impractical to monitor continuous loads on the Maumee River further downstream of the Waterville location due to backwater conditions from Lake Erie’s Maumee Bay. The measurements of load at Waterville will always be extremely important for tracking nutrients being delivered to Lake Erie from the Maumee River. It is also important, however, to account for the nutrient load being contributed to the Maumee River downstream of Waterville, to the mouth of the Maumee at the start of the Maumee Bay, in this TMDL.” (p. 11)
- “Note that the watershed downstream of Waterville, which includes most of the greater Toledo metro area, is far denser in urban and natural land uses than upstream of Waterville. Not shown on Figure 3, but to be included in the next TMDL project document, a denser presence of large municipal wastewater treatment plants also exists downstream of Waterville.” (p. 11) (TMACOG)

Response to comments on target selection:

Ohio EPA has coordinated with the Great Lake National Program Office to identify the targets expressed in the LAP. The Annex 4 Subcommittee’s U.S. Co-chair confirmed to Ohio EPA, in an email sent to Paul Gledhill on Aug. 10, 2020, that the Lake Erie HAB target for the Maumee River of 860 metric tons of total phosphorus applies at the Waterville monitoring station. Regarding the dissolved reactive phosphorus (DRP) targets, the final LAP contains additional material about the nature of DRP and how the project will address this portion of total phosphorus (TP).

Ohio EPA accounts for watershed areas downstream of monitoring “pour points” in our Nutrient Mass Balance Reports. This method includes summing the 1) monitored point source nutrients, 2) calculated nonpoint source based on drainage area load yield determined from the upstream monitored area and 3) calculated home sewage treatment systems load. The far-field targets work presented in Ohio’s 2020

Domestic Action Plan augmented this method by differentiating the land use types of nonpoint source to improve the quality of the calculated nonpoint source load. These methods will be used for calculations and reduction tracking outlined in the TMDL. Further improvements will be outlined utilizing the tributary monitoring network throughout the Maumee. This network includes a station in the suburban Wolf Creek watershed. Further details will be explained in the next stage of the TMDL project, the Preliminary Modeling Results.

Ohio EPA is not aware of details regarding potential monitoring at Grassy Island. If this data becomes available, it could also be evaluated.

## Comment on Phosphorus as a Conservative Pollutant

**Comment 23: The Assumption of Conservative Phosphorus Loading Needs to be Evaluated. The Loading Analysis Plan includes the assumption that “the transport of phosphorus loads through the Maumee watershed to Lake Erie in the springtime is assumed to be conservative, i.e., no phosphorus is removed from within the system.” However, it does not appear that there is an adequate foundation for this assumption, and evidence actually supports the opposite conclusion. The Great Lakes Advisory Board’s Nutrient Workgroup concluded that “investments in larger nutrient reduction projects located within lower watershed tributaries and/or adjacent to receiving water bodies will result in increased nutrient (excess P) removal at a lower cost when compared to multiple smaller projects in the upper watershed.”<sup>5</sup> Further, the contribution of streambank erosion and river bed resuspension are two important processes that must be considered, along with delivery ratios from land parcels to loadings at the Maumee River mouth. AOMWA requests that Ohio EPA provide the research, documentation, or other support for its conclusion that no phosphorus is removed from the system. (AOWMA)**

### Response:

Clarifying information regarding the conservative assumptions in the mass balance methods have been added to the LAP’s model selection section and in a new Dissolved Reactive Phosphorus appendix (see the subsection titled “Uncertainty of modeling DRP”). This material explains that sources and sinks of phosphorus throughout the watershed are captured in via this method since it is based on observed monitoring data near the outlet of the watershed.

## Comments on Total Phosphorus vs. Dissolved Reactive Phosphorus (DRP)

There were several comments on using total phosphorus to calculate the TMDL vs. DRP.

**Comment 24: Using only TP and not DRP is a huge mistake. When we developed the targets for Annex 4 a big portion of the discussion was over whether we needed to include TP. There was complete agreement that DRP was by far the most important component, and increases in DRP loading were driving HABs. We ultimately decided to also include**

a TP target because one of the three models we were using to predict HABs indicated that we couldn't accomplish the goal with only reductions in DRP. As a result, and to be safe, the targets from Annex 4, that both countries agreed to in February 2016, have targets for both TP and DRP, and both targets must be met to achieve blooms that look like 2004 or 2012, or smaller, nine years out of ten. Achieving only the TP goal will not produce those results.

In the five years since 2016, modelers have moved over to forecasting blooms based on bioavailable phosphorus (BAP), and it is very easy to develop BAP targets for the Maumee that comply with the Annex 4 targets. To quickly summarize,  $TP = PP + DRP$ , or  $860 = 674 + 186$ .  $BAP = 0.08(PP) + DRP$ , or  $240 = 54 + 186$ . You will still need to measure TP to address annual loading to the Central Basin and the Dead Zone and to calculate PP, but basing your target on BAP would be a wise move.

Note that the HAB in the Western Basin is fueled by only 8% of the particulate phosphorus (PP). Because DRP is so important, but only 21% of TP, and because controlling erosion and reducing PP is much easier than reducing DRP, it would be very easy to reach a 40% reduction in TP (860) by reducing only PP to 550, have no reductions in DRP (310), and end up with a BAP load =  $0.08(550) + 310 = 354$ . A BAP of 354 would produce a HAB similar to 2019. The Toledo Water Crisis was in 2014 from a HAB smaller than 2019. (Reutter)

**Comment 25:** No comment other than the City of Toledo questions doing a TMDL study using only Total P and without DRP. (City of Toledo)

**Comment 26:** We also understand that OEPA is basing its analysis on total phosphorus, not dissolved reactive phosphorus. While this is consistent with H2Ohio, it should be noted that Lake Erie's blooms are driven by DRP. We strongly feel that a clearer understanding and measurement of DRP be included in the TMDL. (LEF)

**Comment 27:** The use of the total and dissolved phosphorus targets listed in Annex 4 should be used in this TMDL. The assumption by Ohio EPA that the downstream Maumee load from Waterville must be extrapolated is simply wrong. As example is the 2018 green Maumee River that experienced a large algal bloom in the Maumee River in Toledo. This bloom blew in from Lake Erie via Maumee Bay into the River. Clearly that bloom was not caused by a bloom in the river itself. Likewise in 2019, the algae blew into McHenry ditch in Oregon and went into a swale where the bikeway for Maumee Bay State Park is located. That too was Maumee Bay Lake Erie winds carrying the algae inland.

Ohio EPA is not considering the seiche effect downstream of Waterville as part of its calculation. It appears that the extra over 50 tons Ohio EPA proposes to add to this TMDL is calculated by Annex 4 as part of the phosphorus load for Western Lake Erie. The loads determined by Annex 4 were from data and monitoring, not point sources or other estimates Ohio EPA is using for this downstream alleged load. And data from the Cuyahoga is showing that phosphorus concentrations from point sources after heavy rains decreases. Where in the Maumee, monitoring at Waterville shows increases in phosphorus after heavy rains.

Creating a new target that adds 54.4 metric tons of phosphorus downstream of Waterville has no scientific monitoring data to justify this addition and should not be used. Downstream phosphorus from Waterville is already part of the Western Basin phosphorus load. Arbitrarily adding 54.4 metric tons of phosphorus which is not based on monitoring data, and that adds a speculative phosphorus load calculation should not be used.

Instead, a phosphorus standard should be determined for attainment for the Maumee River and its tributaries that is determined by the Annex 4 Committee of the GLWQA. (LEW)

**Comment 28:** Targets must include dissolved phosphorus. The restoration targets should be determined by Michigan, Indiana and Ohio with USEPA approval to have consistent targets, measurements and attainment. Restoration targets need to include source reductions not just Best Management Practices. Attainment targets should include having soils meet the agronomic P rate with the process identified in NRCS 590 standards for impaired watersheds. (LEW)

**Comment 29:** DRP Should Be Used to Develop Allocations. The Agency has acknowledged that Dissolved Reactive Phosphorus must be addressed to make progress in restoring attainment of designated uses in the Western Lake Erie Basin. Before management practices are recommended in the implementation strategy, there must be consideration of how well those management practices perform in terms of reducing DRP loads (TP loads have declined and are holding steady, however, DRP loads are increasing). (AOWMA)

**Comment 30:** The concerns that the City of Toledo has are not reflected in the questions listed above. Specifically, the city questions why the OEPA will conduct research on Total Phosphorus (TP) to come up with a solution to reduce algal blooms when in actuality it is Dissolved Reactive Phosphorus (DRP) that contributes to the blooms. This is especially troubling when considering that the OEPA has stated that there is not currently a good scientific way to either measure dissolved phosphorus for the study and they do not quantify how they will determine DRP levels from TP results so that a TMDL for TP would actually reduce the TRP. The Great Lakes Water Quality Agreement-Annex 4 mentions the use of objectives and targets based on soluble reactive phosphorus. In addition, the study is said to focus on NPS contribution but that eventually the TMDL recommendations will be for both point-source and non-point source, even though 90% of TP comes from non-point sources. Specifically, for the City of Toledo, most of the city is downstream from where all of the data sample points are and there is no provision on how to assign a TMDL for an area that was not included in the sampling. (City of Toledo)

**Comment 31:** On balance, however, the LAP demonstrates that the Maumee Watershed TMDL will not accomplish the goal of remediating harmful algal blooms ("HABs") in Lake Erie for the following reasons:

The LAP fails to account for dissolved reactive phosphorus. The LAP does not explain how the TMDL will address the pollutant primarily responsible for the impairment to Lake Erie: dissolved reactive phosphorus (“DRP”).

As the Agency knows, total phosphorus is comprised of both particulate phosphorus (“PP”) and DRP. DRP drives harmful algal blooms because it is bioavailable and suspended in the water column. Dissolved reactive phosphorus can be taken up by blue-green microcystic algae more readily than particulate phosphorus. DRP is what drives algal blooms, so the LAP and TMDL must include a specific accounting of DRP in the TP load setting and allocation. There is now scientific consensus that the pollutant driving western Lake Erie’s harmful algal blooms is dissolved reactive phosphorus. The Task Team that set the Annex 4 targets recognized this fact and it is apparent from water testing data. Although total phosphorus flowing into western Lake Erie has stayed largely constant, DRP has risen substantially, coinciding with the emergence of the HAB crisis. Because DRP remains a small relative share of total phosphorus, even substantial reductions in total phosphorus do not guarantee meaningful reductions in bioavailable DRP. That is particularly true because some best management practices that reduce total phosphorus increase DRP.

The LAP nonetheless states that the TMDL will focus solely on total P without differentiating between particulate and dissolved phosphorus, meaning no cap will be placed specifically on DRP. The reasons the Agency provides for not focusing on DRP loads in this LAP and TMDL are inadequately explained and inconsistent with sound science. The Agency argues that “[t]he non-conservative nature of DRP means DRP loads are nearly impossible to track using the modeling methods proposed in this LAP.” As an initial matter, OEPA can freely change its modeling methods in order to comply with the Clean Water Act and prepare an appropriate TMDL.

Moreover, the Agency does not explain why its nutrient mass balance and SWAT model plan cannot track DRP. Both models can readily incorporate data for DRP loading and other variables to accurately model DRP loads to Lake Erie. There is nothing inherent in either model that prevents the incorporation of DRP data. The nutrient mass balance load calculation is represented by the following:

$$\text{Total Load} = \text{NPDES} + \text{HSTS} + \text{NPSupst} + \text{NPSdst} \quad (1)$$

In turn, the load for each category of source in the equation derived from P concentration and discharge. The water sampling stations that EPA proposes to use, including the Waterville station, can readily provide sample measurements of DRP. Further, OEPA can, and should, design a model that accurately captures DRP loading measurements among permitted entities for incorporation into the model. There is no reason why the variables in this load model cannot be assigned DRP measurements consistent with the approaches and strategies used in developing the Task Team Report of Annex 4.

Similarly, the Soil and Water Assessment Tool is as good as the data it is supplied with. Studies have used SWAT to measure DRP – from tile drains, groundwater leaching, and from surface runoff – and there is no reason that OEPA cannot draw on the

present science to tailor these models to track and allocate DRP loads among existing sources. The Agency's conclusory statements that tracking DRP is "impossible" are belied by numerous studies that use the Agency's proposed model to track DRP. DRP must be specifically accounted for in this TMDL's calculation, ignoring it will cause this TMDL to fail. (ELPC)

**Comment 32:** Add Dissolved Reactive Phosphorus (DRP) milestones, timelines, and acknowledgment within TMDL document and monitoring and reporting processes. Since Flow Weighted Mean Concentration (FWMC) sampling will be a component of the TMDL monitoring efforts (FWMC x discharge = load), OEPA will have robust FWMC data regarding both TP and DRP. OEPA should commit to a timeline and milestones in the Maumee TMDL to engage in adaptive management based on FWMC numbers and trends for DRP. This will formalize OEPA's commitment in the LAP to addressing DRP over the life of the TMDL.

