



# **Illinois Integrated Water Quality Report and Section 303(d) List, 2018**

**February 2021**

**Clean Water Act Sections 303(d), 305(b), and 314**

**Water Resource Assessment Information  
and List of Impaired Waters**

**Illinois Environmental Protection Agency  
Bureau of Water**

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## EXECUTIVE SUMMARY

The 2018 Integrated Report format is based on federal guidance for meeting the requirements of Sections 305(b), 303(d) and 314 of the Clean Water Act. The basic purpose of this report is to provide information to the federal government and the citizens of Illinois on the condition of surface water in the state. This information is provided in detail in the appendices and is summarized in Section C-3.

### Streams

For this reporting cycle, 18,224 miles (15%) of the total 119,244 miles of streams in Illinois have been assessed for attainment of at least one designated use. For each of many stream segments throughout the state, Illinois EPA determines attainment of applicable designated uses by analyzing various information. When sufficient data are available, each designated use in each segment is assessed as attained (i.e., "Fully Supporting") or not attained (i.e., "Not Supporting"). The term "impaired" refers to a condition in which at least one designated use is not attained.

For each designated use in Illinois streams, the major potential causes of impairment (Table C-35) are: fecal coliform bacteria impairing primary contact use; mercury and polychlorinated biphenyls (PCBs) in fish tissue impairing fish consumption use; low dissolved oxygen, physical-habitat alterations, high phosphorus, excessive siltation, and high total suspended solids impairing aquatic life use; and atrazine, iron, simazine, and nitrate impairing public and food processing water supply use. Important potential sources of impairment (Table C-36) include atmospheric deposition of toxics, agriculture, hydromodification such as channelization, loss of riparian habitat, municipal point sources, and urban runoff/storm sewers.

**Table ES-1. Percent of Illinois Stream Miles Assessed as Fully Supporting and Not Supporting Designated Uses, Reporting Cycle 2018**

Designated Use	Miles Assessed	Percent of Miles Assessed	Percent of Miles Assessed as Fully Supporting	Percent of Miles Assessed as Not Supporting	Percent of Miles Not Assessed
Aesthetic Quality	12,197	10.2	97.1	2.9	89.8
Aquatic Life	17,948	15.1	58.2	41.8	84.9
Fish Consumption	4,582	3.8	0	100	96.2
Indigenous Aquatic Life	90	100	38.8	61.2	0
Primary Contact	4,523	3.8	11.0	89.0	96.2
Public and Food Processing Water Supply	898	100	59.6	40.4	0

Note: Slight rounding errors may exist.

## Freshwater Lakes

For this 2018 cycle report, a total of 153,278 lake acres were assessed for attainment of at least one designated use. This represents 48 percent of the total lake and pond acreage (318,477) in the state. Overall, the percent of lake acres assessed has remained relatively consistent over the last ten cycles – about 46 to 49 percent. As with streams, each designated use in a lake is assessed as attained (i.e., "Fully Supporting") or not attained (i.e., "Not Supporting").

**Table ES-2. Percent of Illinois Lakes Assessed as Fully Supporting and Not Supporting Designated Uses, Reporting Cycle 2018**

Designated Use <sup>(1)</sup>	Statewide Acres Designated <sup>(1)</sup>	Acres Assessed	Percent of Assessed Acres		Percent of Statewide Acres	
			Fully Supporting	Not Supporting	Not Assessed	Insufficient Information
Aesthetic Quality	318,477	146,356	10.0	90.0	52.0	2.0
Aquatic Life	316,877	146,557	90.0	10.0	51.8	2.0
Fish Consumption	318,477	125,197	3.2	96.8	60.7	0.0
Indigenous Aquatic Life	1,600	1,600	100.0	0.0	0.0	0.0
Primary Contact	316,877	1,814	60.2	39.8	99.4	0.0
Public and Food Processing Water Supply	74,349	74,349	92.1	7.9	0.0	0.0

Designated Use <sup>(1)</sup>	Number of Lakes Assessed	Percent of Statewide Lakes Assessed	Percent of Assessed Lakes		Percent of Statewide Lakes	
			Fully Supporting	Not Supporting	Not Assessed	Insufficient Information
Aesthetic Quality	386	0.4	15.5	84.5	99.5	0.1
Aquatic Life	386	0.4	89.9	10.1	99.5	0.1
Fish Consumption	141	0.2	0.7	99.3	99.8	0.0
Indigenous Aquatic Life	1	100.0	100.0	0.0	0.0	0.0
Primary Contact	15	0.0	46.7	53.3	100.0	0.0
Public and Food Processing Water Supply	64	100.0	78.1	21.9	0.0	0.0

Note: Numbers and percentages may not add up due to slight rounding errors.

1. Statewide, in the time period covered by this summary, Illinois had 91,456 lakes and ponds designated for general uses, one lake designated for Indigenous Aquatic Life Use, and 64 lakes designated for Public and Food Processing Water Supply Use.

The major potential causes of impairment (Table C-38) based on number of lake acres affected are: phosphorus (total), total suspended solids, and aquatic algae impairing aquatic life and aesthetic quality uses; nitrate, simazine, and manganese impairing public and food processing water supply use; and, mercury and polychlorinated biphenyls (PCBs) in fish tissue impairing fish consumption use. Important potential sources of impairment (Table C-39) include atmospheric deposition of toxics, crop production, littoral and shoreline modifications, runoff from forest/grassland/parkland, other recreational pollution sources, and internal nutrient recycling.

### **Lake Michigan**

The State of Illinois has jurisdiction over and assesses the quality of three Lake Michigan water types: Lake Michigan Open Waters, Lake Michigan Shoreline, and Lake Michigan Harbors, all bordering Cook and Lake Counties in the northeastern corner of the state.

For assessments in Lake Michigan Open Waters, Illinois EPA uses data collected from the Lake Michigan Monitoring Program nearshore component. A single assessment unit is bounded by the Wisconsin-Illinois border to the North, the Indiana-Illinois border to the South, the shoreline to the West, and 5km offshore to the East. This nearshore assessment unit contains a total of 196 square miles of Lake Michigan Open Water, which represents about 12.8% of the approximately 1,526 square miles of Lake Michigan waters in Illinois. The remaining 1,330 square miles in Illinois's jurisdiction are currently unassessed.

The Lake Michigan Shoreline comprises 51 assessment units that span the entire 64 miles of Lake Michigan shoreline (excluding harbors and harbor entrances) of Illinois. The Lake Michigan Shoreline is assessed for primary contact use by using beach-closure data collected at beaches in the 51 assessment units, in Lake and Cook counties. The closures are determined from samples of *E. coli* bacteria collected by municipal and county agencies that manage the beaches.

For assessments in Lake Michigan Harbors, Illinois EPA uses data collected from the Lake Michigan Monitoring Program harbor component. Currently, all 13 harbors along the Lake Michigan shoreline in Illinois have been assessed.

A summary of use-support for all Lake Michigan-basin waters and uses is shown below in Table ES-3. The entire 196 square miles of assessed Lake Michigan open waters were rated as Fully Supporting for the following uses: aquatic life, primary contact (e.g., swimming, water skiing), aesthetic quality, and public and food processing water supply. However, the Illinois portion of Lake Michigan is assessed as Not Supporting for fish consumption use due to contamination from polychlorinated biphenyls and mercury. In addition, 64 miles of Lake Michigan shoreline in Illinois were assessed as Not Supporting primary contact and fish consumption use due to contamination from *E. coli* bacteria, polychlorinated biphenyls, and mercury.

**Table ES-3. Statewide Individual Use-Support Summary for Lake Michigan-Basin Waters, Reporting Cycle 2018**

**Lake Michigan Harbors (Square Miles)**

Designated Use <sup>(1)</sup>	Total Size	Total Assessed		Size Fully Supporting	Size Not Supporting	Size Not Assessed
		Size	%			
Aesthetic Quality	2.26	0.46	20.4	0.40	0.06	1.8
Aquatic Life	2.26	2.26	100	2.20	0.06	0
Fish Consumption	2.26	0.28	12.4	0	0.28	1.98
Primary Contact	2.26	0.78	34.5	0.78	0	1.48

**Lake Michigan Open Water (Square Miles)**

Designated Use <sup>(1)</sup>	Total Size	Total Assessed		Size Fully Supporting	Size Not Supporting	Size Not Assessed
		Size	%			
Aesthetic Quality	1,526	196	12.8	196	0	1,330
Aquatic Life	1,526	196	12.8	196	0	1,330
Fish Consumption	1,526	196	12.8	0	196	1,330
Primary Contact	1,526	196	12.8	196	0	1,330
Public and Food Processing Water Supplies	196	196	100	196	0	0

**Lake Michigan Shoreline (Miles)**

Designated Use <sup>(1)</sup>	Total Size	Total Assessed		Size Fully Supporting	Size Not Supporting	Size Not Assessed
		Size	%			
Aesthetic Quality	64	0	0	0	0	64
Aquatic Life	64	0	0	0	0	64
Fish Consumption	64	64	100	0	64	0
Primary Contact	64	64	100	0	64	0

1. Illinois has jurisdiction over 1,526 square miles of Lake Michigan open water, 2.26 square miles of Lake Michigan harbors, and 64 miles of Lake Michigan shoreline that are covered under the Lake Michigan Basin Water Quality Standards. Also, 196 square miles of Lake Michigan are designated for Public and Food Processing Water Supply Use.

## **PART A: INTRODUCTION**

### **A-1. Reporting Requirements**

The 2018 Integrated Report is primarily based on guidance from the U.S. Environmental Protection Agency (USEPA) and is intended to satisfy, in a single report, the requirements of sections 305(b), 303(d), and 314 of the Federal Water Pollution Control Act Amendments of 1972 (PL 92-500) and subsequent amendments (hereafter, collectively called the “Clean Water Act” or “CWA”).

According to Section 305(b) of the Clean Water Act, each state, territory, tribe, and interstate commission (hereafter collectively called “state”) must submit to USEPA “a report which shall include—

(A) a description of the water quality of all navigable waters in such State during the preceding year;

(B) an analysis of the extent to which all navigable waters of such State provide for the protection and propagation of a balanced population of shellfish, fish, and wildlife, and allow recreational activities in and on the water;

(C) an analysis of the extent to which the elimination of the discharge of pollutants and a level of water quality which provides for the protection and propagation of a balanced population of shellfish, fish, and wildlife and allows recreational activities in and on the water, have been or will be achieved by the requirements of this Act, together with recommendations as to additional action necessary to achieve such objectives and for what waters such additional action is necessary;

(D) an estimate of (i) the environmental impact, (ii) the economic and social costs necessary to achieve the objective of this Act in such State, (iii) the economic and social benefits of such achievement, and (iv) an estimate of the date of such achievement; and

(E) a description of the nature and extent of nonpoint sources of pollutants, and recommendations as to the programs which must be undertaken to control each category of such sources, including an estimate of the costs of implementing such programs.”

Illinois EPA reports the resource quality of its waters in terms of the degree to which the beneficial uses<sup>1</sup> of those waters are supported and the reasons (causes and sources) beneficial uses may not be supported. In addition, states are required to provide an assessment of the water quality of all publicly owned lakes, including the status and trends of such water quality as specified in Section 314(a)(1) of the Clean Water Act.

Section 303(d) of the Clean Water Act and corresponding regulations in Title 40 of the Code of Federal Regulations, require states to:

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<sup>1</sup> Beneficial uses, also called designated uses, are discussed in more detail in Section B-2 Water Pollution Control Program, Illinois Surface Water Quality Standards.



- Identify water quality-limited waters where effluent limitations and other pollution control requirements are not sufficient to implement any water quality standard;
- Identify pollutants causing or expected to cause water quality standards violations in those waters;
- Establish a priority ranking for the development of Total Maximum Daily Load<sup>2</sup> (TMDL) calculations including waters targeted for TMDL development within the next two years; and,
- Establish TMDLs for all pollutants preventing or expected to prevent the attainment of water quality standards.

This list of water quality limited waters is referred to as the “303(d) List” in this report.

The Integrated Report process has two major phases corresponding to the requirements noted above. In the first phase, use support assessments are conducted for all waters and all designated uses for which data are available to make assessments. As part of that process all potential causes (both “pollutant” and “nonpollutant” causes) and potential sources of impairment are identified. These assessment results, which include all use support assessments and all potential causes and potential sources of use impairment for all assessed waters, are shown in Appendices B-2 (Streams), B-3 (Lakes) and B-4 (Lake Michigan).

The next phase involves categorizing waters based on whether any uses are impaired, whether pollutant or nonpollutant causes are identified and whether or not a TMDL is required. **A subset of all assessed waters and causes of impairment is identified as the 303(d) List (Appendices A-1 and A-2).** It includes only those waters that have uses that are impaired by pollutants and that require a TMDL. Each entry on the 303(d) List is a unique combination of a water body segment (also known as an assessment unit<sup>3</sup>) and pollutant cause of impairment that requires a separate loading calculation. Also, as part of this second phase, each assessment unit-pollutant combination on the 303(d) List is prioritized for TMDL development and a two-year schedule for TMDL development is created. TMDLs are only conducted for causes of impairment that are classified as pollutants such as metals or pesticides. Nonpollutant causes of impairment such as habitat degradation are not a component of Illinois’ 303(d) List submission.

**The distinction between “pollutant” and “nonpollutant” is critical in this process.** Section 502(6) of the Clean Water Act defines a pollutant as “*dredged spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial, municipal, and agricultural waste discharged into water.*” In general, pollutants are substances, chemicals, materials or wastes and their components that are discharged into the water. Pollution, as defined by the Clean Water Act Section 502(19), is “*the man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of a water body.*” This is a broad term that encompasses many types of changes to a water body, including alterations that do not result from the introduction of a specific pollutant or the presence of

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<sup>2</sup> Total Maximum Daily Load calculations determine the amount of a pollutant a water body can assimilate without exceeding the state’s water quality standards or impairing the water body’s designated uses.

<sup>3</sup> A lake, a stream segment, or an open-water area, harbor or shoreline segment of Lake Michigan for which a use attainment assessment is made.

pollutants at a level that causes impairment. In other words, all waters impaired by human intervention suffer from some form of pollution. In some cases, the pollution is caused by the presence of a pollutant, and a TMDL is required. For assessment purposes, Illinois EPA classifies almost all causes of impairment as pollutants. The classification of each cause of impairment is shown in the guidelines for identifying potential causes of impairment related to each use. Some nonpollutant causes may in turn be caused by pollutants. Whenever nonpollutant causes are identified, we attempt to determine if pollutants are ultimately responsible for the impairment, and what those pollutants are.

While pollutant causes of impairment are addressed by Illinois EPA's TMDL program, nonpollutant causes are addressed by other agency programs such as Clean Water Act Section 319 grants for nonpoint source pollution control activities and other grant programs.

To the extent possible, the 2018 Illinois Integrated Report is based on USEPA's *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act* issued July 29, 2005, and additional guidance contained in USEPA memorandums from the Office of Wetlands, Oceans and Watersheds regarding Clean Water Act Sections 303(d), 305(b), and 314 Integrated Reporting and Listing Decisions.

## **A-2. Major Changes from Previous Reports**

Illinois' Secondary Contact and Indigenous Aquatic Life Standards (35 Ill. Adm. Code, 302, Subpart D) were replaced by the *Chicago Area Waterway System and Lower Des Plaines River Water Quality and Indigenous Aquatic Life Standards*. These standards apply to about 90 miles of canals, channels and modified streams and Lake Calumet, in northeastern Illinois (35 Ill. Adm. Code Section 302 Subpart D). The original Secondary Contact and Indigenous Aquatic Life Standards were intended to protect Indigenous Aquatic Life limited only by the physical configuration of the body of water, characteristics, and origin of the water and the presence of contaminants in amounts that do not exceed these water quality standards. Currently, only one water body (South Fork South Branch Chicago River, ILHCA-01) is still designated for Indigenous Aquatic Life use. Three new tiers of aquatic life uses have been designated in the standard revisions, Upper Dresden Island Pool Aquatic Life Use, Chicago Area Waterway System Aquatic Life Use A, and Chicago Area Waterway System and Brandon Pool Aquatic Life Use B. For the 2018 cycle, these uses are assessed using the water quality criteria applicable to each use.

Secondary Contact use is no longer being associated with, or assessed in, any water body in the state. Secondary contact designation was repealed for the Chicago Area Waterway System and there are no specific General Use standards intended to protect secondary contact use in other waters that could be used to assess this use.

