Evaluating Beneficial Use: Public Drinking Water Supply

H1. Background

The 2016 Integrated Report (IR) is the fifth reporting cycle to include assessment of the public drinking water supply (PDWS) beneficial use. Ohio continues to look for connections between Clean Water Act and Safe Drinking Water Act (SDWA) activities and leverage the programs to clean up and protect drinking water sources. Acknowledgement of the public water supply use and identification of impaired waters provides an effective issue in which to engage the public and stakeholders in watershed-wide planning and implementation activities. Conversely, the public water systems can be effective partners in these efforts and stand to benefit through reduced treatment costs, reduced risk to human health and credits toward achieving compliance with new SDWA regulations via source water controls in the watershed.

Assessments for each public water system were completed for nitrate, pesticide and algae (cyanotoxin) indicators. Assessments included in this cycle are based primarily on treated water quality data and to a limited extent other source water quality data available from Ohio EPA and external sources. Information used to complete assessment determinations include public water system treatment information, intake location, number and type of reservoirs and water quality data. Assessments were completed for stream sources, in-stream impounded reservoir sources and upground reservoirs with active drinking water intakes. Figure H-1 identifies Ohio watershed assessment units (WAUs) and large river assessment units (LRAUs) that contain surface waters currently utilized as drinking water sources by a public water system. WAUs correspond to 12-digit hydrologic unit codes. Three public water systems had intakes go inactive since the last reporting period, including MWCD-Atwood Park (Atwood Lake Intake); Cadiz (Sparrow Reservoir Intake); and Fremont (Sandusky River No. 2 Intake). The WAUs associated with Fremont and MWCD-Atwood Park utilize other active intakes and are assessed in the 2016 reporting period. The WAU associated with Cadiz (Sparrow reservoir intake) was not assessed.

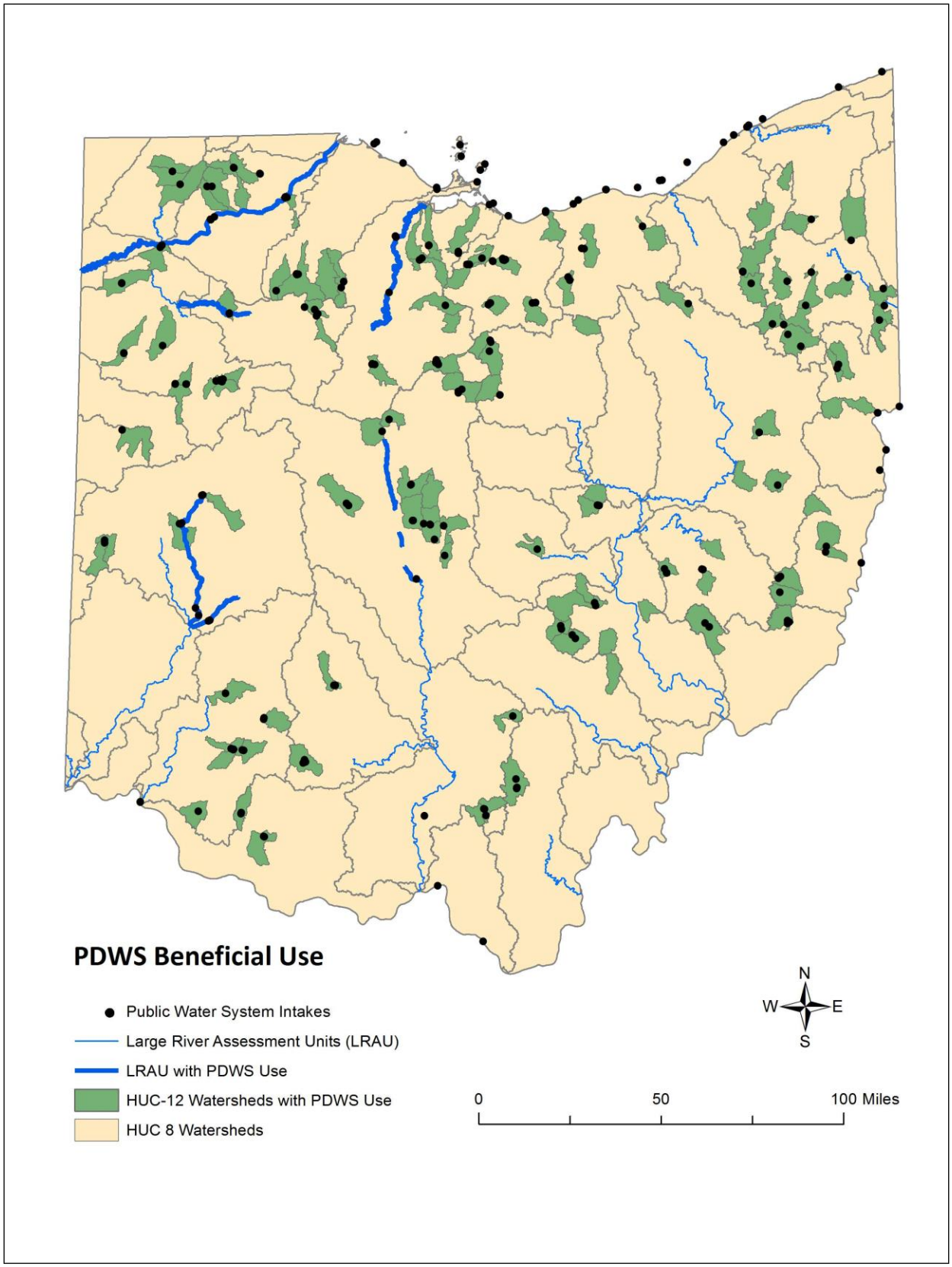

Figure H-1. Ohio WAUs and LRAUs that contain at least one active surface water drinking water intake.

H2. Evaluation Method

The methodology for assessing the PDWS beneficial use was first presented in the 2006 Integrated Water Quality Monitoring and Assessment Report. Updates to the methodology were included in subsequent IRs. The methodology used for this reporting cycle, including the use of an algae indicator, is described in this section. For more detail on how the method was first developed and rationale for indicator selection and exclusion, please refer to the initial methodology at http://www.epa.ohio.gov/portals/35/tmdl/2006IntReport/IR06_app_C_PDWSmethodology.pdf.

H2.1 Beneficial Use Designation

The PDWS use designation is defined in paragraph (B)(3) of OAC rule 3745-1-07. It applies to public waters that, with conventional treatment, will be suitable for human intake and meet federal regulations for drinking water. Although not necessarily included in rules 3745-1-08 to 3745-1-30 of the Ohio Administrative Code, the bodies of water with one or more of the following characteristics are designated public water supply by definition:

- All publicly owned lakes and reservoirs, with the exception of Piedmont reservoir;
- All privately owned lakes and reservoirs used as a source of public drinking water;
- All surface waters within 500 yards of an existing public water supply surface water intake; and
- All surface waters used as emergency water supplies.

Ohio EPA is focusing assessment efforts and limited resources on water bodies currently serving as public drinking water sources. Water bodies with inactive drinking water intakes that are being maintained as an emergency source of drinking water will also be assessed. Assessments for waters designated with the PDWS use but not currently used as a drinking water source are considered a lower priority and will likely be assessed only when water quality data is available.

Attainment determinations will apply to hydrologic assessment units (AUs) as defined by Ohio EPA's Division of Surface Water (DSW). For inland rivers the assessment unit is defined as the 12-digit hydrologic unit code (HUC 12) or the large river assessment unit. Lake Erie beneficial use assessments apply to the corresponding Lake Erie shoreline assessment unit. Although this beneficial use designation applies to a 500-yard zone surrounding the intakes, the attainment determination will be associated with the corresponding hydrologic assessment unit and factor into the 303(d) priority listing determination for impaired waters.

H2.2 Water Quality Standards

Water quality standards are designed to protect source water quality to the extent that public water systems can meet the finished water SDWA standards utilizing only conventional treatment. Source water quality will be assessed though comparison of in-stream and applicable treated water quality data to numeric chemical water quality criteria for the core indicators: nitrate; pesticides and other contaminants; and *Cryptosporidium* (following criteria development). The numeric water quality criteria correspond to the maximum contaminant levels established by the SDWA or were adopted from U.S. EPA's 304(a) recommended water quality criteria. Criteria will apply as average concentrations except for nitrate. At elevated levels, nitrate can cause acute health effects and the SDWA finished water standard applies as a maximum concentration not to be exceeded. Consequently, the water quality

criteria for nitrate will be applied as a maximum value. Annual time-weighted mean pesticide concentrations were calculated by taking the annual average of the quarterly averages and comparing to the water quality criteria.

An additional core indicator based on algae and associated cyanotoxins was incorporated into the assessment methodology for the 2014 IR. It is based on the aesthetic narrative criteria for algae described in OAC rule 3745-1-07 and uses cyanotoxins as an indicator of algae impairment. The State of Ohio developed numeric cyanotoxin drinking water thresholds for microcystins, saxitoxins, anatoxin-a and cylindrospermopsin in 2011 (See 2014 *State of Ohio Public Water System Harmful Algal Bloom Response Strategy* available at http://www.epa.ohio.gov/Portals/28/documents/PWS_HAB_Response_Strategy_5-30-12.pdf). These thresholds are the basis for all cyanotoxin indicators of impairment. In 2015, U.S. EPA released Health Advisory concentrations for microcystins and cylindrospermopsin, which Ohio EPA adopted in the 2015 State of Ohio Public Water System Harmful Algal Bloom Response Strategy. In 2016, Ohio EPA adopted the U.S. EPA Health Advisories for microcystins and established microcystins monitoring and reporting requirements in rule. Ohio EPA plans on reviewing the algae impairment assessment methodology prior to the next reporting cycle to determine potential incorporation of U.S. EPA's cyanotoxin health advisories and revisions to the indicators of impairment. Since cyanotoxin thresholds are based on acute or short-term exposures, the criteria are based on a maximum concentration not to be exceeded. Cyanotoxins have been detected in sources of drinking water since 2009, but were not detected above drinking water thresholds in finished water until 2013. Finished water detections at Carroll Township in 2013 and at Toledo in 2014 led to the issuance of "Do Not Drink" advisories due to cyanotoxins. The Toledo advisory affected almost half a million people and underscores the need for PDWS use assessments to consider algae impacts. Possible future algae indicators include: Total Trihalomethanes (TTHMs) or Haloacetic Acids (HAA5) MCL violations; elevated total organic carbon (TOC); taste and odor events; and additional treatment or source control requirements associated with algae impacts.

