Section

D

Framework for Reporting and Evaluation

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D1. Framework for Reporting and Evaluation

This section describes the framework and basic elements for evaluating and reporting the water quality information in this report.

The 2024 Integrated Report (IR) continues Ohio's evolution to a fully formed watershed basis for reporting on water quality conditions. Since 1988, Ohio has maintained strong linkages between Clean Water Act (CWA) Section 305(b) reporting and Section 303(d) listing. Under the title Water Resource Inventories, Ohio prepares CWA Section 305(b) reports every two years using a biologically based assessment methodology[1]. Subsequently, CWA Section 303(d) lists were compiled using the output of CWA Section 305(b) reporting in 1992, 1994, 1996, and 1998. In 2002, the first IR was produced, addressing the needs of both reporting requirements.

Reporting on Ohio's water resources continues to develop, including more data types and more refined methodologies. The basic framework for this report is built on four beneficial uses:

- **Aquatic Life** — Analysis of the condition of aquatic life in rivers and streams was the long-standing focus of reporting on water quality in Ohio and continues to provide a strong foundation. The 2022 methodology is unchanged from what was used in the 2018 IR. Additionally, as in the 2012 IR and subsequent reports, a methodology for assessing the aquatic life condition of inland lakes is previewed. A preview of an aquatic life use assessment methodology for the open waters of Lake Erie was included in the 2022 IR. The methodology is included in technical reference documents and details provided in section I of the 2024 IR. Ohio rulemaking adopted assessment methodology for the Ohio River units and attainment was updated in the 2024 IR.
- **Recreation** — A methodology for using bacteria data to assess recreation suitability was developed for the 2002 report and was refined several times in subsequent reports. The 2024 methodology is unchanged from what was used in the 2020 IR. The 2024 methodology for recreation use based on algal blooms in Lake Erie was updated for the Sandusky basin shoreline unit to be consistent with current cyanotoxins thresholds for recreational advisories. For all other assessment units, the 2024 methodology is unchanged from what was used in the 2020 IR for recreation use based on algal blooms in Lake Erie.
- **Human Health** — A methodology for comparing fish tissue contaminant data to human health criteria via fish consumption advisories was included in the 2004 report. That methodology has been refined in each subsequent report to align more directly with the human health water quality criteria. The methodology was changed in the 2010 report to be consistent with the methodology described in U.S. EPA's 2009 guidance for implementing the methylmercury water quality criterion. The methodology has not changed for the 2024 report.
- **Public Drinking Water** — The assessment methodology for the public drinking water supply (PDWS) beneficial use was first presented in the 2006 report. Updates to the methodology have been presented in subsequent reports. For the 2014 report, it was revised to include a new core indicator based on algae and associated cyanotoxins, and assessment units listed as impaired for algae. The methodology was aligned with adult drinking water threshold values for

[1] In 1990, the linkage of fish and macroinvertebrate community index scores and attainment of aquatic life use designations was established in Ohio's Water Quality Standards (OAC 3745-1).

cyanotoxin indicators in the 2020 HAB Strategy for PWS (***epa.ohio.gov/divisions-and-offices/drinking-and-ground-waters/public-water-systems/harmful-algal-blooms***) for the 2022 report. The methodology has not changed for the 2024 report.

The methodology for assessing support of each beneficial use is described in more detail in Sections E through H.

D2. Assessment Units

The 2024 IR continues the watershed orientation outlined in previous reports; the assessment units have not changed significantly from the 2010 report. Throughout this report, references are made to large rivers and watersheds as assessment units defined for 303(d) listing purposes. Data from individual sampling locations in an assessment unit are accumulated and analyzed; summary information and statewide statistics are provided in this report. Assessment units for the Ohio River were first included in the 2022 IR and are unchanged for the 2024 IR. The four types of assessment units (AUs) are:

- **Watershed Assessment Units (WAUs)** — 1,538 watersheds that align with the 12-digit hydrologic unit code (HUC) system. Ohio HUC numbers are lowest in the northwest corner of the state, proceeding approximately clockwise around the state. The first two digits of Ohio numbers are either 04 (draining to Lake Erie) or 05 (draining to the Ohio River).
- **Large River Assessment Units (LRAUs)** — 45 segments in the 30 rivers that drain more than 500 square miles; the length of each river included is from the mouth of each river upstream to the point where the drainage area reaches approximately 500 square miles. The LRAU segments were updated in the 2024 IR to be consistent with this definition and data associated with the large river census survey in 2020-2021.
- **Lake Erie Assessment Units (LEAUs)** — Seven segments for the entire Ohio portion of Lake Erie. Each of three basins (western, Sandusky, central) are divided into two units (shoreline and open water). The shoreline area is defined as the portion that extends along each basin out to and including a depth of three meters from the shore; the open water is the area in Ohio beyond three meters. The islands shoreline is its own unit and includes the shoreline of each island up to and including a depth of three meters.

  Each basin's extent is described as follows:
  - western basin shoreline and open water (OH-MI state line to Marblehead);
  - Lake Erie islands shoreline (including South Bass Island, Middle Bass Island, North Bass Island, Kelleys Island, West Sister Island, and other small islands);
  - Sandusky basin shoreline and open water (Marblehead to Lorain Ridge); and
  - central basin shoreline and open water (Black River/Lorain Ridge to OH-PA state line).
- **Ohio River Assessment Units (ORAUs)** – 10 segments for the entire portion of the Ohio River that borders Ohio, divided by the dam pools.

It is important to remember that the information presented here is a summary. All the underlying data observations are available and can be used for more detailed analysis of water resource conditions on a more localized, in-depth scale. Much of the information is available in watershed reports available at

epa.ohio.gov/wps/portal/gov/epa/divisions-and-offices/surface-water/reports-data/biological-and-water-quality-reports.

Total Maximum Daily Load (TMDL) reports, available at ***epa.ohio.gov/wps/portal/gov/epa/divisions-and-offices/surface-water/reports-data/total-maximum-daily-load-tmdl-program***, are another source of more in-depth analyses.

Ohio's large rivers, defined for this report as draining greater than 500 square miles, are illustrated in Figure D-1. Ohio's watershed units are shown in Figure D-2. Lake Erie assessment units are shown in Figure D-3. Ohio River assessment units are shown in Figure D-4.

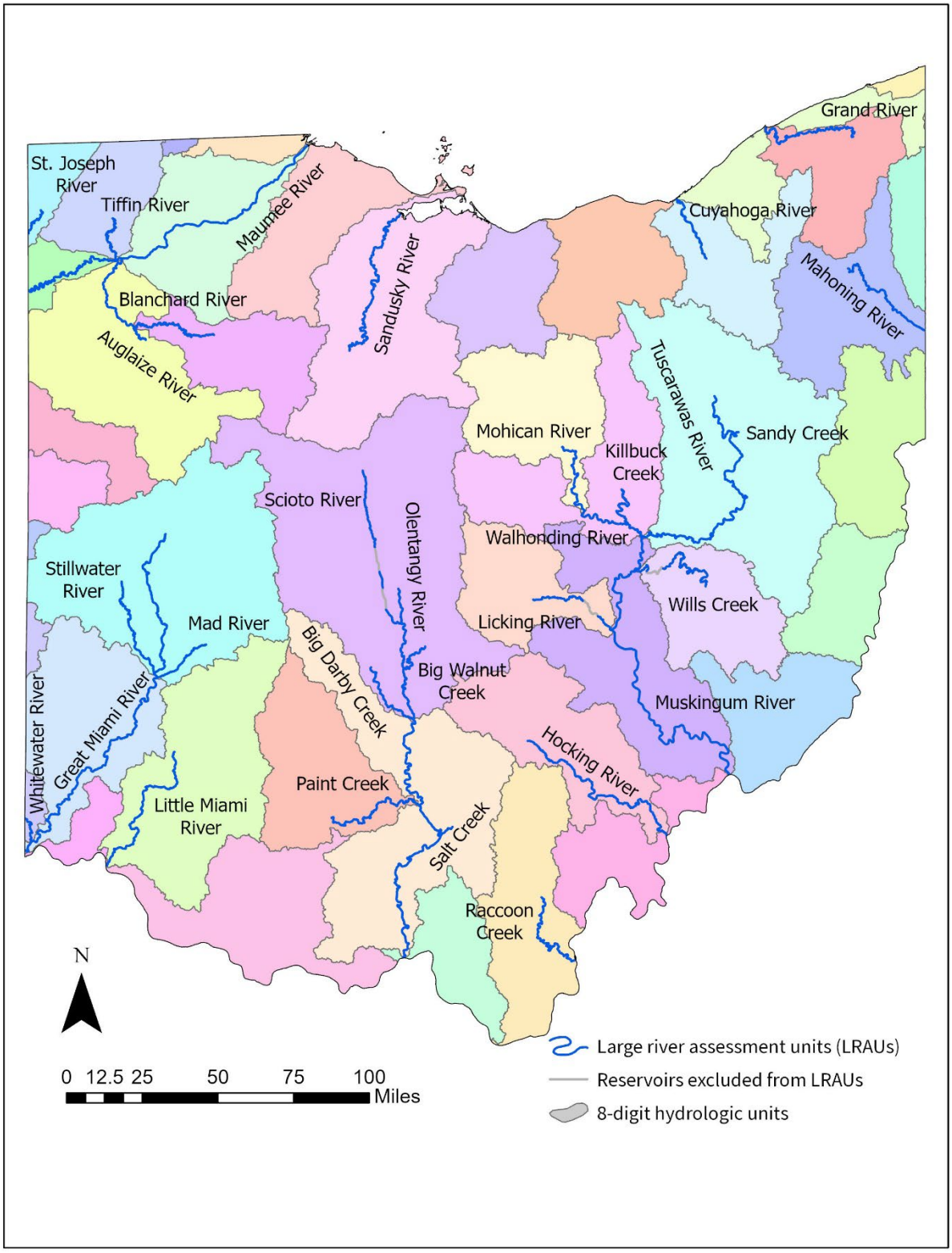

Figure D-1 — Ohio's large rivers (rivers with drainages greater than 500 mi^2) and their watersheds.

Figure D-2 — Ohio's 12-digit WAUs (gray lines) and 8-digit hydrologic units (heavy black lines).

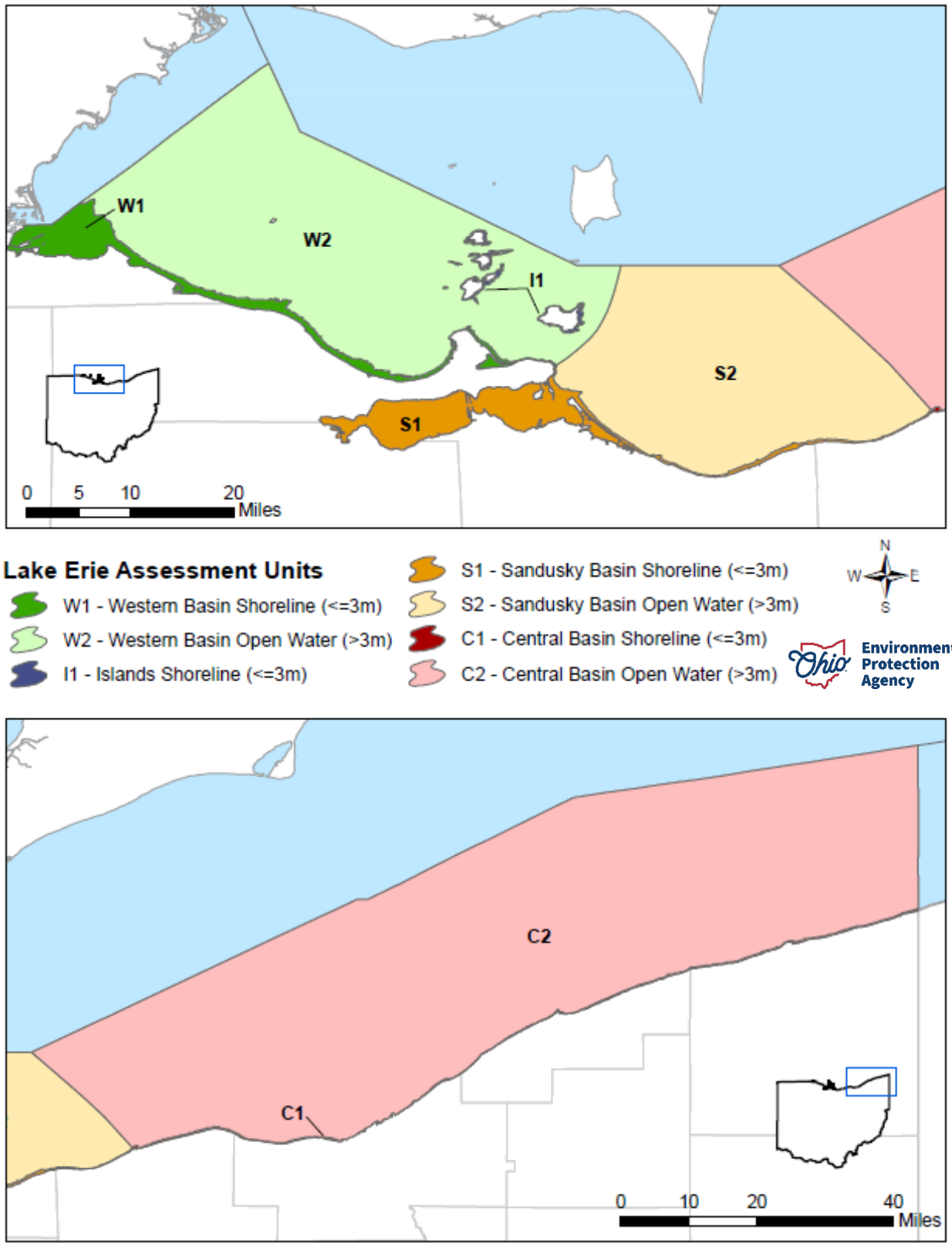

Figure D-3 — Ohio's Lake Erie assessment units – western basin, islands, Sandusky basin, and central basin shorelines and open water areas.