Illinois has previously classified and summarized all assessment results as "Fully Supporting – Good," "Not Supporting – Fair," or "Not Supporting – Poor." Due to constraints in USEPA's new ATTAINS database, it is no longer possible to distinguish between Not Supporting – Fair and Not Supporting – Poor. Therefore, in this cycle all assessment results will be classified and summarized as either Fully Supporting or Not Supporting. This is accomplished by combining

the Not Supporting – Fair and Not Supporting – Poor categories. However, the methodology to determine Fully Supporting and Not Supporting remains the same for each use

We no longer consider the following six lakes for integrated Clean Water Act 305(b)/303(d) reporting because in past reports, we did not correctly recognize them as *treatment works* (35 Ill. Adm. Code 301.415) that are not subject to the same regulations as other lakes. The six lakes are: Braidwood (Assessment Unit IL\_RFC), Powerton (IL\_SDZE), Dresden (IL\_UDD), LaSalle Cooling (IL\_SDZG), Heidecke (IL\_SDX), and Baldwin (IL\_ROW).

Besides the changes noted above, the methodology used in the previous (2016) Integrated Report remained the same.

### **A-3. Primary Data Sources and Time Periods Covered**

#### **Data Used for This Assessment Cycle**

Surface water assessments in this 2018 report are based primarily on biological, water chemistry, physical habitat, and fish-tissue information collected through 2015 from various monitoring programs (Illinois EPA 2014). These programs include the Ambient Water Quality Monitoring Network, Intensive Basin Surveys, Facility-Related Stream Surveys, the Fish Contaminant Monitoring Program, the Ambient Lake Monitoring Program, the Volunteer Lake Monitoring Program, the Lake Michigan Monitoring Program, TMDL monitoring, and other outside sources. Use attainment was updated for surface waters where sufficient new information became available. In addition, assessments were updated when errors were discovered in previous assessments. Older assessments are based on the most recent data available, which, in some cases, may be over 15 years old. Although the Intensive Basin Survey program generally revisits each major basin in the state on a five-year basis, limited state resources make it impossible to monitor all water bodies in each basin every five years.

In 2018, stream assessments of *Aquatic Life* use and *Aesthetic Quality* use, which rely primarily on data from Intensive Basin Surveys, were updated for stream segments in these basins: Apple River, Plum River, Mississippi River North, Green River, Upper Illinois River, Kankakee River, Mississippi River North Central, Spoon River, Iroquois River, Vermillion River, Mackinaw River, Bear Creek, Mississippi River Central, Wood River, Piasa Creek, Mississippi River South Central, Mississippi River South, Cache River, Saline River, and Ohio River tributaries. These basins were sampled in 2014 and 2015. In a few cases, where other data were available for waters outside these basins, we used those data to update assessments as well. Water chemistry data from the Ambient Water Quality Monitoring Network and from the Metropolitan Water Reclamation District's (MWRD) Ambient Water Quality Monitoring program from 2013 through 2015 were also used in some of those assessments. Some assessments of *Aquatic Life* use in streams were updated based on Facility-Related Stream Survey data from 2014 and 2015.

All use attainment assessments on Lake Michigan were updated with Lake Michigan Monitoring Program data through 2015.

Assessments of *Indigenous Aquatic Life*, *Upper Dresden Island Pool Aquatic Life Use*, *Chicago Area Waterway System Aquatic Life Use A*, and *Chicago Area Waterway System and Brandon*

Pool Aquatic Life Use B in the Chicago Area Waterways, were made using water data from 2014 and 2015 from various sources.

Assessments of Primary Contact use in streams were updated with Illinois EPA Ambient Water Quality Monitoring Network data and MWRD Ambient data from 2013 through 2015. Because there were no new fecal coliform samples collected in lakes since the last report, no new assessments of Primary Contact use were made for freshwater lakes.

Assessments of Fish Consumption use were updated with new fish tissue data from 2011 - 2015.

Aquatic Life use and Aesthetic Quality use in lakes were updated with Ambient Lake Monitoring Program data from 2014 and 2015.

Public and food processing water supply use in streams was updated from a variety of data sources covering a period of 2013 through 2015. Public and food processing water supply use assessments in freshwater lakes were updated using data from a variety of sources from 2013 through 2015.

Non-agency data sources such as the Illinois Department of Natural Resources, the Lake County Health Department, the Metropolitan Water Reclamation District of Greater Chicago, the U.S. Geological Survey, TMDL contractors, and others are considered and may be used for the assessment of various uses and water bodies.

### **Solicitation of Information**

For assessing Illinois surface waters, Illinois EPA routinely considers data from three outside sources including, (1) biological data (from streams) collected by the Illinois Department of Natural Resources as part of the cooperative Intensive Basin Survey program, (2) physicochemical water data provided by the Lake County Public Health Department (freshwater lake data), and (3) United States Geological Survey's Long Term Resource Monitoring Program (<https://umesc.usgs.gov/ltrm-home.html>) that focuses on the Upper Mississippi River.

On August 24, 2016, Illinois EPA posted the "*Guidance for Submission of Surface Water Data For Consideration in Preparing the 2018 Integrated Report on Illinois Water Quality, including the List of Clean Water Act Section 303(d) Impaired Waters*" and associated data-solicitation information on the Illinois Environmental Protection Agency website (Illinois EPA 2016). The guidance describes the required format for data packages and associated quality assurance documentation and provides instructions on how and when (by October 15, 2016) to submit data for consideration for assessments in this report.

Data sets and other information were received from the following external organizations: River Prairie Group, Eagle View Group, Northwest Cook County Water Sentinels, Chicago Water Team, and Valley of the Fox Group, all Illinois Chapters of the Sierra Club; The Conservation Foundation – DuPage River Salt Creek Workgroup; and the Metropolitan Water Reclamation District of Greater Chicago. All submitted data that meet Illinois EPA Quality Assurance/Quality Control requirements will be evaluated and considered for assessments in this report.

## PART B: BACKGROUND

### B-1. Total Surface Waters

Illinois has abundant water resources (Table B-1). The U.S. Geological Survey's National Hydrography Dataset (NHD 1:24,000 scale) shows approximately 119,244 miles of streams within the state's borders, including major rivers such as the Big Muddy, Cache, Des Plaines, Embarras, Fox, Illinois, Kankakee, Kaskaskia, Little Wabash, Rock, Sangamon, and Vermilion rivers. In addition, the NHD shows 911 miles of large rivers forming the state's western (Mississippi River), eastern (in part, Wabash River), and southern (Ohio River) borders. Throughout this document, we refer to all flowing waters of all sizes as streams.

More than 91,400 freshwater lakes and ponds exist in Illinois, 3,256 of which have a surface area of six acres or more (Illinois Department of Natural Resources 1999). The term freshwater lake is used for any Illinois lake other than Lake Michigan and its harbors. About three-fourths of Illinois' freshwater lakes are man-made, including dammed stream and side-channel impoundments, strip-mine lakes, borrow pits, and other excavated lakes. Natural lakes include glacial lakes in the northeastern counties, sinkhole ponds in the southwest, and oxbow and backwater lakes along major rivers.

Illinois is bordered by one of the Great Lakes, Lake Michigan. The state has jurisdiction over approximately 1,526 square miles of Lake Michigan open water and 64 miles of Lake Michigan shoreline, bordering Cook and Lake counties in the northeastern corner of the state. Lake Michigan is the third largest of the Great Lakes and is the largest body of fresh water located entirely within the boundaries of the United States. With the exception of the polar ice caps, the Great Lakes form the largest freshwater system on earth.

**Table B-1. Illinois Atlas.**

Topic	Value	Scale	Source
State Population in year 2017 (estimate)	12,802,023		US Census Bureau
State Surface Area (sq. mi.)	56,250		
Major Watersheds	52		USGS
Total Stream Miles	119,244	1:24,000	NHD
Interior Stream Miles	118,333	1:24,000	NHD
Perennial Streams	25,019	1:24,000	NHD
Intermittent Streams	78,245	1:24,000	NHD
Ditches and Canals	3676	1:24,000	NHD
Other	11,393	1:24,000	NHD
Border Stream Miles	911	1:24,000	NHD
Mississippi River	582	1:24,000	NHD
Ohio River	131	1:24,000	NHD
Wabash River	198	1:24,000	NHD
Freshwater Lakes and Ponds	91,456	(1)	(1)
Total Acreage	318,477	(1)	(1)

**Table B-1. (Cont) Illinois Atlas.**

<b>Topic</b>	<b>Value</b>	<b>Scale</b>	<b>Source</b>
Total Freshwater Lakes (6 acres and more)	3,256	(1)	(1)
Total Freshwater Lake Acreage (6 acres and more)	253,224	(1)	(1)
Publicly Owned Freshwater Lakes	1,279	(1)	(1)
Publicly Owned Lake Acreage	154,333	(1)	(1)
Freshwater Lakes over 5,000 Acres	4	(1)	(1)
Acreage of Freshwater Lakes over 5,000 Acres	61,545	(1)	(1)
Lake Michigan		(1)	(1)
Illinois Shoreline Miles <sup>2</sup>	63.95	1:24,000	NHD
Illinois Square Miles	1,526	(1)	(1)
Total Shallow Water Wetlands Acreage	720,000	(1)	(1)

NHD = National Hydrography Dataset

1. 1999 Inventory of Illinois Surface Water Resources, Illinois Department of Natural Resources, Division of Fisheries, April 2000.
2. The length of Lake Michigan Shoreline Segments was recalculated in 2014 based on the high resolution (1:24,000 scale) NHD (see Appendix D).

## **B-2. Surface Water Pollution Control Program**

Illinois EPA's Bureau of Water works to ensure that Illinois' rivers, streams, and lakes will support all uses for which they are designated including protection of aquatic life, primary contact recreation, aesthetic quality, drinking water supply, and fish consumption. They also ensure that Illinois public water supply systems provide water that is consistently safe to drink, and that Illinois' groundwater resources are protected for designated drinking water and other beneficial uses.

The Bureau of Water monitors the quality of the state's surface and groundwater resources; runs a municipal, stormwater, and industrial effluent permitting program; regularly inspects sources of pollution and citizen complaints; ensures compliance with regulatory standards; and enforces applicable requirements. They also provide a number of loan and grant programs designed to upgrade existing and build new wastewater, stormwater treatment and public water supply infrastructure; reduce nonpoint source pollution; conduct green infrastructure projects; and protect and restore Illinois' inland lakes and streams.

## **Illinois Surface Water Quality Standards**

Water pollution control programs are designed to protect the beneficial uses of the water resources of the state. Each state has the responsibility to set water quality standards that protect these beneficial uses, also called "designated uses." Illinois waters are designated for various uses including aquatic life, wildlife, agricultural use, primary contact (e.g., swimming, water skiing), secondary contact (e.g., boating, fishing), industrial use, public and food-processing water supply, and aesthetic quality. Illinois' water quality standards provide the basis for assessing whether the beneficial uses of the state's waters are being attained.



The Illinois Pollution Control Board is responsible for setting water quality standards to protect designated uses. The Illinois EPA is responsible for developing scientifically based water quality standards and proposing them to the Illinois Pollution Control Board for adoption into state rules and regulations. The federal Clean Water Act requires the states to review and update water quality standards every three years. Illinois EPA, in conjunction with USEPA, identifies and prioritizes those standards to be developed or revised during this three-year period.

The Illinois Pollution Control Board has established four primary sets (or categories) of narrative and numeric water quality standards for surface waters. The standards are available at the Pollutions Control Board website:

<https://pcb.illinois.gov/SLR/PCBandIEPAEnvironmentalRegulationsTitle35>. Each set of standards is intended to help protect various designated uses established for each category (Table B-2).

- *General Use Standards* (35 Ill. Adm. Code Part 302, Subpart B) - These standards apply to almost all waters of the state and are intended to protect aquatic life, wildlife, agricultural, primary contact, secondary contact, and most industrial uses. These General Use standards are also designed to ensure the aesthetic quality of the state's aquatic environment and to protect human health from disease or other harmful effects that could occur from ingesting aquatic organisms taken from surface waters of the state.
- *Public and Food Processing Water Supply Standards* (35 Ill. Adm. Code Part 302, Subpart C) - These standards protect surface waters of the state for human consumption or for processing of food products intended for human consumption. These standards apply at any point at which water is withdrawn for treatment and distribution as a potable water supply or for food processing.
- *Chicago Area Waterway System and Lower Des Plaines River Water Quality and Indigenous Aquatic Life Standards*. (replaces the *Secondary Contact and Indigenous Aquatic Life Standards*) (35 Ill. Adm. Code 302, Subpart D) – The former Secondary Contact and Indigenous Aquatic Life Standards were intended to protect limited uses in Chicago-area waters not suited for general-use activities due to hydromodification, flow alteration, wastewater discharges, and storm-water discharges from urban development. These standards applied to portions of the Chicago, Calumet, and lower Des Plaines river drainages and Lake Calumet. Since the original adoption of the Secondary Contact and Indigenous Aquatic Life Standards in the 1970s, water quality has improved in these waters, and the standards were repealed and replaced by the *Chicago Area Waterway System and Lower Des Plaines River Water Quality and Indigenous Aquatic Life Standards* in 2016. Several new designated uses have been added. These new uses represent tiers of human-contact uses and tiers of aquatic-life uses. Some aspects of this rulemaking are still pending approval from USEPA. The new standards can be found at: <https://pcb.illinois.gov/SLR/PCBandIEPAEnvironmentalRegulationsTitle35>.
- *Lake Michigan Basin Water Quality Standards* (35 Ill. Adm. Code 302, Subpart E) – These standards protect the beneficial uses of the open waters, harbors, waters within breakwaters, and the waters within Illinois jurisdiction tributary to Lake Michigan, except for the Chicago River, North Shore Channel, and Calumet River.

**Table B-2. Illinois Designated Uses and Applicable Water Quality Standards,  
Reporting Cycle 2018**

<b>Illinois EPA Designated Uses</b>	<b>Illinois Waters in which the Designated Use and Standards Apply<sup>(1)</sup></b>	<b>Applicable Illinois Water Quality Standards<sup>(1)</sup></b>
<i>Aquatic Life</i>	Streams, Freshwater Lakes	General Use Standards
	Lake Michigan-basin waters	Lake Michigan Basin Standards
<i>Aesthetic Quality</i>	Streams, Freshwater Lakes	General Use Standards
	Lake Michigan-basin waters	Lake Michigan Basin Standards
	Specific Chicago-area waters	Chicago Area Waterway System and Lower Des Plaines River Water Quality and Indigenous Aquatic Life Standards <sup>(2)</sup>
<i>Upper Dresden Island Pool Aquatic Life Use</i>	Specific Chicago-area waters	Chicago Area Waterway System and Lower Des Plaines River Water Quality and Indigenous Aquatic Life Standards <sup>(2)</sup>
<i>Chicago Area Waterway System Aquatic Life Use A</i>	Specific Chicago-area waters	
<i>Chicago Area Waterway System and Brandon Pool Aquatic Life Use B</i>	Specific Chicago-area waters	
<i>Indigenous Aquatic Life</i>	South Fork South Branch Chicago River	
<i>Primary Contact</i>	Streams, Freshwater Lakes	General Use Standards
	Lake Michigan-basin waters	Lake Michigan Basin Standards
	Specific Chicago-area waters <sup>(3)</sup>	Chicago Area Waterway System and Lower Des Plaines River Water Quality and Indigenous Aquatic Life Standards <sup>(2)</sup>
<i>Public and Food Processing Water Supply</i>	Streams, Freshwater Lakes, Lake Michigan-basin waters	Public and Food Processing Water Supply Standards
<i>Fish Consumption</i>	Streams, Freshwater Lakes	General Use Standards (Human Health)
	Lake Michigan-basin waters	Lake Michigan Basin Standards (Human Health)
	Specific Chicago-area waters	Chicago Area Waterway System and Lower Des Plaines River Water Quality and Indigenous Aquatic Life Standards <sup>(2)</sup>

- As defined in 35 Ill. Adm. Code Parts 302 and 303:  
<https://pcb.illinois.gov/SLR/PCBandIEPAEnvironmentalRegulationsTitle35>.
- Chicago Area Waterway System and Lower Des Plaines River Water Quality and Indigenous Aquatic Life Standards replaced the Secondary Contact and Indigenous Aquatic Life Standards. (Pending USEPA approval.)
- Waters designated for Primary Contact Recreation Use under the Chicago Area Waterway System and Lower Des Plaines River Water Quality and Indigenous Aquatic Life Standards must meet the fecal coliform criteria in the General Use Standards.