H2.3 Attainment Determination

Each assessment will result in identification of one of three attainment categories: Impaired, Full Attainment and Not Assessed-Insufficient Data. For AUs with multiple PDWS zones, the attainment statuses of all zones are combined and the lowest attainment status applied to determine the PDWS assessment status for the entire assessment unit. That is, the overall AU status is considered "Impaired" if <u>any</u> of the PDWS zones have an impaired attainment status. Conversely, the overall assessment status for the AU could be listed as "Full Support" only if sufficient data for at least the nitrate indicator was available to determine the attainment status for <u>all</u> PDWS zones within the AU.

The following table displays some potential scenarios that might occur within an assessment unit, either with one PDWS zone or multiple zones. In each case, the reverse situation of what is shown might occur (e.g., for the first row, full support of the first indicator and insufficient data for the second indicator would result in an AU assessment status of insufficient data).

Nitrate Indicator	Pesticide or Other Indicator	AU Assessment Status
Full support	Full support/Insufficient data	Full support
Full support	Impaired	Impaired
Impaired	Insufficient data/Full Support	Impaired
Insufficient data	Impaired	Impaired
Insufficient data	Insufficient data/Full Support	Insufficient data

AUs are further evaluated for water quality conditions placing them on a "watch list." Source waters are placed on the "watch list" where water quality was impacted, but not at a level that indicates impairment[1]. Waters may remain on the watch list based on historical data, if current raw water data or applicable finished water quality data are not available. While these waters are still considered in full attainment of the PDWS use, they will be targeted for additional monitoring and more frequent assessment, if resources are available. Table H-1 identifies impaired and "watch list" water quality conditions.

Table H-1. PDWS attainment determination.
Applies to ambient and treated water quality data from 2010 through December 2015.

Indicator	Impaired Conditions
Nitrate	☐ Two or more excursions[a] above 10.0 mg/L within the 5-year period
Pesticides	☐ Annual average exceeds WQ criteria (atrazine = 3.0 µg/L)
Other Contaminants	☐ Annual average exceeds WQ criteria
Algae: Cyanotoxins[b]	☐ Two or more excursions[a] above the state drinking water thresholds (microcystins = 1.0 µg/L) within the 5-year period
Cryptosporidium[c]	☐ Annual average exceeds WQ criterion (1.0 oocysts/L)
Indicator	**Full Attainment Conditions**
Nitrate	☐ No more than one excursion[a] above 10.0 mg/L within the 5-year period
Pesticides	☐ Annual average does not exceed the WQ criteria (atrazine = 3.0 µg/L)
Other Contaminants	☐ Annual average does not exceed the WQ criteria
Algae: Cyanotoxins	☐ No more than one excursion[a] above the state drinking water thresholds (microcystins = 1.0 µg/L) within the 5-year period
Cryptosporidium	☐ Annual average does not exceed the WQ criterion
Indicator	**"Watch List" Conditions** *Source waters targeted for additional monitoring and assessment*
Nitrate	☐ Maximum instantaneous value > 8 mg/L (80% of WQ criterion)
Pesticides	☐ Running quarterly average ≥ WQ criteria ☐ Maximum instantaneous value ≥ 4x WQ criteria
Other Contaminants	☐ Maximum instantaneous value ≥ WQ criteria
Algae: Cyanotoxins	☐ Maximum instantaneous value ≥ 50% of the state drinking water thresholds
Cryptosporidium	☐ Annual average ≥ 0.075 oocysts/L

[a] Excursions must be at least 30 days apart in order to capture separate or extended source water quality events.
[b] Impaired conditions based on source water detections at inland public water systems and detections at public water system intakes for Lake Erie source waters. Cyanotoxins include: microcystins, saxitoxins, anatoxin-a and cylindrospermopsin.
[c] Impaired conditions for *Cryptosporidium* are based on water quality criteria that Ohio EPA intends to develop.

[1] Impaired waters may also be on a watch list for an indicator for which they are not impaired. For instance, the Beaver Creek watershed (04100011-12-02) is impaired for algae, but is on the watch list for nitrates.

H2.4 Data Sources and Requirements

In order to capture current water quality conditions, these assessments have traditionally focused on the most recent five years of data. However, for the 2016 IR, the eligible data timeframe for this beneficial use only was expanded to incorporate the most recent six years of data and include the 2015 results. The 2016 PDWS use impairment list was developed using public water system compliance monitoring treated data and ambient water quality data from January 2010 through December 2015. Water quality data were requested and obtained from the Syngenta Crop Protection, Inc. Atrazine Monitoring Program (AMP; 2010-2014). Treated water quality data were obtained from the Safe Drinking Water Information System (SDWIS) database, which contains all SDWA compliance data submitted to the Division of Drinking and Ground Waters (DDAGW) by Ohio public water systems and their certified laboratories. Raw water quality data from samples collected near intakes were obtained from the DSW's ambient monitoring database and level 3 credible data collected and submitted by level 3 qualified data collectors. Additional raw water quality data were collected by DDAGW at intake locations within DSW watershed surveys. Cyanotoxin data were retrieved from Ohio EPA's Harmful Algal Bloom database.

Treated water quality data could only be used for the assessments if the water system did not blend with ground water, selectively pump from the stream source to an upground reservoir to avoid contamination, or use a nitrate or pesticide removal treatment process. A significant number of water systems use activated carbon during the water treatment process, which precludes use of the treated pesticide data for PDWS assessments and leads to a significant number of assessments completed with nitrate data only.

To assure that surface water samples are representative of the source water, the following sampling guidance was followed:

- Preferred sampling location was within the 500-yard PDWS zone or directly at the intake. Samples collected at the treatment plant raw water line were also considered representative.
- Data collected upstream from the intake beyond the 500-yard zone were utilized if there were no significant hydrologic or water quality changes between the sample location and the intake. Dams, channel modification, tributaries with significant flow or contaminant sources were assumed to significantly alter in-stream water quality and limit applicability of farther upstream sampling data.
- For PDWS lakes and reservoirs with known stratification or seasonal turnover, the preferred data collection location was either the raw water intake line or in the lake at the same depth or zone as the raw water intake screen(s). Surface sampling data collected at the intake were utilized if no other raw water data were available.

PDWS attainment determinations based on small sample sets present several challenges. The small sample set may fail to identify an exceedance of a water quality standard, resulting in a determination of attainment when in fact an area is impaired. Statistical confidence in the determination decision is also reduced. To address these concerns, the assessment looks at multiple lines of evidence including several sources of water quality data and treatment plant information. The attainment decision target sample size is 20 samples collected within the past five years. This sample count will provide sufficient power to detect exceedances of greater than or equal to 15 percent above the criterion with a Type I error of 0.15. Ohio EPA has limited resources for source water sampling, therefore attainment determinations may be concluded with a minimum of 10 samples if these samples represent the critical

period when the contaminant is typically detected. Attainment decisions may also be made with less than the required sample count when there is overwhelming evidence of impairment, such as a large single sample exceedance of nitrate or microcystins (verified with a repeat sample).

Many source water contaminants occur in surface waters seasonally with maximum concentration in early spring through summer. In order to assure that sampling for nitrates and pesticides accurately characterizes these seasonal fluxes, at least 50 percent of the samples are collected from the period March to August with at least two years represented. The critical sampling time for cyanotoxins is late spring through fall (May to November). In order to minimize dataset seasonal bias, any impairment determination based on exceedance of a mean water quality criterion requires a minimum of 10 samples representing at least two seasons. If a large dataset is available with sample collection skewed toward high flow events (i.e., stratified sampling program), it may be necessary to calculate time-weighted seasonal or monthly average values.

Most of the nitrate assessments were completed with sufficient samples and well over the recommended minimum sample counts. Much lower sample counts for pesticides were available and several assessments were completed with fewer than 10 samples. Use of fewer than 10 samples were allowed if the samples were collected from at least two separate years, the samples were all within the spring runoff period (typically March through June) and all results were well below (all results less than 50 percent) the water quality criteria. Exception to the ten sample minimum was also allowed if the PDWS zone was in an area with minimal atrazine application, all samples were also below the criteria and available samples were collected during the spring runoff period when occurrence is most likely.

To provide additional information within the “Not Assessed” reporting category 3, “i” was added to note when some water quality data were available but not enough to complete an assessment. A determination was also made to retain all impaired listings until sufficient valid data were obtained to justify delisting.

The impaired status will remain until there are five consecutive years without any excursions and sufficient raw water data are obtained. The same number of samples required to list an AU as impaired due to nitrate, pesticides or algae will be required to delist the AU.

For the 2016 assessment cycle, only the nitrate, pesticide and algae (cyanotoxin) indicators were evaluated in-depth. Other contaminants monitored by the public water systems for SDWA compliance and reported in the SDWIS database were also reviewed but no in-stream raw water data were evaluated for these contaminants. All available *Cryptosporidium* data from SDWA compliance monitoring were reviewed for this assessment cycle, but the water quality criteria have not yet been established and no impairment determinations could be made based on this parameter.