- OEPA is planning to base its TMDL loading analysis, load allocations, and implementation actions on total phosphorus (TP.) 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/pollutants 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. If OEPA doesn't have the resources to include DRP at present, they should include in this TMDL 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.
- As referenced from ELPC's comments: Bring the LAP in line with the Annex 4 of the Great Lakes Water Quality Agreement. This LAP must incorporate FWMC concentrations of DRP pollution at the outset and strengthen these FWMC goals to account for climate change. (AGL, OEC, FWF)

**Comment 33:** The TMDL should account for the role that dissolved reactive phosphorus (DRP) has in non-attainment of the designated uses in the Western Lake Erie Basin (WLEB).

The Great Lakes Water Quality Agreement (GLWQA) targets include loadings for total phosphorus (TP) and dissolved reactive phosphorus ("DRP") (page 10). However, in the LAP module, Ohio EPA states:

*"Only total phosphorus will be used to develop allocations in this initial TMDL. Dissolved reactive phosphorus (DRP) is a subset of total phosphorus; it is the part that*

*is most available for algae to use because it is not bound to solids. The non-conservative nature of DRP means DRP loads are nearly impossible to track using the modeling methods proposed in this LAP. This fact, combined with the limited ability of other models to effectively represent key pathways for DRP movement, forces Ohio to continue to follow the adaptive implementation approach set out in Ohio's Domestic Action Plan (Ohio Lake Erie Commission, 2020a)."* (Page 13.)

Although the process of tracking and modeling DRP is not without challenges, failing to substantively address it in the Preliminary Modeling Report and subsequent TMDL is a recipe for disaster. Ohio EPA (and the stakeholders) should develop a prospectus that clearly defines how the adaptive management process will account for DRP and other related issues. The science clearly indicates that focusing solely on TP reductions will almost certainly not address the nutrient-caused impairments, because the data shows that harmful algal blooms (HABs) have increased at the same time that TP loads first decreased and are now stable (See Attachment 2). By contrast, the increasing load of DRP—which is far more bioavailable to algae—in the WLEB is positively correlated with the increase in algal blooms. The TMDL evaluation must focus on changes in recent decades, including DRP, that are correlated with the observed increase in frequency and severity of HABs in the WLEB. (MWC)

- Comment 34:** Dissolved Reactive Phosphorus (DRP) load allocations should be included in the Loading Analysis Plan. We acknowledge that there are many unknowns regarding the pathways of DRP. However, DRP is the primary driver for the impairments the TMDL is intended to address. During the October 5 webinar, the agency stated that the reason for not addressing DRP is because there is not a good way to track it. It is not clear what was intended by this comment. The rationale about tracking is further confused by the statement on page 9 of the LAP that tracking of nutrient reduction progress will be accomplished through monitoring. Allocation of DRP loads will be necessary for the finer scale hydrologic planning that will come with future phases of the TMDL and subsequent implementation planning. The omission of DRP ignores the significant modelling and analysis conducted by the Annex 4 Task Team. The Annex 4 Task Team report states that reductions to DRP will be more efficient at reducing bioavailable phosphorus and recommends that BMPs focusing on DRP be given a higher priority. (NWF, OCF)
- Comment 35:** Furthermore, we recommend Ohio EPA develop load allocations using bioavailable phosphorus, the metric used by NOAA, Heidelberg University and other partners in the Lake Erie HAB seasonal forecast. Alignment of metrics used by partners can advance the public's understanding of the different products issued by different agencies and partners. (NWF, OCF)
- Comment 36:** Similarly, we believe the agency is missing an opportunity to incorporate the Flow Weighted Mean Concentration (FWMC) into the analysis plan. We understand that TMDLs are load based planning tools and that a concentration value is not a load. Yet the agency states on page 10 of the plan that FWMC are a helpful addition to the load target. This is a major oversight not to include FWMC in some manner, particularly in

light of the omission of DRP. The agency demonstrated its ability for developing new approaches with the far-field construct as well as the development of the methodology for determining attainment status for the nearshore and open waters of Lake Erie. The attainment methodology incorporated innovative approaches for a waterbody that had no precedent in attainment analysis for determining impairment. And while these new methodologies are not the same as a loading analysis, we believe the agency has the ability to adapt and incorporate new components into the TMDL. (NWF, OCF)

**Comment 37:** “Ohio EPA’s Nutrient Mass Balance study (Ohio EPA, 2018c and 2020) identifies that the largest sources of nutrient pollution in the Maumee watershed are from diffuse/nonpoint sources. Further, the springtime loading period of concern for the Western Basin of Lake Erie is generally when flows are high and biological activity is lower than the summertime low-flow period, reducing the impact of assimilative capacity from algal growth. Therefore, the transport of phosphorus loads through the Maumee watershed to Lake Erie in the springtime is assumed to be conservative, i.e., no phosphorus is removed from within the system (U.S. EPA 2018). Note that recent research findings in the Maumee watershed system that dissolved forms of phosphorus are sorbed to suspended particulates during high flow events (King, 2020) does not change this assumption. This TMDL effort is calculating total phosphorus rather than separating dissolved and particulate forms of the nutrient. The dynamics described in King, 2020 will have no, or very little, net change on total phosphorus.”

This statement from page 8 does not convince me that a focus on just Total Phosphorus (TP, where  $TP = DRP + \text{Particulate P [PP]}$ ) is good enough. The Annex 4 Task Team spent much time discussing this and concluded that we needed to focus on both TP and Dissolved Phosphorus (DRP), and if we were only going to do one, it would be DRP. The current model used by Dr. Rick Stumpf (NOAA) to predict bloom severity uses the spring bioavailable P (BAP) load, where  $BAP = DRP + 0.08(PP)$ . That clearly demonstrates the importance of DRP loads as measured at Waterville, for Dr. Stumpf’s model uses only 8% of the PP load.

Leaving DRP loading out (the main focus of the Annex 4 recommendations) because some of it may be sorbed to sediment particles, and including only TP while we understand that approximately 80% of TP is PP, is an example of working to eliminate one possible error while committing a second much larger error. Furthermore, it would be very wrong to eliminate DRP because some is absorbed to soil particles and include only TP when we know that some PP is lost as it settles to the bottom in the river and as it enters Lake Erie.

We cannot solve the HAB problem in the Western Basin of Lake Erie without reducing DRP. I believe we could come up with a very reasonable solution to your dilemma by getting a small, knowledgeable group of us together for a day to discuss this. I am willing to serve and can suggest others. My confidence in making this statement is increased when I review the figure (pasted below) from OEPA created during Governor Kasich’s failed Executive Order. The DRP values are all very reasonable and

**explainable. My proposed team of scientists could also help you address the issue of correctly blending point and nonpoint sources. (Reutter)**

**Comment 38: Dissolved reactive phosphorus should be included in modeling, restorations targets, and load allocations**

- **Page 13 – OEPA only intends to use total phosphorus to develop P load allocations. Because Lake Erie’s algal blooms are driven primarily by dissolved reactive phosphorus (DRP), the Maumee Nutrient TMDL must account for the relative contributions of DRP and particulate phosphorus and target TMDL load reductions and implementation actions accordingly. Comments separately submitted in phase 1&2 by TMACOG and nine other interested parties, cite numerous reports that provide justification for addressing DRP in this TMDL.**
- **Page 13 states “TMDLs are living documents, therefore this project can be updated to address DRP once research and science has evolved.” As referenced in comments from Alliance for the Great Lakes, Ohio Environmental Council and Freshwater Future, since FWMC data will be a component of the TMDL monitoring efforts ( $FWMC \times flow = load$ ), OEPA will have abundant and regular information regarding both FWMC for TP and DRP. OEPA should commit to a timeline and milestones in this TMDL to engage in adaptive management based on FWMC numbers and trends. The final LAP should include a plan with goals, timelines, and milestones for including DRP in the TMDL including the following –**
  - **Identify the research partners who will review existing research and identify research/data gaps**
  - **Develop and immediately fund research that will provide the data needed to include DRP in the TMDL.**
  - **Define what is considered adequate research and data availability to trigger including DRP in the TMDL.**
- **Refer to comments submitted by ELPC and the joint comments of the Alliance for the Great lakes, Ohio Environmental Council, and Freshwater Future to extended discussion of the necessity for including DRP. (TMACOG)**

Response to comments on using total phosphorus vs. DRP:

The state of Ohio is committed to the DRP reduction targets for the Maumee River watershed and has updated the LAP with additional DRP analysis. This includes a new appendix specifically on this subject. To develop the appendix Ohio EPA reached out to researchers and government agency specialists to help refine our understanding of technical issues that impact management decisions about DRP in the TMDL process. The new appendix explains how DRP load increases brought about the annual HABS causing impairments to Lake Erie and explains the state of science concerning DRP exports from upland areas, phosphorus cycling in stream networks, and the capabilities to model these dynamics.

Ohio EPA is committed to providing detailed source assessments of DRP in the next step of this TMDL project. Most importantly, this work will be used to direct nutrient reduction implementation actions to activities that address DRP most efficiently. Further development of implementation and management decisions to select what these actions are will be developed in the Preliminary Modeling Results, the

next step in the TMDL process. Ohio EPA has also committed to using the extensive water quality data collected in the watershed, tracking both total and dissolved reactive phosphorus, to ensure that DRP targets are met.

## Comments on Inclusion of Flow-weighted Mean Concentration (FWMC)

There were several comments on including the FWMC as a component of the TMDL.

**Comment 39:** “The Targets document explains total and dissolved reactive phosphorus load targets for the Maumee River to the Waterville, Ohio monitoring point of 860 and 186 metric tons, respectively, for this spring loading period. These target loads are expected to result in Western Basin of Lake Erie HAB blooms at or equal to the blooms observed in 2004 or 2012, which are considered years with acceptable sized blooms, 90% of the time. With targets framed in this manner, they are translated to be met in nine out of ten years. Flow weighted mean concentrations that corresponded to these loading targets are also provided in the Targets document for the Maumee River. These are 0.23 and 0.05 mg/L for total phosphorus and dissolved reactive phosphorus, respectively. These concentration targets provide a benchmark to track progress of load reduction. Flow weighted means are used instead of standard concentrations as this statistic is less sensitive to stream flow fluctuations. This is a helpful addition to the load targets especially during spring seasons that may be a great deal wetter or dryer than the norm. **TMDLs are inherently load based planning tools, therefore the concentrations outlined in the Targets document will not be included in this TMDL project’s calculations.** The concentration targets are, however, included in the Ohio Domestic Action Plan.”

This section is from pages 9 and 10. The section in red is a big problem. All TMDL’s do not have to be the same. We are working to address targets set by the Annex 4 Task Team with this TMDL, and that Task Team told us how to monitor our progress. The Task Team also demonstrated that using the 0.23 mg/l TP and 0.05 mg/l DRP concentrations as targets would produce blooms that were smaller than 2004 or 2012 during low flow years. We have information about this watershed that is not available for any other watershed in the world. We must not disregard what we know about this watershed and make it look like watersheds for which less information is available. This TMDL must utilize all of the information available and become a model for large TMDL’s in other locations. Furthermore, if you measure loads and know the discharge volumes, calculating FWMC is simple. (Reutter)

**Comment 40:** The LAP is not in line with Ohio’s commitments under Annex 4. Pursuant to Annex 4 of the Great Lakes Water Quality Agreement, Ohio committed to reduce DRP to a flow-weighted mean concentration (“FWMC”) of 0.05mg/L. The Task Team found this concentration would ensure that the annual HAB would be no larger than the 2004 and 2012 bloom 90% of the time. The LAP, however, states that the TMDL will not incorporate the agreed-to Annex 4 FWMC target in TMDL calculations. The OEPA’s LAP states “TMDLs are inherently load based planning tools, therefore the concentration outlined in the Targets document will not be included in this TMDL project’s calculations.” This statement is concerning

**because a P load is inherently the product of the phosphorus concentration and the rate of discharge; and we know the minimum concentration necessary to achieve water quality restoration based on scientific recommendations in Annex 4. The FWMC in the targets document is based on the work of numerous experts and is the bare minimum concentration required to restore the water quality of Lake Erie assuming that there is no increase in the rate of discharge. The Target FWMC provides OEPA with guidance, but the Agency will need to adapt the FWMC to account for increases in the rate of discharge in the coming decade. This increase in discharge is a result of climate change increasing the frequency and severity of storms. The fact that TMDLs are planning tools actually increases the need to incorporate the Annex 4 FWMCs as a baseline and tighten the concentration requirements based on the projected rate of discharge in the future. The decision to not include FWMC targets for DRP in the TMDL project's calculations ignores what Ohio, researchers and the parties to Annex 4 have all agreed is necessary to remediate HABs in Lake Erie. (ELPC)**

**Comment 41: Overall, there should be close alignment with the Annex 4 targets including DRP and FWMCs. Ohio has repeatedly committed to these targets and it is remiss not to utilize the TMDL program to advance progress towards this commitment. More than simply meeting target goals, TMDLs are intended to provide a path towards moving a waterbody from impairment status to attainment. Integrating the Maumee Nutrient TMDL with the Annex 4 targets provide the opportunity for development of reasonable assurances required by the TMDL program that will result in the most efficient and effective path towards nutrient reduction. (NWF, OCF)**

Response to comments on the inclusion of the FWMC:

The Annex 4 recommended phosphorus loading targets document includes FWMC as they “provide a useful means to address inter-annual variability by normalizing the phosphorus delivery from a tributary with respect to flow, so that year-to-year performance is not confounded by inter-annual variability in hydrology.” The document also notes that, “Because discharge varies considerably from year to year, and because the discharge of the Maumee River was so large in 2008 that it has only been exceeded about 10 percent of the time in the last 20+ years, the Task Team expects that achieving a FWMC of 0.23 mg/L for TP and 0.05 mg/L for DRP will result in phosphorus loads below the targets (860 and 186 metric tons) 90 percent of the time (nine years out of 10), if precipitation patterns do not change.”