## **Narrative Standards and Antidegradation Regulations**

Water quality standards generally consist of three components: designated uses, a set of numeric and narrative criteria to protect those uses, and an antidegradation statement. In Illinois, the antidegradation statement (35 Ill. Adm. Code 302.105) is separate and covers all designated uses. This component of Illinois' water quality standards describes regulations that protect "*existing uses of all waters of the State of Illinois, maintain the quality of waters with quality that is better than water quality standards, and prevent unnecessary deterioration of waters of the State.*"

All Illinois water quality standards include a narrative description of their intent, and nearly all also have associated numeric components for applying the concepts of the narrative component. For example, narrative language in the General Use standard at 35 Ill. Adm. Code 302.210 protects against toxic substances, "harmful to human health, or to animal, plant or aquatic life." A well-defined quantitative methodology then follows for how to derive numeric criteria intended to provide this protection. Only a few Illinois water-quality standards are exclusively narrative, i.e., having no explicit numeric component in the standard to apply them. For example, the standard at 35 Ill. Adm. Code 302.203 called "Offensive Conditions" simply comprises language that prohibits "sludge or bottom deposits, floating debris, visible oil, odor, plant or algal growth, color or turbidity of other than natural origin" in all "general use" waters of the state. Because of revisions that were made to 35 Ill. Adm. Code 302.203, 302.403 and 302.515 by the Illinois Pollution Control Board in 1990 and 1997, these exclusively narrative standards apply only to the protection of aesthetic quality in Illinois waters.

## **Derived Water Quality Criteria**

The narrative standards in Title 35 of the Illinois Administrative Code, Section 302.210 and in Subpart F for General Use Waters and at 302.540 and elsewhere in Subpart E allow the Illinois EPA to derive numeric water quality criteria values for any substance that does not already have a numeric standard in the Illinois Pollution Control Board regulations. These criteria serve to protect aquatic life, human health or wildlife, although wildlife-based criteria have not yet been derived. Illinois EPA derived criteria can be found at the following web site:  
<https://www2.illinois.gov/epa/topics/water-quality/standards/Pages/derived-criteria.aspx>.

## **B-3. Cost/Benefit Assessment**

Section 305(b) requires the state to report on the economic and social costs and benefits necessary to achieve Clean Water Act objectives. Information on costs associated with water quality improvements is complex and not readily available for developing a complete cost/benefit assessment. Individual state fiscal year 2016 program costs of pollution control activities in Illinois follow. Economic benefits of water quality improvements, while difficult to quantify, include increased opportunities for water-based recreational activities, enhanced commercial and sport fisheries, recovery of damaged aquatic environments, and reduced costs of water treatment to various municipal and industrial users.

### **Cost of Pollution Control and Water Protection Activities**

The Illinois EPA Bureau of Water distributed a total of \$443.4 million in loans during SFY2016 for construction of municipal wastewater treatment facilities. Other Water Pollution Control program and Groundwater/Source Water Protection costs for Bureau of Water activities conducted in 2016 are summarized in Table B-3.

**Table B-3. Water Pollution Control Program Costs for the Illinois Environmental Protection Agency's Bureau of Water, SFY2016**

<b>Activity</b>	<b>Cost</b>
Monitoring	\$6,861,902
Planning	\$50,687
Point Source Control Programs	\$11,141,163
Nonpoint Source Control Programs	\$4,613,411
Groundwater/Source-Water Protection	\$2,186,587
<b>Total</b>	<b>\$24,853,750</b>

## PART C: SURFACE WATER MONITORING AND ASSESSMENT

### C-1. Monitoring Program

Illinois EPA's "Surface Water Monitoring Strategy" (Illinois EPA 2014) provides a detailed discussion of all agency monitoring programs. Field, laboratory, and data-management procedures are explained in the Illinois EPA Bureau of Water's "Quality Assurance Project Plan" (Illinois EPA 1994). Specific programs that contribute data to the assessment of streams include the Ambient Water Quality Monitoring Network, the Pesticide Monitoring Subnetwork, Facility-Related Stream Surveys, and Intensive Basin Surveys (Figure C-1). Programs that contribute data to freshwater lake assessments include the Ambient Lake Monitoring Program and the Volunteer Lake Monitoring Program. The Lake Michigan Monitoring Program provides data for the assessment of Lake Michigan. The Fish Contaminant Monitoring Program provides data for the assessment of all water resources (streams, freshwater lakes, and Lake Michigan). More specific information regarding all of these programs can be found in the Surface Water Monitoring Strategy cited above at

<https://www2.illinois.gov/epa/Documents/epa.state.il.us/water/water-quality/monitoring-strategy/monitoring-strategy-2015-2020.pdf>.

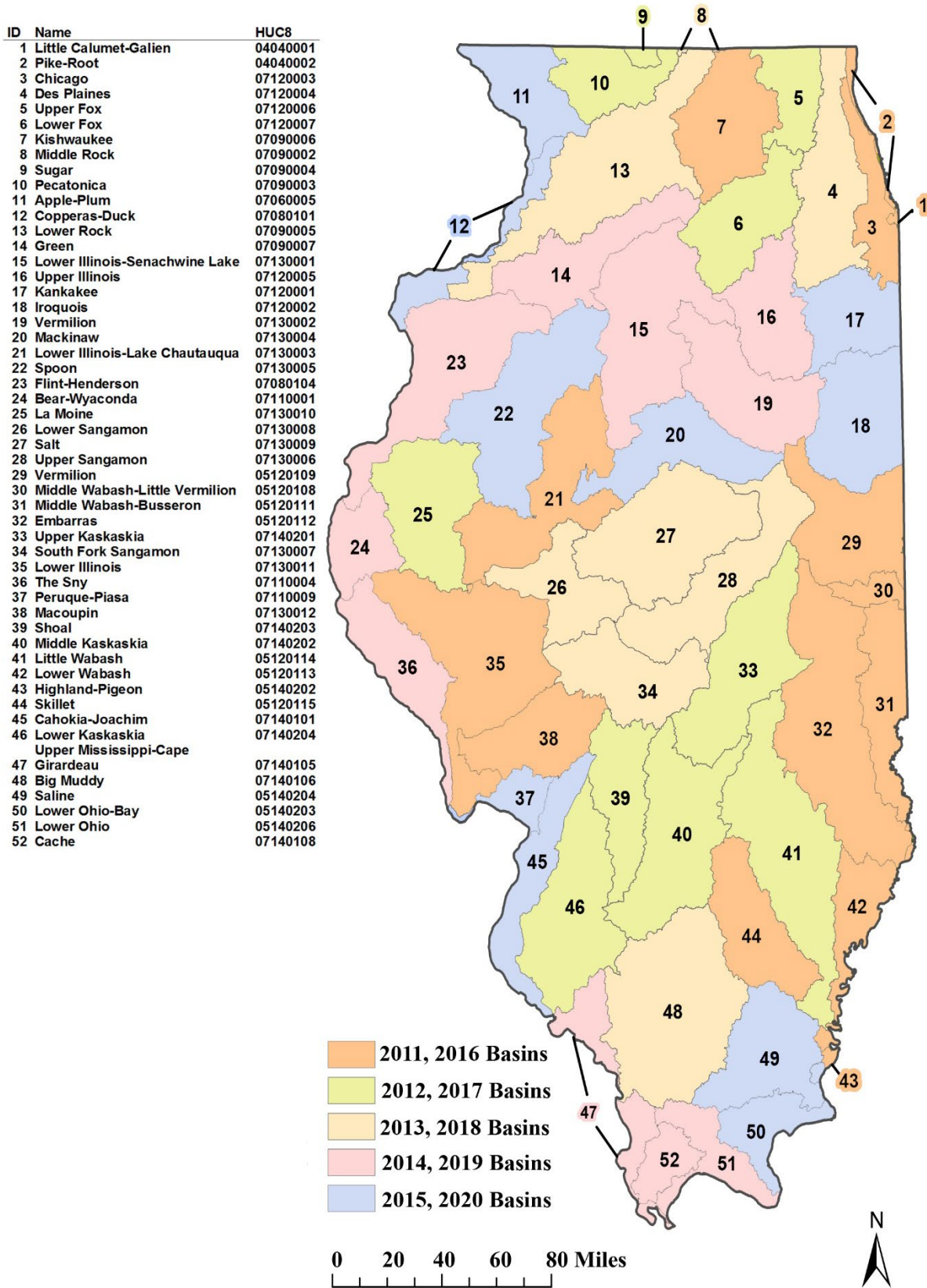
### C-2. Assessment Methodology

This section explains how Illinois EPA uses various criteria (including, but not limited to, Illinois water quality standards) to assess the level of support (attainment) of the following applicable designated uses in the waters of the state: Aquatic Life, Upper Dresden Island Pool Aquatic Life use, Chicago Area Waterway System Aquatic Life use A, Chicago Area Waterway System and Brandon Pool Aquatic Life use B, Indigenous Aquatic Life, Fish Consumption, Primary Contact, Public And Food Processing Water Supply, and Aesthetic Quality. Assessments of designated uses are based on water-body-specific monitoring data believed to accurately represent existing resource conditions. The methodology for the assessment of use attainment and causes of impairment is explained below for each use and each water body type. At the end of Section C-2, we explain guidelines for identifying potential sources of impairment.

#### Water Body Segments

Illinois EPA uses the National Hydrography Dataset (NHD) 1:24,000 scale as the basis for mapping and calculating the length of streams and Lake Michigan shoreline segments. A few stream segments not included or not accurately delineated in the NHD are hand digitized based on aerial maps, USGS topo maps, or other sources. Mapping and area calculations of freshwater lakes and Lake Michigan are based on Illinois data (see Table B-1). While assessments of designated uses are based on data from individual monitoring stations, the data are extrapolated to represent larger water body segments (i.e., a stream segment, a freshwater lake, an open water area in Lake Michigan), also called assessment units. Assessment units delineated for Aquatic Life use are typically used as the basis for all other assessed uses.

Figure C-1. IEPA/IDNR Intensive Basin Survey Schedule, 2011-2020





For streams, monitoring data are extrapolated to linear segments depending on the size of the stream (USEPA 1997). Assessments of *Aquatic Life* use typically apply approximately 10 miles upstream and downstream from the sampling site for wadable streams, about 25 miles upstream and downstream for unwadable streams (i.e., generally  $\geq 7^{\text{th}}$  order,  $\geq 3.5$  ft. average depth, and fish sampled with an electrofishing boat) and approximately 50 miles upstream and downstream for large rivers (i.e., Illinois and Wabash rivers). However, the final extent of any particular segment is determined by considering significant influences such as point or nonpoint source inputs; changes in watershed characteristics such as land use; changes in riparian vegetation, stream banks, slope or channel morphology; stream confluence or diversions; or hydrologic modifications such as channelization or dams. This process often results in segments that are either longer or shorter than the general numeric guidelines above. On the Mississippi River, the segments mostly reflect a September 2003 interstate memorandum of understanding between five states (Illinois, Iowa, Minnesota, Missouri and Wisconsin) designed to improve the assessment process on the Mississippi River (UMRBA 2003, <http://www.umrba.org/wq.htm>). On the Ohio River, segmentation is based on Ohio River Valley Water Sanitation Commission assessments.

In the case of lakes, monitoring data are used to assign an assessment to the entire lake acreage as a single assessment unit.

For assessments in Lake Michigan Open Waters, Illinois EPA uses data collected from the Lake Michigan Monitoring Program nearshore component. A single assessment unit is bounded by the Wisconsin-Illinois border to the North, the Indiana-Illinois border to the South, the shoreline to the West, and 5km offshore to the East. This nearshore assessment unit contains a total of 196 square miles of Lake Michigan Open Water, which represents about 12.8% of the approximately 1,526 square miles of Lake Michigan waters in Illinois. The remaining 1,330 square miles in Illinois's jurisdiction are currently unassessed.

The Lake Michigan Shoreline comprises 51 assessment units that span the entire 64 miles of Lake Michigan shoreline (excluding harbors and harbor entrances) in Illinois. For assessments in Lake Michigan Harbors, Illinois EPA uses data collected from the Lake Michigan Monitoring Program harbor component. Assessments of *Fish Consumption* use are generally extrapolated to include the entire named water body. Changes made to 2016 assessment units are described in Appendix E.

## **Levels of Use Attainment**

The Illinois EPA determines the resource quality of each assessment unit by determining the level of attainment of each applicable designated use. For each assessment unit and designated use applicable to that assessment unit, an Illinois EPA assessment concludes one of two possible use-support levels: "Fully Supporting" or "Not Supporting." Fully Supporting means that the designated use is attained. Not Supporting means the use is not attained. Uses determined to be Not Supporting are called "impaired," and waters that have at least one use assessed as Not Supporting are also called impaired. For each impaired use in each assessment unit, Illinois EPA attempts to identify potential causes and sources of the impairment as explained below.

## Aquatic Life - Streams

Aquatic life use assessments in streams are typically based on the interpretation of biological information, physicochemical water data, and physical-habitat information from the Intensive Basin Survey, Ambient Water Quality Monitoring Network, or Facility-Related Stream Survey programs. The primary biological measures used are the fish Index of Biotic Integrity (fIBI; Karr et al. 1986; Smogor 2000, 2005), the macroinvertebrate Index of Biotic Integrity (mIBI; Tetra Tech, Inc. 2004), and the Macroinvertebrate Biotic Index (MBI; Illinois EPA 1994). Physical-habitat information used in assessments includes quantitative or qualitative measures of stream-bottom composition and qualitative descriptors of channel and riparian conditions. Physicochemical water data used include measures of “conventional” parameters (e.g., dissolved oxygen, pH, and temperature), priority pollutants, non-priority pollutants, and other pollutants (USEPA 2002 and [www.epa.gov/waterscience/criteria/wqcriteria.html](http://www.epa.gov/waterscience/criteria/wqcriteria.html)). In a minority of streams for which biological information is unavailable, Aquatic Life use assessments are based primarily on physicochemical water data. Physicochemical data and habitat information play primary roles in identifying potential causes and sources of Aquatic Life use impairment.

All biological indices are divided into three ranges: a range that indicates no impairment; a range that indicates moderate impairment, and a range that indicates severe impairment (Table C-2). Water-chemistry data are also evaluated to determine whether the potential for impairment of Aquatic Life use is indicated (Table C-3). In addition, several conditions of physical habitat are used to indicate the potential for impairment of Aquatic Life use (Table C-4).

Table C-1 shows a decision matrix that illustrates how biological data (fIBI, mIBI, and MBI), physicochemical water data (i.e., water chemistry), and physical-habitat information are integrated and interpreted to guide the assessment of Aquatic Life use. The last stage of the assessment process is a final review of the assessment conclusion (Table C-1, cell 8). In this review, Illinois EPA biologists carefully examine all available biological, water chemistry and habitat data and also use their site-specific knowledge and other information about the environmental setting of the stream segment. This additional information includes field notes and observations, knowledge of the nature of the stream and its biological potential, the existence of potential sources of pollution, and riparian or watershed information. Based on this review, the biologist may modify the use-attainment decision indicated in any cell in Table C-1. For example, conflicting biological information may require case-specific interpretation, including analysis of possible error or ambiguity in an IBI score, especially when scores are near the threshold values in Table C-2. Also, physicochemical, physical-habitat and other information are examined for corroborating or refuting evidence of Aquatic Life use attainment. In some cases, after careful review, it may be determined that the current data are not adequate to make a new assessment. In these cases, the previous assessment status remains unchanged. Illinois EPA believes that this final review helps improve the accuracy of Aquatic Life use assessments.

When a stream segment is determined to be Not Supporting Aquatic Life use, generally, one exceedance of an applicable Illinois water quality standard (related to protection of aquatic life) results in identifying the parameter as a potential cause of impairment (Table C-5). Additional guidelines used to determine potential causes of impairment include site-specific standards (35 Ill. Adm. Code 303, Subpart C), or adjusted standards (published in the Illinois Pollution Control

Board's *Environmental Register* at <https://pcb.illinois.gov/SLR/PCBandIEPAEnvironmentalRegulationsTitle35>.

**Category 4C.** In some cases, biological data indicate that *Aquatic Life* use in streams is impaired, but no pollutant cause of impairment is identified. If, after further review of all data, the assessor determines that the segment is not impaired by any pollutant, the segment is placed in category 4C, depending on the results of other use-attainment assessments (see Section C-3, Five-Part Categorization of Surface Waters). In each of these cases, water data is available but reveals no violation of an Illinois Water Quality Standard<sup>4</sup>. Illinois EPA does not place water bodies in Category 4C unless sufficient water chemistry data is available for review. In addition, the assessor considers all of the information related to the segment, including the amount of water-chemistry data available, the nature of the stream, the degree of impairment, the existence of potential pollution sources, NPDES permits, other relevant watershed information, and whether the impairment is explained by the presence of degraded habitat or other non-pollutant causes. If the assessor judges that an unidentified pollutant is contributing to the impairment, then Cause Unknown is identified as an additional cause and the segment is placed in Category 5 (the 303(d) List).

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<sup>4</sup> In some segments a TMDL study has determined that violations of the dissolved oxygen standard are not caused by a pollutant. These segments may be included in category 4C.