H2.5 Ohio River Assessments

The Ohio River Valley Water Sanitation Commission (ORSANCO) evaluates the PDWS use for Ohio River intakes and present assessments in the Biennial Assessment of Ohio River Water Quality Conditions Report. ORSANCO is an interstate agency that was created in 1948 to control and abate pollution in the Ohio River Basin. ORSANCO operates programs to monitor, assess and improve water quality within the basin. Consequently, Ohio EPA will not assess the PDWS use for intakes located on the Ohio River. ORSANCO’s water quality standards are available at the commission’s website: http://www.orsanco.org.

H3. Results

Using the PDWS assessment methodology and available water quality data, results for the PDWS beneficial use are presented here for all WAUs, LRAUs and Lake Erie AUs (LEAUs) where the PDWS use applies. Applicable water quality data were evaluated to determine an impairment status for each key indicator in each AU. In order to be considered "assessed," sufficient data were required for only the nitrate indicator. There are a total of 119 public water systems using surface water (excluding Ohio River intakes) in 123 separate AUs. The 123 AUs with the PDWS beneficial use include the following: 111 WAUs, nine LRAUs and all three LEAUs. A summary of the nitrate, pesticide and algae (cyanotoxin) indicators for each public water system are presented in Section H4. Table H-2 provides supporting information for each of the 29 AUs listed as impaired for the PDWS beneficial use.

Nitrate Indicator. Sufficient data were available to complete nitrate evaluations for 53 (43 percent) of the 123 AUs using data primarily from Ohio EPA's compliance database and Ohio EPA watershed surveys. Of all 123 AUs, five (4 percent) were identified as impaired and 48 (39 percent) were in full support. Impairments included four of the nine LRAUs. Three Maumee River and one Sandusky River LRAU remain impaired. Most of the 27 waters placed on the nitrate watch list (single detection greater than eight mg/L) are located in the northwest part of the state (Figure H-2).

Ohio EPA is working with U.S. EPA to develop a total maximum daily load (TMDL) report that addresses nitrate impacts to all three of the PDWS impaired Maumee River LRAUs. The Maumee River is the source water for five public water supplies.

Pesticide Indicator. Sufficient data were available to complete atrazine evaluations for 26 (21 percent) of the 123 PDWS AUs using data from Ohio EPA's compliance database (treated water), Ohio EPA water quality surveys and Syngenta Crop Protection, Inc.'s AMP. Five of the WAUs were impaired while the remaining 19 were in full support. For LRAUs, five remained on the watch list from the previous report cycle. A total of 24 waters were placed on the pesticide watch list because of elevated atrazine [single exceedance of four times the water quality criteria (WQC) or quarterly average greater than WQC]. These areas of elevated atrazine coincide with the predominantly agricultural land use in western and northwestern Ohio (Figure H-3).

In response to the atrazine drinking water use impairment on Sterling Run, Ohio EPA, through a U.S. EPA contractor developed Ohio's first TMDL report specifically for a public water supply. The White Oak Creek watershed TMDL report, which includes Sterling Run, prepared TMDLs for atrazine, fecal coliform, nitrate+nitrite, total suspended solids, total phosphorus and ammonia. In 2009, a Clean Water Act Section 319 grant was awarded that funded atrazine reduction best management practices in the Sterling Run subwatershed. The final TMDL report was approved by U.S. EPA on February 25, 2010.

Ohio EPA is in the process of developing a TMDL report that address atrazine impacts to Swift Run Lake, which is the public water supply source water for the City of Piqua.

Algae (cyanotoxin) Indicator. Since the end of the last report cycle, incidents of harmful algal blooms (HABs) impacting Ohio public drinking water supplies have greatly increased. Algal toxin sample data collection has also increased in response to these incidents. This has included both Ohio EPA data collection and public water system data collection efforts. From 2010 – 2015, more than 3,700 algal toxin samples have been collected and analyzed from Ohio PDWS intakes.

Sufficient data were available to list 19 AUs (15 percent) as impaired. The impairment listing includes the entire Lake Erie Western Basin shoreline, Lake Erie Central Basin shoreline and Lake Erie Island shoreline AUs. In addition, 15 WAUs are now assessed as impaired. While microcystin is the predominant cyanotoxin impacting attainment determinations, saxitoxin has been found responsible for impairment in two WAUs. An additional 19 AUs were also placed on the watch list. With the passage of new HAB rules in Ohio in 2016, data to assess all 123 PDWS AUs will be available for the next IR report cycle.

WAUs that are impaired or on the watch list for cyanotoxins are found distributed across Ohio virtually in every geographic region (Figure H-4).

***Cryptosporidium* Indicator.** Since Ohio EPA has not yet formalized water criteria for *Cryptosporidium*, assessment of this indicator could not be included in this report nor used for Ohio's 2016 303(d) listings. Ohio EPA requested all available *Cryptosporidium* data from U.S. EPA and summarized the results to demonstrate how the data would be evaluated using the PDWS assessment methodology.

Cryptosporidium data are available for 124 public water systems. This dataset included samples collected from 2006 to 2012 in order to fulfill new SDWA regulations that require the water systems to submit 24 to 47 samples over a two-year period. Round 1 of data collection was completed in 2012. Round 2 of sampling began in 2015 with completion scheduled for 2017. The Round 2 data will be assessed for the next report.

The highest average (in oocysts/L) in any 12 consecutive months is compared to SDWA Bin classifications 1 through 4. Any water systems with an average *Cryptosporidium* concentration between 0.075 and less than 1.0 oocysts/L would be placed in Bin 2. Most Ohio public water systems using surface water are already meeting the treatment levels required for this bin. Concentrations equal or greater than 1.0 oocysts/L place the system in Bin 3 or 4 and require additional treatment beyond conventional or source water controls in the watershed, resulting in significant expenditures for the community. Ohio EPA's proposed water quality criteria and watch list condition for *Cryptosporidium* correlate to these trigger concentrations for the Bins.

A review of available data indicates that no water systems have exceeded the 1.0 oocysts/L 12-month average. Ten water systems had average concentrations between 0.075 oocysts/L and 1.0 oocysts/L and met the threshold for the watch list. Watch list water systems are: Akron, Fremont, Berea, Delaware, Westerville, Newark, Greenville, Cambridge, Napoleon and Sebring.

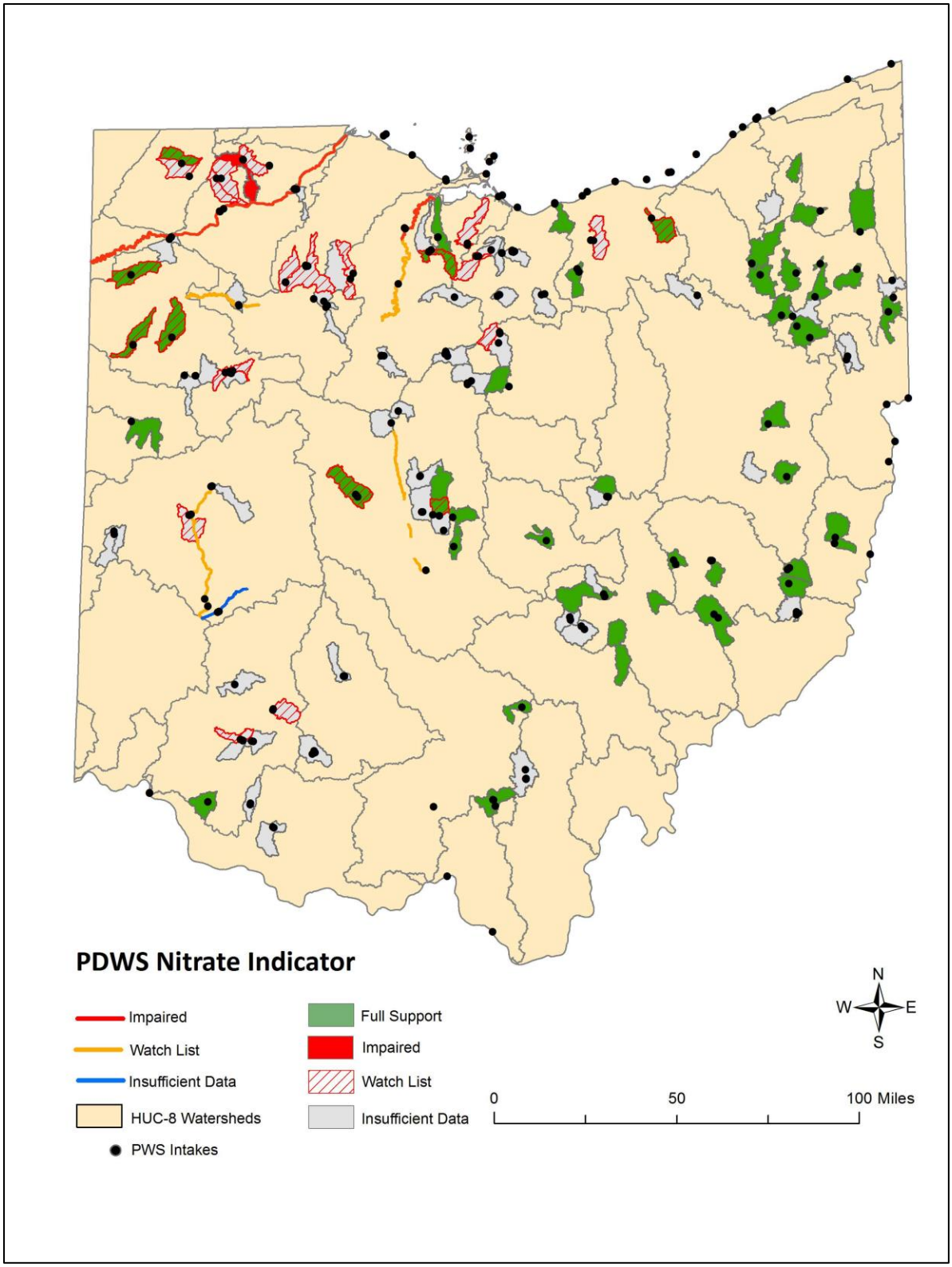

Figure H-2. AUs with nitrate indicator results.