These statements highlight the relationship between the FWMC's and loading targets developed in the target document. Using loading targets is protective where a changing climate results in greater stream discharge. This does not change the importance of the FWMC as a valuable tool to track progress. For example, FWMC is one of the parameters used to evaluate progress in the Ohio Lake Erie Commission's annual water monitoring fact sheet. This type of tracking is one option to consider for informing adaptive implementation. Additional information on tracking progress will be included in the subsequent stages of the TMDL development.

## Comment on Target for Central Basin for Hypoxia

**Comment 42:** When we consider the spring load reduction target for the Maumee (the focus of this TMDL), we must also remember that the Dead Zone target for the Central Basin of Lake Erie is a 40% TP annual reduction—a total load of about 6,000 MT annually. We can't become so narrowly focused on the spring reduction that we forget that the Maumee is also the largest contributor of TP to the Central Basin, and make the Central Basin problem worse. See note below.

- “The Targets document also includes annual phosphorus loading targets to reduce seasonal hypoxia in the Central Basin of Lake Erie. Ohio currently does not have beneficial use impairments for seasonal hypoxia in the Central Basin. While nutrient reductions that occur in the Maumee watershed due to this TMDL will help in working towards hypoxia targets, because there is no impairment present, this TMDL is not explicitly addressing these targets.”

This statement from page 11 is a problem. The fact that we do not have an impairment designation for the Dead Zone is a critical weakness. From 4-7 September 2021 there was an upwelling event east of Cleveland, Ohio that extended over 20 miles, killed thousands of fish, littered the beaches with dead fish, released huge amounts of methane to the atmosphere, created a terrible odor, and sent high concentrations of dissolved manganese to the local water treatment plants—a health hazard. (Reutter)

### Response:

The Clean Water Act requires TMDLs to be developed for waterbodies impaired on a state's 303(d) list. At this time there are no impairments listed for Ohio's Central Basin Lake Erie Assessment Units due to hypoxia.

Furthermore, in 2021 Annex 4 held a series of webinars and an all-day workshop addressing the unknowns of Lake Erie Central Basin hypoxia. This work explored the existing state of knowledge of this phenomenon, which has changed a great deal since the 2015 targets document. A compilation document of this effort is expected in early 2022, but in short, emerging science may call for a reevaluation in the linkage between nutrient loads and Lake Erie hypoxia. It is expected that the Adapted Management Task Team of Annex 4 will take up this issue in the near future.

## Comments on Critical Period

There were several comments about what the critical period was to address HABs in Lake Erie and how the TMDL will address that critical period.

**Comment 43:** It appears that the measurement will take place in summer months rather than springtime. The rationale for this is not clear to us as the greatest flow is between April 1 and July 1. We would like a better explanation why the springtime flow is not being used as the measurement point. (LEF)

**Comment 44:** There are a number of positive elements in the draft plan, including the application of the recently developed construct of a “far-field TMDL”, an important departure from previous TMDLs and the historical focus on “near-field” in-stream impairments. We understand the challenges this brings with the change in scale to the larger basin hydrology of the Maumee River, but this approach acknowledges the cumulative impact on the Western Basin of Lake Erie. We also support Ohio EPA’s approach to focus on the Annex 4 critical high flow period of March to July. (NWF, OCF)

**Comment 45:** The following is a good statement from the introduction:  
“Further, these near-field TMDLs used targets and often hydrology that focused on stream low flow critical periods from June 15 – October 15 which does not align with the Annex 4 critical period (March to July). In general, the critical period focused implementation efforts on point sources of nutrients that are more influential during low flow periods. For this project addressing HABs in Lake Erie, the springtime, higher flow critical period is more important. This shifts the focus to nonpoint sources of nutrients that are more influential during the higher stream flow periods.” (Reutter)

Response to comments on the critical period:

The nutrient load reduction allocations for this TMDL will be applicable to the “spring” loading season as outlined by the Annex 4, 2015 recommended targets document. This is 1 March through 31 July.

## Comments on Modeling

There were many comments about modeling, including how the model was selected, how modeling will inform source assessment and implementation actions, and how the modeling will provide loading targets for smaller subwatersheds.

**Comment 46:** Explanation of mass balance methods pp. 7-9 - The mass balance method is the core modeling approach for the loading analysis plan, which will drive the modeling results, future load allocations, wasteload allocations, and ultimately implementation actions. While the OEPA provides a list of other mass balance approaches, the agency does not explain specifically how the mass balance approach will be applied to the Maumee watershed, how currently available data will be used as model input, or the intended model output parameters. While OEPA assures stakeholders that “the mass balance method is adequate” to guide watershed implementation plans, the agency has not proven this assertion with the draft LAP. (TMACOG)

**Comment 47:** Yes. The OEPA does not explain specifically how the mass balance approach will be applied to the Maumee watershed. The OEPA states that the mass balance method is adequate, but has not shown or proven this in the draft LAP. There is little to no discussion of why the version the OEPA is using is the correct one, just that it is the one that will be used. There is also no explanation of what information will be used to input into the model – will the OEPA use existing data or just data that they collect during the study period? (City of Toledo)

**Comment 48:** Also from TMACOG's comments: "The agency does not explain specifically how the mass balance approach will be applied to the Maumee watershed, how currently available data will be used as model input, or the intended model output parameters. While OEPA assures stakeholders that "the mass balance method is adequate" to guide watershed implementation plans, the agency has not proven this assertion with the draft LAP." (AGL, OEC, FWF)

**Comment 49:** As noted above, Ohio EPA has demonstrated that almost all of the phosphorus load to the Waterville pour point originates from nonpoint sources. However, the Loading Analysis Plan acknowledges that Ohio EPA has not fully developed an understanding of these various and complex sources of phosphorus. Such a thorough and complete analysis will be critical to developing an understanding of how phosphorus moves to and behaves in the watershed and in evaluating the proper load reduction strategies for specific nonpoint sources in the implementation of the TMDL. Ohio EPA should complete this analysis before it selects a modelling approach to ensure that the model incorporates and accounts for these complexities. (OMA)

**Comment 50:** The use of a mass balance approach is not scientifically supportable as a basis for the stated goal of HAB reduction. If the TMDL is, nevertheless, going to be based on the mass-balance approach, at the very least, the implicit assumption in that approach that there is no attenuation of TP should be verified and confirmed prior to the development of the TMDL and associated wasteload allocations (WLAs) and load allocations (LAs).

a) The mass balance approach that Ohio EPA is currently proposing to use assumes there is no attenuation of TP (or DRP), a premise that is at best unsubstantiated, and if used as the basis for allocation, would result in the imposition of phosphorus reductions in parts of the watershed that will be unnecessary to achieve the HAB reduction goals and almost certainly create financial hardship. There are several other models that should be considered, among which are the model developed for a previous Maumee TMDL by US EPA, the five SWAT models for the Harmful Algal Bloom Research Initiative (HABRI), and the USDA Conservation Effects Assessment Project (CEAP) model. The other available models should be evaluated and explicit scientifically based reasons must be articulated for their acceptance or rejection.

In accordance with OAC 3745-2-12, the LAP must be revised to assess all considered models and present Ohio EPA's findings and conclusions regarding the viability of these models to accurately predict phosphorus movement in the watershed and to develop a scientifically sound basis for selecting the model for the TMDL allocation. The Coalition assumes that the selection of the mass balance model is only a tentative decision, and that the Agency will initiate a robust stakeholder process so that this key decision, and others, can be subject to scrutiny and an interactive dialogue.

b) If Ohio EPA nevertheless decides to utilize the mass-balance approach to determine phosphorus reductions in the watershed, the model must be validated, preferably using the SWAT model that has been developed for the Maumee River. The Coalition understands that Ohio EPA intends to validate the model *after* the SWAT model is updated. Once the validation is complete, the stakeholders must be afforded an

**opportunity to review the entire methodology and findings documenting the verification of the mass-balance process separate and prior to the public comment period associated with the Preliminary Modeling Results.**

**c) If the stakeholder process identifies an alternative modeling platform that would more accurately predict phosphorus movement in the watershed, this alternative model should likewise be subject to a rigorous validation process prior to the development of the TMDL. (MWC)**

**Comment 51: Modeling that is not based on data will fail to produce the needed reductions. Those that have worked on the Chesapeake TMDL, state the models often conflict with what the data and observations show. Suggest Ohio EPA looks at the Chesapeake TMDL and learn from the process and what has worked to achieve 60% of the 40% nutrient reduction goal. (LEW)**

**Comment 52: While nutrient nonpoint Mass Balance is evolving as an effective tool, it has failed to document the changes in commercial fertilizer use and manure. It is very concerning that Ohio in all of its reports, has failed to identify and assess the massive increases in CAFO's and animal units in the Maumee, estimated by the Ohio Department of Agriculture to be an increase in animal units from 2002-2017 of 88%, and that numbers continue to grow beyond 2017, with continuing large increases in 2021. Numbers for point sources are in the mass balance and well defined. But nonpoint sources are generic – agriculture rather than a break out between commercial fertilizer and manure. These omissions demonstrate that Mass Balance should not be the basis for determinations for this TMDL for load reduction strategies. (LEW)**

**Comment 53: It appears the SWAT scenarios fail to predict a target load that reflect attainment. This argument is swelled by the following statement:  
“But, only in one realistic scenario did a majority (3/5) of the models predict that the total phosphorous loading target would be met in 9-out-of-10 years. Further dissolved phosphorous loading target was predicted to meet the 9-out-of-10 goal by only one model and only in three scenarios. Ensemble modeling revealed general agreement about the effects of several practices although some scenarios resulted in a wide range of uncertainty. Overall, our results demonstrate that there are multiple pathways to the approach the established water quality goals, but greater adoption of practices than those tested here will likely be needed to attain the management targets.”**

**1. Does the above statement infer that model runs fails to predict the attainment of the target? If not, please explain.**

**2. Does the above statement imply that a demonstration of attainment of the target phosphorous level through the use of a SWAT is not possible?**

**Therefore, the only avenue available to the Ohio EPA is to expound attainment through the mass balance approach.**

**3. Does the assertion reflect, as edified by others, the unreliability in the model inputs?**

4. Does this account assert, as expounded upon by others, the menu of BMP15 are grossly insufficient to attain the attainment target? If not, please explain.

5. Does the testimony mean the SWAT shows the current suite of and applicability for the BMPs are inadequate to attain the attainment target? If not, please explain. (Hess)

**Comment 54:** There is an exceeding wide growth of evidence of an appalling dearth of information on the use of manure application, distribution and utilization (D&U), livestock population, confined livestock operations. Persons have alluded that this lack of information is, or will be, a critical flaw in obtaining approval of the TMDL from the US EPA. This argument is magnified by the following publications and statements:

- In 2015, over 324,000,000 gallons of liquid manure from 26 of the 48 CAFOs and approximately 36,000 tons of solid manure from 18 of the 48 CAFOs were planned to be applied to fields under control of CAFOs.
  - Approximately 75% of all manure nutrients generated on CAFOs in northwest Ohio is planned to be land applied on fields in which CAFOs use the D&U process to transfer their manure.
  - A critical knowledge gap for manure management in Ohio is the management of manure that is distributed offsite through D&U.
  - Approximately 71% of swine, 76% of cattle, and 15% of poultry and proportional volumes of manure were generated in the unpermitted (and unregulated and unenforced to minimally regulated) facilities. 18
- “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 phosphate exists due to manure transferred through Distribution and Utilization and manure produced from non-permitted livestock operation.”

“Improving Watershed Modeling of Manure: Data Challenges and Opportunities

- Temporal and Spatial Scales
  - o Livestock population
  - o Confined livestock operations
  - o US Census of Agriculture every 5 years and reported level
- Livestock Source
  - o Manure imported into the watershed?
  - o Manure Management of smaller livestock operations vs. livestock in permitted operations?
  - o Distribution and Utilization of manure from permitted operations

Gap in knowledge of 80% of manure phosphorous management in watershed (Kast et al., 2019).”

1. Does this information indicate that 80% of manure phosphorous is from unpermitted operations where the spatial and temporal data is unknown?
2. As stated by various persons, is it a correct assumption that the Ohio Department of Agriculture-DLEP has little or no information on the use of manure, or even the location of the aforementioned operations? What information does it have?