**Table C-1. Decision Table for Assessing Attainment of Aquatic Life Use in Illinois Streams.**

Each table cell shows the preliminary assessment conclusions based primarily on biological data: fish Index of Biotic Integrity (fIBI), macroinvertebrate Index of Biotic Integrity (mIBI), and Macroinvertebrate Biotic Index (MBI). See Table C-2 for how to interpret these biological indicators. See Tables C-3 and C-4 for how to interpret surrogate water-chemistry data or habitat data. The final review in table cell 8 applies to every preliminary assessment conclusion.

<b>Biological Indicator Indicates:</b>	<b>A. fIBI Indicates No Impairment fIBI <math>\geq</math> 41</b>	<b>B. fIBI Indicates Moderate Impairment fIBI &lt; 41 and &gt; 20</b>	<b>C. fIBI Indicates Severe Impairment fIBI <math>\leq</math> 20</b>	<b>D. fIBI is Unavailable</b>
<b>1. mIBI Indicates No Impairment mIBI <math>\geq</math> 41.8</b>	<i>Fully Supporting</i> (Water chemistry and other data are considered during final review) (See cell 8 below.)	If water-chemistry data or habitat data indicate a potential for impairment, then <i>Not Supporting.</i> Otherwise, <i>Fully Supporting</i>	<i>Not Supporting</i>	If water-chemistry data indicate a potential for severe impairment, then <i>Not Supporting</i> Otherwise, <i>Fully Supporting</i>
<b>2. mIBI Indicates Moderate Impairment mIBI &lt; 41.8 and &gt; 20.9</b>	If water-chemistry data or habitat data indicate a potential for impairment, then <i>Not Supporting</i> Otherwise, <i>Fully Supporting</i>	<i>Not Supporting</i>	<i>Not Supporting</i>	<i>Not Supporting</i>
<b>3. mIBI Indicates Severe Impairment mIBI <math>\leq</math> 20.9</b>	<i>Not Supporting</i>	<i>Not Supporting</i>	<i>Not Supporting</i>	<i>Not Supporting</i>

**Table C-1. (Cont.) Decision Table for Assessing Attainment of Aquatic Life Use in Illinois Streams.**

<b>Biological Indicator Indicates:</b>	<b>A. fIBI Indicates No Impairment fIBI &gt; 41</b>	<b>B. fIBI Indicates Moderate Impairment fIBI &lt; 41 and &gt; 20</b>	<b>C. fIBI Indicates Severe Impairment fIBI &lt; 20</b>	<b>D. fIBI is Unavailable</b>
<b>4. mIBI is Unavailable and MBI Indicates No Impairment MBI ≤ 5.9</b>	<i>Fully Supporting</i>	<i>Not Supporting</i>	<i>Not Supporting</i>	<p>If water-chemistry data indicate a potential for moderate impairment, then <i>Not Supporting.</i></p> <p>If water-chemistry data and sufficient habitat data<sup>(1)</sup> indicate no impairment, then <i>Fully Supporting.</i></p> <p>Otherwise, no assessment is made<sup>(2)</sup>.</p>
<b>5. mIBI is Unavailable and MBI Indicates Moderate Impairment MBI &gt; 5.9 and ≤ 8.9</b>	<p>If water-chemistry data or habitat data indicate a potential for impairment, then <i>Not Supporting.</i></p> <p>Otherwise, <i>Fully Supporting</i></p>	<i>Not Supporting</i>	<i>Not Supporting</i>	<i>Not Supporting</i>
<b>6. mIBI is Unavailable and MBI Indicates Severe Impairment MBI &gt; 8.9</b>	<i>Not Supporting</i>	<i>Not Supporting</i>	<i>Not Supporting</i>	<i>Not Supporting</i>

**Table C-1. (Cont.) Decision Table for Assessing Attainment of Aquatic Life Use in Illinois Streams.**

<b>Biological Indicator Indicates:</b>	<b>A. fIBI Indicates No Impairment fIBI &gt; 41</b>	<b>B. fIBI Indicates Moderate Impairment fIBI &lt; 41 and &gt; 20</b>	<b>C. fIBI Indicates Severe Impairment fIBI &lt; 20</b>	<b>D. fIBI is Unavailable</b>
<b>7. mIBI and MBI are Unavailable</b>	<p>If water-chemistry data indicate a potential for severe impairment, then <i>Not Supporting</i></p> <p>Otherwise, <i>Fully Supporting</i></p>	<i>Not Supporting</i>	<i>Not Supporting</i>	<p>If water-chemistry data indicate a potential for moderate impairment, then <i>Not Supporting</i>.</p> <p>If water-chemistry data indicate a potential for severe impairment, then <i>Not Supporting</i>.</p> <p>If sufficient water-chemistry data<sup>(3)</sup> and sufficient habitat data<sup>(1)</sup> indicate no impairment, then <i>Fully Supporting</i>.</p> <p>Otherwise, no assessment is made<sup>(2)</sup>.</p>
<p><b>8. Final review using site-specific knowledge and considering all available biological, water-chemistry, habitat and other information.</b>  This review considers factors such as the extent to which biological-indicator scores exceed or fall short of impairment thresholds, the type and degree of water quality standard exceedances, the type and degree of habitat degradation, and the presence or absence of pollution sources. Based on this review, the biologist may modify the preliminary use-attainment decision. In some cases, after careful review, it may be determined that current data are not adequate to make a new assessment. In these cases, the previous assessment status remains unchanged.</p>				

1. “*Sufficient habitat data*” means a dataset at least as representative of physical-habitat conditions as the dataset that is typically available from an Intensive Basin Survey. For a relatively few waters, assessments of *Aquatic Life* use as *Fully Supporting* may not include consideration of habitat data because appropriate physical-habitat indicators have not yet been fully developed or conditions prevented comprehensive habitat measurements or observations. Typically, these are large-stream locations.
2. If a previous assessment exists, it remains unchanged.
3. “*Sufficient water chemistry data*” means a dataset at least as representative of water-chemistry conditions as the three-year dataset that is typically available from an Ambient Water Quality Monitoring Network station.



**Table C-2. Guidelines for Using Biological Information in Table C-1 to Assess Aquatic Life Use Attainment in Streams**

Biological Indicator	No Impairment	Moderate Impairment	Severe Impairment
	Fully Supporting <u>Aquatic Life</u> Use	Not Supporting <u>Aquatic Life</u> Use	Not Supporting <u>Aquatic Life</u> Use
Fish Index of Biotic Integrity (fIBI,)	fIBI $\geq$ 41	fIBI < 41 and > 20	fIBI $\leq$ 20
Macroinvertebrate Index of Biotic Integrity (mIBI)	mIBI $\geq$ 41.8	mIBI < 41.8 and > 20.9	mIBI $\leq$ 20.9
Macroinvertebrate Biotic Index <sup>(1)</sup> (MBI)	MBI $\leq$ 5.9	MBI > 5.9 and $\leq$ 8.9	MBI > 8.9

1. When the mIBI is available, the MBI is not used independently to assess attainment of Aquatic Life use.

**Table C-3. Guidelines for Using Water-Chemistry Data in Table C-1 to Indicate the Potential for Impairment of Aquatic Life Use in Streams**

Number of Observations <sup>(1)</sup>	Type of Parameter	Water Quality Standard	Water Chemistry Condition Indicating Potential for Moderate Impairment of <u>Aquatic Life</u> Use <sup>(2)</sup>	Water Chemistry Condition Indicating Potential for Severe Impairment of <u>Aquatic Life</u> Use <sup>(2)</sup>
Ten or more observations are available for the applicable water-chemistry parameter	Toxic <sup>(3)</sup>	Acute	For any single parameter, two observations exceed the applicable standard <sup>(4)</sup> .	For any single parameter, three or more observations exceed the applicable standard.
		Chronic	For any single parameter, there is one exceedance of the applicable standard <sup>(5)</sup> .	For any single parameter, there are two or more independent exceedances of the applicable standard <sup>(5)</sup> .
	Nontoxic <sup>(6)</sup>	Other	For any single parameter, more than 10% but no more than 25% of observations exceed the applicable standard; or, there is one exceedance of any standard that requires multiple observations to apply.	For any single parameter, more than 25% of observations exceed the applicable standard; or, there are two or more exceedances of any standard that requires multiple observations to apply.

**Table C-3. (Cont.) Guidelines for Using Water-Chemistry Data in Table C-1 to Indicate the Potential for Impairment of Aquatic Life Use in Streams**

<b>Number of Observations<sup>(1)</sup></b>	<b>Type of Parameter</b>	<b>Water Quality Standard</b>	<b>Water Chemistry Condition Indicating Potential for Moderate Impairment of <u>Aquatic Life Use</u><sup>(2)</sup></b>	<b>Water Chemistry Condition Indicating Potential for Severe Impairment of <u>Aquatic Life Use</u><sup>(2)</sup></b>
Fewer than 10 observations are available for the applicable water-chemistry parameter	Toxic <sup>(3)</sup>	Acute	Among all parameters, one observation exceeds an applicable standard.	Among all parameters, two or more observations exceed an applicable standard.
		Chronic	Among all parameters, there is one exceedance of an applicable standard <sup>(5)</sup> .	Among all parameters, there are two or more independent exceedances of an applicable standard <sup>(5)</sup> .
	Nontoxic <sup>(6)</sup>	Other	Among all parameters, two observations exceed an applicable standard.	Among all parameters, three or more observations exceed an applicable standard.

1. The most recent consecutive three years of data are used. It is not necessary that observations be available for every parameter of each type; the assessment is based on available data. As used in Table C-1, “*sufficient water chemistry data*” means a dataset at least as representative of water-chemistry conditions as the three-year dataset that is typically available from an Ambient Water Quality Monitoring Network station.
2. If conditions in at least one table cell apply, then the potential for impairment is indicated.
3. Includes 2, 4-D, alachlor, atrazine, ammonia, arsenic, barium, benzene, cadmium, chloride, chlorine, chromium (hexavalent and trivalent), copper, cyanazine, cyanide, dicamba, endrin, ethylbenzene, fluoride, iron, lead, manganese, mercury, metolachlor, metribuzin, nickel, selenium, silver, sulfate, terbufos, toluene, xylenes, and zinc or any parameter with an acute or chronic aquatic life criteria derived under 35 IAC 302.210. If no specific chronic water quality standard applies, the standard is interpreted as an acute one.
4. Hereafter in this table, “*applicable standard*” refers to an Illinois General Use Water Quality Standard, 35 IAC 302.208, 302.212 and 303.444 and 35 IAC 303.311 through 303.445) or an aquatic life criterion derived according to 35 IAC 302.210 (<https://pcb.illinois.gov/SLR/PCBandIEPAEnvironmentalRegulationsTitle35>)
5. Chronic standards are applied consistent with 35 IAC 302.208, 302.210, 302.212, and 303.444 as follows. If the chronic standard is exceeded for one or more combinations of four consecutive observations, then the water chemistry condition indicates the potential for impairment of Aquatic Life use. If the chronic standard is exceeded for more than one *independent* set of four consecutive observations, then the water chemistry condition indicates the potential for severe impairment of Aquatic Life use. An *independent* set of four consecutive observations is one that does not share any observations with any other set of four consecutive observations.
6. Includes: water temperature, pH, and dissolved oxygen.

**Table C-4. Guidelines for Using Habitat Information in Table C-1<sup>(1)</sup> to Assess Attainment of Aquatic Life Use in Streams**

<b>Degraded Habitat Conditions Indicating the Potential for Impairment of <u>Aquatic Life</u> Use<sup>(2)</sup></b>	<b>Information Sources Used to Determine Degraded Habitat</b>
Moderate to severe habitat alteration by channelization and dredging activities, removal of riparian vegetation, bank failure, heavy watershed erosion or alteration of flow regime (USEPA 1997).	<p><u>Illinois EPA field observations and notes documenting:</u>  new channelization; or,  &gt;50% of riparian vegetation is denuded; or,  heavy sediment deposition; or,  the presence of dams/impoundments.</p> <p><u>A Qualitative Habitat Evaluation Index (Rankin 1989) assessment</u> indicating:  instream cover is “nearly absent” (due to anthropogenic causes); or,  there is “recent channelization/no recovery;” or,  substrate quality indicates “Silt heavy;” or,  there is no riparian width; or,  bank erosion is “heavy/severe.”</p>

1. As used in Table C-1 “*sufficient habitat data*” means a dataset at least as representative of physical-habitat conditions as the dataset that is typically available from an Intensive Basin Survey.
2. If any of the conditions exist, the potential for impairment is indicated.

**Table C-5. Guidelines for Identifying Potential Causes of Impairment of *Aquatic Life* Use in Illinois Streams**

Potential Cause	Basis for Identifying Causes
<b>Pesticides and other Organic Pollutants</b>	<b>Criteria based on Water Quality Standards<sup>(1)</sup></b>
2,4-D	Acute: 100 µg/L <sup>(2)</sup> , Chronic: 8 µg/L <sup>(2)</sup>
Alachlor	Acute: 1100 µg/L <sup>(2)</sup>
alpha-BHC	Acute: 31 µg/L <sup>(2)</sup> , Chronic: 2.5 µg/L <sup>(2)</sup>
Atrazine	Acute: 82 µg/L <sup>(2)</sup> , Chronic: 9 µg/L <sup>(2)</sup>
Benzene	Acute: 4200 µg/L, Chronic: 860 µg/L <sup>(3)</sup>
Cyanazine	Acute: 370 µg/L <sup>(2)</sup> , Chronic: 30 µg/L <sup>(2)</sup>
Dicamba	Acute: 1500 µg/L <sup>(23)</sup> , Chronic: 150 µg/L <sup>(2)</sup>
Endrin	Acute: 160 µg/L <sup>(2)</sup> , Chronic: 33 µg/L <sup>(2)</sup>
Ethylbenzene	Acute: 150 µg/L, Chronic: 14 µg/L <sup>(3)</sup>
Metolachlor	Acute: 380 µg/L <sup>(2)</sup> , Chronic: 30.4 µg/L <sup>(2)</sup>
Metribuzin	Acute: 8.4 mg/L <sup>(2)</sup>
Terbufos	Acute: 0.024 µg/L <sup>(2)</sup>
Toluene	Acute: 2000 µg/L <sup>(3)</sup> , Chronic: 600 µg/L <sup>(3)</sup>
Trifluralin	Acute: 26 µg/L <sup>(2)</sup> , Chronic: 1.1 µg/L <sup>(2)</sup>
Xylenes (total mixed)	Acute: 920 µg/L <sup>(3)</sup> , Chronic: 360 µg/L <sup>(3)</sup>
<b>Metal Pollutants</b>	<b>Criteria based on Water Quality Standards<sup>(1)</sup></b>
Arsenic	Acute: 360 µg/L (dissolved) <sup>(3)</sup> , Chronic: 190 µg/L (dissolved) <sup>(3)</sup>
Barium	Acute: 5000 µg/L <sup>(3)</sup>
Boron	Acute: 40100 µg/L <sup>(3)</sup> , Chronic: 7600 µg/L <sup>(3)</sup>
Cadmium	Hardness dependent <sup>(3)</sup>
Copper	Hardness dependent <sup>(3)</sup>
Chromium, hexavalent	Acute: 16 µg/L <sup>(3)</sup> , Chronic: 11 µg/L <sup>(3)</sup>
Chromium, trivalent	Hardness dependent <sup>(3)</sup>
Iron	Acute: 1000 µg/L (dissolved) <sup>(3)</sup>
Lead	Hardness dependent <sup>(3)</sup>
Manganese	Hardness dependent <sup>(3)</sup>
Mercury	Acute: 2.2 µg/L (dissolved) <sup>(3)</sup> , Chronic: 1.1 µg/L(dissolved) <sup>(3)</sup>
Nickel	Hardness dependent <sup>(3)</sup>
Selenium	Acute: 1000 µg/L <sup>(3)</sup>
Silver	Acute: 5 µg/L <sup>(3)</sup>
Zinc	Hardness dependent <sup>(3)</sup>
<b>Other Pollutants<sup>(7)</sup></b>	<b>Criteria based on Water Quality Standards<sup>(1)</sup></b>
Ammonia (Total)	Temperature and pH dependent <sup>(3)</sup>
Cause Unknown	If the pollutant causing a water quality standard violation is unknown, cause unknown is listed <sup>(7)</sup>
Chlorides	Acute: 500 mg/L <sup>(3)</sup>
Chlorine	Acute: 19 µg/L <sup>(3)</sup> , Chronic: 11 µg/L <sup>(3)</sup>
Cyanide	Acute: 22 µg/L <sup>(3)</sup> , Chronic: 5.2 µg/L <sup>(3)</sup>

**Table C-5 (Cont.) Guidelines for Identifying Potential Causes of Impairment of Aquatic Life Use in Illinois Streams**

<b>Potential Cause</b>	<b>Basis for Identifying Causes</b>
<b>Other Pollutants (Cont.)<sup>(7)</sup></b>	<b>Criteria based on Water Quality Standards<sup>(1)</sup></b>
Fluoride	Hardness dependent <sup>(3)</sup>
Oxygen, Dissolved <sup>(8)</sup>	Seasonal and water body dependent <sup>(3)</sup>
pH	Acute: <6.5 or >9.0 <sup>(3)</sup>
Sulfate	Hardness and chloride dependent <sup>(3)</sup>
Temperature, Water (used only for thermal point sources)	Dependent on season and 2.8°C maximum rise in water temperature <sup>(3, 6)</sup>
Other Toxic Pollutants	(any pollutant with aquatic life criteria derived under 35 IAC 302.210) <sup>(2)</sup>
<b>Nonpollutant Causes</b>	<b>Criteria not based on Water Quality Standards</b>
Alteration in stream-side or littoral vegetative covers	Observed degradation from alteration in stream-side or littoral vegetative covers <sup>(4, 5)</sup>
Alteration in wetland habitats	Observed degradation from alteration in wetland habitats <sup>(5)</sup>
Changes in stream depth and velocity patterns	Observed degradation from alteration/reduction of hydrologic diversity <sup>(4, 5)</sup>
Fish Kills	Documented fish kill from IDNR or Illinois EPA records <sup>(4)</sup>
Fish-Passage Barrier	Observed degradation from fish-passage barrier <sup>(4)</sup>
Loss of instream cover	Observed degradation from reductions in instream cover <sup>(4, 5)</sup>
Flow alterations	Observed degradation from flow alterations <sup>(4, 5)</sup>
Non-Native Fish, Shellfish, or Zooplankton	Observed degradation from non-native fish, shellfish or zooplankton <sup>(4, 5)</sup>
Physical substrate habitat alterations	Observed degradation from substrate alterations

Unless otherwise indicated, a single exceedance of a water quality standard indicates a potential cause of impairment. For applying these guidelines, Illinois EPA typically uses data from our three-primary stream-monitoring programs: Ambient Water Quality Monitoring Network (most recent three years), Intensive Basin Survey (most recent survey), Facility-Related Stream Survey (most recent survey).