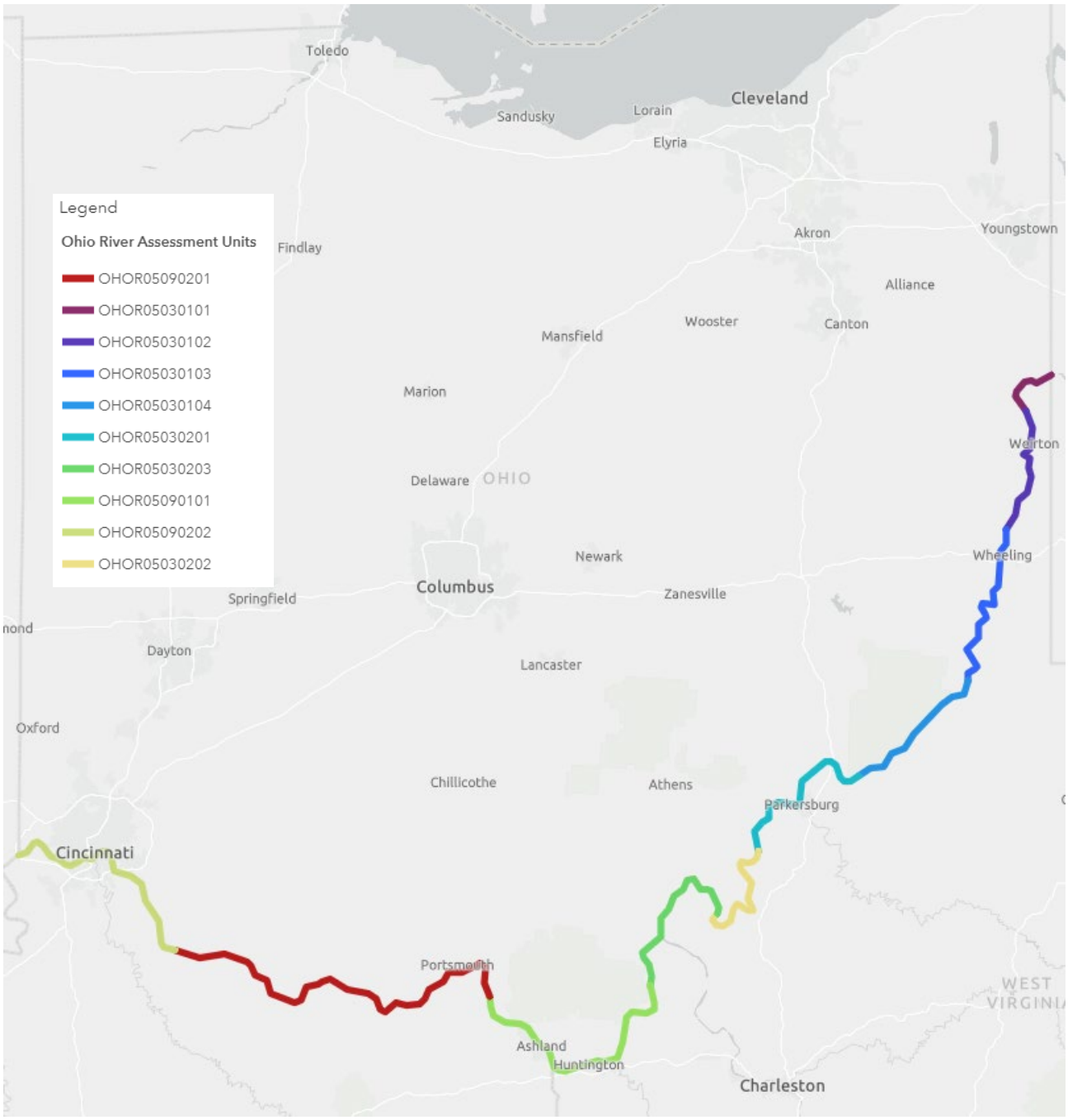

Figure D-4 – Ohio's Ohio River assessment units

D3. Evaluation of the Ohio River

For evaluation of the Ohio River, Ohio EPA defers to the Ohio River Valley Water Sanitation Commission (ORSANCO). ORSANCO is an interstate commission, established on June 30, 1948, to control and abate pollution in the Ohio River Basin. It represents eight states and the federal government. Member states include Illinois, Indiana, Kentucky, New York, Ohio, Pennsylvania, Virginia, and West Virginia. ORSANCO operates programs to improve water quality in the Ohio River and its tributaries including setting wastewater discharge standards, performing biological

assessments, monitoring for the chemical and physical properties of the waterways, and conducting special surveys and studies. ORSANCO also coordinates emergency response activities for spills or accidental discharges to the river and promotes public participation in the programs such as the Ohio River Sweep, River Watchers Volunteer Monitoring Program, and Friends of the Ohio.

Since 1948, ORSANCO and its member states have cooperated to improve water quality in the Ohio River Basin so that the river and its tributaries can be used for drinking water, industrial supplies, and recreational purposes and can support healthy and diverse aquatic communities. ORSANCO operates monitoring programs to check for pollutants and toxins that may interfere with specific uses of the river and conducts special studies to address emerging water quality issues.

As a member of the Commission, the State of Ohio supports ORSANCO activities, including monitoring of the Ohio River mainstem, by providing funding based on state population and miles of Ohio River shoreline. As such, monitoring activities on the Ohio River are coordinated and conducted by ORSANCO staff or its contractors. More information about ORSANCO and the Ohio River monitoring activities conducted through that organization can be found online at ***orsanco.org***.

Ohio EPA participates in an ORSANCO workgroup to promote consistency in 305(b) reporting and 303(d) listing. The workgroup discussed and agreed upon methods to evaluate attainment/non-attainment of aquatic life, recreation, and public water supply uses, as well as impairments based on sport fish consumption advisories ORSANCO utilizes in their Section 305(b) report for the Ohio River. The 2022 IR was the first time that Ohio EPA included 10 Ohio River assessment units and reported on the attainment status for three beneficial uses: recreation, public water supply, and human health uses. Ohio EPA is using data collected by ORSANCO and reported to Ohio EPA for this assessment using Ohio EPA's methodologies. In the 2024 IR, Ohio EPA reports on attainment status for all four beneficial uses, including aquatic life of the Ohio River (ORSANCO methodology adopted into Ohio rules). Ohio EPA incorporated ORSANCO's analysis in the 2022 Biennial Assessment of Ohio River Water Quality Conditions (ORSANCO 2022). ORSANCO plans to complete a biennial assessment in 2024 that will be available at: ***orsanco.org/publications/biennial-assessment-305b-report/***.

D4. Evaluation of Lake Erie

Lake Erie is bordered by four states and one Canadian province. As such, it has federal oversight by two sovereign nations. Unlike most other waters in Ohio, Lake Erie has a more complicated governance structure with a binational agreement (GLWQA) between the U.S. and Canada providing a framework to identify binational priorities and implement actions that improve water quality. For comparison, assessment and reporting on one of Ohio's other multi-state waters, the Ohio River, is conducted by ORSANCO, which, as stated above, is an interstate commission representing eight states and the federal government.

Ohio's assessment and impairment designation for Lake Erie has been the focus of considerable discussion between Ohio EPA, U.S. EPA, and local stakeholders. In 2018, Ohio, with the considerable aid of several universities and NOAA, developed a method for assessing the western basin open waters in Ohio for algae blooms. This methodology was used in the 2018 report and continues to be employed in this cycle. It is presented in Section F4 and utilizes the assessment units defined above in Section D2. In addition, Section F4 contains methodologies for the Sandusky and central basin units. In the

2024 report, sufficient data are available to update the Sandusky shoreline unit as meeting criteria for algae parameter for recreation use.

As in the past four reports, the shoreline units have been assessed for all four beneficial uses using the already established methods. All but the central basin shoreline and central basin open waters are listed as impaired for all four uses (the central basin open water is now meeting criteria (watch list) for algae parameter for public drinking water supply, central basin shoreline has no intakes or designated use for public water supply). See Sections E through H for more information on each use assessment.

D5. Ohio's Water Quality Standards Use Designations

Beneficial use designations describe existing or potential uses of water bodies. They take into consideration the use and value of water for public water supplies, protection and propagation of aquatic life, recreation in and on the water, agricultural, industrial, and other purposes. Ohio EPA assigns beneficial use designations to water bodies in the state. There may be more than one use designation assigned to a water body. Examples of beneficial use designations include public water supply, primary contact recreation, and numerous sub-categories of aquatic life use. Table D-1 lists all of Ohio's water quality standards (WQS) designated uses and outlines how the use was evaluated for the Ohio 2024 IR. Additional information is included in Section F4 about the WQS and uses evaluated for Lake Erie related to algae.

Table D-1 — Ohio water quality standards in the 2024 IR.

Beneficial Use Category	Key Attributes[2]	Evaluation status in the 2024 IR
Categories for the protection of aquatic life		
Coldwater habitat (CWH)	native cold water or cool water species; put-and-take trout stocking	Assessed on case-by-case basis
Seasonal salmonid habitat (SSH)	supports lake run steelhead trout fisheries	No direct assessment, streams assessed as EWH or WWH
Exceptional warmwater habitat (EWH)	unique and diverse assemblage of fish and invertebrates	66% of the WAUs and 98% of the LRAUs fully assessed using direct comparisons of fish and macroinvertebrate community index scores to the biocriteria in Ohio's WQS; sources and causes of impairment were assessed using biological indicators and water chemistry data
Warmwater habitat (WWH)	typical assemblages of fish and invertebrates	
Modified warmwater habitat	tolerant assemblages of fish and macro-invertebrates; irretrievable condition precludes WWH	
Limited resource water	fish and macroinvertebrates severely limited by physical habitat or other irretrievable condition	Assessed on case-by-case basis
Categories for the protection of human health		
Human health [fish consumption]	all waters outside mixing zones	43% of the WAUs, 100% of the LRAUs assessed, all seven LEAUs, and all 10 ORAUs assessed using applicable water quality criteria
Categories for the protection of recreational activities		
Bathing Waters	Lake Erie (entire lake); for inland waters, bathing beach with lifeguard or bathhouse facility	All four Lake Erie shoreline AUs fully assessed based on analysis of data collected from 65 public beaches, all 10 ORAUs assessed
Primary Contact Recreation (PCR)	waters suitable for one or more full-body contact recreation activity such as wading and swimming; three classes are recognized, distinguished by relative potential frequency of use	11% of the WAUs and 26% of the LRAUs assessed using applicable PCR geometric mean *E. coli* criteria
Secondary Contact Recreation (SCR)	waters rarely used for recreation because of limited access; typically located in remote areas and of very shallow depth	Assessed as part of the WAU using applicable SCR geometric mean *E. coli* criteria
Categories for the protection of water supplies		
Public Water Supply	waters within 500 yards of all public water supply surface water intakes, publicly owned lakes, waters used as emergency supplies	Sufficient data were available to assess the nitrate indicator at 56%, pesticide indicator at 31%, and algae indicator at 99% of the 121 AUs with PDWS use; assessed using chemical water quality data; only waters with active intakes were assessed
Agricultural Water Supply	water used, or potentially used, for livestock watering and/or irrigation	Not assessed
Industrial Water Supply	water used for industrial purposes	Not assessed

[2] Reasons for which a water body would be designated in the category.

D6. Sources of Existing and Readily Available Data

For two decades Ohio EPA has placed a high priority on collecting data to accurately measure the quality of Ohio's rivers and streams. Therefore, the Agency has a great deal of information and data to draw upon for the IR. The available data sets from Ohio EPA and external sources, including efforts used to obtain additional data, are also discussed below. The 2008 IR marked the first time that Ohio's credible data law was fully implemented in generating external data for consideration.

The credible data law, enacted in 2003 (ORC 6111.50 to 6111.56), requires that the director of Ohio EPA adopt rules which would, among other things, do the following:

- establish a water quality monitoring program for the purpose of collecting credible data under the act; require qualified data collectors to follow plans pertaining to data collection; and require the submission of a certification that the data were collected in accordance with such a plan; and
- establish and maintain a computerized database or databases of all credible data in the director's possession and require each state agency in possession of surface water quality data to submit that data to the director.

Ohio EPA adopted rules in 2006, which were revised in 2011, 2018, and 2021, to establish criteria for three levels of credible data for surface water quality monitoring and assessment and to establish the necessary training and experience for persons to submit credible data. Apart from a few exceptions, people collecting data and submitting it to Ohio EPA for consideration as credible data must have status as a qualified data collector (QDC). Only Level 3 data can be used for decisions about beneficial use assignment and attainment; water quality standards; listing and delisting (303(d) list); and TMDL calculations.

Ohio EPA solicited data from all Level 3 QDCs for the 2024 IR. The letter requesting data and the website containing information about how to submit data are included in Section D7. Table D-2 summarizes the WQS uses evaluated in the 2024 IR, the basic types of data used, the period of record considered, the sources of data, and the minimum amount of data needed to evaluate a water body. Specific methodologies used to assess attainment of the standards are described in more detail in Sections E through H.