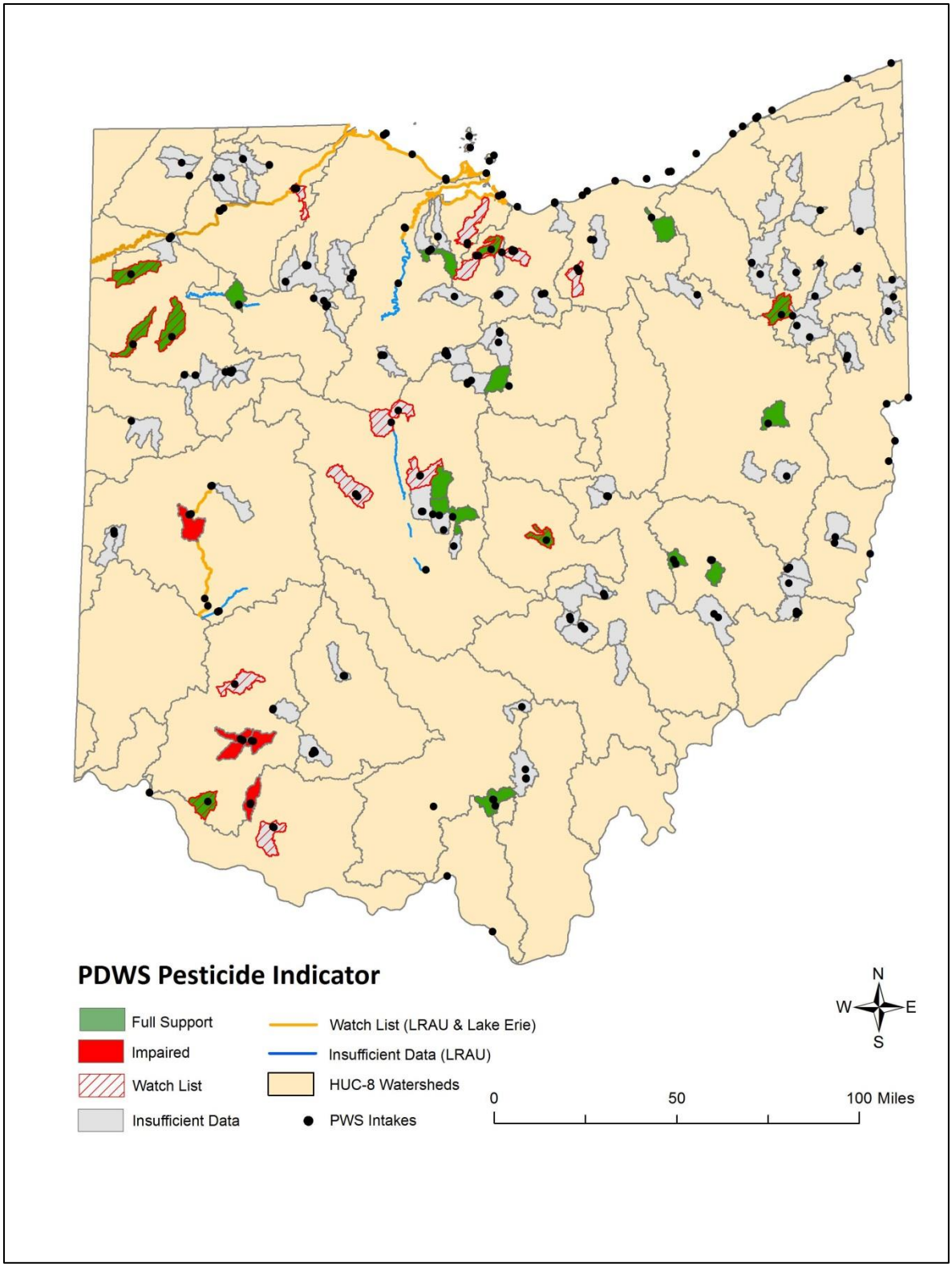

Figure H-3. AUs with pesticide indicator results.

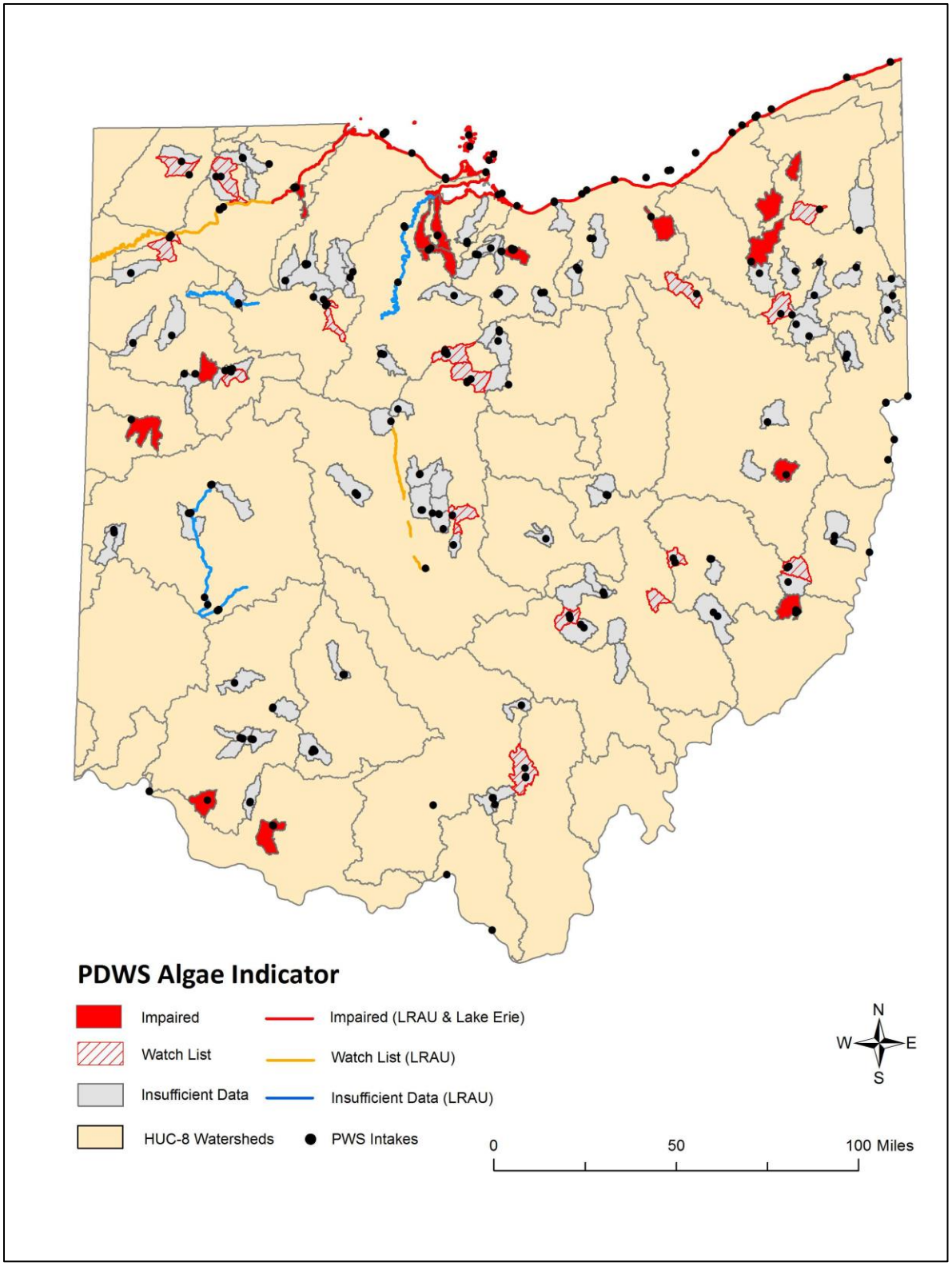

Figure H-4. AUs with algal toxin indicator results.

Table H-2. Waters designated as impaired for (not supporting) the PDWS beneficial use.

Assessment Unit	Cause of Impairment	Summary of Key Water Quality Data
04100005 90 01 Maumee River Mainstem (IN border to Tiffin River)	*Nitrate* One public water system had at least one excursion above the nitrate WQC and finished nitrate levels above the WQC. Original impairment listed in 2008.	The City of Defiance exceeded the nitrate WQC in finished water during three events (12/24/02-1/28/03; 6/17/03-6/19/03; and 5/15/06-5/16/06). None of the excursions occurred during the reporting period, but the impairment will remain until raw water is collected that supports delisting the assessment unit. A watch list level exceedance occurred on 1/14/13 (8.73 mg/L) and there were seven samples collected by the public water system at their intake that exceeded the WQC (>10 mg/L), indicating more data is needed to delist.
04100007 04 03 Honey Run	*Algae* One public water system had intake microcystins concentrations above the threshold in August, October and November 2015.	The City of Lima's Williams Reservoir and Bresler Reservoir had a total of seven raw water microcystins sample results greater than the threshold in the Fall of 2015. Included were 11/2/15 results of 25 ug/L (Williams) and 39 ug/L (Bresler).
04100007 03 02 Lower Bad Creek	*Nitrate* One public water system had two excursions above the Nitrate 10.0 mg/L WQC.	Nitrate Samples collected from source water for Delta Public water system exceeded WQC in 2015. Included were 17.6 mg/L on 6/11/15 and 13.4 mg/L on 7/14/15.
04100009 06 03 Haskins Ditch – Maumee River	*Algae* One public water system had numerous microcystins concentrations above the threshold.	During 2013-2014, the microcystins threshold was exceeded at the Bowling Green public water system reservoir raw water 19 times. For 2015, the average concentration for microcystins exceeded 7.0 ug/L.
04100009 90 01 Maumee River Mainstem (Tiffin River to Beaver Creek)	*Nitrate* One public water system had several excursions above the nitrate WQC during the 5-year period. The public water system had finished nitrate levels above the WQC and received SDWA violations.	Finished water nitrate excursions reported for Campbell's Soup on 12/27/12 (11.3 mg/L), 12/31/12 (12.5 mg/L) and 6/18/14 (10.6 mg/L). In June 2015, finished water sample results exceeded 8.0 mg/L at Napoleon and Campbell's Soup.