1. General Use Water Quality Standards at 35 Ill. Adm. Code 302, Subpart B.
2. Criterion derived according to 35 Ill. Adm. Code 302.210. Derived water quality criteria are available at <https://www2.illinois.gov/epa/topics/water-quality/standards/Pages/derived-criteria.aspx>.
3. Water Quality Standards criteria are available at: <https://pcb.illinois.gov/SLR/PCBandIEPAEnvironmentalRegulationsTitle35> with further explanation.
4. Physical-habitat criteria are available in Table C-4 with further explanation.
5. Site-specific observation, information, or knowledge.
6. 35 Ill. Adm. Code 302.211.
7. Cause Unknown means unknown pollutant and is used when the pollutant causing a water quality standard violation is not identified or when no causes of any type are identified.
8. In some segments a TMDL study may have determined that violations of the dissolved oxygen standard are not caused by a pollutant. For these specific segments, the cause "Oxygen, Dissolved" is classified as a non-pollutant.

## Aquatic Life – Freshwater Lakes

The *Aquatic Life* Use Index (ALI) is the primary tool used for assessing *Aquatic Life* use in lakes (Tables C-6 and C-7). The Trophic State Index (TSI; Carlson 1977), the percent surface area macrophyte coverage during the peak growing season (June through August), and the median concentration of nonvolatile suspended solids (NVSS) are used to calculate the ALI score. Higher ALI scores indicate increased impairment.

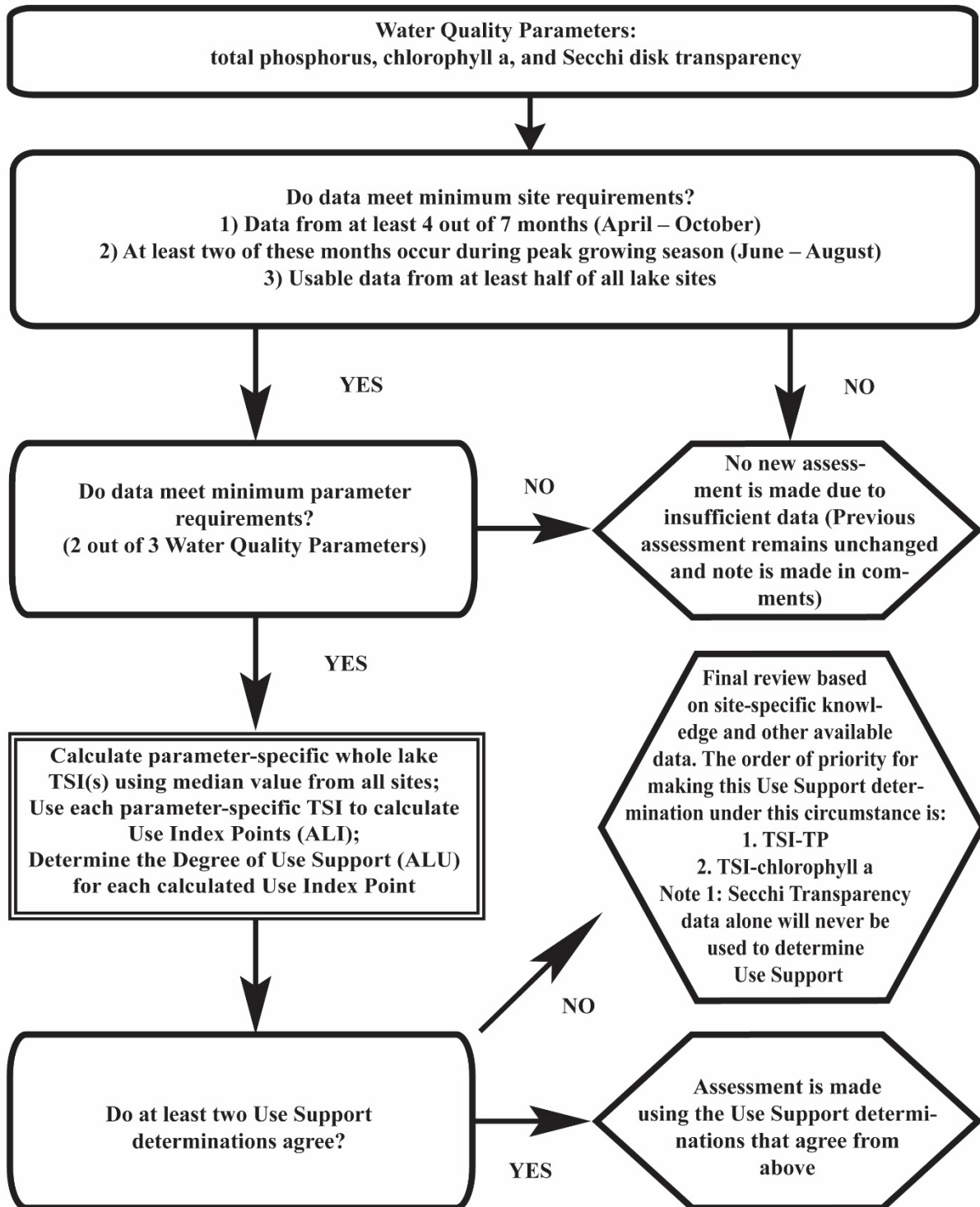
Assessments of *Aquatic Life* use are based primarily on physical and chemical water quality data collected via the Ambient Lake Monitoring Program or by non-Illinois EPA persons under an approved quality assurance project plan. The physical and chemical data used for *Aquatic Life* use assessments include: Secchi disk transparency, chlorophyll *a*, total phosphorus (epilimnetic samples only), nonvolatile suspended solids (epilimnetic samples only), and percent surface area macrophyte coverage. Data are collected a minimum of five times per year (April through October) from one or more established lake sites. Data are considered usable for assessments if meeting the following minimum requirements (Figure C-2): 1) at least four out of seven months (April through October) of data are available, 2) at least two of these months occur during the peak growing season of June through August (this requirement does not apply to NVSS), and 3) usable data are available from at least half of all lake sites within any given lake each month. As outlined in Figure C-2, a whole-lake TSI value is calculated for the median Secchi disk transparency, median total phosphorus (epilimnetic sample depths only), and median chlorophyll *a* value. A minimum of two parameter-specific TSI values are required to calculate parameter-specific use support determinations. An assessment is then made based on the parameter-specific use support determinations. The 0.05 mg/L Illinois General Use Water Quality Standard for total phosphorus in lakes (35 Ill. Adm. Code 302.205) has been incorporated into the weighting criteria used to assign point values for the ALI.

**Table C-6. Aquatic Life Use Index**

Evaluation Factor	Parameter	Weighting Criteria	Points
1. Trophic State Index (TSI)	For data collected April-October: Whole-lake TSI value calculated from median total phosphorus (epilimnetic sample only), median chlorophyll <i>a</i> , and median Secchi disk transparency values.	a. <60 b. ≥60<85 c. ≥85<90 d. ≥90	a. 40 b. 50 c. 60 d. 70
2. Macrophyte Coverage	Average percentage of lake area covered by macrophytes (emergent, floating, and submersed) during peak growing season (June through August). Determined by: a. Macrophyte survey conducted during same water year as the chemical data used in the assessment, <u>or</u> b. Average value based on reported field observations.	a. ≥15<40 b. ≥10<15, ≥40<50 c. ≥5<10, ≥50<70 d. <5, ≥70	a. 0 b. 5 c. 10 d. 15
3. Nonvolatile Suspended Solids (NVSS) Concentration	For data collected April-October: Median epilimnetic sample NVSS concentration (mg/L).	a. <12 b. ≥12<15 c. ≥15<20 d. ≥20	a. 0 b. 5 c. 10 d. 15



**Figure C-2. Flow Chart for Assessing Attainment of Aquatic Life Use in Lakes**



**Table C-7. Guidelines for Assessing Aquatic Life Use in Illinois Freshwater Lakes**

Degree of Use Support	Guidelines
Fully Supporting	Total ALI points are <75
Not Supporting	Total ALI points are ≥75

When Aquatic Life use is found to be Not Supporting in a particular lake, potential causes of impairments are identified. Specific guidelines used to determine potential causes of impairment of Aquatic Life use in freshwater lakes are listed in Table C-8. Generally, one exceedance of an applicable Illinois water quality standard results in identifying the parameter as a potential cause of impairment. Additional guidelines used to determine potential causes of impairment include site-specific standards (35 Ill. Adm. Code 303.Subpart C) or adjusted standards (published in the Illinois Pollution Control Board's *Environmental Register* at <https://pcb.illinois.gov/SLR/IPCBAandIEPAEnvironmentalRegulationsTitle35>). In addition, documented anthropogenic disturbances to lake habitat may also be used as the basis for listing some non-pollutant causes when the biologist believes they contribute to the impairment.

**Table C-8. Guidelines for Identifying Potential Causes of Impairment of Aquatic Life Use in Illinois Freshwater Lakes**

Potential Cause	Basis for Identifying Causes <sup>(1)</sup>
Pesticides and other Organic Pollutants	Criteria based on Water Quality Standards <sup>(2)</sup>
2,4-D	Acute: 100 µg/L <sup>(3)</sup> , Chronic: 8 µg/L <sup>(3)</sup>
Alachlor	Acute: 1100 µg/L <sup>(3)</sup>
alpha-BHC	Acute: 31 µg/L <sup>(3)</sup> , Chronic: 2.5 µg/L <sup>(3)</sup>
Atrazine	Acute: 82 µg/L <sup>(3)</sup> , Chronic: 9 µg/L <sup>(3)</sup>
Benzene	Acute: 4200 µg/L <sup>(4)</sup> , Chronic: 860 µg/L <sup>(4)</sup>
Cyanazine	Acute: 370 µg/L <sup>(3)</sup> , Chronic: 30 µg/L <sup>(3)</sup>
Dicamba	Acute: 1500 µg/L <sup>(3)</sup> , Chronic: 150 µg/L <sup>(3)</sup>
Endrin	Acute: 160 µg/L <sup>(3)</sup> , Chronic: 33 µg/L <sup>(3)</sup>
Ethylbenzene	Acute: 150 µg/L <sup>(4)</sup> , Chronic: 14 µg/L <sup>(4)</sup>
Metolachlor	Acute: 380 µg/L <sup>(3)</sup> , Chronic: 30.4 µg/L <sup>(3)</sup>
Metribuzin	Acute: 8.4 mg/L <sup>(3)</sup>
Terbufos	Acute: 0.024 µg/L <sup>(3)</sup>
Toluene	Acute: 2000 µg/L <sup>(4)</sup> , Chronic: 600 µg/L <sup>(4)</sup>
Trifluralin	Acute: 26 µg/L <sup>(3)</sup> , Chronic: 1.1 µg/L <sup>(3)</sup>
Xylenes (total mixed)	Acute: 920 µg/L <sup>(4)</sup> , Chronic: 360 µg/L <sup>(4)</sup>
Metal Pollutants	Criteria based on Water Quality Standards <sup>(2)</sup>
Arsenic	Acute: 360 µg/L (dissolved) <sup>(4)</sup> , Chronic: 190 µg/L (dissolved) <sup>(4)</sup>
Barium	Acute: 5000 µg/L <sup>(4)</sup>
Boron	Acute: 40100 µg/L <sup>(3)</sup> , Chronic: 7600 µg/L <sup>(3)</sup>
Cadmium	Hardness dependent <sup>(4)</sup>
Copper	Hardness dependent <sup>(4)</sup>

**Table C-8 (Cont.) Guidelines for Identifying Potential Causes of Impairment of Aquatic Life Use in Illinois Freshwater Lakes**

Potential Cause	Basis for Identifying Causes <sup>(1)</sup>
<b>Metal Pollutants (Cont.)</b>	<b>Criteria based on Water Quality Standards<sup>(2)</sup></b>
Chromium, hexavalent	Acute: 16 µg/L <sup>(4)</sup> , Chronic: 11 µg/L <sup>(4)</sup>
Chromium, trivalent	Hardness dependent <sup>(4)</sup>
Iron	Acute: 1000 µg/L (dissolved) <sup>(4)</sup>
Lead	Hardness dependent <sup>(4)</sup>
Manganese	Hardness dependent <sup>(4)</sup>
Mercury	Acute: 2.2 µg/L (dissolved) <sup>(4)</sup> , Chronic: 1.1 µg/L(dissolved) <sup>(4)</sup>
Nickel	Hardness dependent <sup>(4)</sup>
Selenium	Acute: 1000 µg/L <sup>(4)</sup>
Silver	Acute: 5 µg/L <sup>(4)</sup>
Zinc	Hardness dependent <sup>(4)</sup>
<b>Other Pollutants<sup>(8)</sup></b>	<b>Criteria based on Water Quality Standards<sup>(2)</sup></b>
Ammonia (Total)	Temperature and pH dependent <sup>(4)</sup>
Cause Unknown	If the pollutant causing a water quality standard violation is unknown, cause unknown is listed <sup>(9)</sup>
Chlorides	Acute: 500 mg/L <sup>(4)</sup>
Chlorine	Acute: 19 µg/L <sup>(4)</sup> , Chronic: 11 µg/L <sup>(4)</sup>
Cyanide	Acute: 22 µg/L <sup>(4)</sup> , Chronic: 5.2 µg/L <sup>(4)</sup>
Fluoride	Hardness dependent <sup>(4)</sup>
Oxygen, Dissolved <sup>(8)</sup>	Seasonal and water body dependent <sup>(4)</sup>
pH	Acute: <6.5 or >9.0 <sup>(4)</sup>
Phosphorus (Total)	Acute: 0.05 mg/L in lakes ≥ 20 acres <sup>(4, 5)</sup>
Sulfate <sup>(4)</sup>	Hardness and chloride dependent <sup>(4)</sup>
Temperature, Water ( <i>used only for thermal point sources</i> )	Dependent on season and 2.8°C maximum rise in water temperature <sup>(4, 7)</sup>
Other Toxic Pollutants	(any pollutant with aquatic life criteria derived under 35 IAC 302.210) <sup>(3)</sup>
<b>Nonpollutant Causes</b>	<b>Criteria not based on Water Quality Standards</b>
Alteration in stream-side or littoral vegetative covers <sup>(6)</sup>	Observed degradation from alteration in stream-side or littoral vegetative covers <sup>(6)</sup>
Alteration in wetland habitats	Observed degradation from alteration in wetland habitats <sup>(6)</sup>
Fish Kills	Documented fish kill from IDNR or Illinois EPA records <sup>(6)</sup>
Non-Native Aquatic Plants	Observed degradation from non-native aquatic plants <sup>(6)</sup>
Non-Native Fish, Shellfish, or Zooplankton <sup>(6)</sup>	Observed degradation from non-native fish, shellfish or zooplankton <sup>(6)</sup>

1. In general, a single exceedance of a water quality standard results in listing the parameter as a potential cause of impairment. Determination of causes is normally based on the most recent year of data from the Ambient Lake Monitoring Program or Source Water Assessment Program.
2. General Use Water Quality Standards at 35 Ill. Adm. Code 302, Subpart B.
3. Criterion derived according to 35 Ill. Adm. Code 302.210. Derived water quality criteria are available at <https://www2.illinois.gov/epa/topics/water-quality/standards/Pages/derived-criteria.aspx>.