Table D-3 summarizes the data Ohio EPA used in the 2024 IR. Ohio EPA's 2024 IR uses fish contaminant data to determine impairment using the human health-based water quality criteria. Fish consumption advisories (FCAs) were not used in determining impairment status. However, the public should use the FCAs in determining the safety of consuming Ohio's sport fish.

The evaluation of bacteria, biological, and water quality survey data was not changed from the approach used in the 2010 IR. Data collected by Ohio EPA and Level 3 QDCs were evaluated. The following QDCs and state and federal environmental agencies that are exempted from the QDC requirement submitted data or the data were available from readily obtained reports:

- Ohio Department of Natural Resources
- U.S. Geological Survey
- Northeast Ohio Regional Sewer District
- Midwest Biodiversity Institute
- Heidelberg University
- The Ohio State University
- Ohio Department of Health
- Cuyahoga County Board of Health

- EnviroScience, Inc.
- EA Science and Technology, Inc.
- Cleveland Metroparks
- Clermont County Office of Environmental Quality
- Ohio University Voinovich School
- MAD Scientist
- National Oceanic and Atmospheric Administration
- Bowling Green State University
- University of Toledo
- ORSANCO

Table D-2 — Data types used in the 2024 IR.

WQS Uses and Criteria Evaluated (basic rationale[3])	Type of Data Time Period	Source(s) of Data	Minimum Data Requirement
Human health, single route exposure via food chain accumulation and eating sport fish (criteria apply to all waters of the state)	Fish Tissue Contaminant Data 2013 to 2022	Fish Tissue Contaminant Database ORSANCO	Data collected within past 10 years[4]. Two samples, each from trophic levels 3 and 4 in each WAU or inland lake.
Recreation uses - evaluation based on a comparison of *E. coli* levels to applicable geometric mean and STV *E. coli* criteria in the WQS.	E. coli counts 2018 to 2022 (May through October only)	Ohio Dept of Health Cuyahoga County Health Department Northeast Ohio Regional Sewer District (NEORSD) ORSANCO	Five or more E. coli samples collected within a 90-day period; at least one site per AU; data period 2018-2022
Aquatic life (specific sub-categories), fish and macroinvertebrate community index scores compared to biocriteria in WQS [OAC 3745-1-07(C) and Table 7-1]	Watershed scale biological and water quality surveys and other more targeted monitoring 2005 to 2021	ODNR U.S. Geological Survey NEORSD Midwest Biodiversity Institute Heidelberg University The Ohio State University EnviroScience, Inc.	Fish and/or macroinvertebrate samples collected using methods cited in WQS [OAC 3745-1-03(A)(5)]. Generally, two to three locations sampled per WAU (12-digit HUC).
Public drinking water supply (criteria apply within 500 yards of active drinking water intakes, all publicly owned lakes, and all emergency water supplies)	Chemical water quality data 2017 to 2023	SDWIS (PWS compliance database) Syngenta Crop Protection, Inc. (Atrazine Monitoring Program)[5]	Data collected within past five years. Minimum of 10 samples with a few exceptions (noted in Section H).

[3] Additional explanation is provided in the text of Section D5.

[4] Data more than five years old are historical data. The rules provide that "Credible data may include historical data if the director identifies compelling reasons as to why the data are credible." ORC 6111.51(D) also says: "If the director has obtained credible data for a surface water, the director also may use historical data for the purpose of determining whether any water quality trends exist for that surface water."

[5] These data were collected as part of an intensive monitoring program at community water systems required by the January 2003 Atrazine Interim Reregistration Eligibility Decision and subsequent Memorandum of Agreement between U.S. EPA and the atrazine registrants (including Syngenta Crop Protection, Inc.).

Table D-3 — Description of data used in the 2024 IR from sources other than Ohio EPA.

Entity	Dates data were collected	Data description	Basis of qualification[6]
NPDES permittees	2013 – 2017 (May – Oct only)	Bacteria	Data credible – submittal pursuant to permit
Ohio Department of Health (ODH)	2018 – 2022 (May – Oct only)	Bacteria	State environmental agency
Cuyahoga County Health Department	2018 – 2022 (May – Oct only)	Bacteria	Level 3 qualified data collector (under ODH's study plan)
Northeast Ohio Regional Sewer District	2018 – 2022 (May – Oct only)	Bacteria	Level 3 qualified data collector
	Jul 2006 – Oct 2016	Physical habitat	
	Jun 2006 – Oct 2016	Biology	
	Apr 2006 – Oct 2016	Chemistry	
Ohio Department of Natural Resources	2013 –2022	Fish tissue	State environmental agency/Level 3 qualified data collector
	Sep 2006 – Oct 2016	Biology (fish only)	
	Jun – Oct 2016	Physical habitat	
PWS compliance database (permittees)	Jan 2018 – Sept 2023	Chemistry	Data credible – submittal pursuant to permit
Syngenta Corp Protection, Inc.	Jan 2012 – Dec 2019	Chemistry	See footnote[7]
The Ohio State University	May – Oct 2006	Biology (macroinvertebrates only)	Level 3 qualified data collector
Midwest Biodiversity Institute	Jul 2010 – Apr 2023	Biology	Level 3 qualified data collector
		Physical habitat	
		Chemistry	
Enviroscience, Inc.	Sep – Nov 2011	Biology	Level 3 qualified data collector
		Physical habitat	
Ohio Department of Transportation	Jun 2007 – Oct 2010	Biology (fish only)	State environmental agency/Level 3 qualified data collector
		Physical habitat	
Heidelberg University	Jun 2012 – Oct 2012	Biology (macroinvertebrates only)	Level 3 qualified data collector
EA Science and Technology, Inc.	Jul 2014 – Oct 2014	Biology	Level 3 qualified data collector
Cleveland Metroparks	Jun 2012 – Sep 2014	Biology (fish only)	Level 3 qualified data collector
Clermont County Office of Environmental Quality	May 2009 – Sep 2016	Chemistry	Level 3 qualified data collector
Ohio University – Voinovich School	Jun 2016 – Sep 2017	Biology (fish only)	Level 3 qualified data collector
		Physical Habitat	
		Chemistry	
MAD Scientist, Inc	Jun 2016 – Sep 2016	Biology (fish only)	Level 3 qualified data collector
NOAA	2002 – present	Algal (cyanobacteria equivalent) density interpolated by satellite data	Federal environmental agency

[6] Level 3 Qualified Data Collector requirements are described in OAC Rule 3745-4-03(A)(3). Included in table D-3 are Qualified Data Collectors Ohio EPA has approved for stream habitat assessment, fish community biology, benthic macroinvertebrate biology, and/or chemical water quality assessment. Data submitted by state and federal environmental agencies used in this IR have been determined to be Level 3 Credible Data in accordance with OAC Rule 3745-4-06(B)(6).

[7] These data were collected as part of an intensive monitoring program at community water systems required by the January 2003 Atrazine Interim Reregistration Eligibility Decision and subsequent Memorandum of Agreement between U.S. EPA and the atrazine registrants (including Syngenta Crop Production, Inc.).

Entity	Dates data were collected	Data description	Basis of qualification[6]
Bowling Green State University	Jun 2018 – Sep 2023	Microcystin (cyanotoxin)	Level 3 qualified data collector; samples analyzed by Ohio EPA's Division of Environmental Services

D7. Public Involvement in Compiling Ohio's Section 303(d) List of Impaired Waters

The public was involved in various ways in the development of the 2024 IR. Several means of public communication are discussed below.

Much of the data used in this report have been presented to the public in meetings and publications concerning individual watersheds. Data and assessments have also been available in previous 305(b), 303(d), and IRs. All this information can be accessed from the following websites: ***epa.ohio.gov/wps/portal/gov/epa/divisions-and-offices/surface-water/reports-data/total-maximum-daily-load-tmdl-program*** and ***epa.ohio.gov/wps/portal/gov/epa/divisions-and-offices/surface-water/reports-data/ohio-integrated-water-quality-monitoring-and-assessment-report***.

The draft 2024 303(d) was also available for public review and comment prior to submitting the final list and report to U.S. EPA.

Solicitation for External Water Quality Data, 2024 IR Project (January 31, 2023)

The following memorandum soliciting Level 3 qualified data was emailed to all Level 3 qualified data collectors on January 31, 2023.

Ohio Environmental Protection Agency

Mike DeWine, Governor
Jon Husted, Lt. Governor
Anne M. Vogel, Director

Date January 31, 2023

Re Solicitation of Water Quality Data, 2024 Integrated Report
(No action is required on your part - submission of data is voluntary)

To Interested Parties: Stream Monitoring Personnel

From Tiffani Kavalec, Chief
Division of Surface Water

The Ohio Environmental Protection Agency (Ohio EPA) is asking for chemical, biological, and/or fish tissue data you may wish to submit for consideration as the Agency prepares its 2024 Integrated Water Quality Monitoring and Assessment Report, commonly referred to as the Integrated Report. Both state and federal governments have an interest in utilizing all available data to make informed decisions about managing Ohio's aquatic resources; however, Ohio EPA is only able to use data from a limited number of external sources, including Level 3 certified data collectors and National Pollutant Discharge Elimination Systems (NPDES) discharge permit holders[1].

The 2024 Integrated Report fulfills the State's reporting obligations under Sections 305(b) and 303(d) of the Clean Water Act. Additional information about the report is available at epa.ohio.gov/dsw/tmdl/OhioIntegratedReport.

Credible Data Law
Credible Data rules (OAC 3745-4-01 to 06), developed in accordance with the 2003 credible data law (ORC 6111.50 to 6111.56), established a citizen water quality monitoring program for the purpose of collecting credible data under the act and required qualified data collectors to follow plans pertaining to data collection. The law further required that collectors submit a certification that the data were collected in accordance with such a plan.

Additionally, the law established that external data found to be compliant with the specifications for "level 3 credible data," which generally means data from a level 3 qualified data collector, can be used for certain regulatory and reporting purposes, such as the Section 303(d) list of Ohio's impaired waters.

[1] It is unnecessary to resubmit data that have already been submitted to the Division of Surface Water.

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epa.ohio.gov • (614) 644-3020 • (614) 644-3184 (fax)

According to Ohio EPA's administrative rules, you may meet the qualifications of a level 3 qualified data collector in one or more areas of water quality data and have submitted a study plan to the Agency in the last two years. Therefore, in pursuit of all readily available data for use in the state's reporting documents, the Agency is requesting your voluntary participation by submitting any recent water quality data that you have on Ohio's waters (e.g., lakes, rivers and streams) that you are qualified and authorized to collect.

Data submission deadlines are dependent on the type of data and are as follows:

- **Biological, chemical and fish tissue = April 30, 2023**
- **Bacteria = April 30, 2023**

More information about the specific types of data being requested by Ohio EPA, and **how** to submit such data, may be found at: epa.ohio.gov/divisions-and-offices/surface-water/reports-data/ohio-integrated-water-quality-monitoring-and-assessment-report.

Web Page with Instructions for Submitting Level 3 Credible Data

For organizations interested in submitting data to Ohio EPA, a webpage was established during the call for data period with instructions on what qualified data are to be submitted and how to do so. A selection of the content is displayed below.

Call for Data

2024 Integrated Water Quality Monitoring and Assessment Report - Call for Level 3 Credible Data

Information about submitting Level 3 credible data to Ohio EPA is organized as outlined below. More information about the Integrated Report is on the Ohio Integrated Water Quality Monitoring and Assessment Report page.

- What kind of data does Ohio EPA want?
  - Microbiological data
  - Biological data
  - Chemical water quality data
  - Fish tissue data
- Do I have level 3 data?
- Have I already given Ohio EPA my data?
- What will be needed in addition to data?
  - Microbiological data requirements
  - Biological, chemical, and fish tissue data requirements
- How do I send the data?
- To whom do I send the data?

To access the information, click on the relevant link below.

What kind of data does Ohio EPA want?

Do I have Level 3 data?

Have I already given Ohio EPA my data?

What will be needed in addition to data?

How do I send the data?

Ohio EPA already has data from some credible data collectors, as listed in the table above. Additional data may be available, and Ohio EPA is soliciting these data.

The Agency's capacity to accept and utilize the data in preparation of the Integrated Report is dependent upon a variety of factors and the use of all data brought to our attention may not be possible. Data must be provided in electronic format such as Excel or Access.

If you would like to discuss the possible use of data in the 2024 Integrated Report, please contact Kelsey Heyob at kelsey.heyob@epa.ohio.gov before preparing and submitting any information.

To whom do I send the data?

Submit all data and supporting information listed above to Kelsey Heyob at kelsey.heyob@epa.ohio.gov.

All data must be received by April 30, 2023.

Notice of Availability and Request for Comments CWA Section 303(d) TMDL Priority List for 2024

OHIO ENVIRONMENTAL PROTECTION AGENCY PUBLIC NOTICE

NOTICE OF AVAILABILITY and REQUEST FOR COMMENTS Federal Water Pollution Control Act Section 303(d) TMDL PRIORITY LIST FOR 2024

Public notice is hereby given that the Ohio Environmental Protection Agency (Ohio EPA) Division of Surface Water (DSW) is providing for public review and comment the *2024 Integrated Water Quality Monitoring and Assessment Report.* This report includes the Total Maximum Daily Load (TMDL) priority list for 2024 as required by Section 303(d) of the Federal Water Pollution Control Act (a.k.a., Clean Water Act), 33 U.S.C. Section 1313(d). The list indicates the waters of Ohio that are currently impaired or threatened and may require TMDL development in order to meet water quality standards. The priority list is contained within Section J, and a list of all categories of waters is available on Ohio EPA's website at the address below. The report describes the procedures that Ohio EPA used to develop the list and indicates which areas have been assigned high priority for TMDL development during the next two years.