Assessment Unit	Cause of Impairment	Summary of Key Water Quality Data
04100009 90 02 Maumee River Mainstem (Beaver Creek to Maumee Bay)	*Nitrate* One public water system had at least one excursion above the nitrate WQC during the 5-year period. *Algae* One public water system had at least two raw water samples above the threshold for microcystins.	Numerous Maumee River samples from 2012 to 2015 exceeded the Nitrate WQC. In addition, raw water from Bowling Green exceeded the nitrate WQC during three events in 2011 and 2012 Bowling Green's raw water intake on the Maumee River exceeded the microcystins threshold four times in limited sampling conducted in 2014 and 2015.
041000110 02 04 Raccoon Creek 04100011 12 02 Beaver Creek 04100011 12 03 Green Creek	*Algae* One public water system had numerous microcystins concentrations above the threshold.	For the City of Clyde public water system, Raccoon Creek Reservoir and Beaver Creek Reservoir raw water sample results for microcystins routinely exceeded the threshold in 2014 and 2015. Included was a maximum of 300 ug/L in July 2015 on Beaver Reservoir.
04100011 90 02 Sandusky River Mainstem (Wolf Creek to Sandusky Bay)	*Nitrate* One public water system had an excursion above the nitrate WQC during the 5-year period in both raw and finished water. This public water system also received SDWA violations.	The City of Fremont exceeded the nitrate WQC in May 2010 (13 mg/L). In addition, Sandusky River samples exceeded the nitrate WQ criteria numerous times from 2010-2015.
04100012 06 03 Norwalk Creek	*Algae* One public water system had at least two raw water samples above the threshold for microcystins.	Norwalk public water system reservoir sampling had 22.7 ug/L microcystins on Memorial Reservoir in August 2014 and results greater than 5.0 ug/L in June and July 2015.

Assessment Unit	Cause of Impairment	Summary of Key Water Quality Data
04110002 01 01 East Branch Reservoir-East Branch Cuyahoga River 04110002 01 04 Ladue Reservoir-Bridge Creek 04110002 02 03 Lake Rockwell-Cuyahoga River	*Algae* One public water system had at least two raw water samples in each assessment unit with microcystins concentrations above the threshold.	Source waters for Akron had microcystins levels above the drinking water threshold on at least two occasions in 2010. Maximum raw water microcystins concentrations were 43.0 ug/L in LaDue reservoir, 3.6 ug/L in East Branch reservoir and 3.2 ug/L in Lake Rockwell.
05030201 01 01 Upper Sunfish Creek	*Algae* One public water system had at least two raw water samples above the threshold for microcystins.	Raw water sampling for Woodsfield public water system from Ruble Lake and Witten Lake exceeded the microcystins threshold in 2015. Included were 1.6 ug/L from Witten Lake on 9/2/15 and 1.4 ug/L from Ruble Lake on 10/13/15.
05040001 01 04 Wolf Creek	*Algae* One public water system had at least two raw water samples exceeding the saxitoxins threshold.	Raw water sample results from Barberton's Wolf Creek Reservoir exceeded the saxitoxins threshold multiple times in 2015. Included were results of 0.25 ug/L on 9/3/15, 0.81 ug/L on 8/22/15 and 0.23 ug/L on 7/23/15.
05040001 15 03 Upper Little Stillwater Creek	*Algae* One public water system had at least two raw water samples above the threshold for microcystins.	Cadiz raw water sampling from Tappan Lake routinely exceeded the microcystins threshold in 2015. There were 48 results greater than 1.0 ug/L threshold with an average result of 2.9 ug/L. In addition, seven microcystins threshold exceedances occurred in 2014.
05080001 07 05 Garbry Creek-Great Miami River	*Pesticides* One public water system had the pesticide atrazine in source water where the annual average exceeded the WQC.	The City of Piqua uses several surface water sources and participates in Syngenta Crop Protection's AMP[1]. Swift Run Lake (impounded section of Swift Run) is one of the three drinking water sources and the atrazine annual average[2] was 3.62 µg/L in 2008. In 2011, atrazine results remained at levels of concern with several lake samples exceeding 12.0 ug/L (4xWQ criteria). This included 38.5 ug/L in June 2011.
05090201 08 02 Headwaters Straight Creek	*Algae* One public water system had at least two raw water samples exceeding the saxitoxins threshold.	During 2015, raw water sampling on Sycamore Run Reservoir (Waynoka Regional public water system) indicated several exceedances of the threshold for saxitoxins. Included are: 0.29 ug/L (12/7/15), 0.68 ug/L (10/29/15), 0.49 ug/L (8/17/15) and 0.82 ug/L (6/26/15).

Assessment Unit	Cause of Impairment	Summary of Key Water Quality Data
05090201 10 01 Sterling Run	*Pesticides* One public water system had the pesticide atrazine in source water where the annual average exceeded the WQC.	The Village of Mt. Orab draws surface water from Sterling Run and participates in Syngenta Crop Protection's AMP[1]. The 2011 annual average[2] (6.2 ug/L) exceeded the WQC. In addition, single sample maximum atrazine detections were over four times the WQC in June 2011 (121 ug/L) and April 2012 (18.05 ug/L).
05090202 07 02 Second Creek 05090202 10 05 West Fork East Fork Little Miami River 05090202 13 01 Headwaters Stonelick Creek	*Pesticides* One public water system had the pesticide atrazine in source water where the annual average exceeded the WQC.	The Village of Blanchester draws surface water from Whitacre Run, Stonelick Creek and the West Fork of the East Fork Little Miami River and participates in Syngenta Crop Protection's AMP[1]. The raw and finished water sampling locations for this monitoring program do not differentiate between the three separate source waters. In 2005, the annual average of the AMP samples was 4.63 µg/L and exceeded the WQC for atrazine in finished water. Ohio EPA conducted two sampling runs in 2008 at the three separate sources and measured elevated atrazine levels ranging between 23 µg/L and 70 µg/L. Considering the 2008 atrazine levels, Ohio EPA conservatively applied the impairment listing to all three AUs. In 2012, atrazine concentrations were greater than four times the WQC in samples collected at Stonelick Creek (102.0 ug/L) and the West Fork of the East Fork Little Miami River (89.5 ug/L) and resulting annual averages for atrazine exceeded the WQC in the source water. Finished water result of 21.7 ug/L in May 2014. The impairment listings will remain until adequate source water sampling is conducted to confirm the water source is no longer impaired.
05090202 12 03 Lucy Run-East Fork Little Miami River	*Algae* One public water system had at least 2 raw water samples with microcystins concentrations above the threshold.	Multiple raw water samples collected from Clermont County public water system source water locations on Harsha Lake (East Fork Lake State Park) exceeded the microcystins threshold. Maximum concentration observed was 190 ug/L in June 2014. Saxitoxins also detected in source water but below the threshold.
05120101 02 04 Grand Lake-St Marys	*Algae* One public water system had at least 2 raw water samples with microcystins concentrations above the threshold.	The Grand Lake Saint Marys public water system intake for the City of Celina continues to be heavily impacted by microcystins. For 2015, the mean microcystins concentration was 60 ug/L with a maximum observed value of 185 ug/L on 9/21/15. 50 sample results were greater than 1.0 ug/L. Threshold exceedances have occurred every year since the lake was first sampled in 2009.

Assessment Unit	Cause of Impairment	Summary of Key Water Quality Data
24001 001 Lake Erie Western Basin Shoreline (including Maumee Bay and Sandusky Bay)	*Algae* Six public water systems had at least two raw water samples with microcystins concentrations above the threshold.	Oregon, Toledo, Carroll Township and Ottawa County have all had raw water samples that exceeded the microcystins threshold in 2010, 2011, 2013, 2014 and 2015. Marblehead had raw water samples that exceed the microcystins threshold in 2010 and 2015. Sandusky had raw water samples that exceeded the microcystins threshold in 2014 and 2015.
24001002 Lake Erie Central Basin Shoreline	*Algae* One public water system had at least two raw water samples above the threshold for microcystins.	Huron had raw water microcystins above the threshold on 9/6/13 (4.6 ug/L) and again on 8/17/15 (2.1 ug/L). In addition, Lake County West, Mentor, Painesville and Fairport Harbor all had raw water microcystins threshold exceedances in 2015.
24001003 Lake Erie Islands Shoreline	*Algae* Four public water systems had at least two raw water samples above the threshold for microcystins.	Raw water microcystins sample results exceeded microcystins thresholds as recently as 2015. Put-In-Bay had sample results above the threshold in 2010 and from 2013-2015. Kelleys Island had results above the threshold from 2013-2015. Camp Patmos had results above the threshold in 2010 and from 2013-2015. Lake Erie Utilities had results above the threshold in 2014 and 2015.

[1] 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., initiated an atrazine monitoring program at select community water systems.

[2] Annual average calculated as average of the quarterly means for calendar year.

H4. Supplemental Information

Table H-3 provides a summary of PDWS assessment results for the nitrate, pesticide and algae indicators and is organized by assessment unit. A description of the PDWS use zone is also included.

Table H-3. Summary of PDWS assessment results for the nitrate, pesticide and algae indicators.