4. Water Quality Standards criteria are available at: <https://pcb.illinois.gov/SLR/IPCBAandIEPAEnvironmentalRegulationsTitle35> with further explanation.
5. The total phosphorus standard at 35 Ill. Adm. Code 302.205 applies to lakes of 20 acres or larger.
6. Site-specific observation, information, or knowledge.
7. 35 Ill. Adm. Code 302.211.
8. In some lakes, a TMDL study may have determined that violations of the dissolved oxygen standard are not caused by a pollutant. For these specific lakes, the cause “Oxygen, Dissolved” is classified as a non-pollutant.
9. Cause Unknown means unknown pollutant and is used when the pollutant causing a water quality standard violation is not identified or when no causes of any type are identified.

## Aquatic Life – Lake Michigan

Aquatic life use assessments are currently made for Lake Michigan open waters and Lake Michigan harbors. These assessments are based on the applicable Lake Michigan Basin Water Quality Standards. The most-current three years of water quality data are used. Table C-9 provides the guidelines used to assess Aquatic Life use in Lake Michigan open waters and harbors.

**Table C-9. Guidelines for Assessing Aquatic Life Use in Lake Michigan Open Waters and Harbors**

Exceedances of Lake Michigan Basin Water Quality Standards <sup>(1)</sup>	Fully Supporting	Not Supporting
	For every parameter	For any single parameter
<b>Conventionals<sup>(2)</sup>:</b> Percent of samples exceeding standards	≤10%	>10%
<b>Other Chemical Constituents<sup>(3)</sup>:</b> Number of samples exceeding acute standard	<2	≥2
<b>Other Chemical Constituents<sup>(3)</sup>:</b> Number of samples exceeding chronic standard	No exceedances	At least one exceedance

1. 35 Ill. Adm. Code 302, Subpart E. Based on the most current three years of data from Lake Michigan Monitoring Program sampled three times per year.
2. 35 Ill. Adm. Code, 302.502, 302.503, 302.507: dissolved oxygen, pH, and water temperature
3. 35 Ill. Adm. Code 302, 504, 302.535, and 302.540.

After a segment of Lake Michigan is assessed as Not Supporting Aquatic Life use, potential causes of impairments are identified. The guidelines for identifying and listing potential causes of Aquatic Life use impairment are shown in Table C-10. These guidelines are based on Lake Michigan Basin Water Quality Standards. In general, at least one exceedance of a numeric standard within the most current three-year period serves as a guideline for identifying a potential cause of impairment.

**Table C-10. Guidelines for Identifying Potential Causes of Impairment of  
Aquatic Life Use in Lake Michigan Open Waters and Harbors**

Potential Cause	Basis for Identifying Causes <sup>(1)</sup>
<b>Pesticides and other Organic Pollutants</b>	<b>Criteria based on Water Quality Standards<sup>(2)</sup></b>
Benzene	Acute: 3900 µg/L <sup>(4)</sup> , Chronic: 800 µg/L <sup>(4)</sup>
bis (2-ethylhexyl) phthalate	Acute: 76 µg/L <sup>(3)</sup> , Chronic: 17 µg/L <sup>(3)</sup>
Dieldrin	Acute: 240 ng/L <sup>(4)</sup> , Chronic: 56 ng/L <sup>(4)</sup>
Endrin	Acute: 0.086 µg/L <sup>(4)</sup> , Chronic: 0.036 µg/L <sup>(4)</sup>
Ethylbenzene	Acute: 150 µg/L <sup>(4)</sup> , Chronic: 14 µg/L <sup>(4)</sup>
Lindane (gamma BHC)	Acute: 0.95 µg/L <sup>(4)</sup>
Parathion	Acute: 0.065 µg/L <sup>(4)</sup> , Chronic: 0.013 µg/L <sup>(4)</sup>
Pentachlorophenol (PCP)	pH dependent <sup>(4)</sup>
Toluene	Acute: 2000 µg/L <sup>(4)</sup> , Chronic: 610 µg/L <sup>(4)</sup>
Xylenes (total mixed)	Acute: 1200 µg/L <sup>(4)</sup> , Chronic: 490 µg/L <sup>(4)</sup>
<b>Metal Pollutants</b>	<b>Criteria based on Water Quality Standards<sup>(2)</sup></b>
Arsenic	Acute: 340 µg/L (dissolved) <sup>(4)</sup> , Chronic 148 µg/L (dissolved) <sup>(4)</sup>
Barium	Acute: 5 mg/L <sup>(4)</sup>
Boron	Acute: 40100 µg/L <sup>(3)</sup> , Chronic: 7600 µg/L <sup>(3)</sup>
Cadmium	Hardness dependent <sup>(4)</sup>
Copper	Hardness dependent <sup>(4)</sup>
Chromium, hexavalent	Acute: 16 µg/L, Chronic: 11 µg/L <sup>(4)</sup>
Chromium, trivalent	Hardness dependent <sup>(4)</sup>
Iron	Acute: 1 mg/L (dissolved) <sup>(4)</sup>
Lead	Hardness dependent <sup>(4)</sup>
Manganese	Acute: 1 mg/L <sup>(4)</sup>
Mercury	Acute: 1700 ng/L (dissolved) <sup>(4)</sup> , Chronic: 910 ng/L (dissolved) <sup>(4)</sup>
Nickel	Hardness dependent <sup>(4)</sup>
Selenium	Chronic: 5.0 µg/L (dissolved) <sup>(4)</sup>
Zinc	Hardness dependent <sup>(4)</sup>
<b>Other Pollutants</b>	<b>Criteria based on Water Quality Standards<sup>(2)</sup></b>
Ammonia (Total)	Acute: 15 mg/L <sup>(4)</sup>
Ammonia (Un-ionized)	Temperature and pH dependent <sup>(4)</sup>
Cause Unknown	If the pollutant causing a water quality standard violation is unknown, cause unknown is listed <sup>(7)</sup>
Chlorides	Acute: 500 mg/L <sup>(4)</sup>
Chlorine	Acute: 19 µg/L, Chronic: 11 µg/L <sup>(4)</sup>
Cyanide	Acute: 22 µg/L, Chronic: 5.2 µg/L <sup>(4)</sup>
Fluoride	Acute: 1.4 mg/L <sup>(4)</sup>
Oxygen, Dissolved	≥90% saturation in open waters, 5.0 mg/L in remainder of basin <sup>(4, 6)</sup>

**Table C-10. (Cont.) Guidelines for Identifying Potential Causes of Impairment of  
Aquatic Life Use in Lake Michigan Open Waters and Harbors**

Potential Cause	Basis for Identifying Causes <sup>(1)</sup>
<b>Other Pollutants</b>	<b>Criteria based on Water Quality Standards<sup>(2)</sup></b>
pH	Acute: <7.0 or >9 in open waters; <6.5 or >9.0 in remainder of basin <sup>(4)</sup>
Temperature, Water (used only for thermal point sources)	1.7°C maximum rise in water temperature <sup>(4)</sup>
Total Dissolved Solids	Acute: 1000 mg/L or Conductivity > 1667 umho/cm <sup>(4)</sup>
<b>Nonpollutant Causes</b>	<b>Criteria not based on Water Quality Standards<sup>(2)</sup></b>
Alteration in stream-side or littoral vegetative covers	Observed degradation from alteration in stream-side or littoral vegetative covers <sup>(5)</sup>
Non-Native Aquatic Plants	Observed degradation from non-native aquatic plants <sup>(5)</sup>
Non-Native Fish, Shellfish, or Zooplankton	Observed degradation from non-native fish, shellfish or zooplankton <sup>(5)</sup>

1. Generally, a single exceedance of a water quality standard indicates a potential cause of impairment. For applying these guidelines, Illinois EPA typically uses data from the Lake Michigan Monitoring Program (LMMP) (most recent three years).
2. Illinois Lake Michigan Basin Water Quality Standards, 35 Ill. Adm. Code, Subpart E.
3. The criterion was derived according to 35 Ill. Adm. Code 302.540. Derived water quality criteria are available at <https://www2.illinois.gov/epa/topics/water-quality/standards/Pages/derived-criteria.aspx>.
4. Water Quality Standards criteria are available at: <https://pcb.illinois.gov/SLR/IPCBandIEPAEnvironmentalRegulationsTitle35> with further explanation.
5. Site-specific observation, information, or knowledge.
6. Dissolved oxygen must not be less than 90% of saturation, except due to natural causes, in the open waters of Lake Michigan. The other waters of the Lake Michigan Basin must not be less than 6.0 mg/L during at least 16 hours of any 24-hour period, nor less than 5.0 mg/L at any time.
7. Cause Unknown means unknown pollutant and is used when the pollutant causing a water quality standard violation is not identified or when no causes of any type are identified.

**Indigenous Aquatic Life, Upper Dresden Island Pool Aquatic Life, Chicago Area Waterway System Aquatic Life Use A, and Chicago Area Waterway System and Brandon Pool Aquatic Life Use B**

Illinois' Secondary Contact and Indigenous Aquatic Life Standards (35 Ill. Adm. Code, 302, Subpart D) were replaced by the *Chicago Area Waterway System and Lower Des Plaines River Water Quality and Indigenous Aquatic Life Standards*. These standards apply to about 86 miles of canals, channels and modified streams and Lake Calumet, in northeastern Illinois (35 Ill. Adm. Code Section 302 Subpart D). The original Secondary Contact and Indigenous Aquatic Life Standards were intended to protect Indigenous Aquatic Life limited only by the physical configuration of the body of water, characteristics, and origin of the water and the presence of contaminants in amounts that do not exceed these water quality standards. Currently only one water body (South Fork South Branch Chicago River, ILHCA-01) is still designated for Indigenous Aquatic Life use. Three new tiers of aquatic life uses have been designated in the new standards, Upper Dresden Island Pool Aquatic Life Use, Chicago Area Waterway System Aquatic Life Use A, and Chicago Area Waterway System and Brandon Pool Aquatic Life Use B.

For this 2018 cycle report, these uses are assessed using the water quality criteria applicable to each use.

All available water chemistry data are compared to the appropriate Chicago Area Waterway System and Lower Des Plaines River Water Quality and Indigenous Aquatic Life Standards. Table C-11 provides the guidelines used to assess the applicable aquatic life use for each stream segment and in Lake Calumet. Table C-12 provides the guidelines for identifying potential causes of impairment.

**Table C-11. Guidelines for Assessing Indigenous Aquatic Life, Upper Dresden Island Pool Aquatic Life Use, Chicago Area Waterway System Aquatic Life Use A, and Chicago Area Waterway System and Brandon Pool Aquatic Life Use B**

Exceedances of Chicago Area Waterway System and Lower Des Plaines River Water Quality and Indigenous Aquatic Life Standards <sup>(1)</sup>	Fully Supporting	Not Supporting
	For every parameter	For any single parameter
<b>Conventionals<sup>(2)</sup>:</b> Percent of samples exceeding standards	≤10%	>10%
<b>Other Chemical Constituents<sup>(3)</sup>:</b> Number of samples exceeding acute standard	<2	≥2
<b>Other Chemical Constituents<sup>(3)</sup>:</b> Number of samples exceeding chronic standard	No exceedances	At least one exceedance

1. 35 Ill. Adm. Code, 302, Subpart D. For applying these guidelines, Illinois EPA typically uses the most recent three years of data from our Ambient Water Quality Monitoring Network or other sources.
2. 35 Ill. Adm. Code 302.404, 302.405, and 302.408: Dissolved oxygen, pH, and water temperature.
3. 35 Ill. Adm. Code 302.407, 302.408, 302.409, 302.412 and 302.410.

**Table C-12. Guidelines for Identifying Potential Causes of Impairment of Indigenous Aquatic Life, Upper Dresden Island Pool Aquatic Life Use, Chicago Area Waterway System Aquatic Life Use A, and Chicago Area Waterway System and Brandon Pool Aquatic Life Use B**

Potential Cause	Basis for Identifying Causes <sup>(1)</sup>	
	<u>Indigenous Aquatic Life</u>	<u>Other Aquatic Life Uses</u>
<b>Metal Pollutants</b>	Criteria based on Water Quality Standards <sup>(2)</sup>	
Arsenic	1000 µg/L (total)	Acute: 340 µg/L, Chronic: 150 µg/L (trivalent, dissolved)
Barium (total)	5000 µg/L	NA
Cadmium	150 µg/L (total)	Hardness dependent (dissolved)
Copper	1000 µg/L (total)	Hardness dependent (dissolved)
Chromium, hexavalent	300 µg/L	Acute: 16 µg/L, Chronic: 11 µg/L
Chromium, trivalent	1000 µg/L	Hardness dependent
Iron	500 µg/L (dissolved); 2000 µg/L (total)	1000 µg/L (dissolved)

**Table C-12. (Cont.) Guidelines for Identifying Potential Causes of Impairment of  
Indigenous Aquatic Life, Upper Dresden Island Pool Aquatic Life Use,  
Chicago Area Waterway System Aquatic Life Use A, and  
Chicago Area Waterway System and Brandon Pool Aquatic Life Use B**

Potential Cause	Basis for Identifying Causes(1)	
	<u>Indigenous Aquatic Life</u>	<u>Other Aquatic Life Uses</u>
<b>Metal Pollutants</b>	<b>Criteria based on Water Quality Standards<sup>(2)</sup></b>	
Lead	100 µg/L (total)	Hardness dependent (dissolved)
Manganese	1000 µg/L (total)	Hardness dependent (dissolved)
Mercury	0.5 µg/L (total)	Acute: 22 µg/L, Chronic: 10 µg/L (dissolved)
Nickel	1000 µg/L (total)	Hardness dependent (dissolved)
Selenium (total)	1000 µg/L	1000 µg/L
Silver	1100 µg/L (total)	Hardness dependent (dissolved)
Zinc	1000 µg/L (total)	Hardness dependent (dissolved)
<b>Other Pollutants</b>	<b>Criteria based on Water Quality Standards<sup>(2)</sup></b>	
Ammonia	0.1 mg/L (Un-ionized)	Temperature and pH dependent (total)
Benzene	NA	Acute: 4200 µg/L, Chronic: 860 µg/L
Chloride	NA	500 mg/L
Cyanide	0.1 mg/L	Acute: 22 µg/L, Chronic: 10 µg/L
Ethylbenzene	NA	Acute: 150 µg/L, Chronic: 14 µg/L
Fluoride	15 mg/L	Hardness dependent
Oil and Grease	15 mg/L	NA
Oxygen, Dissolved <sup>(3)</sup>	≥ 4.0 mg/L (≥ 3.0 mg/L in the Cal-Sag Channel)	Seasonal and water body dependent
pH	≥6.0 & ≤9.0	≥6.5 & ≤9.0
Phenols	0.3 mg/L	NA
Sulfate	NA	Hardness & Chloride dependent
Temperature, Water (used only for thermal point sources)	100° F maximum & shall not exceed 93 °F more than 5% of time	Dependent on season and 2.8 °C maximum rise in water temperature
Total Dissolved Solids	1500 mg/L (Conductivity >2500 umho/cm)	1500 mg/L
Toluene	NA	Acute: 2000 µg/L, Chronic: 600 µg/L
TRC	NA	Acute: 19 µg/L, Chronic: 11 µg/L
Xylenes	NA	Acute: 920 µg/L, Chronic: 360 µg/L
<b>Other Toxic Substances<sup>(4)</sup></b>	<b>Criteria based on Water Quality Standards<sup>(2)</sup></b>	
Any toxic substance not listed above <sup>(4)</sup>	One half the 96-hour median tolerance limit	(any pollutant with aquatic life criteria derived under 35 IAC 302.612 through 302.618, 302.621, 302.627, or 302.630) <sup>(2)</sup>



**Table C-12. (Cont.) Guidelines for Identifying Potential Causes of Impairment of  
Indigenous Aquatic Life, Upper Dresden Island Pool Aquatic Life Use,  
Chicago Area Waterway System Aquatic Life Use A, and  
Chicago Area Waterway System and Brandon Pool Aquatic Life Use B**

Potential Cause	Basis for Identifying Causes(1)	
	<u>Indigenous Aquatic Life</u>	<u>Other Aquatic Life Uses</u>
<b>Nonpollutant Causes</b>	<b>Criteria not based on Water Quality Standards<sup>(5)</sup></b>	
Fish Kills	Documented fish kill from IDNR or Ill. EPA Records <sup>(5)</sup>	
Fish-Passage Barrier	Observed degradation from fish-passage barrier <sup>(5)</sup>	
Low flow alterations	Observed degradation from low flow alterations <sup>(5)</sup>	
Non-Native Fish, Shellfish, or Zooplankton	Observed degradation from non-native species <sup>(5)</sup>	
Other flow alterations	Observed degradation from other flow alterations <sup>(5)</sup>	

1. Unless otherwise indicated, for numeric criteria serving as guidelines, a single exceedance of a water quality standard indicates that the substance is a potential cause of impairment. For applying these guidelines, Illinois EPA typically uses data from our three-primary stream-monitoring programs: Ambient Water Quality Monitoring Network (most recent three years), Intensive Basin Surveys (most recent survey), and Facility-Related Stream Surveys (most recent survey).
2. Chicago Area Waterway System and Lower Des Plaines River Water Quality and Indigenous Aquatic Life Standards, 35 Ill. Adm. Code, 302, Subpart D. Water Quality Standards criteria are available at: <https://pcb.illinois.gov/SLR/PCBandIEPAEnvironmentalRegulationsTitle35> with further explanation.
3. In some segments a TMDL study may have determined that violations of the dissolved oxygen standard are not caused by a pollutant. For these specific segments, the cause “Oxygen, Dissolved” is classified as a non-pollutant.
4. 35 Ill. Adm. Code, 302.410.
5. Site-specific observation, information, or knowledge.