Ohio EPA will present information about the report and 303(d) list through a webinar on February 28, 2024, at 1:30 p.m. The webinar may be viewed by registering and joining online at: https://attendee.gotowebinar.com/register/6439787264225368663

All interested persons wishing to submit comments on the report and 303(d) list for Ohio EPA's consideration may do so by email to EPATMDL@epa.ohio.gov or in writing to Ohio EPA, Division of Surface Water, P.O. Box 1049, Columbus, Ohio 43216-1049 Attn: 303(d) Comments, by 5:00 p.m. on March 8, 2024. Comments received after this date may be considered as time and circumstances allow.

After reviewing the comments, Ohio EPA will submit a final document to the United States Environmental Protection Agency (U.S. EPA) for approval.

The report is available for review on Ohio EPA's Division of Surface Water website at https://epa.ohio.gov/divisions-and-offices/surface-water/reports-data/ohio-integrated-water-quality-monitoring-and-assessment-report. To arrange to inspect Agency files or records pertaining to the document, please contact Richard Bouder at (614) 644-3037. To request notice of when Ohio EPA submits the document to U.S. EPA, please contact the email address above.

Response to Comments Received regarding the Request for Comments CWA Section 303(d) TMDL Priority List for 2024

The draft Ohio 2024 Integrated Water Quality Monitoring and Assessment Report (a.k.a., Integrated Report) was available for public review from February 6, 2024, through March 8, 2024.

During that time frame, one set of public comments were received on the draft report, as follows:

- Midwest Biodiversity Institute

Most of the comments are expressed verbatim as they were received; however, grammatical errors and typos may have been corrected and some comments were reduced to just the main points or requests. Please note that page number references to the draft report may not correspond to the same page numbers in the final report. Complete copies of the comments are included at the end of this section.

Section A

Comment 1: Page A-2: "Stream assessments are based on the experience gained through the collection of more than 28,000 fish population samples and nearly 14,500 aquatic insect community samples, depicted in Figure A-1." While this is certainly notable it implicitly supports a misleading message that we will detail later in these comments. These numbers differ from that stated on page G-2: "Stream assessments are based on the experience gained through the collection of more than 28,300 fish population samples, nearly 15,100 macroinvertebrate community samples …" The Section A and G numbers should match and be updated through at least 2022. Please see our detailed comments on Section G.

Response 1: **These numbers have been revised in the final report.**

Comment 2: Page A-3, ATTAINS This refers to the information available at ***https://www.epa.gov/waterdata/hows-mywaterway***. It might be difficult for the public to grasp the meaning of what is actually included so it could use a very simple explanation here to encourage its use. This source also provides very general information. It seems appropriate for the Agency to also direct readers to the TMDL page at ***https://epa.ohio.gov/divisions-and-offices/surface-water/reports-data/total-maximum-daily-load-tmdl-program*** for more detail and explanation in the reports for their areas.

Response 2: **More information on the How's My Waterway application as well as links to the TMDL and Biological and Water Quality Reports pages, have been added to the final report.**

Comment 3: Page A-4: "Figure A-2 — Overall summary of Ohio's combined assessment units. Output from ATTAINS." This information might benefit from a table similar to Table A-1. Summary of Human Health Fish Tissue Results where numbers in each risk category are provided. Providing percentages in each category in tables like this would help the general reader understand the information better. Table A-1. Summary of Human Health Fish Tissue Results might benefit from percentages for these numbers in each

row, while also including the actual numbers assessed, and the total number assessed in each row and column. We have the same recommendation for Table A-2. Summary of Recreation (Bacteria) Use Results on Page A-6. Also, please provide a brief explanation for what attainment and impairment status means, or at least provide a reference in the IR to where these are more fully explained. It should help make this information more understandable to the general reader. MBI spends a considerable amount of time educating, meeting with and assisting with the general public, local government, and other environmental professionals. Many of these people are not familiar (some not at all) with the terminology that might seem simple to Ohio EPA, but oftentimes is foreign to people who do not use these terms in their work, or do not comprehend the meaning or ramifications of what is stated in the content and context of a report like this.

Response 3: **A clarifying statement regarding impairment and attainment status has been added to the final report.**

Comment 4: Page A-6, paragraph 2: "96% of watershed" We assume this meant to say "96% of watersheds," unless there are some other words missing.

Response 4: This correction has been made to the final report.

Comment 5: Page A-9: While "Hydromodification, or flow alteration" has been a long-term section in the IRs, we note that this section does not include stream channelization or ditch construction and maintenance as reasons that there is "hydromodification, or flow alteration." The "surface drainage" hydrologic impact is similar to that of subsurface drainage (drainage tile) and usually precedes the laying of tile drainage.

Response 5: **Within the context of ATTAINS and the Integrated Report, Ohio EPA emphasizes the causes of impairment in a watershed – in this instance "hydromodification or flow alteration". Stream channelization or ditch construction would be considered sources of impairment, which are detailed further in project specific biological and water quality reports and TMDLs. Stream channelization has been added to the "Hydromodification, or flow alteration" subsection on page A-10 of the final report.**

Comment 6: Page A-11: "Row crop cultivation" appropriately mentions "Many cropland practices involve the channelization of streams." Both agricultural practices and "Land development" on the same page cause hydromodification that leads to stream channel erosion due to stream flashiness, a leading source of stream suspended solids. The section does state "streams become unstable." That means they are flashy and there is a channel erosion rate that is greater than natural. This could be mentioned here, which might help improve public understanding.

Response 6: Clarification has been made in the final report.

Comment 7: Page A-13: This link appears to be mistyped: Ohio EPA Division of Drinking and Ground Waters — epa.ohio.gov/wps/portal/gov/epa/divisions-and-offices/drinking-ground-and-waters. It should be: ***https://epa.ohio.gov/divisions-and-offices/drinking-and-ground-waters***

Response 7: This revision has been made to the final report.

Section C

Comment 8: Page C-7:

"As of May 2021, the Ohio EPA currently has 925 Level 1, 118 Level 2 and 60 Level 3 qualified data collectors"

We suggest creating a table to help track recent QDC numbers.

Based on these numbers there has been an increase in Level 2 and 3 QDCs since the 2022 IR, thus we recommend updating the numbers in the 2024 IR to those of May 2023, as they are readily available. We note that the number of Level 3 QDCs was 86 in the 2020 report, so the 66 reported as of 5/2/2023 is a reduction from previous levels. As we asked in 2022, what Level 3 specialties were reduced in terms of the number of QDCs? What are the reasons for this reduction? (Was it QHEI-related?) (See MBI 2022 Draft Ohio IR Comments February 28, 2022, and Ohio EPA response on page D-24 of the final 2022 IR.) This is a good place in the IR to report Credible Data Program status and progress on QDCs, especially in light of recent rule changes.

It would also be useful to state the amount of data that is actually being submitted by QDCs and how the agency actually uses it.

Response 8: **Edits were made to page C-7 of the IR to include the current number for QDCs as of February 2024. Additionally, here is a table showing the number of QDCs by level for the current and past two IRs:**

Level	2020 IR (Oct 2019)	2022 IR (May 2021)	2024 IR (Feb 2024)
1	936	925	1092
2	113	118	163
3	86	60	67

Since 2022, 15 Level 3 certifications have expired. For specific information regarding QDCs, the Agency provides a list of approved QDCs along with their specialty on its webpage at: ***https://epa.ohio.gov/static/Portals/35/credibledata/CurrentQDCs.pdf*****. The statement in the IR is general in nature and intended to provide a factual statement about participation in the Credible Data program overall.**

Comment 9: Page C-17:

We note some significant gaps between data collection and issuing TMDL reports. Some TMDLs appear to be taking up to several years to issue, and some might have Biological & Water Quality Reports that are not followed up with a TMDL. The length of the delay risks that changes in stream conditions might have outdated a TMDL by the time it is issued. Please address our perception that these delays are getting to be longer between the survey and the TMDL report. Such delays make the surveys, a Biological & Water Quality Report and a TMDL significantly less useful. Affected parties, such as

dischargers or a watershed organization trying to address impairments or protection, cannot make informed decisions and take appropriate action based on aged data and TMDLs that are based on aged information. And as we have stated, this is compounded by the reduction in sampling density related to the implementation of the Two-Pronged Approach. This also goes for other stakeholder-initiated actions such a 9- Element plans that are based on data that is approaching 15-20 years in age.

Response 9: Ohio EPA recognizes the issue and is working to address it. Since new TMDL requirements became effective in 2019, Ohio EPA has been working to implement the new five-step process. Study plans and Biological and Water Quality Reports are the first two steps. Step 3, loading analysis plan (LAP) determines management actions to address impairments and is a new step in the process. We have completed LAPs for 39 projects generating a list of actions, management decisions for all causes of impaired uses and associated uses that were identified in the assessment reports (step 2). There are nine basin-specific TMDL projects at step 4, Preliminary Modeling Results (PMR, see details in Section J), and two projects at step 5, TMDL. Additionally, we are developing multi-watershed TMDL projects to address common causes of impairment for bacteria (recreation use), sediment (aquatic life use), and a habitat restoration plan.

Comment 10: Page C-31:

"continue to focus on restoring stream habitat to address Aquatic Life use impairments (category 4C) through a multi-watershed habitat restoration plan;

- follow-up on effectiveness of current TMDLs, revise as appropriate, and support additional implementation efforts where necessary;"

MBI recommends that the "restoring stream habitat" include a statewide effort to evaluate the success of various levels of stream habitat restoration projects. Implemented over the past two decades, there are numerous examples in Ohio of stream restoration projects ranging from simple riparian vegetation plantings to two-stage ditches to full, QHEI-based Natural Channel Design (NDC) projects. The Big Darby Creek watershed includes several examples of the NCD projects, for example. Determining the "ecological lift" and changes in biotic indices of these projects would address TMDL goals. If enough are included in this assessment, covering the range of projects across Ohio would lead to helpful information about the level of success of different methods. It would also be useful for providing training to watershed project implementers, local governments, consultants, DSW staff, and the general public.

Response 10: Thank you for the comment and suggestion.

Section D

Comment 11: In the Final 2022 IR, Page D 22, the report states:

"Ohio EPA has discussed this concern with ORSANCO. ORSANCO is conducting a trends analysis on fish tissue data that will be available later this summer with a report available by the end of the year."

We appreciate the coverage of fish tissue data in the draft 2024 IR (e.g., Page D-13, Table D-2 — Data types used) in the 2024 IR. Specifically, could Ohio EPA point to how this "trends analysis on fish tissue data" is covered in the draft 2024 IR, or update us about the status of the above ORSANCO report? We have not been able to find this in the latest ORSANCO 305(b) report, Biennial Assessment of Ohio River Water Quality Conditions 2016-2020 ***https://www.orsanco.org/wp-content/uploads/2016/07/ORSANCO_2022_305b_Report.pdf***. The latest we found for ORSANCO is a statement on their "Proposed FY2022 Technical Program," "Complete trends analysis of PCBs in Ohio River fish tissue" ***https://www.orsanco.org/wp-content/uploads/2021/10/TECMinutesJune21Final.pdf***. If there is such a fish tissue trends analysis completed, could Ohio EPA include this in the 2024 IR?

Response 11: Ohio EPA reached out to ORSANCO for the status of the trends report of PCBs in Ohio River fish tissue. ORSANCO noted that the report has been submitted to Journal of Environmental Monitoring and Assessment, and the manuscript is currently under review. Inquiries on this report may be directed Daniel Cleves (*dcleves@orsanco.org*).

Comment 12: Page D-14, Table D-3:

In the draft 2024 IR, Page D-14, Table D-3. Description of data used in the 2024 IR from sources other than Ohio EPA, we see that for "Dates data were collected," MBI is listed as July 2010 – April 2023. Our records indicate that we uploaded data on July 11, 2023 which includes 2022 Level 3 surveys.

We do appreciate the steps to improve the data review and updates. While it is no small task, it would help to know the specifics of what each QDC is actually submitting and how it was used by Ohio EPA. MBI has submitted extensive data to Ohio EPA, but it is oftentimes difficult to determine how that data was actually used. It would also demonstrate to others that Ohio EPA actually uses Level 3 data for IR purposes. At this time, it is unknown even to us.

Response 12: On January 31, 2023, Ohio EPA released a Call for Level 3 Credible Data. The submission deadline for this request was April 30, 2023. Data received after this date will be considered in the 2026 IR. It is important to note that site-level information is aggregated to the assessment unit level for IR reporting. We refer to other reports with site-level details.

Comment 13: D7. Public Involvement in Compiling Ohio's Section 303(d) List of Impaired Waters

> "The draft 2024 303(d) list will be also available for public review and comment prior to submitting the final list and report to U.S. EPA."

We assume this will be beyond what is provided in this draft report, and we look forward to seeing this 303(d) list.

Response 13: See page D-19 with the Notice of Availability and Request for Comments CWA Section 303(d) TMDL Priority List. The 303(d) list of priority waters was included in Section J of the draft 2024 IR and excel spreadsheet of data from ATTAINS was available

during the comment period. No further comment period is planned, and the 303(d) list was submitted with the 2024 IR.

Section G

Comment 14: Page G-2. See: G1. Background and Rationale

> "Stream assessments are based on the experience gained through the collection of more than 28,300 fish population samples, nearly 15,100 macroinvertebrate community samples …"

The Section A and G numbers need to be matched and updated through at least 2022.