- 3. Is it not correct that the policy makers and legislators in the States in the Chesapeake Bay TMDL region required the above-mentioned information from their respective NPS sources in order to generate their TMDL? Why shouldn't Ohio follow the Chesapeake Bay data collection path?**
- 4. Has any staff of the Ohio EPA had discussions with the US EPA on the three above mentioned items? If so, please provide this information.**
- 5. What are the proposals to obtain an accurate computation of all of the manure that is deposited within the watershed? Is it correct that without this information SWAT and LAP targets cannot be prepared?**
- 6. What are the strategies to obtain an accurate spatial determination of where the manure is deposited within the watershed? When will these be unveiled?**
- 7. Has a determination or an exploration been conducted to discern whether and if so the amount of manure that is being deposited on land as a waste product rather than a fertilizer?**
- 8. How can a SWAT have any validity without qualified data demonstrating where and when the manure is being deposited? How will the information from the supposedly 80% of the manure used by non-permitted sources be obtained?**
- 9. Does any agency within the State of Ohio (State agencies, County, or any person) possess the information that will answer the aforementioned questions? Should these people who control the data be interfacing with the interested public? When will the pertinent manure information be collected and officially released?**
- 10. When will the data be collected and become publicly available from D&U exchanges and smaller nonpermitted livestock operations? Since those manure users who have subscribed to the monetary incentive program have been required to subscribe to the MMP program, in order to obtain data to populate the SWAT, has dropping the threshold for the preparation of a MMP to a every source that uses manure or to a de minimis level been considered?**
- 11. When will data be collected and become publicly available for Distribution and Utilization processes? Please explain the rationale for excluding D&U exchanges from specifying their pertinent data in order to obtain information to construct the LAP or populate the SWAT?**
- 12. When will data be collected and become publicly available pertaining to manure imported into the watershed?**
- 13. When will data be collected and become publicly available pertaining to timing and spatial scale of livestock population counts?**
- 14. Some people have alluded that the State of Ohio doesn't have '...a hope of a candle burning in a hurricane' of the US EPA approving the TMDL until the 80% of the manure sources are made part of the program so to have a science driven program. When in the adaptive planning process will additional data to create a science-based program occur? (Hess)**

**Comment 55:** There appears that the clear goal of the NPS abatement program is the subscription to the voluntary BMPs? However, the details to measuring success are not articulated. “10 conservation practices with a proven track record in Ohio and beyond

- 1) Soil Testing & Volunteer Nutrient Mgmt. Plans
- 2) Variable Rate Application
- 3) Subsurface Phosphorous Placement
- 4) Manure Incorporation
- 5) Conservation Crop Rotation
- 6) Overwintering Cover Crops
- 7) Drainage Water Management
- 8) Riparian Forest Buffers
- 9) Two-stage Ditch Construction
- 10) Headwater & Coastal Flow-through Wetlands”

Common sense leads a person to believe there must be a goal of enrollment into the voluntary BMP program that implies success. The following elements are in regard to measuring success and progress with models populated with data.

1. What is the acreage within the watershed, delineated by each of the 10 items, which is compulsory to achieve the reduction of phosphorous to meet the attainment target?
2. What is the spatial distribution of the acreage mentioned in the above question to meet the target level of phosphorous reduction? Is there a target of acreage per county, or a larger or smaller defined authority?
3. The location of the acres enrolled into the voluntary BMP program is critical to the reduction of phosphorous. This is true because acres enrolled contiguous to a waterway would have a greater probability of phosphorous incursion into a waterway than acreage without such drainage access. What is the number of acres that has been enrolled to date distributed in each of the ten practices? Where is location of each of the enrollments? What is the quantity of manure that was distributed to each property enrolled during the last two years?
4. What is the calculated reduction of phosphorous from entities currently enrolled in the voluntary BMP program during the last two years?
5. If the questions cannot be answered because the information is unknown, how can the SWAT be accurately run without the data?
6. How is it anticipated maintenance of the target reduction level of phosphorous from voluntary BMPs continue without a guarantee of long-term funding? Will the funding of the voluntary BMPs be forever? What will be the consequences to the voluntary BMP program if the Ohio legislature diminishes funding or if funding lags behind inflation?
7. Please provide a list or a map of where the manure distribution occurs within the watershed.
8. Why are seven of the ten practices obtainable under the compensation program? Why are three practices excepted? Will the other three practices be part of the program and the SWAT modeling?
9. What is the plan to correct the lack of quantification of the amount, spatial and temporal scale issues with manure contamination? (Hess)

**Comment 56:** Failure of Michigan NPS measures to reduce loading raises doubts about Ohio NPS strategy.

1. The Module 3 YouTube information outlined the efforts by Michigan in the collection of data inputs for their use of the SWAT model. It appears that Michigan has collected significantly more data than the State of Ohio. Is there plan for Ohio to catch up with Michigan? If so, please delineate that plan.
2. The same YouTube information stated the failure of the Michigan BMP controls to ameliorate the problems in the River Rasin basin. Doesn't this acknowledged lack of progress raise warning flags for Ohio and Michigan? What is the plan to evaluate those findings and make mid-course corrections? (Hess)

**Comment 57:** Phosphorous load readings at the Waterville monitoring station signal that there has been no reduction since the inception of the BMP voluntary program.

1. Frankly, there has been no appreciable improvement (reduction) in the phosphorous measurements at the Waterville station. What is the cause of the lack of improvement? Is it correct, as stated by various persons, which based upon the readings, the Ohio NPS strategy stalled out or it is on the road to failure? How will the quantification of success be ascertained when the phosphorous readings are stagnant?
2. The NPS program using BMP has been operational for the past two years. If the program is effective, a reasonable person would expect to see phosphorous reductions. Will SWAT sensitivity evaluations show otherwise without far-fetched error bands? Can those SWAT evaluations be considered dependable due to the lack of a full field of data? Please explain why there has been no observable reductions in the monitoring of phosphorous.
3. How, other than using SWAT sensitivity runs on bundled management scenarios, does the Ohio EPA intend to measure whether the program is effectuating reduction of NPS generated phosphorous?
4. Is the growth of new and modified sources overwhelming any control effectuated by the NPS voluntary BMP program? It appears that the growth of manure distribution to smaller nonregulated through D&U may have an impact upon the LAP. How will this be accounted for? (Hess)

**Comment 58:** Specific modeling questions found below.

1. Lack of publicly available details, other published papers, on the specifics of the inputs and configuration for the various SWAT modeling is concerning. The well-prepared papers in Technical Journals are the only medium for the interested public to be aware of the progress. Is there a method to keep interested persons informed of progress? What is the boundary of the domain of the model? Please amplify the impediments for the inclusion of the contiguous areas that contribute to the degradation to the water in the modeling runs. Please discuss the methods that is under consideration to account for (boundary conditions) the loadings from out-of-state sources. Please explain why the modeling should not incorporate the more detailed resolution if available.
2. What is the anticipated precision and the accuracy of the model results based upon the accuracy of the proposed inputs and the limits of the domain?

3. What is the range of the accuracy of the critical input parameters for the predictive model?
4. Please provide a discussion of the input parameters that are the critical variables to achieve accurate predictive results from the model. What is the accuracy and precision of the calculated parameters versus the measured parameters as anticipated as inputs to the model? Is the Mass Balance route for the establishment of the loading due to the failure of SWAT modeling to predict attainment of the targets?
5. Due to the aforementioned issues stated in items 1-4, what is the uncertainty adjustment factor for the targets of the LAP modeling? Should certain segments of the model that have lower or higher uncertainty have a commensurate adjustment?
6. Will the model runs be prepared at varying levels of assumptions, such as origin and quantity of the pollutant?
7. Please provide an in-depth discussion of the role of measured versus calculated inputs to the model and how each may influence the results of the modeling.
8. What is the methodology to develop the baseline and future inputs such as pollutant inputs, delivery systems and water body kinetics used as model inputs? When will that methodology and those inputs be available for review and comment?
9. How will the users of the modeling results develop the predictive future inputs to the model? Namely the loadings in future years due to mitigation and to growth of new and modified sources. When will the future year loadings be released to the public?
10. Will contingency measure scenarios (as required by a TMDL) be evaluated? (For example, lowering of the permit threshold for CAFFs, moving from a voluntary to a mandatory BMP program for manure users.)
11. In determining the future loading, please articulate the amount of the loading due to growth of manure deposition since 2017 and by year thereafter until attainment is reached. Will growth of manure deposition outpace the reductions?
12. Will the runs of the predictive model incorporate various high, low, mean, median parameters of the inputs? If these parameters are known, please articulate them.
13. What is the anticipated process to validate the modeling?
14. What is the process to develop assumptions used in the model? For example, how will the Ohio EPA calculate the permitted (or unpermitted) changes in the production of and use of nutrients (manure)? What is the process to account to the future growth (or diminution) of nutrients within Ohio and the contiguous states?
15. Will the selection of the model, parameters, and running of the model be by the staff of Division of Surface Water? Have the State of Ohio given thought to letting a contract with a reputable international consulting firm to perform this critical work? Also, is it correct that a Modeling Advisory Group of the 'best of the best' experts to advise the Ohio EPA in formulating the best available Loading Analysis Plan has been established? If so, kudos to you! It would be beneficial to publish (release to the public) a chronology of the findings of that group. Such dissemination of information will gain a 'bucket full of trust' with all involved in the process.

There are options available to the Ohio EPA on the choice of models, so this is not an issue. The issues are the choice of the inputs to the model and the accuracy and validity of the same. The 5,000 square mile modeling domain will present challenges,

but the decided lack of accurate critical inputs may afford a greater challenge. In this regard, the following technical questions follow:

- I. What is the chosen model sensitivity and performance? Or the desired parameters if not selected?
- II. What is the chosen model segmentation and resolution? How will the segmentation and resolution be best allocated to provide meaningful results? If not selected?
- III. How will you treat equilibrium and coupling equilibrium chemistry?
- IV. Since wetlands is a major part of the DAP2020, to what degree will plant stoichiometry be incorporated into the model?
- V. Because the desired target (water quality goal) at the Waterville monitoring site is on an adjusted annual basis, averaged over a rolling year; how will impulse, step, linear and exponential loading issues be addressed?
- VI. Again, due to the aforementioned, how will state and time variable reactions, diffusion, and distributed systems be addressed?
- VII. Due to the complexity of the 5,000 square mile domain, how will the hydro geometry, dispersion, mixing, water balance, resuspension of nutrients, transport through sediments be treated in the model? How will temporal loading and mitigation measures (impulse, step, linear and exponential) be factored into the analysis? (Hess)

**Comment 59:** The nutrient mass balance method as designed does not adequately account for hotspots. There is data to suggest that some CAFOs represent “hotspots” of nutrient loading.

These CAFO hotspots are the result of high STP, manure mismanagement and topographic, hydrologic, and geologic factors. While the nutrient mass balance method proposed by OEPA does well to draw on information from numerous water sampling sites and subwatersheds, this LAP would be made much stronger by also collecting and incorporating finer grain datapoints to capture the effect of hotspots. The Agency must include some sort of field level assessment for setting the nonpoint source load figures in its nutrient balance model. Such an assessment could include an analysis of phosphorus loading risk from tiles and surface runoff. Data for the nutrient balance model might include scoring based on slope, topography, soil testing and other factors.

The current approach by OEPA may capture nutrient loads coming off of fields in each subwatershed, but that is not enough information to equitably and accurately allocate loads to specific P sources. Dividing the load by the number of sources in the subwatershed will produce an uneven and inefficient accounting of reductions. This will lead to overburdening some sources, and setting ineffective load reductions for others. The Agency should incorporate methods for modeling and anticipating hotspots, but it also might consider employing edge of field testing and water sampling to correct this problem. Procedures to account for CAFO hotspots will allow the OEPA

to more equitably allocate loads among agricultural sources while ensuring that hotspots are reducing their load by an adequate amount. (ELPC)

**Comment 60:** As referenced from ELPC's comments: "The nutrient mass balance method as designed does not adequately account for hotspots. ...This will lead to overburdening some sources, and setting ineffective load reductions for others." This approach is actually not equitable and potentially opens OEPA up to challenges and possible litigation from those sources. The WLAs and LAs should be proportional and accurate to their activity, critical conditions, and geomorphology. (AGL, OEC, FWF)

**Comment 61:** Reduction strategy (pp. 9-10) – The LAP states that the Annex 4 40% reduction strategy will be applied to HUC-12s across the watershed but is lacking sufficient explanation of the modeling methodology that will drive this strategy. As referenced in comments from Alliance for the Great Lakes, Ohio Environmental Council and Freshwater Future, we also ask that OEPA develop a scientifically defensible method of sub allocating subwatershed targets. The Hydrologic Weighting factor described in the Domestic Action Plan is insufficient to account for these loading variations across land use types and watershed conditions. There will naturally be very little load reduction potential in some HUC12s compared to very great potential in others; a focus on "equity" in reductions is misguided. A focus on equity will lead to misallocation of resources during the TMDL implementation phase by targeting nutrient sources that will not offer as great a return on investment.