### **Fish Consumption – Streams, Freshwater Lakes, and Lake Michigan**

Fish consumption use is associated with all water bodies in the state. The assessment of Fish Consumption use is based on (1) water body-specific fish-tissue data, and (2) fish-consumption advisories issued by the Illinois Fish Contaminant Monitoring Program (FCMP). A list of water bodies having advisories can be found at the Illinois Department of Public Health website (<http://www.idph.state.il.us/envhealth/fishadvisory/index.htm>). Fish-consumption advisories are incorporated into the process for assessing Fish Consumption use as explained below.

The FCMP uses the U.S. Food & Drug Administration’s (FDA) Action Levels as criteria for determining the need for advisories, except for polychlorinated biphenyls (PCBs), mercury, and chlordane. For these contaminants the FDA criteria have been replaced by a risk-based process developed in the *Protocol for a Uniform Great Lakes Sport Fish Consumption Advisory* (Anderson et al. 1993, herein after referred to as the Protocol). The Protocol requires the determination of a Health Protection Value (HPV), for a contaminant, that is then used with five meal consumption frequencies (eight ounces of uncooked filet): 1) Unlimited (140 meals/year); 2) One meal/week (52 meals/year); 3) One meal/month (12 meals/year); 4) One meal/two months (six meals/year); and 5) Do not eat (0 meals/year). The level of contaminant in fish is then calculated that will not result in exceeding the HPV at each meal consumption frequency.

The Protocol also assumes a 50% reduction of contaminant levels for organic chemicals (not used for mercury) when recommended cleaning and cooking methods are used. The HPVs, target populations, critical health effects to be protected by the HPVs, and the criteria for PCBs, mercury and chlordane for the various meal frequencies, are listed in Table C-13 as well as the FDA action levels for other contaminants.

Except in extraordinary circumstances, two or more recent sampling events in a water body in two different sampling years finding fish exceeding a level of concern for one or more contaminants are necessary for issuing or changing an advisory (based on data collected since 1985). Similarly, two or more recent samples finding no fish exceeding criteria are necessary for rescinding an advisory. For any contaminant except mercury, the issuance of a fish-consumption advisory for a specific water body provides the basis for a determination that Fish Consumption use is impaired, with the contaminant of concern listed as a cause of impairment. Currently, fish-consumption advisories are in effect only for PCBs, chlordane and mercury. However, a statewide fish-consumption advisory ("no more than one meal per week of predator fish" for pregnant or nursing women, women of childbearing age, and children less than 15 years of age) has been issued for mercury because fish-tissue data indicated widespread contamination above criteria levels throughout the state. This statewide advisory applies to all waters in Illinois even though not all water bodies were sampled and not all samples exceeded the criteria levels for that advisory.

This last sentence represents a fundamental difference between the purpose and methodology for issuing fish-consumption advisories and assessing attainment of Fish Consumption use. Fish-consumption advisories are, as their name implies, advice to the public on how best to avoid a certain level of exposure to contaminants that may be present in fish tissue. The purpose of assessing attainment of Fish Consumption use is to identify those specific waters where Fish Consumption use is impaired. While statewide or watershed advisories are a justifiable, conservative approach to the protection of human health, they do not identify the specific waters where contaminants are known to occur and may be overprotective in waters where contaminants do not occur.

Because of this, Illinois EPA does not assess Fish Consumption use as Not Supporting in all waters of the state based on the statewide fish-consumption advisory for mercury. Rather, Fish Consumption use is assessed as Not Supporting only for those specific waters where at least one fish-tissue sample is available and where at least one fish species exceeds the 0.06 mg/kg criterion for mercury. Also, because the statewide advisory is for predator species, Fish Consumption use is only assessed as Fully Supporting in those waters where predator fish-tissue data from the most recent two years do not show mercury contamination above criteria levels. Waters where sufficient fish-tissue data are unavailable are considered Not Assessed.

Table C-14 shows the guidelines used for assessing attainment of Fish Consumption use.

Table C-15 lists guidelines for identifying potential causes of Fish Consumption use impairment. Although all parameters with FDA action levels are listed in the table, only PCBs, mercury and chlordane have ever been detected in Illinois fish samples at levels that would warrant a fish-consumption advisory.

**Table C-13. Health Protection Values (HPVs) and Criteria Levels for Sport-Fish-Consumption Advisories for Polychlorinated Biphenyls, Methyl Mercury, and Chlordane; and FDA Action Levels for Other Contaminants**

<b>Chemical</b>	<b>HPV (Ug/Kg/D)</b>	<b>Target Population Effect</b>	<b>Meal Frequency</b>	<b>Criteria Levels (Mg/Kg)</b>
Polychlorinated biphenyls	0.05	All (emphasis on sensitive <sup>(1)</sup> ) Reproductive/ developmental effects	Unlimited	0 – 0.05
			1 meal/week	0.06 – 0.22
			1 meal/month	0.23 – 0.95
			1 meal/2 months	0.96 – 1.9
			Do not eat	>1.9
Methyl mercury	0.1	Sensitive <sup>(1)</sup> , Reproductive/ developmental effects	Unlimited	0 – 0.05
			1 meal/week	0.06 – 0.22
			1 meal/month	0.23 – 1.0
			Do not eat	>1.0
	0.3	Nonsensitive <sup>(1)</sup> , Nervous system effects	Unlimited	0 – 0.15
			1 meal/week	0.16 – 0.65
			1 meal/month	0.66 – 1.0
			Do not eat	>1.0
Chlordane	0.15	All, Liver effects	Unlimited	0 – 0.15
			1 meal/week	0.16 – 0.65
			1 meal/month	0.66 – 2.8
			1 meal/2 months	2.9 – 5.6
			Do not eat	>5.6

FDA Action Level (mg/kg)

Aldrin	0.3
DDT (Total)	5.0
Dieldrin	0.3
Endrin	0.3
Heptachlor	0.3
Heptachlor epoxide	0.3
Mirex	0.1
Toxaphene	5.0

1. Sensitive Population includes pregnant or nursing women, women of child-bearing age, and children under 15.  
Nonsensitive Population includes women beyond child-bearing age and men over 15.

**Table C-14. Guidelines for Assessing Fish Consumption Use in all Illinois Waters Including Streams, Freshwater Lakes, and Lake Michigan**

<b>Degree of Use Support</b>	<b>Guidelines<sup>(1)</sup></b>
Fully Supporting <sup>(6)</sup>	PCBs are less than 0.06 mg/kg and chlordane is less than 0.16 mg/kg in fish tissue in the two most recent years of samples for each species collected since 1985; and, Mercury is less than 0.06 mg/kg in fish tissue in the two most recent years of samples for each species collected since 1985, and those samples include at least one predator species <sup>(2)</sup> of a “large size class <sup>(3)</sup> ” in two different years.
Not Supporting	A water body-specific <sup>(4)</sup> , “restricted consumption <sup>(5)</sup> ” or “no consumption” fish-consumption advisory is in effect; or, Mercury is greater than or equal to 0.06 mg/kg in fish tissue of any species, in at least one of the two most recent years of samples collected in 1985 or later <sup>(7)</sup> ; or, a commercial fishing ban is in effect.
Not Assessed	None of the guidelines above apply.

1. In general, all data for each named stream or lake are combined to make the assessment. For larger rivers, assessments may be made for partial river segments.
2. “Predatory species” include northern pike, muskellunge, flathead catfish, chinook salmon, coho salmon, lake trout, brown trout, white bass, striped bass, striped-bass hybrids, smallmouth bass, largemouth bass, spotted bass, sauger, walleye, and saugeye.
3. “Large size class” is dependent on the particular species and the water body where the species is collected.
4. Although a general statewide advisory for mercury exists, Illinois EPA assesses Fish Consumption use as “Not Supporting” only for specific waters from which fish tissue has been collected and analyzed for contaminants and mercury contamination is confirmed. Fish-tissue data needed to confirm the advisory are not available from all waters.
5. Restricted consumption is defined as limits on the number of meals or size of meals consumed per unit time, per fish species. In Illinois, restricted-consumption advisories are: 1 meal/week, 1 meal/month, or 1 meal/2 months.
6. An assessment of Fully Supporting Fish Consumption use requires fish-tissue data from two different years (1985 or later). If more than two years of fish-tissue data are available (1985 or later), only the two most recent years of data (per species) are used in the assessment process.
7. Only one sample of fish tissue (1985 or later) exceeding criteria levels is necessary for an assessment of Not Supporting. If more than two years of fish-tissue data are available (1985 or later), only the two most recent years of data (per species) are used in the assessment process.

**Table C-15. Guidelines for Identifying Potential Causes of Impairment of  
Fish Consumption Use in Illinois Streams, Freshwater Lakes and Lake Michigan**

Potential Cause	Basis for Identifying Cause
Aldrin	Fish-consumption advisory or commercial fishing ban is in effect, attributable to any applicable parameter.
Chlordane	
DDT	
Dieldrin	
Endrin	
Heptachlor	
Heptachlor epoxide	
Mirex	
Polychlorinated biphenyls (PCBs)	
Toxaphene	
Mercury	Water body-specific fish-tissue data indicating mercury $\geq 0.06$ mg/kg

### **Primary Contact – Streams and Freshwater Lakes**

According to Illinois water quality standards, “primary contact” means “...*any recreational or other water use in which there is prolonged and intimate contact with the water involving considerable risk of ingesting water in quantities sufficient to pose a significant health hazard, such as swimming and water skiing*” (35 Ill. Adm. Code 301.355). The assessment of Primary Contact use is based on fecal coliform bacteria data. The General Use Water Quality Standard for fecal coliform bacteria specifies that during the months of May through October, based on a minimum of five samples taken over not more than a 30-day period, fecal coliform bacteria counts shall not exceed a geometric mean of 200 cfu/100 ml, nor shall more than 10 percent of the samples during any 30-day period exceed 400 cfu/100 ml (35 Ill. Adm. Code 302.209). This standard protects Primary Contact use of Illinois waters by humans.

Due to limited state resources, fecal coliform bacteria are not normally sampled at a frequency necessary to apply the General Use standard, i.e., at least five times per month during May through October, and very little data available from others are collected at the required frequency. Therefore, assessment guidelines are based on application of the standard when sufficient data are available to determine standard exceedances; but, in most cases, attainment of Primary Contact use is based on a broader methodology intended to assess the likelihood that the General Use standard is being attained.

To assess Primary Contact use, Illinois EPA uses all fecal coliform bacteria from water samples collected in May through October, over the most recent five-year period (i.e., 2011 through 2015 for this report). Based on these water samples, geometric means and individual measurements of fecal coliform bacteria are compared to the concentration thresholds in Tables C-16 and C-17. To apply the guidelines, the geometric mean of fecal coliform bacteria concentration is calculated from the entire set of May through October water samples, across the five years. No more than 10% of all the samples may exceed 400 cfu/100 ml for a water body to be considered Fully Supporting.

Some portions of stream segments are exempt from the fecal coliform bacteria water quality standard and Primary Contact use does not apply in these segments (35 Ill. Adm. Code 302.209). Stream miles assessed for Primary Contact use only include those reaches represented by Ambient Water Quality Monitoring Network stations where such exemptions do not apply.

Since Illinois EPA does not collect fecal coliform bacteria samples in lakes and received no fecal coliform data from outside sources during this cycle, there are no new assessments of Primary Contact use for lakes in this report. However, 1,814 lake acres remain assessed for Primary Contact use based on data received from the Lake County Health Department, Lakes Management Unit prior to 2002.

**Table C-16. Guidelines for Assessing Primary Contact Use in Illinois Streams and Freshwater Lakes**

Degree of Use Support	Guidelines
Fully Supporting	No exceedances of the fecal coliform bacteria standard in the last five years, <u>and</u> the geometric mean of all fecal coliform bacteria observations in the last five years $\leq 200$ cfu/100 ml, <u>and</u> $\leq 10\%$ of all observations in the last five years exceed 400 cfu/100 ml.
Not Supporting	At least one exceedance of the fecal coliform bacteria standard in the last five years (when sufficient data is available to assess the standard); <u>or</u> , The geometric mean of all fecal coliform bacteria observations in the last five years $> 200$ cfu/100 ml, <u>or</u> $> 10\%$ of all observations in the last five years exceed 400 cfu/100 ml.

**Table C-17. Guidelines for Identifying Potential Causes of Impairment of Primary Contact Use in Illinois Streams and Freshwater Lakes**

Potential Cause	Basis for Identifying Cause - Numeric Standard
Fecal Coliform	When <u>Primary Contact</u> Use is assessed as Not Supporting based on the criteria in Table C-16, Fecal Coliform is listed as the cause.

### **Primary Contact – Lake Michigan Open Waters and Shoreline Waters**

Primary contact use is assessed in Lake Michigan open waters and Lake Michigan Shoreline waters. This use is not currently assessed in Lake Michigan harbors.

For Lake Michigan open waters, the assessment of Primary Contact use is based on fecal coliform bacteria. Fecal coliform bacteria data are collected in the nearshore segment as part of the Lake Michigan Monitoring Program, but insufficient numbers of samples are collected during a 30-day period to appropriately apply the standard. In addition, these samples are collected in the open lake and may not reflect conditions at shoreline areas. Primary contact use in Lake Michigan open waters is assessed by using criteria in Table C-18.

**Table C-18. Guidelines for Assessing Primary Contact Use in Lake Michigan Open Waters**

<b>Degree of Use Support</b>	<b>Guidelines <sup>(1, 2)</sup></b>
Fully Supporting	Geometric mean of all fecal coliform bacteria samples <200 cfu/100 ml, <u>and</u> ≤10% of samples exceed a count of 400 cfu/100 ml.
Not Supporting	The geometric mean of all fecal coliform bacteria samples >200 cfu/100 ml, <u>or</u> >10% of samples exceed a count of 400 cfu/100 ml.

1. Based on most-current three years of data from Lake Michigan Monitoring Program sampled approximately three times per year.
2. 35 Ill. Adm. Code 302.505.

At 51 Lake Michigan shoreline segments, local agencies collect daily *Escherichia coli* bacteria samples at beaches during the swimming season. Advisories are posted or beaches may be closed by these agencies if samples exceed 235/100 ml *Escherichia coli* bacteria (77 Ill. Adm. Code 820). Illinois EPA uses the advisory information to assess Primary contact use in Lake Michigan Shoreline waters based on the criteria in Table C-19.

Criteria for identifying causes of impairment for Primary Contact use in Lake Michigan open waters and Lake Michigan shoreline waters are shown in Table C-20.

**Table C-19. Guidelines for Assessing Primary Contact Use at Lake Michigan Shoreline Waters (USEPA 1997)**

<b>Degree of Use Support</b>	<b>Guidelines<sup>(1)</sup></b>
Fully Supporting	For any shoreline segment, on average, less than one bathing area closure/advisory per year of less than one week's duration.
Not Supporting	For any shoreline segment, on average, at least one bathing area closure/advisory per year, <u>or</u> at least one bathing area closure of longer than one-week duration.