Beyond this, bundling the much more intensive collection of data 1978-2018 prior to the Two-Pronged Approach is potentially misleading. Our analysis of sites sampled in four periods of time flows:

1979-1992: average 309 sites/year
1993-2000: average 600 sites/year
2001-2017: average 470 sites/year
2018-2022: average 193 sites/year

This is documented in Figure 1 which shows the number of fish/habitat sites sampled by Ohio EPA 1978-2022. When making comparisons the agency needs it use the full spectrum of data collection in order to gain a better understanding of the current program scope and coverage. We are finding that current practitioners, most of whom were not around when the program began in 1978 simply do not comprehend this issue. We are not purposefully trying to impugn the intent of the agency, but there needs to be some honesty about where the program came from. The ability to continue reaping the benefits of the 1980s and 1990s especially will fade with time so long as the monitoring effort stays at a comparatively reduced level.

Response 14: Comment acknowledged. Values were revised in the final report to be consistent.

Comment 15: Rivers and Streams: Watershed Assessment Units (WAUs)

Page G-5:

"HUC 12 (1,538 HUC 12s averaging 28 mi2 drainage areas)"

And,

"This dramatic reduction in assessment unit size requires consideration of what constitutes adequate sampling within each HUC 12 WAU and appropriate evaluation of the sampling results. The relatively small drainage area of the HUC 12 WAU requires that the sites evaluated adequately characterize the smaller watershed. While the smaller size of the HUC 12 WAU greatly reduces the number of sites necessary to be assessed, this creates an emphasis on appropriate sampling locations within the assessment unit."

This is very misleading. While a HUC12 is smaller than HUC11, the site density (sites per area) was much higher in the years when the standard was a HUC11. So this change does not produce more information per area, it actually produces less than what was formerly done.

Page G-5/G-6:

Figure G-1. Flowchart for determining if WAU score can be derived based on available sampling locations.

In the box "3 or more sites," note that this used to be 6 or more sites. We have encountered the need to sample 10 or more sites in some cases and we emphasize that these higher density surveys will yield information that is more accurate and it better informs affected entities about any liabilities they may incur due to either overlooking impairment or attainment.

Page G-5:

"Baseline IR statistics generated beginning with the 2010 IR were used along with the updated 2024 IR results to track trends of attainment levels across Ohio's watersheds and large rivers to quantify progress made in point and nonpoint source pollution controls and in meeting Ohio's water quality goals."

While we appreciate the continued tracking of trends of attainment levels on a biennial basis adding a bar to represent the starting year of 1980 would give this some badly needed historical perspective. We do appreciate that the agency added this perspective to the large rivers report.

Response 15: Comment acknowledged.

Chlorides

Comment 16: Chlorides in Rivers and Streams

Page C-26:

"Through this initiative, H2Ohio plans to:

- Address the issue of rising salinity in Ohio's rivers and streams"

Page C-33:

"The H2Ohio Rivers Initiative includes a focus on preserving high-quality riparian areas to maintain healthy waterways. In response to observing increased chloride concentrations in Ohio's large rivers, the new H2Ohio Chloride Reduction Grant was announced in December 2013 and will award approximately $1 million in funding to help reduce road salt runoff and water contamination and protect waters from impairment."

While we appreciate seeing that stream chloride levels of concern and increasing trends are being recognized the level effort being devoted to what is a decades in the making problem, is statewide in scope, and is likely a permanent modification to water quality seems inadequate. There are other states (e.g., Minnesota) that have advanced

programs, so we would urge examining those approaches to perhaps cut down the development time frame for an Ohio program (see below).

Specifically, we request the reporting of quantities of road salt usage, which would help focus management on reducing the amounts released to the environment. Like most things, measurement is a key to diligence and progress. A focus on usage reporting focuses directly on use reduction. It more strongly implies responsibility for reduction than do concentrations and trends in streams and other water resources, although that information is also important.

While the draft IR refers to this new H2Ohio program, we encourage that it further discuss the chloride concentrations and trends in Ohio rivers and streams. The Large Rivers report cited on page A-7 and C-33 (and elsewhere) of this draft IR does not expand on chloride trends other than a very brief mention. The evidence of increasing stream concentrations and an accumulating problem is extensive, and we encourage the IR to include water resource chloride trends and concentrations, and road salt use trends, in this and future reports. We are seeing increases in stream chloride concentrations, including summer/low flow concentrations, some exceeding the U.S. EPA (1988) Ambient Water Quality Criteria for Chloride of 230 mg/l and the Miltner (2021) "hazard concentration" of 52 mg/l for the protection of high quality waters.

Dugan and Arnott (2022) discuss the sensitivity of aquatic species and the Canadian water quality guidelines for chronic exposure (120 mg L/1) established by the Canadian Council of Ministers of the Environment.

We encourage the agency to review the historical increases in chloride concentrations in the MBI report on the Middle Scioto and Lower Olentangy Rivers (pages 77-84; MBI 2022; see also Figure 21) that has been submitted to the agency as a Level 3 assessment. There is a follow-on 2022 report that focuses on tributaries to the lower Olentangy River where chloride levels vary considerably between individual streams. This has critical implications for monitoring design.

That report will also be submitted as a Level 3 assessment yet this month.

Many states recognize upward chloride trends and are moving forward with active programs to reduce road salt use. For example, we encourage you to review Wisconsin's Salt Wise (https://www.wisaltwise.com/) and the Minnesota Statewide Chloride Management Plan

(https://www.pca.state.mn.us/sites/default/files/wq-s1-94.pdf). Both of these states apply less road salt per year than Ohio (Clear Roads 2023). As a state, in addition to road salt, Ohio also can be expected to release relatively large amounts of chlorides from other sources, such as fertilizer use, wastewater plants, specific industries, water treatment plants, and septic systems.

We appreciate the Division of Drinking and Ground Water attention to increasing chloride concentrations. Page L-9 states:

"Spreading of salt on roads certainly contributes to ground water quality impacts, but the greatest local impact is associated with salt storage."

We recommend that a wider analysis of groundwater chloride concentrations be conducted, as the area of salt storage is very small compared to the area of surface salt application, and given the known trends of chloride increases in streams (including during summer low flows) and groundwater across much of the Midwest and northeast U.S. (Kaushal et al 2018). Page L-10 notes that:

"positive trends in chloride concentrations in Ambient Ground Water Quality Monitoring data are present at some sites."

We suggest that Ohio EPA conduct a review of summer and low flow chloride concentrations in Ohio streams using Ohio EPA, MBI, USGS, and Heidelberg University data. We suspect a large portion of this chloride has accumulated in soils and riparian zones, entered streams through near-surface groundwater, and contributes to the high low flow concentrations at levels of concern. We suspect, given the broad application of road salt across Ohio by both public and private entities, that groundwater contamination is likely to be more widespread, which contributes to elevated river and stream concentrations, and is often, if not usually, from cumulative road salt applications.

In addition to Ohio EPA and MBI data, studies by other investigators such as Bill Hintz at the University of Toledo and Doug Kane at Heidelberg University, there are many Ohio river and stream concentrations that approach or exceed the U.S. EPA 230 mg/l and the Miltner (2021) "hazard concentration" of 52 mg/l.

Response 16: **Ohio EPA is aware of the programs in Minnesota and Wisconsin. Our approach is to provide direct support for modernization, and there has been strong interest in the initial round of funding. By offering competitive grants, we have been able to generate interest, raise awareness, and gauge willingness to adopt better practices. Although a certification program with a coordinator would be an optimal scenario, a significant impact has already been made in terms of raising awareness with just this first round of funding.**

While Ohio Department of Transportation (ODOT) tracks road salt usage, gathering information on usage for the various municipalities and townships would not be practicable at this time. Even states like Minnesota and Wisconsin, which have more established programs, are still developing ways to accurately track this information. Although it is not a feasible goal for this report, Ohio is looking to further develop this program to address these issues.

The issue of trends has been well documented in the literature and observed while analyzing trends from Ohio's ambient program.

Nutrients

Comment 17: Nutrients

We appreciate the coverage of nutrients throughout the draft IR, such as in the beginning in Section A. The following comments address the topic throughout the draft IR and provide overall recommendations.

In reference to the October 2023 Response to Comments for "Project: Draft Summary of Findings from the 2020-2021 Aquatic Life and Water Quality Survey of Ohio's Large Rivers", AOMWA asked about the assessment process used to evaluate whether a river is impaired for nutrients. Ohio EPA's response was:

"Response 1: Ohio EPA plans to begin a rulemaking process on nutrient criteria and implementation next year. Ohio EPA will include stakeholder meetings and opportunities for input as part of the rulemaking process and will notify AOMWA of such activities."

Nutrient enrichment of streams is noted many times throughout this draft IR, which we appreciate. For example, Page G-9 of this draft report recognizes:

"LRAUs in the Great Miami River, Maumee River, and Scioto River are considered threatened due to over-enrichment (nutrients),"

These river basins are among Ohio's largest and most agriculture-dominated, but the Scioto and Great Miami also have a number of large municipal wastewater treatment plants. MBI also commented in January 2023 when the Agency requested stakeholder input on Ohio EPA's Triennial Review through the online form. We submitted our prioritization proposals, including nutrient standards, where years of collaboration between government, regulated industry, agriculture, NGOs, and the concerned public have led to plans and proposals were a step in the right direction. However, we are not aware at this time that any progress towards implementing those plans through adoption of a water quality criterion or combined approach. The agency also needs to be very clear about the end goals and what constitutes evidence of impairment. Is it maintaining and restoring aquatic life use attainment or is it more in terms of cultural eutrophication? Based on our own studies in the Scioto and Olentangy Rivers these can be very different endpoints resulting in significant implications for wastewater treatment and nonpoint source management.

As we also stated in our comments on the draft 2022 IR that we encouraged Ohio EPA to take more action on nutrients, such as fully adopting and implementing the large rivers nutrient and SNAP approaches. For the Maumee and Sandusky Rivers, we expect that the sources related to the lack of attainment or exceedance of cultural eutrophication indicators in these rivers also contribute to the Western Lake Erie Basin nutrient related problems. Also, since the nitrate-N indicator is failing to attain goals, Ohio EPA should continue to actively work with the Ohio Department of Agriculture and others to increase attention on nitrogen as a pollutant. In the 2022 final IR, the Agency responded that it is acting on nutrients not only for aquatic life use impairments, but public water

supply impairments as well, and cites the Maumee Watershed Nutrient TMDL project addressing harmful algal blooms in the Western Basin of Lake Erie and the East Fork Little Miami River TMDL which presumably focuses on the Harsha reservoir. We recognize other relevant components such as the Ohio Nutrient Reduction Strategy, but encourage that more resources - funds and staff - to be provided for this and not at the expense of other water quality programs.

In terms of the Gulf Hypoxia issue and nitrate pollution statewide, and especially in the Ohio River basin, we expect that addressing pollution at the near-field, local level will help address far-field impacts such as in the Gulf of Mexico. We encourage more coverage of the Gulf of Mexico hypoxia problem in this report, as Ohio contributes to this problem and addressing nitrate pollution in Ohio streams should help reduce Ohio's contribution. We appreciate the efforts such as the November 2022 Request for Proposals to boost HUC-12 watershed 9- Element nonpoint implementation strategies in Priority Ohio River Basin Watersheds (https://epa.ohio.gov/static/Portals/35/nps/319DOCS/Hypoxia-NPSIS-RFP.pdf). More Gulf Hypoxia focus in this IR could help improve the awareness and attention to this issue, track progress at the Ohio River basin scale, and for NPS-IS make further improvements. At the near- field level, which is well-covered in this report, this large-scale focus on Ohio contributions to Gulf Hypoxia also would help address problems like the City of Columbus exceedances of the nitrate Water Quality Criteria in finished drinking water (page H-15 and H-26). Unlike the Lake Erie nutrient and algae problems, it is our sense that the general public is not as familiar with the Gulf Hypoxia issue, which is why we encourage more coverage and emphasis.

We recognize this draft IR includes a paragraph on the Statewide Nutrient Reduction Strategy (page J-20). This IR would be an excellent place to provide some of the specific points in the Scope of Work listed in the Ohio Nutrient Reduction Strategy April 2023 Request for Proposals https://epa.ohio.gov/static/Portals/35/nps/319DOCS/Ohio%20Nutrient%20Reduction%20Strat egy%20Request%20for%20Proposal%20(RFP).pdf.

We appreciate these projects, and encourage the Agency to pursue the rulemaking process noted above to help focus attention and further progress at a broader, statewide scale.

Response 17: **Ohio EPA uses a weight of evidence approach to determine nutrients as a cause of impairment (see details in basin *Biological and Water Quality Reports* and *Summary of Findings from 2020-2021 Large River Survey*), so yes, in some respects cultural eutrophication is being addressed. In the Large River report, we note that the biological indicators in large rivers may tend to not be as sensitive to enrichment, possibly because the indices were calibrated to an enriched background condition. Ohio EPA plans to begin a rulemaking process on nutrient criteria and implementation.**

PFAS

Comment 18: Beyond reference to the H2Ohio Rivers Initiative on page C-27, the draft IR does not include extensive coverage of per- and polyfluoroalkyl (PFAS) substances, but we believe that mention of Governor DeWine's announcement of December 1, 2023, concerning the "PFAS Prevalence Study" is warranted for this IR:

"As part of the H2Ohio Rivers program, Ohio will undergo a statewide survey to measure its large rivers for the existence of per- and polyfluoroalkyl (PFAS) substances. … To measure PFAS contamination, Ohio EPA will collect water samples and aquatic life tissue specimens in 29 of Ohio's rivers. Once analyzed, the baseline measurement findings will be used to inform Ohio's work to remediate any contamination and will give insight on the potential for any sport fish consumption advisories." (https://governor.ohio.gov/media/news-and-media/governor- dewine-announces-expansion-of-h2ohio)

The list on Page C-27 does not include the Ohio "PFAS Prevalence Study" monitoring effort. (DeWine 12/11/2023 press release.) We recommend the IR include mention of this study and we look forward to the reporting of the results in the 2026 IR or sooner. We greatly appreciate the efforts of Ohio EPA to cover PFAS in drinking water (https://epa.ohio.gov/monitor- pollution/pollution-issues/per-and-polyfluoroalkyl-substances-pfas). We look forward to more extensive coverage on PFAS presence in surface waters including rivers and streams. The ORSANCO Ohio River PFAS effort is covered at: https://www.orsanco.org/per-and- polyfluorinated-substances-pfas/. We assume that the results of such efforts will be reported in future IRs.