Before OEPA moves forward with modeling and publishing results and reduction strategies, it must provide a clear and direct explanation for the modeling methodology that includes -

1. Explanation of how the model will account for the wide variation in P loading from the various land use types across the watershed. Urban runoff contributes considerably less P than agricultural runoff. Local MS4 operators need assurance that they will not be held responsible for P reductions through their stormwater NPDES permits disproportionate to their actual load. OEPA has not adequately explained this in the LAP.
2. Explanation of how the model will account for reductions already made over four decades and billions of dollars invested in POTW upgrades, combined sewer overflow elimination, and other infrastructure improvements. Again, local governments need assurance from OEPA that their NPDES effluent limits for wastewater will not be disproportionately impacted as a means of reaching the 40% reduction goal.
3. Explanation of how the model and reduction strategy will adequately address 90% of the P load in the Maumee Watershed attributable to non-point sources
4. How SWAT modeling will be used to "verify mass balance methods" and if/how SWAT or other mechanistic modeling will be used to ensure accuracy in attributing load and wasteload allocations to all point sources and non-point sources. SWAT models are used worldwide and are continuously under development. They can be applied in different ways to emphasize different aspects to complex watersheds and be used for various applications. In short, not all SWAT models are the same and it depends on how you use them. It is important to know OPEA's plan for applying a SWAT model. (TMACOG)

**Comment 62:** The mass balance approach is a good strategy for determining loads, and basing it on the works of Dolan, Maccoux, and Ohio's Nutrient Mass Balance reports of 2016, 18, and 20, is good. However, because we know that legacy fields are important, and we know that fields with higher STP levels produce more P runoff, and fields where manure has been spread have higher STP levels, we must find a way identify the problem fields when we pinpoint sources. If the planned approach cannot do that, then it is severely flawed and unacceptable. (Reutter)

**Comment 63:** SWAT models are fine, but they are not all created equal, and are only as good as the numbers we plug into them and the design of each model. I have seen both good and bad SWAT models. (Reutter)

Response to comments on modeling:

Many of these comments also include references to allocations and model validation, these comments were addressed separately starting on page 43 and page 34, respectively.

Response on model selection:

Identifying the model that will be used to develop TMDL allocations is a primary purpose of the LAP. The draft LAP identified the model but did not include enough detail about the model selection process. All models have limitations to understanding the complex nature of environmental processes. Identifying the best model for a given scenario requires an evaluation of strengths and weakness offered by any modeling platform. Further, model selection requires choosing the best fit for a given circumstance. Discussion on strengths and weaknesses supporting model selection has been added to the LAP.

The phosphorus targets presented in the LAP are based on the already established Great Lakes Water Quality Agreement's Annex 4 recommended reductions to address western Lake Erie HABs. Various models were utilized for that target setting exercise. These included models that considered limnological and hydrodynamic factors contributing to Lake Erie's HABs. With the targets established, modeling these factors is not necessary for setting allocations in this TMDL and the scope of models considered was narrowed to those that model watershed loadings.

Ohio EPA primarily considered the data-driven mass balance approach versus the process-driven Soil and Water Assessment Tool (SWAT) model. TMDL allocations are divided into point (wasteload allocation) and nonpoint sources (load allocation), with additional considerations for uncertainty (margin of safety) and future growth. The mass balance method, as presented in the LAP, can provide this level of bifurcation.

Mass balance methods and process-based models, like SWAT, both must make many generalizations due to the scale of a project area as big as the Maumee watershed. The results of a data driven model are more readily reproduced, and uncertainty is constrained by tying the loading estimates to measured data. Using the mass balance model will minimize issues from disagreement of observed and modeled results. There are many versions and iterations of SWAT models in this watershed with ongoing refinement. Picking one model for TMDL allocation development would be quickly outdated. For these reasons a SWAT model will not be used to develop TMDL allocations.

Response on source assessments and implementation recommendations:

While the mass balance model lacks predictive ability, research using process-driven models can still be considered to inform source assessments and implementation strategies. This includes aspects of source assessment frequently commented on such as manure used as fertilizer and identifying critical areas for phosphorus loading. This work will draw heavily on and synthesize the extensive existing and ongoing research in the watershed. All source assessment information presented in the TMDL will include a focus on DRP.

Ohio EPA will collaborate with Ohio Department of Agriculture, Ohio Department of Natural Resources, research modelers, and other experts for this effort. This includes, but is not limited to:

- Work carried out by multi-jurisdictional groups similar to the referenced Chesapeake Bay TMDL effort.
- OSU led SWAT modeling to test hypothesis about implementation practices and levels of implementation required in the past. *Note:* The quoted material in comment 53 is from the abstract of a study not published by Ohio EPA. While this work may be referenced in the TMDL's source assessment and implementation recommendations, Ohio EPA has not made any management decisions based on the outcome of this work.
- Analysis regarding manure application currently being carried out by the Environmental Working Group (noted in Michigan's slides of Module 3 of this TMDL project). This work extends to Ohio's portion the Maumee River watershed and Ohio agencies have been regularly engaged in this effort.
- Work on identifying and quantifying legacy phosphorus being led by USDA's Agricultural Research Service with many university partners.

Response on subwatershed load targets:

Projecting loading targets to subwatersheds similar to what was done for Ohio's Domestic Action Plan and proposed to be updated for this project, will not be TMDL allocations. Rather, they are reduction targets to help guide local watershed planning efforts. Many field scale nutrient reduction recommendations are best managed at a local level in direct communication with the people involved in making the management decisions.

Comments on Validation of Mass Balance Approach

There were several comments on validation of the mass balance approach.

**Comment 64: The Agency Should Provide a Comment Opportunity for Verification of the Mass-Balance Model Approach. The Agency has indicated that it plans to use the mass balance model to develop the Maumee Watershed Nutrient TMDL. The mass balance approach does not account for legacy phosphorus or critical source areas and, as discussed above, does not account for the contribution of phosphorus from streambank erosion and river bed resuspension. The use of the mass-balance model in this manner has not been validated. The agency has indicated it will verify the mass**

balance methods using the Soil and Water Assessment Tool (“SWAT”). The SWAT accounts for instream processes, legacy phosphorus and critical source areas. Under the Agency’s current planned approach, stakeholders would only receive an opportunity to evaluate this verification within the review of the Preliminary Modeling Results. AOMWA requests an opportunity to review this important, fundamental verification in isolation. We believe a separate opportunity for comment is necessary because the verification will drive the Agency’s approach to the Preliminary Modeling Report. If stakeholders are only afforded an opportunity to address the verification within the Preliminary Modeling Report, then many of the decisions based on the verification will already be underway. In addition, OAC 3745-2-12(A)(2)(a) requires that the Agency provide an opportunity to comment on “the proposed modeling approach” *before* the preliminary modeling results, and the verification may be an important piece of the Agency’s modeling approach that must be completed before moving forward with the preliminary modeling results. (AOWMA)

**Comment 65: Several other items in the LAP could use further clarification**

- 1. The document lacks the organizational structure that clearly define OEPA’s planned research methods, model validation, and reduction strategy. Rather these elements are loosely referenced throughout other sections.**
- 2. Water quality and flow monitoring are discussed on p 8, but the document provides no explanation of how this monitoring data will be used.**
- 3. Tables 1 and 2 are not particularly useful to readers who are not already familiar with the content as they are not explained in the context of the TMDL process generally or the modeling methods, specifically.**
- 4. The statement on page 9 is unclear - “This TMDL project will further refine sources of nutrients and more effectively capture the influence of diffuse sources in the Maumee watershed study area.” Please explain how this will be accomplished and the data sources OEPA will use to identify diffuse P sources. (TMACOG)**

Response to comments on validation of the mass balance approach:

The loading analysis plan is a starting point for calculating TMDLs. It requires three management decisions: 1) identification of the impairment, 2) modeling approach, and 3) water quality targets. Detailed modeling methods will be presented in the preliminary modeling results. Model verification/validation must also happen in the preliminary modeling results step because it requires that the model be developed. If model validation finds that the selected model is unacceptable and the TMDL modeling process must be changed, the TMDL will revert to the LAP stage. Were this to occur, a new LAP document with public comment periods would be required.

Stakeholder outreach prior to the publishing of the draft Preliminary Modeling Results (PMR) and the comment period on the draft PMR provide opportunities to discuss how the modeling results are analyzed and interpreted. These opportunities provide engagement prior to when modeling results will be used to determine final allocations and provided feedback on the implementation framework. Then a later comment period for those decisions is afforded in the draft TMDL report stage.

The TMDL development process requires certain technical arguments to be made. Ohio EPA is working to develop a FAQ document to help explain the technical content. The FAQ document will be written with minimal technical language and in a way to maximize accessibility.

The statement on page 9 referred to in comment 65 was removed from the LAP. It was attempting to convey a concept that is now more fully explained in the LAP. For example, regulated stormwater is a diffuse source grouped as a nonpoint source in other mass balance efforts. In this TMDL it will be grouped with point sources in the wasteload allocation. More generally, a detailed source assessment of nutrients will be included in the TMDL utilizing all available published and ongoing research. This work will be used to guide implementation recommendations targeted at meeting the nonpoint and point source load allocations.

Also see the responses to modeling starting on page 33.

### [Comment on Tracking](#)

**Comment 66:** “Tracking of nutrient reduction progress will not be accomplished through modeling, rather measured through continuous monitoring by USGS and Heidelberg University’s National Center for Water Quality Research (NCWQR) through the Lake Erie Tributary Monitoring Network.” This statement from page 9 is excellent. (Reutter)

Response:

This comment is acknowledged.

### [Comments on Recreation Use](#)

There were two comments on the criteria for restoring the recreational use.

**Comment 67:** Evaluation criteria for recreational use look good. (Reutter)

**Comment 68:** The Draft LAP identifies that the total phosphorus target for the Maumee Watershed Nutrient TMDL is consistent with the Annex 4 total phosphorus target. EPA supports Ohio EPA’s efforts to develop a TMDL to meet the Annex 4 target. However, federal requirements established in 40 C.F.R. § 130.7(c)(1) state “TMDLs shall be established at levels necessary to attain and maintain the applicable narrative and numerical WQS”. Therefore, additional discussion is needed in the final LAP or subsequent TMDL documents to explain how the springtime total phosphorus target will attain and maintain Ohio EPA’s water quality criteria. With regard to recreation use, page 7 of the Draft LAP discusses the applicable narrative water quality criteria and how Ohio EPA makes assessment decisions based on this narrative, but does not discuss how the springtime total phosphorus target will attain and maintain the narrative criteria. (U.S. EPA Region 5)

Response to comments on recreation use:

Ohio EPA has clarified how achieving the total phosphorus target from Annex 4 will achieve recreation use water quality standards for algae in the final LAP document.

Comments on Public Drinking Water Supply Use

There were several comments on how the TMDL will address the drinking water use impairments in the Western Basin.

- Comment 69:** This section that states that two or more excursions above the state drinking water standards will be used for attainment. In addition to a drinking water attainment threshold, there should be a determination of a threshold for microcystin in the source waters that cause the problem in the drinking water. While public drinking water systems have to monitor, test and treat for cyanobacteria, the source water used for drinking water has no requirement for attainment. This is a request that source water at public drinking water intakes be required to meet low levels of cyanobacteria in addition to the drinking water standard. Source waters would be a good attainment bench mark for ensuring the safety of the water used for drinking water. Table 4 lists attainment goals for treated water, while Table 5 shows the source water problem, but there are no attainment goals for source water. There should be. To base the decision that no attainment is necessary for source water standards on one year, 2012 is simply unacceptable. The algae fluctuate's a great deal from year to year. If the tests were done in Toledo's intake in early August 2014, this scenario would be very different. This source assessment is faulty and needs a valid science basis as the source waters for drinking water are critical to a water plants ability to treat the water, especially for small drinking water plants. (LEW)
- Comment 70:** The OEPA should monitor the cost of intervention and monitoring by public drinking water supplies (PDWS) in the three assessment units for the TMDL. a. The LAP states: "The TMDLs for recreation use impairments due to algae, explained in the prior section, will also directly address the public drinking water use impairments. Because of this, no additional actions or targets are required to be presented in this section of the Plan. The same TMDL allocations will be applicable to address both beneficial uses." However, we argue that additional and simple actions should be considered and downstream stakeholders should be engaged more robustly in that effort. This could include something as simple as annually surveying all (PDWS) for these costs incurred annually. OEPA could develop a cost-benefit analysis metric to use to track expenditures and assess progress socio-economically. (AGL, OEC, FWF)
- Comment 71:** With regard to public drinking water supply use, pages 14 and 15 of the Draft LAP include a discussion which indicates that applicable water quality criteria may be met<sup>1</sup> but the concluding paragraph of this section on page 15 of the Draft LAP states that the TMDLs for recreation use impairments "will also directly address the public drinking water use impairments." Either the final LAP or subsequent TMDL documents will need to present Ohio EPA's rationale for why the springtime total phosphorus

**target will attain and maintain the public drinking water supply use water quality criteria in all years. (U.S. EPA Region 5)**

Response to comments on public drinking water supply use:

Ohio EPA's public drinking water supply attainment determination for Algae (cyanotoxins) uses the results of source water monitoring. For additional information on Ohio EPA's assessment of the public drinking water supply use, please see Section H of Ohio's 2020 Integrated Monitoring and Water Quality Assessment Report ([https://epa.ohio.gov/static/Portals/35/tmdl/2020intreport/2020\\_SectionH.pdf](https://epa.ohio.gov/static/Portals/35/tmdl/2020intreport/2020_SectionH.pdf)).