Assessment Unit ID	Assessment Unit Name	PDWS Zone [Public Water System(s)]	Use Support	Nitrate Indicator	Pesticide Indicator	Algae Indicator
04100005 90 01	Maumee River Mainstem (IN border to Tiffin River)	Maumee River @ RM 65.84 [Defiance]	No	Impaired	Full Support; Watch List	Insufficient Data; Watch List
04100006 03 01	Bates Creek-Tiffin River	Tiffin River @ RM 47.54 [Archbold]	Yes	Full Support; Watch List	Insufficient Data	Insufficient Data
04100006 03 03	Flat Run-Tiffin River	Archbold Upground Reservoirs [Archbold]	Unknown	Insufficient Data; Watch List	Insufficient Data	Insufficient Data; Watch List
04100007 02 03	Sims Run-Auglaize River	Auglaize River @ RM 64.58 (Agerter Rd) [Lima]	Unknown	Insufficient Data	Insufficient Data	Insufficient Data
04100007 03 05	Lost Creek	Ottawa River @ RMs 42.60 (Roush Rd) and 43.45 (upstream of low-head dam at Metzger Rd) [Lima]	Unknown	Insufficient Data	Insufficient Data	Insufficient Data; Watch List
04100007 03 06	Lima Reservoir-Ottawa River	Lima Reservoir [Lima]	Unknown	Insufficient Data; Watch List	Insufficient Data	Insufficient Data
04100007 04 03	Honey Run	Bresler Reservoir [Lima]	No	Insufficient Data	Insufficient Data	Impaired
04100007 06 04	Dry Fork-Little Auglaize River	Little Auglaize River @ RM 23.40 [Delphos]	Yes	Full Support; Watch List	Full Support; Watch List	Insufficient Data
04100007 08 04	Lower Town Creek	Town Creek @ RM 18.35 [Van Wert]	Yes	Full Support; Watch List	Full Support; Watch List	Insufficient Data
04100007 12 06	Big Run-Flatrock Creek	Flat Rock Creek @ RM 14.13 [Paulding]	Yes	Full Support; Watch List	Full Support; Watch List	Insufficient Data
04100007 12 09	Eagle Creek-Auglaize River	Defiance Upground Reservoir [Defiance]	Unknown	Insufficient Data	Insufficient Data	Watch List
04100008 02 03	Findlay Upground Reservoirs-Blanchard River	Findlay Upground Reservoirs [Findlay]	Unknown	Insufficient Data	Insufficient Data	Watch List
04100008 02 05	City of Findlay Riverside Park-Blanchard River	Blanchard River @ RMs 58.72, 62.43 and 65.20 [Findlay]	Unknown	Insufficient Data	Insufficient Data	Insufficient Data
04100008 06 02	Pike Run-Blanchard River	Ottawa Upground Reservoirs [Ottawa]	Unknown	Insufficient Data	Full Support	Insufficient Data

Assessment Unit ID	Assessment Unit Name	PDWS Zone [Public Water System(s)]	Use Support	Nitrate Indicator	Pesticide Indicator	Algae Indicator
04100008 90 01	Blanchard River Mainstem (Dukes Run to mouth)	Blanchard River @ RM 28.50 [Ottawa]	Unknown	Insufficient Data; Watch List	Insufficient Data	Insufficient Data
04100009 03 02	Lower Bad Creek	Bad Creek @ RM 17.0 [Delta]	No	Impaired	Insufficient Data	Insufficient Data
04100009 04 01	Konzen Ditch	Unnamed trib segments immediately adjacent to Wauseon Reservoir, Big Ditch Intake [Wauseon]	Unknown	Insufficient Data; Watch List	Insufficient Data	Insufficient Data
04100009 04 02	North Turkeyfoot Creek	Stucky Ditch Intake and Reservoir [Wauseon]	Unknown	Insufficient Data; Watch List	Insufficient Data	Insufficient Data; Watch List
04100009 06 03	Haskins Road Ditch – Maumee River	Bowling Green Upground Reservoir [Bowling Green]	No	Insufficient Data	Insufficient Data Watch List	Impaired
04100009 07 02	Fewless Creek-Swan Creek	Swan Creek @ RM 30.84 [Swanton]	Unknown	Insufficient Data; Watch List	Insufficient Data	Insufficient Data
04100009 90 01	Maumee River Mainstem (Tiffin River to Beaver Creek)	Maumee River @ RMs 35.91 [McClure], 45.88 and 47.10 [Campbell Soup], 47.13 [Napoleon and Wauseon]	No	Impaired	Full Support; Watch List	Watch List
04100009 90 02	Maumee River Mainstem (Beaver Creek to Maumee Bay)	Maumee River @ RMs 23.16 [Bowling Green]	No	Impaired	Insufficient Data; Watch List	Impaired
04100010 01 01	Rader Creek	Rader Creek @ RM 13.57 and upground reservoirs [McComb]	Unknown	Insufficient Data; Watch List	Insufficient Data	Insufficient Data
04100010 01 03	Rocky Ford	Rocky Ford Creek @ RMs 10.66 and 11.10 and Upground Reservoirs [North Baltimore]	Unknown	Insufficient Data; Watch List	Insufficient Data	Insufficient Data
04100010 02 02	East Branch Portage River	East Branch Portage River @ RMs 13.84 and 16.15 and Upground Reservoirs [Fostoria]	Unknown	Insufficient Data; Watch List	Insufficient Data	Insufficient Data
04100010 02 03	Town of Bloomdale - South Branch Portage River	Veterans Memorial Reservoir [Fostoria]	Unknown	Insufficient Data	Insufficient Data	Insufficient Data

Assessment Unit ID	Assessment Unit Name	PDWS Zone [Public Water System(s)]	Use Support	Nitrate Indicator	Pesticide Indicator	Algae Indicator
04100011 01 03	Mills Creek	Snyders Ditch @ RMs 5.0 and 5.5 and Upground Reservoirs [Bellevue]	Unknown	Insufficient Data; Watch List	Insufficient Data; Watch List	Insufficient Data
04100011 02 04	Raccoon Creek	Raccoon Creek Upground Reservoir [Clyde]	No	Full Support	Insufficient Data	Impaired
04100011 04 03	Headwaters Middle Sandusky River	Sandusky River @ RM 115.4 and Upground Reservoirs [Bucyrus]	Unknown	Insufficient Data	Insufficient Data	Insufficient Data Watch List
04100011 07 02	Town of Upper Sandusky-Sandusky River	Sandusky River @ RMs 82.9 and 83.15 and Upground Reservoirs [Upper Sandusky]	Unknown	Insufficient Data	Insufficient Data	Insufficient Data
04100011 08 05	Middle Honey Creek	Honey Creek @ RM 28.35 and Upground Reservoirs [Attica]	Unknown	Insufficient Data	Insufficient Data	Insufficient Data
04100011 12 02	Beaver Creek	Beaver Creek @ RM 2.88 r [Clyde]	No	Full Support; Watch List	Full Support	Impaired
04100011 12 03	Green Creek	Beaver Creek Upground Reservoir [Clyde]	No	Insufficient Data	Insufficient Data	Impaired
04100011 90 01	Sandusky River Mainstem (Tymochtee Creek to Wolf Creek)	Sandusky River @ RM 41.08 [Tiffin-Ohio American Water]	Unknown	Insufficient Data; Watch List	Insufficient Data	Insufficient Data
04100011 90 02	Sandusky River Mainstem (Wolf Creek to Sandusky Bay)	Sandusky River @ RM 18.02 [Fremont]	No	Impaired	Insufficient Data; Watch List	Insufficient Data
04100012 01 04	New London Upground Reservoir-Vermilion River	Vermilion River @ RM 52.24 and Upground Reservoirs [New London]	Unknown	Insufficient Data	Insufficient Data	Insufficient Data
04100012 02 04	Mouth Vermilion River	Vermilion River @ RM 0.2 [Vermilion]	Yes	Full Support	Insufficient Data	Insufficient Data
04100012 04 03	Walnut Creek-West Branch Huron River	West Branch Huron River @ RM 33.8 and Upground Reservoirs [Willard]	Unknown	Insufficient Data	Insufficient Data	Insufficient Data
04100012 05 03	Frink Run	Frink Run @ RM 4.83 and Upground Reservoir #5 [Bellevue]	Unknown	Insufficient Data; Watch List	Insufficient Data; Watch List	Insufficient Data
04100012 05 06	Mouth West Branch Huron River	W. Branch Huron River @ RM 8.52 and Upground Reservoirs [Monroeville]	Unknown	Insufficient Data	Full Support; Watch List	Insufficient Data