Response 18: **Reference to the PFAS Prevalence Study has been added to the final report. Information on this study will be available once it is complete, and could be included in the 2026 IR. Ohio EPA is closely following development of new regulations and drinking water standards for PFAS and updates are available on *www.pfas.ohio.gov*. When new standards are finalized, Ohio will re-evaluate the public drinking water supply assessment methodology.**

Comments related to impaired waters listings

Comment 19: These comments relate to impairment determinations made in other reports such as a Loading Analysis Plan and the recently completed statewide Large Rivers Assessment.

See AMS/2012-MSCIO-3 Loading Analysis Plan – Middle Scioto River and selected Tributaries April 2023 (https://epa.ohio.gov/static/Portals/35/tmdl/LAPs/2010-Middle-Scioto-LAP.pdf).

On page 5 of the above referenced report, see Table 2. Aquatic life use attainment for impaired sampling locations …

The Scioto River sites 600860 (downstream Greenlawn Avenue), and V07P28 (downstream Jackson Pike WWTP) stations in the draft IR are out of date, and should have Attainment Status as Full, not Partial based on 20202 Level 3 data submitted by

MBI. MBI sampled these sites in both 2020 and 2022 and these sites were found to be in full attainment by MBI.

On page 9 of the above report, see Table 3. Summary of ALU impairments and potential modeling approaches. Related to the Scioto River:

Station 600860: the "Source(s) of Impairment," "Columbus CSOs," were eliminated in 2015 by the OARS tunnel. Station V07P28: both "Sources of Impairment" are out of date. "Columbus CSOs," were eliminated in 2015. "Jackson Pike WWTP" is out of date, and should have Attainment Status as Full in Table 2, not Partial. MBI sampled these sites in 2020 and 2022. The supporting data from 2020 were submitted to Ohio EPA by MBI. The 2022 data will be submitted shortly.

This is an example of how data collected in 2009-10 and used in a loadings Analysis and published in 2023 can easily become outdated by the time it is publicly released. Since the agency can no longer fill these gaps, it will need to increasingly rely on Level 3 assessments (not only the data) to keep the IR current.

See Ohio EPA Technical Report AMS/2020-LRGRV-2, Summary of Findings from the 2020-2021 Aquatic Life and Water Quality Survey of Ohio's Large Rivers, Table 1. Attainment status of Ohio's large rivers surveyed in 2020 and 2021.

Related to the Olentangy River Station V04S16: The Fifth Avenue dam was removed in 2014, and MBI sampling in 2015, 2020, and 2022 showed the site in full attainment of WWH, not MWH. WWH was adopted in 2022, but the recommended use goes back to 2015. The 2015 and 2020 Level 3 data were submitted to Ohio EPA by MBI. The ALU should be updated to WWH. See 3745-1-09, Table 9-1.Use designations for water bodies in the Scioto river, Effective: 7/18/2022. If the "Large Rivers" report was used for the draft 2024 IR, this ALU could misrepresent attainment status due to not including certain sites where contrasting data is available.

For example, for a contrasting attainment status, see the report (MBI 2022) below:

Table 1. Status of aquatic life use attainment at 25 ambient sites in the Scioto River mainstem and Big Walnut Creek during July-October, 2020. In this table, MBI Site SR05 shows partial ALU attainment at Scioto RM 130.45/130.10, with an IBI of 36, an ICI of 16 and QHEI of 57. This is an impairment of the MWH use in the Greenlawn impoundment thus this should be added to the impaired waters list. The Large Rivers report did not have sufficient site density to detect this impaired segment.

The Large Rivers report also listed Scioto River site V03W25 as being in partial attainment due to a less than WWH ICI in Table 1 of that report. The partial attainment status was extended to the reach between Griggs Reservoir and the Olentangy River confluence in Figure of the LR report. The MBI 2020 results were full attainment at this site and two other sites not sampled by Ohio EPA in this same reach. All three sites showed full attainment. We would appreciate this being reflected as full attainment, the same as the lower Olentangy River in the 2024 IR and ensuing impaired waters listing.

The 2020 and pending 2022 results better align with the actions taken by the City of Columbus in compliance with the 2015 WWMP and subsequent updates.

These finding were confirmed by another survey in 2022, but the agency has not yet received that report which will be forthcoming later this month.

Response 19: Comment acknowledged. Ohio EPA conducted a basin survey in the Middle Scioto River watershed in 2023 (see *study plan* for more details on sampling) and intends to survey the Upper Scioto River and Olentangy River watersheds in 2024. The refenced report has been shared with the study team. Biological and Water Quality Reports will be prepared for the surveys with site-level information and can address recent changes in watershed and attainment status. In the Integrated Report, site-level information is aggregated to the assessment unit. For the 2024 IR, seven new large river assessment units (LRAUs) were added, including the Olentangy River (mouth to river mile 9.99). Warmwater Habitat (WWH) aquatic life use designation is reported for this LRAU based on information from the Large River survey.

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March 8, 2024

To Whom It May Concern:

The Midwest Biodiversity Institute (MBI) has reviewed the draft Ohio "2024 Integrated Water Quality Monitoring and Assessment Report" announced on February 6, 2024. MBI is a not-for-profit corporation specializing in applied research with aquatic bioassessments, water quality standards, monitoring and assessment, and state bioassessment program development. As part of our mission, MBI has conducted in depth reviews of 27 state, three federal, and two tribal programs since 2002. These reviews have included the development and implementation of the monitoring and indicators needed to produce the biennial 305[b]/303[d] Integrated Report (IR) for each state. In addition, MBI has also conducted comprehensive watershed bioassessments in Ohio and other states that emulate the essential concepts and attributes of the Ohio EPA program that had been reflected by IRs and basin assessments prior to 2020. It is from this base of experience that we offer the attached comments and suggestions for improving the draft report and detailing how the changes to monitoring and assessment have affected the IR and CWA programs in general. Our comments reflect a concern that we have now expressed many times to the agency about the reduction in spatial intensity of the river and stream monitoring. This will include pointing out discrepancies between agency delineations of impairments vs. what we are producing for various clients, who are in the end the most affected by inaccuracies in this process.

We remain committed to advising the agency and others in a positive, yet frank manner. We appreciate the opportunity to provide input to critical water quality program issues at Ohio EPA.

Very truly yours,

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Detailed Comments on Draft 2024 Ohio Integrated Report
Submitted by the Midwest Biodiversity Institute

Monitoring to Support Impaired Waters Listings and TMDLs

We have commented extensively about how changes to the exemplary Ohio EPA monitoring and assessment (M&A) program that consisted of nearly 40 years of systematic pollution assessment for inland rivers and streams pose risks to future knowledge about river and stream quality. We are now seeing real world examples about how the proposed Two-Pronged Approach and actions that were taken before that time are exposing serious issues with the accuracy and age of data used to support important water quality management functions such impaired waters listings as TMDLs. Those are detailed in our comments on specific sections of the 2024 IR.

There is no question that one of the essential components of the Ohio surface water program was the systematic implementation of M&A and the rigor of the spatial context and biological, chemical, and physical indicators upon which the assessments were based. However, the reduction in this rigor and scope made before and formalized by the implementation of the Two-Pronged Approach that was introduced in 2018 and implemented in 2020 is now becoming apparent in the content, or more importantly the lack of content, in the 2022 and draft 2024 IRs. Our previously stated comments and concerns about the ***Ohio EPA Monitors Water Quality in Ohio and Reports its Findings*** discussion in Part A of the 2020 and 2022 IRs providing a potentially misleading message about the future of the program that many stakeholders have simply come to expect, has been validated by the examples listed above. Thus far the agency response to these concerns has been less than compelling.

Section C: Managing Water Quality

Chlorides in Rivers and Streams

Page C-26:

"Through this initiative, H2Ohio plans to:

- Address the issue of rising salinity in Ohio's rivers and streams"

Page C-33:

"The H2Ohio Rivers Initiative includes a focus on preserving high-quality riparian areas to maintain healthy waterways. In response to observing increased chloride concentrations in Ohio's large rivers, the new H2Ohio Chloride Reduction Grant was announced in December

2013 and will award approximately $1 million in funding to help reduce road salt runoff and water contamination and protect waters from impairment."

While we appreciate seeing that stream chloride levels of concern and increasing trends are being recognized the level effort being devoted to what is a decades in the making problem, is statewide in scope, and is likely a permanent modification to water quality seems inadequate. There are other states (e.g., Minnesota) that have advanced programs, so we would urge examining those approaches to perhaps cut down the development time frame for an Ohio program (see below).

Specifically, we request the reporting of quantities of road salt usage, which would help focus management on reducing the amounts released to the environment. Like most things, measurement is a key to diligence and progress. A focus on usage reporting focuses directly on use reduction. It more strongly implies responsibility for reduction than do concentrations and trends in streams and other water resources, although that information is also important.

While the draft IR refers to this new H2Ohio program, we encourage that it further discuss the chloride concentrations and trends in Ohio rivers and streams. The Large Rivers report cited on page A-7 and C-33 (and elsewhere) of this draft IR does not expand on chloride trends other than a very brief mention. The evidence of increasing stream concentrations and an accumulating problem is extensive, and we encourage the IR to include water resource chloride trends and concentrations, and road salt use trends, in this and future reports. We are seeing increases in stream chloride concentrations, including summer/low flow concentrations, some exceeding the U.S. EPA (1988) Ambient Water Quality Criteria for Chloride of 230 mg/l and the Miltner (2021) "hazard concentration" of 52 mg/l for the protection of high quality waters. Dugan and Arnott (2022) discuss the sensitivity of aquatic species and the Canadian water quality guidelines for chronic exposure (120 mg L/1) established by the Canadian Council of Ministers of the Environment.

We encourage the agency to review the historical increases in chloride concentrations in the MBI report on the Middle Scioto and Lower Olentangy Rivers (pages 77-84; MBI 2022; see also Figure 21) that has been submitted to the agency as a Level 3 assessment. There is a follow-on 2022 report that focuses on tributaries to the lower Olentangy River where chloride levels vary considerably between individual streams. This has critical implications for monitoring design. That report will also be submitted as a Level 3 assessment yet this month.

Many states recognize upward chloride trends and are moving forward with active programs to reduce road salt use. For example, we encourage you to review Wisconsin's Salt Wise (https://www.wisaltwise.com/) and the Minnesota Statewide Chloride Management Plan

(https://www.pca.state.mn.us/sites/default/files/wq-s1-94.pdf). Both of these states apply less road salt per year than Ohio (Clear Roads 2023). As a state, in addition to road salt, Ohio also can be expected to release relatively large amounts of chlorides from other sources, such as fertilizer use, wastewater plants, specific industries, water treatment plants, and septic systems.

We appreciate the Division of Drinking and Ground Water attention to increasing chloride concentrations. Page L-9 states:

> "Spreading of salt on roads certainly contributes to ground water quality impacts, but the greatest local impact is associated with salt storage."

We recommend that a wider analysis of groundwater chloride concentrations be conducted, as the area of salt storage is very small compared to the area of surface salt application, and given the known trends of chloride increases in streams (including during summer low flows) and groundwater across much of the Midwest and northeast U.S. (Kaushal et al 2018). Page L-10 notes that:

> "positive trends in chloride concentrations in Ambient Ground Water Quality Monitoring data are present at some sites."

We suggest that Ohio EPA conduct a review of summer and low flow chloride concentrations in Ohio streams using Ohio EPA, MBI, USGS, and Heidelberg University data. We suspect a large portion of this chloride has accumulated in soils and riparian zones, entered streams through near-surface groundwater, and contributes to the high low flow concentrations at levels of concern. We suspect, given the broad application of road salt across Ohio by both public and private entities, that groundwater contamination is likely to be more widespread, which contributes to elevated river and stream concentrations, and is often, if not usually, from cumulative road salt applications.

In addition to Ohio EPA and MBI data, studies by other investigators such as Bill Hintz at the University of Toledo and Doug Kane at Heidelberg University, there are many Ohio river and stream concentrations that approach or exceed the U.S. EPA 230 mg/l and the Miltner (2021) "hazard concentration" of 52 mg/l.

Chloride References

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Kaushal, S.S., Likens, G.E., Pace, M.L., Utz, R.M., Haq, S., Gorman, J. and Grese, M., 2018. Freshwater salinization syndrome on a continental scale. Proceedings of the National Academy of Sciences, 115(4), pp.E574-E583. https://www.pnas.org/doi/full/10.1073/pnas.1711234115

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Miltner, R. 2021. Assessing the Impacts of Chloride and Sulfate Ions on Macroinvertebrate Communities in Ohio Streams. Water 2021, 13(13), 1815; https://doi.org/10.3390/w13131815

Snodgrass, J.W., J. Moore, S.M. Lev, R.E. Casey, D.R. Ownby, R.F. Flora and G. Izzo. 2017. Influence of Modern Stormwater Management Practices on Transport of Road Salt to Surface Waters. Environ. Sci. Technol. 2017, 51, 8, 4165–4172. https://doi.org/10.1021/acs.est.6b03107 https://pubs.acs.org/doi/epdf/10.1021/acs.est.6b03107

Nutrients

We appreciate the coverage of nutrients throughout the draft IR, such as in the beginning in Section A. The following comments address the topic throughout the draft IR and provide overall recommendations.