Under Ohio's revised statute for TMDLs, Ohio Revised Code (ORC) 6111.562 requires the consideration of "the estimated economic impact, on a categorical basis, on government subdivisions, point sources, agricultural operations, and nonpoint sources." Consideration of the impact on public drinking water supplies will be included in the draft TMDL report that is expected to be released for public comment in September 2022.

Revisions to the final LAP document address concerns about attaining the public drinking water supply use with the use of Annex 4 developed nutrient reduction targets.

Comments on Lake Erie Aquatic Life Use

There were two comments on information pertaining to aquatic life use impairment and how the TMDL will address existing impairments.

**Comment 72: Future Aquatic Life Use Standards Should be Promulgated as Rules.** Ohio EPA has indicated that it plans to update its Lake Erie aquatic life use assessment in the 2022 Integrated Report. Ohio EPA has acknowledged that water quality standards must be promulgated as rules pursuant to R.C. 119.03. *Fairfield Cty. Bd. Of Comm'rs v. Nally*, 2015-Ohio-991, ¶ 37, 143 Ohio St. 3d 93, 102, 34 N.E.3d 873, 882. Yet it appears Ohio EPA is planning to include the assessment methodology in the Integrated Report, without complying with R.C. 119.03. AOWMA believes that the development of aquatic life use assessment methodologies or any other de facto water quality standards should be finalized as part of a notice and comment process separate from that of the Integrated Report. (AOWMA)

**Comment 73:** EPA recognizes that Ohio EPA is reviewing and considering revisions to its assessment methodology for aquatic life use for the open waters of Lake Erie. However, as noted on page 15 of the *Draft Loading Analysis Plan and Supporting Data Acquisition Needed for the Maumee Watershed Nutrient TMDL (Draft LAP)*, two Western Basin of Lake Erie shoreline assessment units are presently identified as not attaining the aquatic life use due to nutrients. Given the timeline Ohio EPA has planned for development of the Maumee Watershed Nutrient TMDL, i.e., target timeline for preliminary modeling results is Spring 2022 and target timeline for public notice draft TMDL report is Fall 2022, and the timeline for including an update on the revisions to the assessment methodology, i.e., the 2022 Integrated Report in April 2022, EPA recommends that Ohio EPA address the impaired aquatic life use for the two Western Basin of Lake Erie

**shoreline assessment units or provide a rationale for why no further action is needed in either the final LAP or subsequent TMDL documents. (U.S. EPA Region 5)**

Response to comments on aquatic life use:

Ohio EPA is currently in the process of preparing the 2022 Integrated Monitoring and Water Quality Assessment Report. This report will include a summary of the current effort to develop a revised Lake Erie Aquatic Life Assessment methodology in Section I. Ohio EPA intends to incorporate changes to the aquatic life use and criteria into Ohio's waters quality standards in the future.

The LAP has been updated to describe how this TMDL project addresses existing aquatic life use impairments in the Western Lake Erie and Island shorelines.

## Comment on References

**Comment 74: The LAP needs to provide references and access to the sources of information presented in the plan or that otherwise relate to the plan. For example, on page 7 of the Plan, Ohio EPA discusses NOAA satellite data but does not provide a reference to the source of the information or how stakeholders can access this information. The modeling used by NOAA to support its HAB forecast, frequently referenced by Ohio EPA, should also be made available to stakeholders on Ohio EPA's TMDL website. (MWC)**

Response:

The following link was added to the LAP: <https://coastalscience.noaa.gov/research/stressor-impacts-mitigation/hab-forecasts/lake-erie/>

## Comments Outside the Scope of LAP

There were several comments that were outside the scope of the LAP.

**Comment 75: Remediation Should Not Focus on Point Sources. The Loading Analysis Plan states that "[t]his TMDL will ultimately expand to include more detailed allocations beyond nonpoint sources." We appreciate that these allocations will be addressed later in the TMDL development process. When the Agency turns to that step, the Agency should rely principally on the Nutrient Mass Balance Study's conclusion that point sources are not the primary source of phosphorus loading. The Nutrient Mass Balance Study explicitly recognizes that "[i]f nonpoint nutrients are found to be the major contributor of downstream total phosphorus load, then focusing remediation on point source nutrients would neither be prudent or efficient."<sup>2</sup> The Nutrient Mass Balance Study reports that "*nonpoint sources were the highest contributors to the phosphorus load in the . . . Maumee (89 percent) watershed.*"<sup>3</sup> Meanwhile, point sources contributed merely 7% of the phosphorus load.<sup>4</sup> The study attempted to quantify the largest contributors of phosphorus loading to identify the best opportunities for remediation. Its findings demonstrate that point sources should not be a focal point for remediation. Further, as Ohio's 2020 Domestic Action Plan appropriately recognizes, publicly-owned treatment works have already invested significantly in**

efforts to reduce phosphorus loading to Lake Erie. Over the last several decades, AOMWA members have invested literally billions of dollars to address and substantially reduce or treat wet weather flows and to improve their treatment systems, which have helped to reduce nutrient discharges. In fact, many of these systems have already improved their wastewater treatment processes to achieve phosphorus effluent limits, and as a result, have already reduced their total phosphorus discharge loadings by greater than 40 percent. As a result, waste load allocations should be based on equity and account for significant efforts already undertaken by point sources. Additional point source reduction will not achieve corresponding improvements in the Western Lake Erie Basin. (AOMWA)

**Comment 76:** As discussed in The OMA's prior comments on Modules 1 and 2 of the Maumee Watershed TMDL, the Ohio Nutrient Mass Balance Report and the Ohio Domestic Action Plan document that the vast majority (nearly 90%) of the total phosphorus load in the Maumee Watershed is nonpoint source contribution. NPDES permitted discharges comprise only a tiny fraction of the load (8%), and in many cases these dischargers are already subject to strict phosphorus permit limits. The OMA agrees with Ohio EPA's determination that, to be effective, the Maumee Watershed Nutrient TMDL must focus primarily on nonpoint sources of phosphorus, such as agricultural contributions. It would be unreasonable, inequitable, and ineffective for the TMDL to place tighter limits on point source dischargers – such an approach would arbitrarily expose point sources to an enormous economic burden but would not result in any measurable progress towards attainment of water quality standards in the western basin of Lake Erie.

Additionally, in many cases Ohio EPA has already required point source dischargers in the Maumee Watershed to reduce phosphorus loads. Because these dischargers have already made necessary reductions, they should receive credit for these actions in any modeling effort and in the final TMDL implementation plan. In particular, point source dischargers covered by an existing near-field phosphorus TMDL should generally not be targeted for additional reductions (or for any other requirements) in the current far-field TMDL. (OMA)

**Comment 77:** As the Maumee Nutrient TMDL will be the tool used to set future regulatory and targeted management practices, it is imperative that the sources of greatest impairment of run off are clearly identified. It is LEF's understanding that Ohio EPA will not identify where the highest contributions of run off are coming from. If this has changed or our perception is inaccurate we would appreciate updated information We understand that Ohio EPA is relying on "local partners" to determine sources once the TMDL at the mouth of the Maumee is determined: in our opinion this seems to negate the intention of a TMDL. If the plan is to rely on local partners, it is imperative that these partners be contacted now, not in a year when data from the TMDL will be reported. We feel strongly that the TMDL needs to identify sources of pollution otherwise we are losing time and accuracy of the intent of the TMDL. (LEF)

Response to comments outside the scope of the LAP:

These comments were focused on factors that will be taken into consideration in the development of the next step in the TMDL development process, Preliminary Modeling Results (Step 4). These comments will be considered when preparing the draft report for that step but will not be directly responded to at this time.

Comments on Legacy Phosphorus

There were several comments on legacy phosphorus.

**Comment 78:** Agency must account for increased DRP loading from legacy fields with high soil test phosphorus. The science is clear that fields discharge DRP from the soil. Fields that are saturated with excessive nutrients and register high soil test phosphorus are losing a disproportionate amount of nutrients, and even fields with lower STP present problems. But the Agency nowhere details how it will account for this. Nowhere in the loading analysis plan does the Agency describe how it will manage the problem of DRP loading from fields with legacy phosphorus. Legacy phosphorus is P that has built up in Ohio's agricultural fields over the years from repeated application of non-agronomic excess fertilizer. The science is clear that on legacy P fields, discharge of highly concentrated DRP is occurring even when there is no (or low) land application of commercial fertilizer and manure.

Loading of highly concentrated phosphorus from legacy fields increases enormously when discharge events, such as storms, flush tile drains and increase surface runoff from these fields. A recent edge of field study in the Maumee River Watershed by Osterholz et. al. (2020) found that even fields with low STP (20ppm-50ppm) and no recent land application were responsible for DRP loading during storm discharge events.<sup>24</sup> The amount of DRP losses from a field only increased as STP increased. What's more, this study observed these DRP loads on fields that were six months out from their last manure application, illustrating that the observed load was solely from legacy phosphorus. Loadings observed in the study could reach as high as 0.12 mg/L for DRP from tile drains, and as much as 0.8 mg/L from surface runoff – well above the FWMC load target of 0.05 mg/L in the Annex 4 Targets document. This underscores the need deploy BMPs that restrict land application on fields with high soil test phosphorus. However, under the Agency's current loading analysis plan, it will not account for the diversity of STP among sources, and thus misallocate loading reductions. The Agency should detail how it plans to incorporate soil testing data into its load analysis and allocate reductions accordingly.

Particularly because storms and precipitation will increase in severity with climate change, the Agency must account for loadings from legacy fields during storm events in order to appropriately set the target load. The LAP does not acknowledge this issue or indicate that the TMDL will account for phosphorus that is already in the system in the form of legacy phosphorus. If the TMDL ignores this factor Lake Erie will not be brought into attainment with water quality standards because the load will be miscalculated and OEPA will misallocate load reductions. The Agency cannot

practically achieve its goals if it does not account for a significant source of DRP in the water – DRP loading from legacy fields, particularly fields with high STP. The loading analysis plan should incorporate historic data on soil test phosphorus for Ohio’s fields and model discharges from legacy fields in some manner to correct this gap. (ELPC)

**Comment 79:** The TMDL must account for the role legacy phosphorus has in non-attainment of the designated uses in the WLEB.

The LAP and, ultimately, the TMDL must address the role of legacy phosphorus. The TMDL needs to specify how Ohio EPA will identify, prioritize, and address legacy and excess phosphorus “critical source areas” as chronicled by the Great Lakes Advisory Board (GLAB) in its August 2021 Nutrient Workgroup Report (Nutrients Report, Attachment 3). (Nutrients Report at 2-3 and 12-13.) This report states that legacy phosphorus accounts for 80% of the load, suggesting that the principal focus of the TMDL should be the legacy load. (GLAB at page 5.) Unless legacy nonpoint “critical source areas” of phosphorus (including DRP) are clearly identified, their impact quantified, and strategies to address them implemented, it will be impossible to determine the necessary and appropriate reductions for other sources of phosphorus, much less to do so in a fair and equitable manner. It would be arbitrary to impose deep restrictions on current loads when such reduction may be immaterial to the ultimate TMDL goal of restoring attainment in the WLEB.

Perhaps even more problematic, the massive expenditures required to achieve such reductions would almost certainly bankrupt the subsequent effort to implement the measures that would actually achieve attainment. Ohio EPA should coordinate this process, and funding, with the Great Lakes Restoration Initiative (GLRI) in accordance with GLAB’s recommendations. (MWC)

**Comment 80:** Further to comment 2 above, the modeling effort, and ultimately the implementation plan for the TMDL, must detail how the government will address legacy phosphorus.

The GLAB’s recent Nutrient Report states that legacy phosphorus accounts for 80% of the Maumee load, suggesting that the main actions in the TMDL must focus on how the government will address this legacy load. (GLAB at page 5.) It would be arbitrary and capricious to impose restrictions on NPDES dischargers when so much of the load results from legacy phosphorus associated with historic nonpoint sources.

Similarly, the LAP does not discuss how Ohio EPA will identify and address the changes in recent decades that have caused the observed increase in frequency and severity of harmful algal blooms in the western basin of Lake Erie. In particular, total phosphorus loads have remained stable during recent decades, yet dissolved reactive phosphorus loads have steadily increased. The solution to the impairment is more complicated than a simple reduction in TP and will have to account for the actual cause of the increased frequency and severity of the blooms. (OMA)

Response to comments on legacy phosphorus:

The mass balance model is an empirical model that is parameterized using observed nutrient loads from the Maumee River. Therefore, all nonpoint sources of phosphorus, including legacy phosphorus, will be captured in the TMDL calculations as part of the load allocation. Further there is no database of existing legacy fields. This limits any effort to accurately model legacy fields.