Assessment Unit ID	Assessment Unit Name	PDWS Zone [Public Water System(s)]	Use Support	Nitrate Indicator	Pesticide Indicator	Algae Indicator
04100012 06 03	Norwalk Creek	Norwalk Creek @ RMs 0.11 and 4.02 [Norwalk]	No	Insufficient Data	Insufficient Data; Watch List	Impaired
04100012 06 04	Mouth East Branch Huron River	East Branch Huron River @ RM 6.16 [Norwalk]	Unknown	Insufficient Data	Insufficient Data	Insufficient Data
04110001 02 02	Baldwin Creek-East Branch Rocky River	E. Branch Rocky River @ RM 5.06, Baldwin Creek @ RM 0.48, upstream boundaries of Rocky River reservation (RM 15.15) to West Branch [Berea]	Yes	Full Support; Watch List	Insufficient Data	Insufficient Data Watch List
04110001 05 01	Charlemont Creek	Charlemont Creek @ RM 2.97 and Upground Reservoir [Wellington]	Yes	Full Support	Insufficient Data; Watch List	Insufficient Data
04110001 05 06	Lower West Branch Black River	West Branch Black River @ RM 14.42 [Oberlin]	Unknown	Insufficient Data Watch List	Insufficient Data	Insufficient Data
04110002 01 01	East Branch Reservoir – East Branch Cuyahoga River	East Branch Reservoir [Akron]	No	Full Support	Insufficient Data	Impaired
04110002 01 04	LaDue Reservoir- Bridge Creek	LaDue Reservoir [Akron]	No	Insufficient Data	Insufficient Data	Impaired
04110002 02 02	Feeder Canal-Breakneck Creek	Lake Hodgson (Breakneck Creek) [Ravenna]	Yes	Full Support	Insufficient Data	Insufficient Data
04110002 02 03	Lake Rockwell-Cuyahoga River	Lake Rockwell (Cuyahoga River RM 62.0 to 57.97) [Akron]	No	Full Support	Insufficient Data	Impaired
04110004 01 02	Headwaters Grand River	Grand River @ RM 89.12 [West Farmington]	Yes	Full Support	Insufficient Data	Insufficient Data Watch List
05030101 04 03	Stone Mill Run-Middle Fork Little Beaver Creek	Salem Reservoir [Salem]	Unknown	Insufficient Data	Insufficient Data	Insufficient Data
05030101 05 01	Cold Run	Cold Run @ RM 4.96, Salem Reservoir, Unnamed Tributary (Cold Run RM 4.97) @ RM 1.42 [Salem]	Unknown	Insufficient Data	Insufficient Data	Insufficient Data
05030103 01 03	Fish Creek-Mahoning River	Mahoning River @ RMs 83.55 [Alliance] and 91.50 [Sebring]	Yes	Full Support	Insufficient Data	Insufficient Data
05030103 02 01	Deer Creek	Deer Creek @ RM 0.54 (Walborn Reservoir) [Alliance]	No	Full Support	Full Support; Watch List	Watch List

Assessment Unit ID	Assessment Unit Name	PDWS Zone [Public Water System(s)]	Use Support	Nitrate Indicator	Pesticide Indicator	Algae Indicator
05030103 02 04	Island Creek-Mahoning River	Berlin Lake [MVSD]	Unknown	Insufficient Data	Insufficient Data	Insufficient Data
05030103 03 04	Kirwin Reservoir-West Branch Mahoning River	West Branch @ RM 13.25 (W. Branch/Michael J. Kirwan Res) [ODNR-West Branch S.P.]	Yes	Full Support	Insufficient Data	Insufficient Data
05030103 03 06	Charley Run Creek-Mahoning River	Mahoning River @ RMs 56.47 [Newton Falls]	Yes	Full Support	Insufficient Data	Insufficient Data
05030103 05 02	Middle Mosquito Creek	Mosquito Creek @ RM 12.49 (Reservoir) [Warren]	Yes	Full Support	Insufficient Data	Insufficient Data
05030103 07 03	Lower Meander Creek	Meander Creek @ RM 2.96 (Meander Cr Reservoir) [Mahoning Valley S.D.]	Yes	Full Support	Insufficient Data	Insufficient Data
05030103 08 05	Headwaters Yellow Creek	Yellow Creek @ RM 8.40 (Lake Evans) [Struthers- Aqua Ohio]	Yes	Full Support	Insufficient Data	Insufficient Data
05030103 08 06	Burgess Run-Yellow Creek	Yellow Creek @ RM 2.0 (Lake Hamilton) [Campbell]	Yes	Full Support	Insufficient Data	Insufficient Data
05030103 08 07	Dry Run-Mahoning River	Dry Run @ RM 2.86 (Lake McKelvey) [Campbell]	Unknown	Insufficient Data	Insufficient Data	Insufficient Data
05030106 03 03	Cox Run-Wheeling Creek	Jug Run @ RM 3.18 (Provident Reservoir) [St. Clairesville]	Yes	Full Support	Insufficient Data	Insufficient Data
05030106 07 03	Little McMahon Creek	Little McMahon Creek @ RM 6.6 (St. Clairesville Reservoir) [St. Clairesville]	Yes	Full Support	Insufficient Data	Insufficient Data
05030106 09 01	North Fork Captina Creek	Unnamed trib (North Fork RM 10.0) @ RM 0.55 (Res #1 and #3) [Barnesville]	Yes	Full Support	Insufficient Data	Insufficient Data Watch List
05030106 09 02	South Fork Captina Creek	Slope Creek @ RM 1.85 Slope Creek Res) [Barnesville]	Yes	Full Support	Insufficient Data	Insufficient Data
05030201 01 01	Upper Sunfish Creek	Sunfish Creek @ RM 25.50, Unnamed trib (Sunfish Creek RM 24.55) @ RM 0.15 and 0.80 [Woodsfield]	No	Insufficient Data	Insufficient Data	Impaired
05030201 09 01	Headwaters West Fork Duck Creek	Wolf Run @ RM 0.7 (Wolf Run Lake), Dog Run @ RM 1.35 (Caldwell Lake) [Caldwell]	Yes	Full Support	Insufficient Data	Insufficient Data
05030204 01 01	Center Branch	Center Branch Rush Creek @ RM 5.45, Unnamed Tributary (Somerset Creek RM 1.84) @ RM 0.89 [Somerset]	Unknown	Insufficient Data	Insufficient Data	Insufficient Data Watch List

Assessment Unit ID	Assessment Unit Name	PDWS Zone [Public Water System(s)]	Use Support	Nitrate Indicator	Pesticide Indicator	Algae Indicator
05030204 01 02	Headwaters Rush Creek	Yeager Creek (Rush Creek RM 28.46) @ RM 1.0; New Lexington Reservoir [New Lexington]	Unknown	Insufficient Data	Insufficient Data	Insufficient Data
05030204 07 01	East Branch Sunday Creek	East Branch Sunday Creek @ RM 0.23 [Burr Oak Regional]	Yes	Full Support	Insufficient Data	Insufficient Data
05040001 01 04	Wolf Creek	Wolf Creek @ RM 5.12 (Reservoir) [Barberton]	No	Insufficient Data	Insufficient Data	Impaired
05040001 08 02	Pleasant Valley Run-Indian Fork	Indian Fork @ RM 3.0 and 3.7 (Atwood Lake) [Atwood Park and Resort]	Yes	Full Support	Full Support	Insufficient Data
05040001 15 03	Upper Little Stillwater Creek	Tappan Lake [Cadiz]	No	Full Support	Insufficient Data	Impaired
05040001 16 04	Town of Uhrichsville-Stillwater Creek	Stillwater Creek @ RM 7.05 [Twin City W&S]	Unknown	Insufficient Data	Insufficient Data	Insufficient Data
05040002 01 01	Marsh Run	Marsh Run Creek @ RM 0.05 [Shelby]	Unknown	Insufficient Data; Watch List	Insufficient Data	Insufficient Data
05040002 01 02	Headwaters Black Fork Mohican River	Black Fork River @ RMs 50.82, 53.88 [Shelby]	Unknown	Insufficient Data	Insufficient Data	Insufficient Data
05040002 03 01	Headwaters Clear Fork Mohican River	Clear Fork River @ RM 30.6 (Clear Fork Reservoir) [Mansfield]	Yes	Full Support	Full Support	Insufficient Data
05040003 09 01	Mohawk Creek	No identifiable associated stream (dug reservoirs) [Echoing Hills]	Yes	Full Support	Insufficient Data	Insufficient Data
05040004 01 02	Winding Fork	Shalimar Lake [Echoing Hills]	Unknown	Insufficient Data	Insufficient Data	Insufficient Data
05040004 04 05	Kent Run	Kent Run @ RM 1.3 [Maysville]	Unknown	Insufficient Data	Insufficient Data	Insufficient Data
05040004 04 07	Painter Creek-Jonathon Creek	Frazier's Run (Fraziers Quarry) [Maysville]	Yes	Full Support	Insufficient Data	Insufficient Data
05040004 05 01	Black Fork	Dry Run @ RM 2.23 (Resv 1 and 2), Black Fork @ RM 4.69 (Resv. 3,4,5) [Crooksville]	Yes	Full Support	Insufficient Data	Insufficient Data
05040004 06 05	Manns Fork Salt Creek	Manns Fork Salt Creek @ RM 6.77 (Cutler Lake) [ODNR-Blue Rock S.P.]	Yes	Full Support	Insufficient Data	Insufficient Data Watch List
05040005 02 07	Trail Run-Wills Creek	Wills Creek (Cambridge Reservoir) [Cambridge]	Yes	Full Support	Full Support	Insufficient Data

Assessment Unit ID	Assessment Unit Name	PDWS Zone [Public Water System(s)]	Use Support	Nitrate Indicator	Pesticide Indicator	Algae Indicator
05040005 05 01	North Crooked Creek	North Crooked Creek [New Concord]	Yes	Full Support	Full Support	Watch List
05040006 02 05	Log Pond Run-North Fork Licking River	North Fork Licking River @ RM 3.0 [Newark]	Yes	Full Support	Full Support; Watch List	Insufficient Data
05060001 03 03	City of Marion-Little Scioto River	Little Scioto River @ RM 7.1 [Marion-Ohio American Water]	Unknown	Insufficient Data	Insufficient Data; Watch List	Insufficient Data
05060001 04 06	Glade Run-Scioto River	Scioto River @ RM 180.04 [Marion-Ohio American Water]	Unknown	Insufficient Data	Insufficient Data; Watch List	Insufficient Data
05060001 06 02	Middle Mill Creek	Mill Creek @ RM 19.45 [Marysville]	Unknown	Full Support; Watch List	Insufficient Data; Watch List	Insufficient Data
05060001 08 01	Headwaters Olentangy River	Rocky Fork (Olentangy River RM 84.84) @ RM 0.6 [Galion]	Unknown	Insufficient Data	Insufficient Data	Insufficient Data Watch List
05060001 10 07	Delaware Run-Olentangy River	Olentangy River @ RMs 31.23 and 31.02 [Delaware]	Unknown	Insufficient Data	Insufficient Data; Watch List	Insufficient Data
05060001 11 01	Deep Run-Olentangy River	Olentangy River @ RM 18.19 [Del-Co]	Unknown	Insufficient Data	Insufficient Data	Insufficient Data
05060001 13 08	Hoover Reservoir-Big Walnut Creek	Hoover Reservoir, Duncan Run @ RM 0.68 [Columbus]	Yes	Full Support	Full Support	Insufficient Data Watch List
05060001 14 03	Big Run-Alum Creek	Alum Creek Reservoir [Del-Co]	Yes	Full Support	Full Support	Insufficient Data
05060001 14 04	Alum Creek Dam-Alum Creek	Alum Creek Reservoir and Alum Creek @ RM 26.74 [Del-Co]	Yes	Full Support Watch list	Full Support	Insufficient Data
05060001 15 02	City of Gahanna-Big Walnut Creek	Big Walnut Creek @ RM 32.64 [Columbus]	Yes	Full Support	Insufficient Data	Insufficient Data
05060001 16 01	Westerville Reservoir-Alum Creek	Alum Creek @ RM 21.20 (@ low-head dam) [Westerville]	Unknown	Insufficient Data	Insufficient Data	Insufficient Data
05060001 90 01	Scioto River Mainstem (L. Scioto R. to Olentangy R.); excluding O'Shaughnessy and Griggs reservoirs	Scioto River at O'Shaughnessy dam (RM 148.8) to Dublin Road WTP dam [Columbus]	Yes	Full Support; Watch List	Insufficient Data	Insufficient Data Watch List