In reference to the October 2023 Response to Comments for “Project: Draft Summary of Findings from the 2020-2021 Aquatic Life and Water Quality Survey of Ohio’s Large Rivers”,

AOMWA asked about the assessment process used to evaluate whether a river is impaired for nutrients. Ohio EPA's response was:

> *"Response 1: Ohio EPA plans to begin a rulemaking process on nutrient criteria and implementation next year. Ohio EPA will include stakeholder meetings and opportunities for input as part of the rulemaking process and will notify AOMWA of such activities."*

Nutrient enrichment of streams is noted many times throughout this draft IR, which we appreciate. For example, Page G-9 of this draft report recognizes:

"LRAUs in the Great Miami River, Maumee River, and Scioto River are considered threatened due to over-enrichment (nutrients),"

These river basins are among Ohio's largest and most agriculture-dominated, but the Scioto and Great Miami also have a number of large municipal wastewater treatment plants. MBI also commented in January 2023 when the Agency requested stakeholder input on Ohio EPA's Triennial Review through the online form. We submitted our prioritization proposals, including nutrient standards, where years of collaboration between government, regulated industry, agriculture, NGOs, and the concerned public have led to plans and proposals were a step in the right direction. However, we are not aware at this time that any progress towards implementing those plans through adoption of a water quality criterion or combined approach. The agency also needs to be very clear about the end goals and what constitutes evidence of impairment. Is it maintaining and restoring aquatic life use attainment or is it more in terms of cultural eutrophication? Based on our own studies in the Scioto and Olentangy Rivers these can be very different endpoints resulting in significant implications for wastewater treatment and nonpoint source management.

As we also stated in our comments on the draft 2022 IR that we encouraged Ohio EPA to take more action on nutrients, such as fully adopting and implementing the large rivers nutrient and SNAP approaches. For the Maumee and Sandusky Rivers, we expect that the sources related to the lack of attainment or exceedance of cultural eutrophication indicators in these rivers also contribute to the Western Lake Erie Basin nutrient related problems. Also, since the nitrate-N indicator is failing to attain goals, Ohio EPA should continue to actively work with the Ohio Department of Agriculture and others to increase attention on nitrogen as a pollutant. In the 2022 final IR, the Agency responded that it is acting on nutrients not only for aquatic life use impairments, but public water supply impairments as well, and cites the Maumee Watershed Nutrient TMDL project addressing harmful algal blooms in the Western Basin of Lake Erie and the East Fork Little Miami River TMDL which presumably focuses on the Harsha reservoir. We recognize other relevant components such as the Ohio Nutrient Reduction Strategy, but

encourage that more resources - funds and staff - to be provided for this and not at the expense of other water quality programs.

In terms of the Gulf Hypoxia issue and nitrate pollution statewide, and especially in the Ohio River basin, we expect that addressing pollution at the near-field, local level will help address far-field impacts such as in the Gulf of Mexico. We encourage more coverage of the Gulf of Mexico hypoxia problem in this report, as Ohio contributes to this problem and addressing nitrate pollution in Ohio streams should help reduce Ohio's contribution. We appreciate the efforts such as the November 2022 Request for Proposals to boost HUC-12 watershed 9-Element nonpoint implementation strategies in Priority Ohio River Basin Watersheds (https://epa.ohio.gov/static/Portals/35/nps/319DOCS/Hypoxia-NPSIS-RFP.pdf). More Gulf Hypoxia focus in this IR could help improve the awareness and attention to this issue, track progress at the Ohio River basin scale, and for NPS-IS make further improvements. At the near-field level, which is well-covered in this report, this large-scale focus on Ohio contributions to Gulf Hypoxia also would help address problems like the City of Columbus exceedances of the nitrate Water Quality Criteria in finished drinking water (page H-15 and H-26). Unlike the Lake Erie nutrient and algae problems, it is our sense that the general public is not as familiar with the Gulf Hypoxia issue, which is why we encourage more coverage and emphasis.

We recognize this draft IR includes a paragraph on the Statewide Nutrient Reduction Strategy (page J-20). This IR would be an excellent place to provide some of the specific points in the Scope of Work listed in the Ohio Nutrient Reduction Strategy April 2023 Request for Proposals https://epa.ohio.gov/static/Portals/35/nps/319DOCS/Ohio%20Nutrient%20Reduction%20Strategy%20Request%20for%20Proposal%20(RFP).pdf.

We appreciate these projects, and encourage the Agency to pursue the rulemaking process noted above to help focus attention and further progress at a broader, statewide scale.

PFAS

Beyond reference to the H2Ohio Rivers Initiative on page C-27, the draft IR does not include extensive coverage of per- and polyfluoroalkyl (PFAS) substances, but we believe that mention of Governor DeWine's announcement of December 1, 2023, concerning the "PFAS Prevalence Study" is warranted for this IR:

> *"As part of the H2Ohio Rivers program, Ohio will undergo a statewide survey to measure its large rivers for the existence of per- and polyfluoroalkyl (PFAS) substances. … To measure PFAS contamination, Ohio EPA will collect water samples and aquatic life tissue specimens in 29 of Ohio's rivers. Once analyzed, the baseline measurement findings will be used to inform Ohio's work to remediate any contamination and will give insight on the potential for any sport fish*

consumption advisories." (https://governor.ohio.gov/media/news-and-media/governor-dewine-announces-expansion-of-h2ohio)

The list on Page C-27 does not include the Ohio "PFAS Prevalence Study" monitoring effort. (DeWine 12/11/2023 press release.) We recommend the IR include mention of this study and we look forward to the reporting of the results in the 2026 IR or sooner. We greatly appreciate the efforts of Ohio EPA to cover PFAS in drinking water (https://epa.ohio.gov/monitor-pollution/pollution-issues/per-and-polyfluoroalkyl-substances-pfas). We look forward to more extensive coverage on PFAS presence in surface waters including rivers and streams. The ORSANCO Ohio River PFAS effort is covered at: https://www.orsanco.org/per-and-polyfluorinated-substances-pfas/. We assume that the results of such efforts will be reported in future IRs.

Section A: An Overview of Water Quality in Ohio

Page A-2:

"Stream assessments are based on the experience gained through the collection of more than 28,000 fish population samples and nearly 14,500 aquatic insect community samples, depicted in Figure A-1."

While this is certainly notable it implicitly supports a misleading message that we will detail later in these comments.

These numbers differ from that stated on page G-2:

"Stream assessments are based on the experience gained through the collection of more than 28,300 fish population samples, nearly 15,100 macroinvertebrate community samples …"

The Section A and G numbers should match and be updated through at least 2022. Please see our detailed comments on Section G.

Page A-3, ATTAINS

This refers to the information available at https://www.epa.gov/waterdata/hows-my-waterway. It might be difficult for the public to grasp the meaning of what is actually included so it could use a very simple explanation here to encourage its use. This source also provides very general information. It seems appropriate for the Agency to also direct readers to the TMDL page at https://epa.ohio.gov/divisions-and-offices/surface-water/reports-data/total-

maximum-daily-load-tmdl-program for more detail and explanation in the reports for their areas.

Page A-4:

"Figure A-2 — Overall summary of Ohio's combined assessment units. Output from ATTAINS."

This information might benefit from a table similar to Table A-1. Summary of Human Health Fish Tissue Results where numbers in each risk category are provided. Providing percentages in each category in tables like this would help the general reader understand the information better. Table A-1. Summary of Human Health Fish Tissue Results might benefit from percentages for these numbers in each row, while also including the actual numbers assessed, and the total number assessed in each row and column. We have the same recommendation for Table A-2. Summary of Recreation (Bacteria) Use Results on Page A-6. Also, please provide a brief explanation for what attainment and impairment status means, or at least provide a reference in the IR to where these are more fully explained. It should help make this information more understandable to the general reader.

MBI spends a considerable amount of time educating, meeting with and assisting with the general public, local government, and other environmental professionals. Many of these people are not familiar (some not at all) with the terminology that might seem simple to Ohio EPA, but oftentimes is foreign to people who do not use these terms in their work, or do not comprehend the meaning or ramifications of what is stated in the content and context of a report like this.

Page A-6, paragraph 2:

"96% of watershed"

We assume this meant to say "96% of watersheds," unless there are some other words missing.

Page A-9:

While "Hydromodification, or flow alteration" has been a long-term section in the IRs, we note that this section does not include stream channelization or ditch construction and maintenance as reasons that there is "hydromodification, or flow alteration." The "surface drainage" hydrologic impact is similar to that of subsurface drainage (drainage tile) and usually precedes the laying of tile drainage.

Page A-11:
"Row crop cultivation" appropriately mentions "Many cropland practices involve the channelization of streams." Both agricultural practices and "Land development" on the same page cause hydromodification that leads to stream channel erosion due to stream flashiness, a leading source of stream suspended solids. The section does state "streams become unstable." That means they are flashy and there is a channel erosion rate that is greater than natural. This could be mentioned here, which might help improve public understanding.

Page A-13:
This link appears to be mistyped: Ohio EPA Division of Drinking and Ground Waters — epa.ohio.gov/wps/portal/gov/epa/divisions-and-offices/drinking-ground-and-waters. It should be: https://epa.ohio.gov/divisions-and-offices/drinking-and-ground-waters

Section C: Managing Water Quality

Credible Data – Citizen Monitoring Program

Page C-7:

> "As of May 2021, the Ohio EPA currently has 925 Level 1, 118 Level 2 and 60 Level 3 qualified data collectors"

We suggest creating a table to help track recent QDC numbers. It might look something like this (with, of course, the missing data filled in):

Level	2020 IR	2022 IR	2024 IR	https://epa.ohio.gov/static/Portals/35/credibledata/CurrentQDCs.pdf as of 5/2/2023
1			925	
2			118	139
3	86		60	66

Based on these numbers there has been an increase in Level 2 and 3 QDCs since the 2022 IR, thus we recommend updating the numbers in the 2024 IR to those of May 2023, as they are readily available. We note that the number of Level 3 QDCs was 86 in the 2020 report, so the 66 reported as of 5/2/2023 is a reduction from previous levels. As we asked in 2022, what Level 3 specialties were reduced in terms of the number of QDCs? What are the reasons for this reduction? (Was it QHEI-related?) (See MBI 2022 Draft Ohio IR Comments February 28, 2022,

and Ohio EPA response on page D-24 of the final 2022 IR.) This is a good place in the IR to report Credible Data Program status and progress on QDCs, especially in light of recent rule changes.

It would also be useful to state the amount of data that is actually being submitted by QDCs and how the agency actually uses it.

Recent Developments in the TMDL Program

Page C-17:
We note some significant gaps between data collection and issuing TMDL reports. Some TMDLs appear to be taking up to several years to issue, and some might have Biological & Water Quality Reports that are not followed up with a TMDL. The length of the delay risks that changes in stream conditions might have outdated a TMDL by the time it is issued. Please address our perception that these delays are getting to be longer between the survey and the TMDL report. Such delays make the surveys, a Biological & Water Quality Report and a TMDL significantly less useful. Affected parties, such as dischargers or a watershed organization trying to address impairments or protection, cannot make informed decisions and take appropriate action based on aged data and TMDLs that are based on aged information. And as we have stated, this is compounded by the reduction in sampling density related to the implementation of the Two-Pronged Approach. This also goes for other stakeholder initiated actions such a 9-Element plans that are based on data that is approaching 15-20 years in age.

C7. New 303(d) Vision Implementation in Ohio
Annual Prioritization of Impaired Waters for TMDL Development

Page C-31:

> "continue to focus on restoring stream habitat to address Aquatic Life use impairments (category 4C) through a multi-watershed habitat restoration plan;
>
> • follow-up on effectiveness of current TMDLs, revise as appropriate, and support additional implementation efforts where necessary;"

MBI recommends that the "restoring stream habitat" include a statewide effort to evaluate the success of various levels of stream habitat restoration projects. Implemented over the past two decades, there are numerous examples in Ohio of stream restoration projects ranging from simple riparian vegetation plantings to two-stage ditches to full, QHEI-based Natural Channel Design (NDC) projects. The Big Darby Creek watershed includes several examples of the NCD

projects, for example. Determining the "ecological lift" and changes in biotic indices of these projects would address TMDL goals. If enough are included in this assessment, covering the range of projects across Oho would lead to helpful information about the level of success of different methods. It would also be useful for providing training to watershed project implementers, local governments, consultants, DSW staff, and the general public.

Section D: Framework for Reporting and Evaluation

In the Final 2022 IR, Page D 22, the report states:

> *"Ohio EPA has discussed this concern with ORSANCO. ORSANCO is conducting a trends analysis on fish tissue data that will be available later this summer with a report available by the end of the year."*

We appreciate the coverage of fish tissue data in the draft 2024 IR (e.g., Page D-13, Table D-2 — Data types used) in the 2024 IR. Specifically, could Ohio EPA point to how this "trends analysis on fish tissue data" is covered in the draft 2024 IR, or update us about the status of the above ORSANCO report? We have not been able to find this in the latest ORSANCO 305(b) report, Biennial Assessment of Ohio River Water Quality Conditions 2016-2020 https://www.orsanco.org/wp-content/uploads/2016/07/ORSANCO_2022_305b_Report.pdf. The latest we found for ORSANCO is a statement on their "Proposed FY2022 Technical Program," "Complete trends analysis of PCBs in Ohio River fish tissue" https://www.orsanco.org/wp-content/uploads/2021/10/TECMinutesJune21Final.pdf. If there is such a fish tissue trends analysis completed, could Ohio EPA include this in the 2024 IR?