Identifying legacy source locations requires detailed local knowledge. This effort is better addressed at the local level via the development of nonpoint source implementation strategies through the development of HUC-12 based plans like 9-Element Plans. All available resources will be considered to guide implementation actions. The framework for implementation to address specific sources will be developed in the preliminary modeling results, the next step of the TMDL process.

The LAP has been updated to include more information about the history of DRP increases causing the current annual Lake Erie HABs.

Comments on Allocations

There were several comments on how the mass balance model will be used for allocations and where allocations would occur in the watershed.

**Comment 81:** The US EPA and OEPA should be working together to develop TMDL pollutant allocations for the portions of the Maumee in Indiana and Michigan. Watershed work proceeds best when accomplished from the top down. These allocations are critical to determining success downstream, and to maximize the return on investment for downstream work, we need to prioritize upstream work first. The Maumee TMDL effort is garnering the players, science, and attention now so it would be time and resource effective to simply promulgate the allocations within this project. (AGL, OEC, FWF)

**Comment 82:** As I read this, I believe you are suggesting that all subwatersheds will be required to undergo a 40% reduction. We know that the watersheds to the north of the Maumee are closer to the target FWMC while the watersheds to the south of the Maumee are 2-3 times over the FWMC target. There are more animal operations to the south. All farmland should be treated equally. Those applying commercial fertilizer should not end up with more stringent application guidelines than those applying manure. I believe that is where this report is headed. We should end up with a plan where all agricultural tributaries reach the FWMC target. We should not penalize the tributaries to the north of the Maumee with lower FWMC targets to allow those to the south to have higher targets. (Reutter)

**Comment 83:** The LAP needs to provide more clarity regarding the specific methods that will be used to allocate load reductions that address the current phosphorus loading rates across all sub-watersheds. Specifically, the focus in the LAP on “treating all sources equitably regardless of where they are in the watershed” (p.9) does not account for wide variations in P loading rates across sources in each land use category. The focus on “equity” in reductions is misguided. The LAP needs to clarify how the Mass Balance

method with SWAT modeling “verification” will account for these variations in allocating loads and the resulting required reductions.

- The US EPA regulations require TMDLs to establish the Loading Capacity of a watershed. It defines loading capacity as the greatest amount of a pollutant that a water can receive without violating water quality standards (40 C.F.R. §130.2(f) ). The draft LAP has no mention of establishing a Loading Capacity. A far-field 40% reduction in WLE is not a Loading Capacity for the Maumee.
- According the US EPA published Guidelines for Reviewing TMDLs under Existing Regulations issued in 1992: “The TMDL submittal should contain documentation supporting the TMDL analysis, including the basis for any assumptions; a discussion of strengths and weaknesses in the analytical process; and results from any water quality modeling. EPA needs this information to review the loading capacity determination, and load and wasteload allocations, which are required by regulation.” This draft LAP makes no reference to the weaknesses of the analytical methods proposed and amounts to a gross allotment method which is mediocre considering what is at stake for a watershed of this size and complexity.
- The US EPA Guidelines document goes on to explain that “EPA regulations require that a TMDL include load allocations (LA), which identify the portion of the 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.” It is unclear how using a blanket 40% reduction sufficiently characterizes existing and future loading capacities that are needed to generate wasteload allocations (WLA) and LAs. The draft LAP also does not describe sufficiently how LAs will account separately for nonpoint and natural background sources.
- From the report *Effects of Conservation Practice Adoption on Cultivated Cropland Acres in Western Lake Erie Basin, 2003-06 and 2012* (NRCS CEAP 2016) on page vi: “Western Lake Erie croplands are diverse in terms of soils, farm fields, farming operations, and management, which creates differences in conservation needs and potential solutions.” On page vii, the report states “Forty-two percent of cropland acres are the source of 78 percent of total annual phosphorus losses and 80 percent of total annual sediment losses.” It goes on to report: “[Twenty] percent of acres account for 65 percent of total sediment loss, 30 percent of total nitrogen losses, and 45 percent of total phosphorus losses from cropland acres in the 2012 conservation condition.” This characterization by the Natural Resource Conservation Service’s research arm makes it clear that the Maumee TMDL should create unique and specific load sub-allocations for sources and subwatersheds and those sub-allocations should sufficiently reflect the variation across the landscape and be informed via both empirical data, where available, and detailed modeling.
- The LAP references the far-field loading targets developed in Ohio’s Domestic Action Plan (DAP) and proposes to use a “very similar” modeling method to develop TMDL targets. The DAP allocations were based on 40% phosphorus reductions for all land uses. This expectation is unrealistic for some sources, and inadequate for others. The LAP needs to clarify how achievable and effective

loading targets will be determined for each category of land use. A 40% across-the-board reduction from all sources would not achieve TMDL goals.

- The Hydrologic Weighting Factor developed in the DAP seems insufficient by itself to account for the current wide variation in loading rates across the same categories of land use among HUC12 sub-watersheds. There will naturally be less load reduction potential from agriculture in some HUC12s compared to great potential in others, due to variation in types of agriculture, cropping systems, and land management, including historic adoption of agricultural BMPs, among other factors. The same logic applies to factors relevant to other land uses and sources across the HUC12 sub-watersheds.
- Requiring the same amount of reduction per unit area within each category of land use would result in gross inefficiencies, as already high-performing sources would be forced to expend resources to achieve ever-more-marginal load reductions, where those resources could be targeted to achieve greater load reductions at higher priority, low-performing sources and sites. TMDL targets will not be reached without outsized reductions (likely far exceeding 40%) from some high-loading sources.
- It is unclear how SWAT modeling will be used to “verify mass balance methods” or how SWAT or other continuous time modeling will be used to predict impacts of management actions and timing of practices in order to accurately attribute LAs and WLAs to sources. SWAT models can be powerful tools to simulate nutrient cycling especially in agricultural landscapes. SWAT models are used worldwide and are continuously under development. They can be applied in different ways to emphasize different aspects to complex watersheds and be used for various applications. In short, not all SWAT models are the same and it depends on how you use them. It is important to know OEPA’s plan for applying a SWAT model. (AGL, OEC, FWF)

**Comment 84:** OEPA should detail all NPS sources using the best available data for commercial fertilizer, manure application, legacy P sources, natural sources, and any other known NPS P sources. Without an accounting of all known nutrient sources, targeted field-scale planning, permitting, and funding cannot be achieved. Compiling all available data sources will allow the agency and state partners to begin moving forward equitably with permitting and funding programs targeted at known sources. OEPA should ensure an accurate accounting of all NPDES-regulated point sources by enforcing robust monitoring protocols that can be incorporated in the modeling to refine the current estimate of point sources.

OEPA should also quantify the portion of the current P load that is currently unknown based on analysis of the existing data sources. By listing all known sources as well as the unknown portion of the P load, OEPA can highlight data gaps and research needs, allowing the agency and research partners to prioritize data collection. As more data are collected, this adaptive management approach will allow the state to expand regulatory and funding programs to other P sources as data become available.

- Page 8 – Ohio EPA’s Nutrient Mass Balance is insufficient to clearly identify all sources of NPS pollution in the Maumee watershed. The Nutrient Mass Balance report simply lists NPS as responsible for 90% of the P load without detailing the many diverse sources of NPS pollution in the Maumee watershed. During the public comments for stage 1&2, stakeholders provided a long list of documents and data that should be considered in developing the Maumee Nutrient TMDL Loading Analysis Plan. These are listed on p.5 of the draft LAP. However, most of these data sources are not included in Ohio EPA’s Nutrient Mass Balance report and were not incorporated into the draft LAP in a clear and meaningful way. OEPA should explain in the LAP how these data sources will be incorporated into the mass balance modeling for the Maumee Nutrient TMDL.
- OEPA’s current nearfield TMDL approach to attributing pollutant loads to individual point sources is a good approach that should be applied to NPS. While, applying load allocations to individual agricultural fields is neither feasible nor practical, OEPA should begin building the framework to understand and manage nutrient contributions from all agricultural non-point sources, which account for nearly 90% of the P load in the Maumee River. This should include an accounting of manure applications within the watershed, which is currently a large data gap in the Nutrient Mass Balance study. These data can and should be collected through existing CAFO and CAFF permitting programs and OEPA should work with ODA to develop a mechanism for reporting and tracking manure applications that don’t meet permitting thresholds.

It must also be noted that within typical HUC-12 TMDLs, point source discharges from NPDES permitted animal facilities are not currently included in wasteload allocations. The contributions of these nutrient point sources, both permitted and non-permitted, must be included in the Maumee Nutrient TMDL load calculations and wasteload allocations and the LAP should detail plans for incorporating animal operation point sources into the mass balance modeling. (TMACOG)

**Comment 85:** The LAP should specifically address how the WLAs and LAs for Indiana and Michigan will be developed.

It is common practice when a state is developing a TMDL to set the concentrations for the upstream boundary to the water quality targets in the TMDL, whether or not the upstream boundary is at a state line. As stated in US EPA’s draft “Considerations for Development of Multijurisdictional TMDLs:”

*It is clear that a central goal of the Clean Water Act and EPA’s implementing regulations is to ensure that downstream States/Tribes are not subjected to pollutant loads from upstream or adjacent jurisdictions that cause or contribute to the impairment of downstream waters.*

This concept is also applied when upstream states issue National Pollutant Discharge Elimination System (NPDES) permits. As Ohio EPA intends to include the entire watershed in the mass balance calculations, it should be relatively straightforward to include the upstream reductions required for Indiana and Michigan. While the Coalition appreciates the updates provided by Michigan and Indiana in the Module 3 presentations and the October 5 virtual outreach event, the LAP should better document how the Michigan and Indiana loads will be addressed in the modeling work and in the TMDL process generally. (MWC)

**Comment 86:** AOMWA Appreciates Ohio EPA's Case-by-Case Approach to Each HUC-12. The Agency has now clarified that it does not plan to propose 40% reductions in total phosphorus loading from each HUC-12. AOMWA supports this case-by-case approach to each HUC-12. In a HUC-12 that is largely unregulated and fails to manage nutrients effectively, it appears that phosphorus reductions greater than 40% could be achieved more readily than in watersheds that have taken steps to manage nutrients. By contrast, in a HUC-12 that already features optimal nutrient management processes, it would not be appropriate to require an *additional* 40% reduction. (AOWMA)

**Comment 87:** Ohio EPA must address issues of equity in the TMDL and ensure an equitable allocation of load in the final TMDL.

The Coalition objects to the proposed application of uniform reductions for each land use across all HUC12 subwatersheds. This approach, as currently described, appears to ignore issues of cost-effectiveness and equity.

The draft LAP states:

*"Then the strategy will be projected to the finer scale HUC-12s within the Maumee watershed to complete the TMDL and facilitate implementation. Projecting the allocations to the HUC-12 scale will require indexing the basin loading target to the phosphorus sources currently existing in the subwatersheds. This will include considerations about local hydrology, land use and point sources. Since the strategy is determined at the basin scale, the analysis will focus on treating all sources equitably, regardless of where they are in the watershed as supported by the lack of total phosphorus attenuation in the springtime critical period. For example, developed land in all HUC-12 subwatersheds will be required to meet the same amount of reduction, per unit area, in each subwatershed. Since allocations will account for existing point sources and land use within each HUC-12 subwatershed, loading targets for similar sized HUC-12 subwatersheds will, in some cases, vary substantially from one subwatershed to the next. For example, a subwatershed that has more row crop agriculture, or an abundance of failing home sewage treatment systems will get a higher load allocation than a subwatershed that is predominantly park land." (Page 9.)*

This approach raises a number of concerns, including:

- a) How will this approach ensure that full credit is given for reductions that point and nonpoint sources have achieved since the GLWQA 2008 baseline?
- b) The allocations and implementation plan should recognize that greater reductions can be achieved by some point sources (relative to other point sources) and nonpoint sources (relative to other nonpoint sources across the different types of land uses) at lower cost than for others, and that projects in the lower sections of the watershed address the most critical source area and result in the most benefit to the Lake. Further, research has shown that there are critical source areas, which account for disproportionately higher loadings, throughout the watershed that should be addressed first. (MWC)

**Comment 88:** We also refer Ohio EPA to the Great Lakes Advisory Board's Nutrient Report<sup>1</sup> and its discussion of the need to identify, quantify and prioritize critical source areas in the watershed. Research indicates that these areas, associated with historical agricultural activities, account for disproportionately higher loadings and, when located in the lower watershed reaches, may significantly impact the frequency and extent of harmful algal blooms. This concern relates back to the need for the TMDL to equitably address the sources of the blooms and focus reductions on these critical nonpoint sources. (OMA)

**Comment 89:** A Case-by-Case Approach to Land Uses is Also Appropriate. Similarly, a uniform reduction applicable to each land use is also problematic. This approach does not recognize the importance of legacy phosphorus and critical source areas that account for a disproportionate load of phosphorus. (AOWMA)

**Comment 90:** The LAP should provide details regarding the projected expansion of the TMDL. On page 9 of the LAP, Ohio EPA states "*The TMDL will ultimately expand to include more detailed allocations beyond nonpoint sources.*" This statement appears to be trying to address one of the most critical components of the TMDL—reductions of nonpoint sources, which account for 90% or more of the phosphorus load—but the statement provides virtually no guidance or details on how or when the TMDL process will address the issue. We offer the following suggestions and comments:

a) The LAP needs to describe how specific nonpoint sources will be identified, described, and quantified. This is critical for identifying how implementation of nonpoint source controls (in general) will be prioritized in the TMDL to ensure that the most critical nonpoint source areas are addressed first under the adaptive management program.

b) Ohio EPA's statement leaves open whether the TMDL will include a *general* allocation to point sources at this time (and what that might mean), and whether and how this TMDL will be used to generate a later detailed allocation. While Ohio EPA's statement is unclear, we note that point sources are less than 10 percent of the total load and many point sources in the watershed have already achieved significant load

reductions in recent years under the point source permitting program. Requiring additional load reductions from these point sources at this time is inappropriate, likely unnecessary, and will provide little or no benefit to WLEB.

c) It is also not clear how the load allocations, models, etc. used in this TMDL will be applied in the nonpoint source allocations or what Ohio EPA means by “the TMDL will be expanded” (and why those issues are not addressed, or at least discussed, up front rather than in some later iteration of the TMDL).

d) The TMDL needs to explicitly recognize that the mass balance approach has inherent uncertainties which if used for the development of the TMDL, will make the attribution of specific WLAs and LAs to individual sources inappropriate. This includes the lack of accounting for phosphorus loads from streambank erosion; the lack of explicit accounting of delivery factors from land parcels to streams, and streams to the Maumee River, and along the 137 miles of the Maumee; and a host of other variables that are factored into more complex and thorough models. (MWC)

Response to comments on allocations:

Many of these comments also included reference to the model selection discussion in the draft LAP and the role of legacy phosphorus. See the response to modeling and legacy phosphorus comments starting on page 33 and page 42, respectively, regarding these subjects.