Assessment Unit ID	Assessment Unit Name	PDWS Zone [Public Water System(s)]	Use Support	Nitrate Indicator	Pesticide Indicator	Algae Indicator
05060002 08 02	Buckeye Creek	Buckeye Creek/Hammertown Lake [Jackson]	Yes	Full Support	Full Support	Insufficient Data
05060002 08 03	Horse Creek-Little Salt Creek	Jisco Lake [Jackson]	Yes	Full Support	Full Support	Insufficient Data
05060002 09 02	Queer Creek	Rose Lake [ODNR-Hocking Hills S.P.]	Yes	Full Support	Insufficient Data	Insufficient Data
05060003 01 03	Town of Washington Court House-Paint Creek	Paint Creek @ RM 71.4 [Washington Court House]	Unknown	Insufficient Data	Insufficient Data	Insufficient Data
05060003 05 02	Clear Creek	Clear Creek (Rocky Fork) @ RM 7.4 [Hillsboro]	Unknown	Insufficient Data	Insufficient Data	Insufficient Data
05080001 07 02	Mosquito Creek	Tawawa Creek @ RM 0.14 [Sidney]	Unknown	Insufficient Data	Insufficient Data	Insufficient Data
05080001 07 05	Garbry Creek-Great Miami River	Piqua Hydraulic System (Swift Run Lake) and Ernst Gravel Pit [Piqua]	No	Insufficient Data Watch List	Impaired	Insufficient Data
05080001 11 01	Mud Creek	Mud Creek @ RM 0.88 [Greenville]	Unknown	Insufficient Data	Insufficient Data	Insufficient Data
05080001 11 02	Bridge Creek-Greenville Creek	Greenville Creek @ RM 22.3 [Greenville]	Unknown	Insufficient Data	Insufficient Data	Insufficient Data
05080001 90 01	Great Miami River Mainstem (Tawawa Creek to Mad River)	Great Miami River @ RMs 86.6 and 90.3 [Dayton], 118.3 [Piqua] and 130.2 [Sidney]	Unknown	Insufficient Data; Watch List	Insufficient Data; Watch List	Insufficient Data
05080001 90 02	Mad River Mainstem (Donnels Creek to mouth)	Mad River @ RMs 5.2 and 5.6 [Dayton]	Unknown	Insufficient Data	Insufficient Data	Insufficient Data
05090101 04 01	Headwaters Little Raccoon Creek	Little Raccoon Creek @ RM 30, Lake Rupert, Alma Lake [Wellston]	Unknown	Insufficient Data	Insufficient Data	Insufficient Data Watch List
05090201 08 02	Headwaters Straight Creek	Sycamore Run @ RM 0.97 (Reservoir) and Straight Creek (Lake Waynoka) [Waynoka Regional]	No	Insufficient Data	Insufficient Data; Watch List	Impaired
05090201 10 01	Sterling Run	Sterling Run @ RM 6.47 [Mt. Orab]	No	Insufficient Data	Impaired	Insufficient Data
05090202 04 06	Lower Caesar Creek	Caesar Creek Lake [Wilmington]	Unknown	Insufficient Data	Insufficient Data; Watch List	Insufficient Data

Assessment Unit ID	Assessment Unit Name	PDWS Zone [Public Water System(s)]	Use Support	Nitrate Indicator	Pesticide Indicator	Algae Indicator
05090202 06 04	Headwaters Cowan Creek	Cowan Creek @ RM 11.7 [Wilmington]	Unknown	Insufficient Data; Watch List	Insufficient Data	Insufficient Data
05090202 07 02	Second Creek	Whitacre Run @ RM 1.4 [Blanchester]	No	Insufficient Data Watch List	Impaired	Insufficient Data
05090202 10 05	West Fork East Fork Little Miami River	West Branch of the East Fork LMR @ RM 4.6 and Westboro Reservoir [Blanchester]	No	Insufficient Data	Impaired	Insufficient Data
05090202 12 03	Lucy Run-East Fork Little Miami River	Harsha Lake - Impounded E. Fork LMR [Clermont County]	No	Full Support	Full Support; Watch List	Impaired
05090202 13 01	Headwaters Stonelick Creek	Stonelick Creek @ RM 23.4 [Blanchester]	No	Insufficient Data	Impaired	Insufficient Data
05120101 02 04	Grand Lake-St Marys	Grand Lake St. Marys [Celina]	No	Full Support	Insufficient Data	Impaired
24001 001	Lake Erie Western Basin Shoreline (including Maumee Bay and Sandusky Bay)	[Sandusky, Marblehead, Ottawa County Regional, Carrol Water & Sewer, Oregon, Toledo]	No	Full Support	Insufficient Data; Watch List	Impaired
24001 002	Lake Erie Central Basin Shoreline	[Conneaut, Ashtabula-Ohio American Water, Lake County East, Lake County West, Painesville, Fairport Harbor, Mentor-Aqua Ohio, Cleveland, Avon Lake, Elyria, Lorain, Vermilion, Huron]	No	Full Support	Insufficient Data	Impaired
24001 003	Lake Erie Islands Shoreline	[Kelleys Island, Camp Patmos, Lake Erie Utility Co., Put-in-Bay]	No	Full Support	Insufficient Data	Impaired

Notes: "Use Support" reports on the PDWS beneficial use status for each assessment unit and is described as follows:
"Unknown" = insufficient data to complete the assessment for the PDWS zones within the assessment unit
"No" = Impairment of at least one PDWS zone within the assessment unit
"Yes" = Full support of the PDWS use within the assessment unit

Following the approval of the 2014 IR, Ohio EPA discovered that some PDWS waters were incorrectly categorized on the 2014 303(d) list (as found in Section L4 of that report), possibly in the original sorting of the PDWS WAUs. The LRAUs and LEAUs were correctly reported. The following table shows the WAUs that were incorrectly identified as "impaired" in Section L4 - 303(d) List of Prioritized Impaired Waters – of the 2014 IR and what the correct category for those waters should have been.

Assessment Unit ID	Assessment Unit Name	Reported Category[2]	Correct Category
04100007 03 05	Lost Creek	5	3i
05090202 10 06	Glady Creek-East Fork Little Miami River	5	0
05090202 11 02	Fivemile Creek-East Fork Little Miami River	5	0
05090202 09 02	O'Bannon Creek	5	0
04110001 07 02	Mouth Beaver Creek	5	0
04110002 01 02	West Branch Cuyahoga River	5	0
04110002 02 01	Potter Creek-Breakneck Creek	5	0
05120101 01 01	Headwaters Wabash River	5	0
05080001 06 03	Turtle Creek	5	0
05090202 06 02	Headwaters Todd Fork	5	0
05090201 08 03	Evans Run-Straight Creek	4A	0

Below is the complete list of all AUs that should have been categorized as "impaired" in Section L4 of the 2014 IR and how they were actually reported. These waters were correctly listed as "impaired" in Table H-2 of the 2014 IR.

Assessment Unit ID	Assessment Unit Name	Reported Category	Correct Category
04100005 90 01	Maumee River Mainstem (IN border to Tiffin River)	5h	5h
04100007 03 06	Lima Reservoir-Ottawa River	0	5
04100009 90 01	Maumee River Mainstem (Tiffin River to Beaver Creek)	5h	5h
04100009 90 02	Maumee River Mainstem (Beaver Creek to Maumee Bay)	5h	5h
04100011 90 02	Sandusky River Mainstem (Wolf Creek to Sandusky Bay)	5	5
04110002 01 01	East Branch Reservoir-East Branch Cuyahoga River	0	5
04110002 01 04	Ladue Reservoir-Bridge Creek	0	5
04110002 02 03	Lake Rockwell-Cuyahoga River	0	5
05080001 07 05	Garbry Creek-Great Miami River	0	5
05090201 10 01	Sterling Run	0	4A
05090202 07 02	Second Creek	0	5
05090202 10 05	West Fork East Fork Little Miami River	0	5
05090202 12 03	Lucy Run-East Fork Little Miami River	0	5
05090202 13 01	Headwaters Stonelick Creek	0	5
05120101 02 04	Grand Lake-St Marys	0	5
24001 001	Lake Erie Western Basin Shoreline (including Maumee Bay and Sandusky Bay)	5	5

[2] Category descriptions are as follows: 0 = no waters currently utilized for water supply; 1 = use attaining; 3i = use attainment unknown because of insufficient data; 4A = impaired, but a TMDL has been completed; 5 = impaired and a TMDL is needed; 5h = impaired based on historical data and a TMDL is needed.