***Page D-14, Table D-3**:*
In the draft 2024 IR, Page D-14, Table D-3. Description of data used in the 2024 IR from sources other than Ohio EPA, we see that for "Dates data were collected," MBI is listed as July 2010 – April 2023. Our records indicate that we uploaded data on July 11, 2023 which includes 2022 Level 3 surveys.

We do appreciate the steps to improve the data review and updates. While it is no small task, it would help to know the specifics of what each QDC is actually submitting and how it was used by Ohio EPA. MBI has submitted extensive data to Ohio EPA, but it is oftentimes difficult to determine how that data was actually used. It would also demonstrate to others that Ohio EPA actually uses Level 3 data for IR purposes. At this time, it is unknown even to us.

D7. Public Involvement in Compiling Ohio's Section 303(d) List of Impaired Waters

> *"The draft 2024 303(d) list will be also available for public review and comment prior to submitting the final list and report to U.S. EPA."*

We assume this will be beyond what is provided in this draft report, and we look forward to seeing this 303(d) list.

Section G Evaluating Beneficial Use: Aquatic Life

Page G-2. See: G1. Background and Rationale

> *"Stream assessments are based on the experience gained through the collection of more than 28,300 fish population samples, nearly 15,100 macroinvertebrate community samples …"*

The Section A and G numbers need to be matched and updated through at least 2022.

Beyond this, bundling the much more intensive collection of data 1978-2018 prior to the Two-Pronged Approach is potentially misleading. Our analysis of sites sampled in four periods of time flows:

1979-1992: average 309 sites/year
1993-2000: average 600 sites/year
2001-2017: average 470 sites/year
2018-2022: average 193 sites/year

This is documented in Figure 1 which shows the number of fish/habitat sites sampled by Ohio EPA 1978-2022. When making comparisons the agency needs it use the full spectrum of data collection in order to gain a better understanding of the current program scope and coverage. We are finding that current practitioners, most of whom were not around when the program began in 1978 simply do not comprehend this issue. We are not purposefully trying to impugn the intent of the agency, but there needs to be some honesty about where the program came from. The ability to continue reaping the benefits of the 1980s and 1990s especially will fade with time so long as the monitoring effort stays at a comparatively reduced level.

In addition, these numbers including those since program inception are essential for public understanding of the scope of the effort. They should be published here and in other resources so that the value of the effort is known, appreciated and the progress and scope are understood. The Integrated Report is an excellent place to provide this information. The

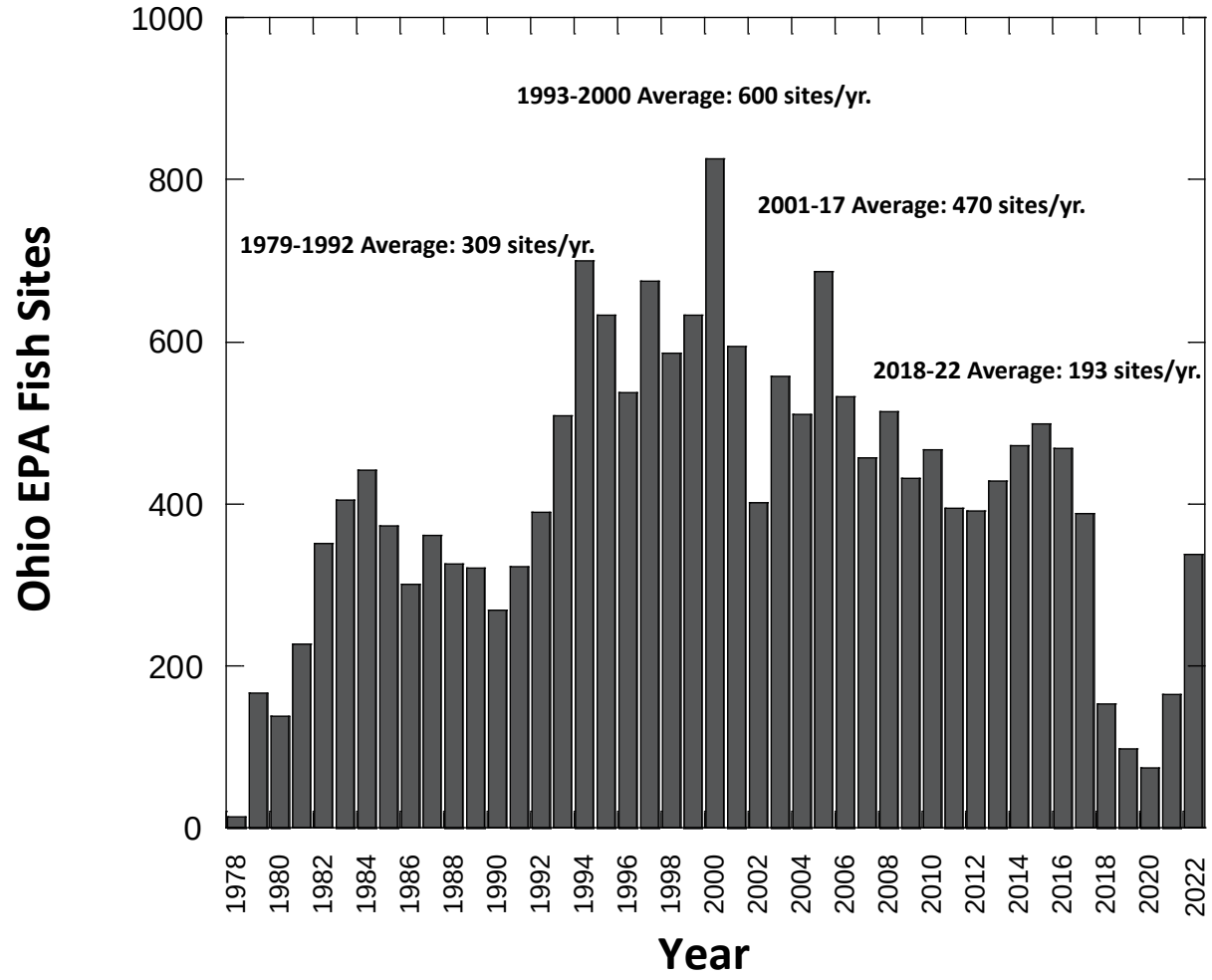

***Figure 1**. Number of fish/habitat sites sampled by Ohio EPA per year 1978-2022. Trends in macroinvertebrates and water quality samples follow a similar pattern.*

numbers would support the statements such as in "General Determination of Attainment Status," page G-3.

"Aquatic life use assessments for the 2024 Integrated Report (IR) are based on biological and chemical data collected from primarily 2009-2021."

Rivers and Streams: Watershed Assessment Units (WAUs)
Page G-5:

"HUC 12 (1,538 HUC 12s averaging 28 mi2 drainage areas)"

And,

> *"This dramatic reduction in assessment unit size requires consideration of what constitutes adequate sampling within each HUC 12 WAU and appropriate evaluation of the sampling results. The relatively small drainage area of the HUC 12 WAU requires that the sites evaluated adequately characterize the smaller watershed. While the smaller size of the HUC 12 WAU greatly reduces the number of sites necessary to be assessed, this creates an emphasis on appropriate sampling locations within the assessment unit."*

This is very misleading. While a HUC12 is smaller than HUC11, the site density (sites per area) was much higher in the years when the standard was a HUC11. So this change does not produce more information per area, it actually produces less than what was formerly done.

Page G-5/G-6:

Figure G-1. Flowchart for determining if WAU score can be derived based on available sampling locations.

In the box "3 or more sites," note that this used to be 6 or more sites. We have encountered the need to sample 10 or more sites in some cases and we emphasize that these higher density surveys will yield information that is more accurate and it better informs affected entities about any liabilities they may incur due to either overlooking impairment or attainment.

Page G-5:

> *"Baseline IR statistics generated beginning with the 2010 IR were used along with the updated 2024 IR results to track trends of attainment levels across Ohio's watersheds and large rivers to quantify progress made in point and nonpoint source pollution controls and in meeting Ohio's water quality goals."*

While we appreciate the continued tracking of trends of attainment levels on a biennial basis adding a bar to represent the starting year of 1980 would give this some badly needed historical perspective. We do appreciate that the agency added this perspective to the large rivers report.

Other Comments Related to Impaired Waters Listings

These comments relate to impairment determinations made in other reports such as a Loading Analysis Plan and the recently completed statewide Large Rivers Assessment.

See AMS/2012-MSCIO-3 Loading Analysis Plan – Middle Scioto River and selected Tributaries April 2023 (https://epa.ohio.gov/static/Portals/35/tmdl/LAPs/2010-Middle-Scioto-LAP.pdf). On page 5 of the above referenced report, see Table 2. Aquatic life use attainment for impaired sampling locations …

The Scioto River sites 600860 (downstream Greenlawn Avenue), and V07P28 (downstream Jackson Pike WWTP) stations in the draft IR are out of date, and should have Attainment Status as Full, not Partial based on 20202 Level 3 data submitted by MBI. MBI sampled these sites in both 2020 and 2022 and these sites were found to be in full attainment by MBI.

On page 9 of the above report, see Table 3. Summary of ALU impairments and potential modeling approaches. Related to the Scioto River:

Station 600860: the "Source(s) of Impairment," "Columbus CSOs," were eliminated in 2015 by the OARS tunnel. Station V07P28: both "Sources of Impairment" are out of date. "Columbus CSOs," were eliminated in 2015. "Jackson Pike WWTP" is out of date, and should have Attainment Status as Full in Table 2, not Partial. MBI sampled these sites in 2020 and 2022. The supporting data from 2020 were submitted to Ohio EPA by MBI. The 2022 data will be submitted shortly.

This is an example of how data collected in 2009-10 and used in a loadings Analysis and published in 2023 can easily become outdated by the time it is publically released. Since the agency can no longer fill these gaps, it will need to increasingly rely on Level 3 ***assessments*** (not only the data) to keep the IR current.

See Ohio EPA Technical Report AMS/2020-LRGRV-2, Summary of Findings from the 2020-2021 Aquatic Life and Water Quality Survey of Ohio's Large Rivers, Table 1. Attainment status of Ohio's large rivers surveyed in 2020 and 2021.

Related to the Olentangy River Station V04S16: The Fifth Avenue dam was removed in 2014, and MBI sampling in 2015, 2020, and 2022 showed the site in full attainment of WWH, not MWH. WWH was adopted in 2022, but the recommended use goes back to 2015. The 2015 and 2020 Level 3 data were submitted to Ohio EPA by MBI. The ALU should be updated to WWH. See 3745-1-09, Table 9-1.Use designations for water bodies in the Scioto river, Effective: 7/18/2022. If the "Large Rivers" report was used for the draft 2024 IR, this ALU could misrepresent attainment status due to not including certain sites where contrasting data is available.

For example, for a contrasting attainment status, see the report (MBI 2022) below:

Table 1. Status of aquatic life use attainment at 25 ambient sites in the Scioto River mainstem and Big Walnut Creek during July-October, 2020. In this table, MBI Site SR05 shows partial ALU attainment at Scioto RM 130.45/130.10, with an IBI of 36, an ICI of 16 and QHEI of 57. This is an impairment of the MWH use in the Greenlawn impoundment thus this should be added to the impaired waters list. The Large Rivers report did not have sufficient site density to detect this impaired segment.

The Large Rivers report also listed Scioto River site V03W25 as being in partial attainment due to a less than WWH ICI in Table 1 of that report. The partial attainment status was extended to the reach between Griggs Reservoir and the Olentangy River confluence in Figure of the LR report. The MBI 2020 results were full attainment at this site and two other sites not sampled by Ohio EPA in this same reach. All three sites showed full attainment. We would appreciate this being reflected as full attainment, the same as the lower Olentangy River in the 2024 IR and ensuing impaired waters listing. The 2020 and pending 2022 results better align with the actions taken by the City of Columbus in compliance with the 2015 WWMP and subsequent updates.

These finding were confirmed by another survey in 2022, but the agency has not yet received that report which will be forthcoming later this month.

Reference:

Midwest Biodiversity Institute (MBI). 2022. Biological and Water Quality Assessment the Middle Scioto River, Lower Olentangy River, and Selected Olentangy Tributaries 2020: Including a 50 Year Retrospective Analysis of Available Biological and Water Quality Data. Franklin and Pickaway Counties, Ohio. MBI Technical Report MBI 2022-4-6. Submitted to City of Columbus, Division of Sewers and Drains, Columbus, OH 273 pp. + appendices. https://midwestbiodiversityinst.org/reports/biological-and-water-quality-assessment-the-middle-scioto-river-lower-olentangy-river-and-selected-olentangy-tributaries-2020/ColsDOSD20%20Biological%20WQ%20Report%20Text%2020221010%20Final.pdf

J6. Schedule for TMDL Work

MBI has clients who support Level 3 biological and water quality assessments where the implicit assumption is that the agency would use that data and execute its obligations for impaired and attaining waters in a timely fashion. Examples like the Middle Scioto Loadings Analysis Plan where 10+ year old data was used when more recent Level 3 data was available and which changed the status of specific AUs. This is a critical gap that will only grow as we get farther into a reliance by the agency on the Two Pronged approach.