The TMDL allocations are only proposed to be calculated at the watershed outlet to Maumee Bay and the Waterville monitoring station. Projecting targets to HUC12 subwatersheds is proposed to facilitate developing local nonpoint source implementation plans. This strategy provides more flexibility for implementation. Some HUC12 subwatersheds could contribute greater reductions than others and remain consistent with the TMDL allocations. How reductions are distributed across different sources will be included in the preliminary modeling results.

A weakness considered in model selection was that mass balance methods do not differentiate between loads from most nonpoint sources. To manage this weakness, a detailed source assessment utilizing the most relevant resources (SWAT modeling, edge of field monitoring, etc.) will be included in the next step of this TMDL.

The LAP has also been updated with more information regarding boundary condition loads from Michigan and Indiana.

## Comments on Adaptive Management

There were several comments on adaptive management and what Ohio EPA uses this term to mean.

**Comment 91:** Adaptive management is not defined and the Agency fails to describe how it plans to exercise adaptive management. That the Agency might adapt to account for DRP later is not an excuse for failing to promulgate a sufficient LAP and TMDL that includes DRP now. The Agency does not describe the conditions under which it will change the TMDL consistent with its adaptive management approach. Adapting to new science and changing environmental conditions is extremely important as this TMDL develops

and is implemented. The U.S. Action Plan for Lake Erie (2018) describes how adaptive management should function in the context of remediating Lake Erie's impairments. Principles of adaptive management include: deliberate planning, experimentation, defining and redefining the problem, modeling linkages and updating models when new information comes to light. Assurances, but no evidence, that the Agency is following "sound science" are not enough. The Agency must articulate reasons why it has chosen the approach it has and how it will adapt to future conditions. To the extent the LAP does describe the Agency's adaptive management approach it does so in a conclusory and vague way. The Agency needs to explain how it is considering and incorporating recent science such as the articles cited in this comment letter and articles that relate to stream dynamics and nutrient conservation such as King, 2020.12

Most importantly, the Agency must incorporate climatic considerations into the LAP and TMDL. Our climate is changing dramatically and quickly. The goal of keeping the earth's temperature below 1.5 degrees of warming above pre-industrial levels will not be achieved.

Indeed, models predict we will exceed this target as soon as 2030. The warming climate will have profound implications for the growing season, crop viability, and precipitation patterns in the Maumee Watershed in the coming 5-10 years. Yet – while claiming that the OEPA is following sound science and an adaptive management approach – the LAP nowhere mentions climate change or how the Agency is planning to adapt to changed environmental conditions in the near term. (ELPC)

**Comment 92:** Because Ohio EPA apparently intends for adaptive management to play a key role in the development and implementation of this TMDL, the agency needs to explain how adaptive management will be used to refine the TMDL and the implementation strategies over time.

Adaptive management is a systematic approach for improving resource management by learning from management outcomes. This means that a well-defined, structured process is needed so that stakeholders can reach consensus on the actions that should be taken first, the effectiveness of those actions can be assessed, and consideration given to the second (and later) tier actions that should be taken next. Initial implementation actions should be targeted towards priority projects that have a high likelihood of effecting meaningful change (*e.g.*, reductions in DRP loads). Without serious consideration of both DRP and legacy phosphorus at this time—even if full analysis and modeling of these issues is deferred—there is a significant risk that limited public and private resources will be expended without materially improving the situation. (MWC)

**Comment 93:** The LAP does not include a description of analytical methods that will be used to calculate the TMDL load allocations or a description of the agency's adaptive management strategy. OEPA should not move forward in releasing preliminary modeling results without providing adequate description of the analytical methods

they will be using and how the agency will continue to proactively refine the TMDL and implementation strategy as data, research, permitting, and funding evolve over time.

TMACOG's recommendations and comments for this section are incorporated into the following responses to specific statements within the draft LAP.

Page 4 – OEPA states that the Maumee Nutrient TMDL builds on numerous other pieces that serve as the previous steps. Indeed, significant work has been done by many partners in research, state and federal government, but these studies themselves do not serve as previous steps in the TMDL process. The LAP does not provide a detailed explanation of how these documents are informing the development of the LAP and which specific elements from each document are being utilized. The list of "Study Plan Documents" and Biological and "Water Quality Report or Equivalent Documents" serves only as a list of references. As with any technical paper or report, a list of references is not a substitute for developing an actual study plan, loading analysis plan, or water quality report.

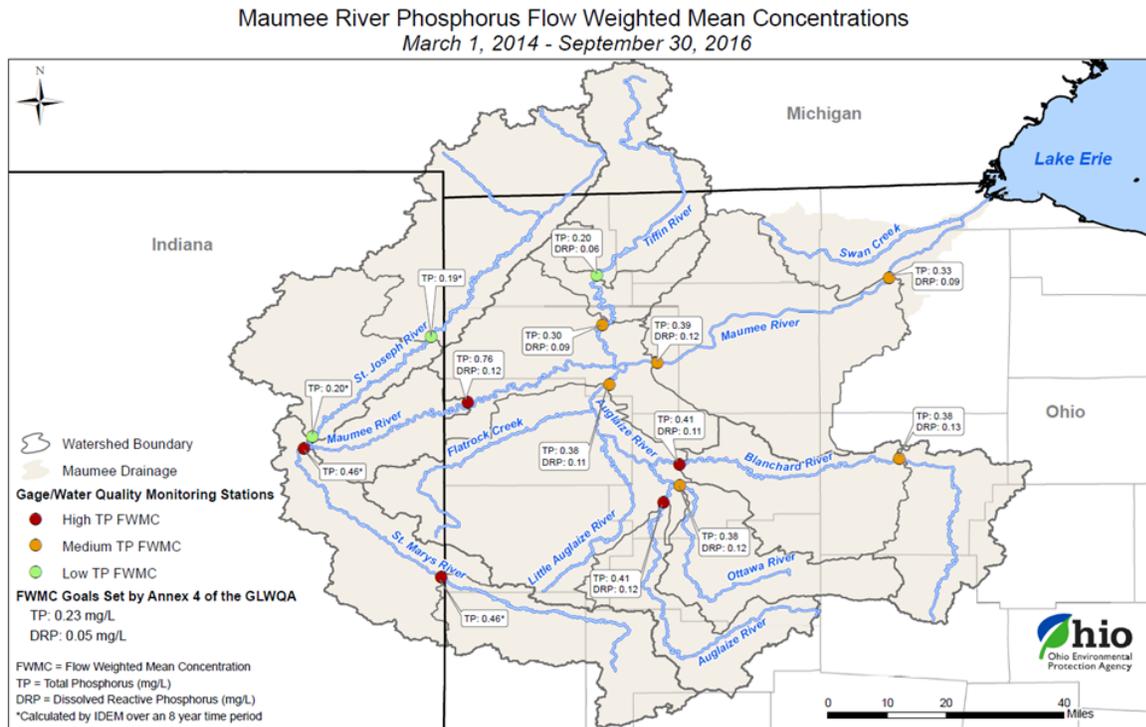
The Maumee Nutrient TMDL Loading Analysis Plan and the results of the proposed modeling will drive implementation strategies, funding allocations, and regulatory programs. The LAP should synthesize data and information from previous work into clear, concise final documents. Failing to do so, will inadequately inform future phases of TMDL development, undermines confidence in the TMDL development process, and makes the TMDL vulnerable to legal challenges. (TMACOG)

Response to comments on adaptive management:

Ohio EPA has long used adaptive management to facilitate implementation of TMDLs. Conceptually this means the Agency promotes an iterative implementation process that make progress toward achieving water quality goals while using any new data, emerging science, and information to reduce uncertainty and adjust implementation activities. What this means to any given TMDL project is different because the uncertainty and data available to inform decisions varies. The adaptive management approach for implementation will be developed with the implementation framework in the preliminary modeling results, the next step of the TMDL process.

Comment on Climate Change

**Comment 94:** Note that the Annex 4 Targets Report also stated that if climate change continues to worsen, it is likely that years wetter than 2008 will occur more frequently than once in 10 years. A review of the last 10 years shows that if we had reached our targets every year, we would have still had HABs worse than 2004 or 2012 on 4 occasions, 2011, 15, 17, and 19.



(Reutter)

Response:

With the monitoring data available in the Maumee River watershed and Western Basin of Lake Erie, Ohio EPA will be able to track progress towards meeting the TMDL target and bloom sizes with the lake. Ohio EPA will utilize an adaptive management approach to determine if and when changing weather patterns in the watershed necessitate revisions to the TMDL report.

Comment on Feasibility

**Comment 95: Ohio EPA must address the issue of feasibility in the TMDL.**

The total cost of implementing the TMDL is of critical importance to every public and private entity, including farmers, cities and counties, businesses, and the cost-share programs that will help fund implementation. It is essential that a process be developed to estimate the cost of the various TMDL scenarios that will be explored. It is also essential that Ohio EPA coordinate funding opportunities and strategies with other governmental stakeholders, such as the GLRI. If the cost exceeds available/affordable funding, then the TMDL will essentially be unimplementable and a Use Attainability Analysis should be performed so that feasible targets are used for the TMDL. Additionally, if cities and counties will be expected to further reduce phosphorus loads, Ohio EPA should initiate development of a cost-share program for implementation of biological nutrient removal and other technologies, as has been done by several other states. (MWC)

Response:

Ohio EPA is required by statute to consider the cost of the TMDL on various sectors in the draft TMDL report (following the preliminary modeling results). Included in this analysis will be the additional cost communities have had to incur to remove cyanotoxins made by the harmful algal blooms from drinking water withdrawn from Lake Erie. The draft TMDL report will also provide the major sources of funding available to various sources in the watershed to reduce phosphorus. The amount of funding currently available to point and nonpoint sources in the Lake Erie watershed through federal and state programs is significant, in recognition of the substantial need.

## Comment on Nonpoint Implementation for DRP

**Comment 96: For nonpoint sources, the practices targeted to reduce TP are not necessarily the same as those needed to reduce DRP.**

**In preparing the implementation plan, Ohio EPA must evaluate the various BMPs for nonpoint source reduction strategies to determine each BMP's impact on both TP and DRP loads. In particular, Ohio EPA must address how the increasing trend in DRP relative to the stable TP load contributes to the algal blooms in the WLEB and will factor into BMP selection. (See Comments #2 and #4). Potential examples of BMPs that might reduce TP but increase DRP are discussed in Attachment 4. (MWC)**

Response:

Ohio EPA is aware of this phenomenon. The framework for implementation plan is part of the Preliminary Modeling Results and we will consider this information while developing that document.

## Comment on Near-field TMDLs

**Comment 97: Future TMDL documents will need to discuss how wasteload allocations and load allocations approved in near-field TMDLs will be considered in this TMDL. More specifically, the Maumee Watershed Nutrient TMDL should clearly identify approved near-field wasteload and load allocations and whether the allocations in the Maumee Watershed Nutrient TMDL supersede these approved near-field allocations. If any approved near-field wasteload and load allocations will not be superseded by new allocations included in the Maumee Watershed Nutrient TMDL, Ohio EPA will need to explain how these approved near-field allocations are sufficient to ensure the three Western Basin of Lake Erie assessment units will attain applicable water quality criteria. (U.S. EPA Region 5)**

Response:

Ohio EPA will include an analysis of near-field TMDLs in the next step, Preliminary Modeling Results (Step 4).

**End of Response to Comments**