1. Based on most-current three years of data.

**Table C-20. Lake Michigan Open Waters and Shoreline Waters**

<b>Potential Cause</b>	<b>Basis for Identifying Causes - Numeric Standard<sup>(1, 2)</sup></b>
Fecal Coliform	Geometric mean of all fecal coliform bacteria observations (minimum of five samples) collected during the most recent three years >200 cfu/100 ml, <u>or</u> >10% of samples exceed a count of 400 cfu/100 ml.
<i>Escherichia coli</i>	For any shoreline segment, on average at least one bathing beach closure/advisory per year based on <i>E. coli</i> bacteria.

1. The applicable fecal coliform standard in 35 Illinois Administrative Code, Part 302, Subpart E, Section 302.505 requires a minimum of five samples in not more than a 30-day period. However, because this number of samples is seldom available in this time frame the criteria are based on a minimum of five samples (May through October) over the most recent three-year period.
2. Department of Public Health Bathing Beach Code (77 Ill. Adm. Code 820.400): An *Escherichia coli* count of 235 colonies/100 ml in each of two samples collected on the same day shall require closing the beach. Note: beaches in Lake County and suburban Cook County are closed when one sample exceeds 235/100 ml; beach managers in Chicago post advisories when a geometric mean of two consecutive water samples exceed 235 *E.*

*coli* cfu/100 ml. Beaches in Chicago are closed in the event that sewage is released to Lake Michigan, and remain closed until the geometric mean of two consecutive water samples is less than 235 *E. coli* cfu/100ml.

## **Public and Food Processing Water Supply – Streams, Freshwater Lakes, and Lake Michigan**

Attainment of Public and Food Processing Water Supply use is assessed only in waters in which the use is currently occurring, as evidenced by the presence of an active public-water-supply intake. The assessment of Public and Food Processing Water Supply use is based on conditions in both untreated and treated water (Table C-21). By incorporating data through programs related to both the federal Clean Water Act and the federal Safe Drinking Water Act, Illinois EPA believes that these guidelines provide a comprehensive assessment of Public and Food Processing Water Supply use.

Assessments of Public and Food Processing Water Supply use recognize that characteristics and concentrations of substances in Illinois surface waters can vary and that a single assessment guideline may not protect sufficiently in all situations. Using multiple assessment guidelines helps improve the reliability of these assessments. When applying these assessment guidelines, Illinois EPA also considers the water-quality substance, the level of treatment available for that substance, and the monitoring frequency of that substance in the untreated water.

One of the assessment guidelines for untreated water relies on a frequency-of-exceedance threshold (10%) because this threshold represents the true risk of impairment better than does a single exceedance of a water quality criterion. Assessment guidelines also recognize situations in which water treatment that consists only of “...*coagulation, sedimentation, filtration, storage and chlorination, or other equivalent treatment processes*” (35 Ill. Adm. Code 302.303; hereafter called “conventional treatment”) may be insufficient for reducing potentially harmful levels of some substances. To determine if a Maximum Contaminant Level (MCL) violation in treated water would likely occur if treatment additional to conventional treatment were not applied (see 35 Ill. Adm. Code 302.305), the concentration of the potentially harmful substance in untreated water is examined and compared to the MCL threshold concentration. If the concentration in untreated water exceeds an MCL-related threshold concentration, then an MCL violation could reasonably be expected in the absence of additional treatment.

Table C-21 provides the guidelines for assessing attainment of Public and Food Processing Water Supply use in Illinois streams, freshwater lakes, and Lake Michigan. In general, compliance with an MCL for treated water is based on a running four-quarter (i.e., annual) average, calculated quarterly, of samples collected at least once per quarter (Jan.-Mar., Apr.-Jun., Jul.-Sep., and Oct.-Dec.). However, for some untreated-water intake locations, sampling occurs less frequently than once per quarter. In these locations, statistics comparable to quarterly averages or running four-quarter averages cannot be determined for untreated water. Rather, for substances not known to vary regularly in concentration in Illinois surface waters (untreated) throughout the year, a simple arithmetic average concentration of all available results is used to compare to the MCL threshold. For substances known to vary regularly in concentration in surface waters during a typical year (e.g., atrazine), average concentrations within the relevant sub-annual (e.g., quarterly) periods are used. Table C-22 lists the guidelines for identifying potential causes of Public and Food Processing Water Supply use impairment.



**Table C-21. Guidelines for Assessing Public and Food Processing Water Supply Use in Illinois Streams, Freshwater Lakes, and Lake Michigan**

Degree of Use Support	Guidelines
Fully Supporting	<p>For each substance in untreated water<sup>(1)</sup>, for the most-recent three years of readily available data or equivalent dataset,</p> <ul style="list-style-type: none"> <li>a) <math>\leq 10\%</math> of observations exceed an applicable Public and Food Processing Water Supply Standard<sup>(2)</sup>; and</li> <li>b) for which the concentration is not readily reducible by conventional treatment, <ul style="list-style-type: none"> <li>i) no observation exceeds by at least fourfold the Maximum Contaminant Level threshold concentration<sup>(3)</sup> for that substance; and</li> <li>ii) no quarterly average concentration exceeds the Maximum Contaminant Level threshold concentration<sup>(3)</sup> for that substance;</li> </ul> </li> </ul> <p>and <sup>(4)</sup>,</p> <p>For each substance in treated water, no violation of an applicable Maximum Contaminant Level<sup>(3)</sup> occurs during the most recent four years of readily available data.</p>
Not Supporting	<p>For any single substance in untreated water<sup>(1)</sup>, for the most-recent three years of readily available data or equivalent dataset,</p> <ul style="list-style-type: none"> <li>a) <math>&gt; 10\%</math> of observations exceed a Public and Food Processing Water Supply Standard<sup>(2)</sup>; or</li> <li>b) for which the concentration is not readily reducible by conventional treatment, <ul style="list-style-type: none"> <li>i) at least one observation exceeds by at least fourfold the Maximum Contaminant Level threshold concentration<sup>(3)</sup> for that substance; or</li> <li>ii) the quarterly average concentration exceeds the Maximum Contaminant Level threshold concentration<sup>(3)</sup> for that substance;</li> </ul> </li> </ul> <p>or,</p> <p>For any single substance in treated water, at least one violation of an applicable Maximum Contaminant Level<sup>(3)</sup> occurs during the most recent four years of readily available data.</p> <p>or,</p> <p>Closure to use as a drinking-water resource (cannot be treated to allow for use).</p>

1. Includes only the untreated-water results that were available in the primary computer database at the time data were compiled for these assessments.
2. 35 Ill. Adm. Code 302.304, 302.306.  
(<https://pcb.illinois.gov/SLR/IPCBAandIEPAEnvironmentalRegulationsTitle35>).
3. 35 Ill. Adm. Code 611.300, 611.301, 611.310, 611.311, 611.325.
4. Some waters were assessed as Fully Supporting based on treated-water data only.

**Table C-22. Guidelines for Identifying Potential Causes of Impairment of  
Public and Food Processing Water Supply Use in  
Illinois Streams, Freshwater Lakes, and Lake Michigan**

Potential Cause	Basis for Identifying Cause <sup>(1, 4)</sup>	
	Numeric Standard <sup>(2)</sup>	Maximum Contaminant Level <sup>(3)</sup>
1,1,1-Trichloroethane	—	0.2 mg/L
1,1,2-Trichloroethane	—	5 µg/L
1,2,4-Trichlorobenzene	—	0.07 mg/L
1,2-Dibromo-3-chloropropane (Dibromochloropropane DBCP)	—	0.2 µg/L
1,2-Dichloroethane	—	5 µg/L
1,2-Dichloropropane	—	5 µg/L
2,3,7,8-Tetrachlorodibenzo-p- dioxin (only)	—	0.03 ng/L
2,4,5-TP (Silvex)	0.01 mg/L	0.05 mg/L
2,4-D	0.1 mg/L	0.01 mg/L
Alachlor	—	2 µg/L
Aldrin	1 µg/L	1 µg/L
Antimony	—	6 µg/L
Arsenic	0.05 mg/L	0.010 mg/L
Asbestos	—	7 MFL <sup>(5)</sup>
Atrazine	—	3 µg/L
Barium	1.0 mg/L	2 mg/L
Benzene	—	5 µg/L
Benzo[a]pyrene (PAHs)	—	0.2 µg/L
Beryllium	—	4 µg/L
Boron	1.0 mg/L	—
Cadmium	0.010 mg/L	5 µg/L
Carbofuran	—	0.04 mg/L
Carbon tetrachloride	—	5 µg/L
Chlordane	3 µg/L	2 µg/L
Chlorides	250 mg/L	—
Chlorobenzene (mono)	—	0.1 mg/L
Chromium (total)	0.05 mg/L	0.1 mg/L
cis-1,2-Dichloroethylene	—	0.07 mg/L
Cyanide	—	0.2 mg/L
Dalapon	—	0.2 mg/L
DDT	0.05 mg/L	0.05 mg/L
DEHP (di-sec-octyl phthalate) (Di(2-ethylhexyl)phthalate)	—	6 µg/L
Di (2-ethylhexyl) adipate	—	0.4 mg/L
Dichloromethane (methylene chloride)	—	5 µg/L

**Table C-22. (Cont.) Guidelines for Identifying Potential Causes of Impairment of  
Public and Food Processing Water Supply Use in  
Illinois Streams, Freshwater Lakes, and Lake Michigan**

Potential Cause	Basis for Identifying Cause <sup>(1, 4)</sup>	
	Numeric Standard <sup>(2)</sup>	Maximum Contaminant Level <sup>(3)</sup>
Dieldrin	1 µg/L	1 µg/L
Dinoseb	—	7 µg/L
Diquat	—	0.02 mg/L
Endothall	—	0.1 mg/L
Endrin	0.2 µg/L	2 µg/L
Ethylbenzene	—	0.7 mg/L
Ethylene dibromide	—	0.05 µg/L
Fecal Coliform	geometric mean of five samples in ≤30 days ≥2000 per 100 ml	—
Fluoride	—	4 mg/L
Glyphosate	—	0.7 mg/L
Heptachlor	0.1 µg/L	0.1 µg/L
Heptachlor epoxide	0.1 µg/L	0.1 µg/L
Hexachlorobenzene	—	1 µg/L
Hexachlorocyclopentadiene	—	0.05 mg/L
Iron	0.3 mg/L (dissolved)	1.0 mg/L (for CWS serving ≥1000 people or ≥300 connections)
Lead	0.05 mg/L	—
Lindane	4 µg/L	0.2 µg/L
Manganese	1.0 mg/L	0.15 mg/L (for CWS serving ≥1000 people or ≥300 connections)
Mercury	—	2 µg/L
Methoxychlor	0.1 mg/L	0.04 mg/L
Nitrate/Nitrite (nitrate + nitrite as N)	—	10 mg/L
Nitrogen, Nitrate	10 mg/L	10 mg/L
Nitrogen, Nitrite	—	1 mg/L
o-Dichlorobenzene	—	0.6 mg/L
Oil and Grease	0.1 mg/L	—
Oxamyl (Vydate)	—	0.2 mg/L
Parathion	0.1 mg/L	—
p-Dichlorobenzene	—	0.075 mg/L
Pentachlorophenol (PCP)	—	1 µg/L
Phenols	1 µg/L	—
Picloram	—	0.5 mg/L

**Table C-22. (Cont.) Guidelines for Identifying Potential Causes of Impairment of  
*Public and Food Processing Water Supply* Use in  
Illinois Streams, Freshwater Lakes, and Lake Michigan**

Potential Cause	Basis for Identifying Cause <sup>(1, 4)</sup>	
	Numeric Standard <sup>(2)</sup>	Maximum Contaminant Level <sup>(3)</sup>
Polychlorinated biphenyls (PCBs)	—	0.5 µg/L
Selenium	0.01 mg/L	0.05 mg/L
Simazine	—	4 µg/L
Styrene	—	0.1 mg/L
Sulfates	250 mg/L	—
Tetrachloroethylene	—	5 µg/L
Thallium	—	2 µg/L
Toluene	—	1 mg/L
Total Dissolved Solids	500 mg/L	—
Toxaphene	5 µg/L	3 µg/L
trans-1,2-Dichloroethylene	—	0.1 mg/L
Trichloroethylene	—	5 µg/L
Vinyl chloride	—	2 µg/L
Vinylidene chloride (1, 1– Dichloroethylene)	—	7 µg/L
Xylene(s) (total) (mixed)	—	10 mg/L
Zinc	—	5 mg/L

1. In general, for untreated water, a cause is identified if:
  - a) 10% or more of the observations exceed the applicable numeric standard; or
  - b) for any substance for which the concentration is not readily reducible by conventional treatment,
    - i) any observation exceeds by at least fourfold the treated-water Maximum Contaminant Level threshold concentration for the substance; or
    - ii) any quarterly average concentration exceeds the treated-water Maximum Contaminant Level threshold concentration for the substance; or
    - iii) any running annual average concentration exceeds the treated-water Maximum Contaminant Level threshold concentration for that substance.

For treated water, a cause is identified if there is any violation of the Maximum Contaminant Level for the substance. Identification of causes is based primarily on data from these monitoring programs: Ambient Water Quality Monitoring Network, Intensive Basin Surveys, Ambient Lake Monitoring Program, Lake Michigan Monitoring Program, and the Source Water Assessment Program.

2. The numeric standard is based on 35 Ill. Adm. Code 302, Subpart C: Public and Food Processing Water Supply Standards are available at: <https://pcb.illinois.gov/SLR/PCBandIEPAEnvironmentalRegulationsTitle35>.
3. Maximum Contaminant Levels are from 35 Ill. Adm. Code 611, Subpart F: Maximum Contaminant Levels (MCLs) and Maximum Residual Disinfectant Levels (MRDLs).
4. All table entries of “—” indicate that a cause guideline is not applicable or is unavailable.
5. MFL – million fibers per liter, for fibers less than 10 microns.

## Aesthetic Quality – Streams

Attainment of *Aesthetic Quality* use in Illinois streams is based on the attainment of the narrative standards in 35 Ill. Adm. Code 302.203 (for streams covered under General Use Standards), 35 Ill. Adm. Code 302.403 (for streams covered under Chicago Area Waterway System and Lower Des Plaines River Water Quality and Indigenous Aquatic Life Standards), or 35 Ill. Adm. Code 302.515 (for streams covered under the Lake Michigan Basin Standards). The assessment of these nearly identical standards is typically performed during Intensive Basin Surveys by Illinois EPA biologists who are experienced with the natural conditions and expectations for the streams in each basin. A form has been developed for use in this assessment process and is shown in Appendix D. Staff have been trained regarding Illinois EPA’s responsibilities in applying these narrative standards and how to properly fill out the form. The assessment involves comparing the observed conditions in the stream to the language in the standard. When the standard is judged as not attained, one or more of nine specific conditions are noted as the cause of non-attainment. These conditions are based on the language in the standard and include, “sludge, bottom deposits, floating debris, visible oil, odor, plant or algal growth [aquatic macrophytes or aquatic algae], color, or turbidity.” In addition, whenever plant growth or algal growth is judged to cause non-attainment, phosphorus (total) is listed as a contributing cause. The guidelines for assessing *Aesthetic Quality* use in Illinois streams are shown in Table C-23. Causes of non-attainment are shown in Table C-24.

**Table C-23. Assessing *Aesthetic Quality* Use in Illinois Streams**

Use Support Rating	Criteria
Fully Supporting	Narrative Standard in 35 Ill. Adm. Code 302.203, 35 Ill. Adm. Code 302.403 or 35 Ill. Adm. Code 302.515 is attained
Not Supporting	Narrative Standard in 35 Ill. Adm. Code 302.203, 35 Ill. Adm. Code 302.403 or 35 Ill. Adm. Code 302.515 is not attained

**Table C-24. Causes of *Aesthetic Quality* Use Impairment in Illinois Streams**

Potential Cause	Criteria based on Water Quality Standards <sup>(1)</sup>
Sludge	The presence of sludge that violates the narrative standard
Bottom Deposits	The presence of bottom deposits that violates the narrative standard
Floating Debris	The presence of floating debris that violates the narrative standard
Visible Oil	The presence of visible oil that violates the narrative standard
Odor	The presence of odor that violates the narrative standard
Specific Odor Causing Pollutant	If identified, the specific pollutant causing odor that violates the narrative standard
Aquatic Plants, Macrophytes	The presence of aquatic macrophytes that violates the narrative standard
Aquatic Algae	The presence of aquatic algae that violates the narrative standard
Phosphorus (total)	When the narrative standard is not attained due in part to aquatic plant or algal growth, phosphorus (total) is listed as a contributing cause
Color	The presence of color that violates the narrative standard
Turbidity	The presence of turbidity that violates the narrative standard

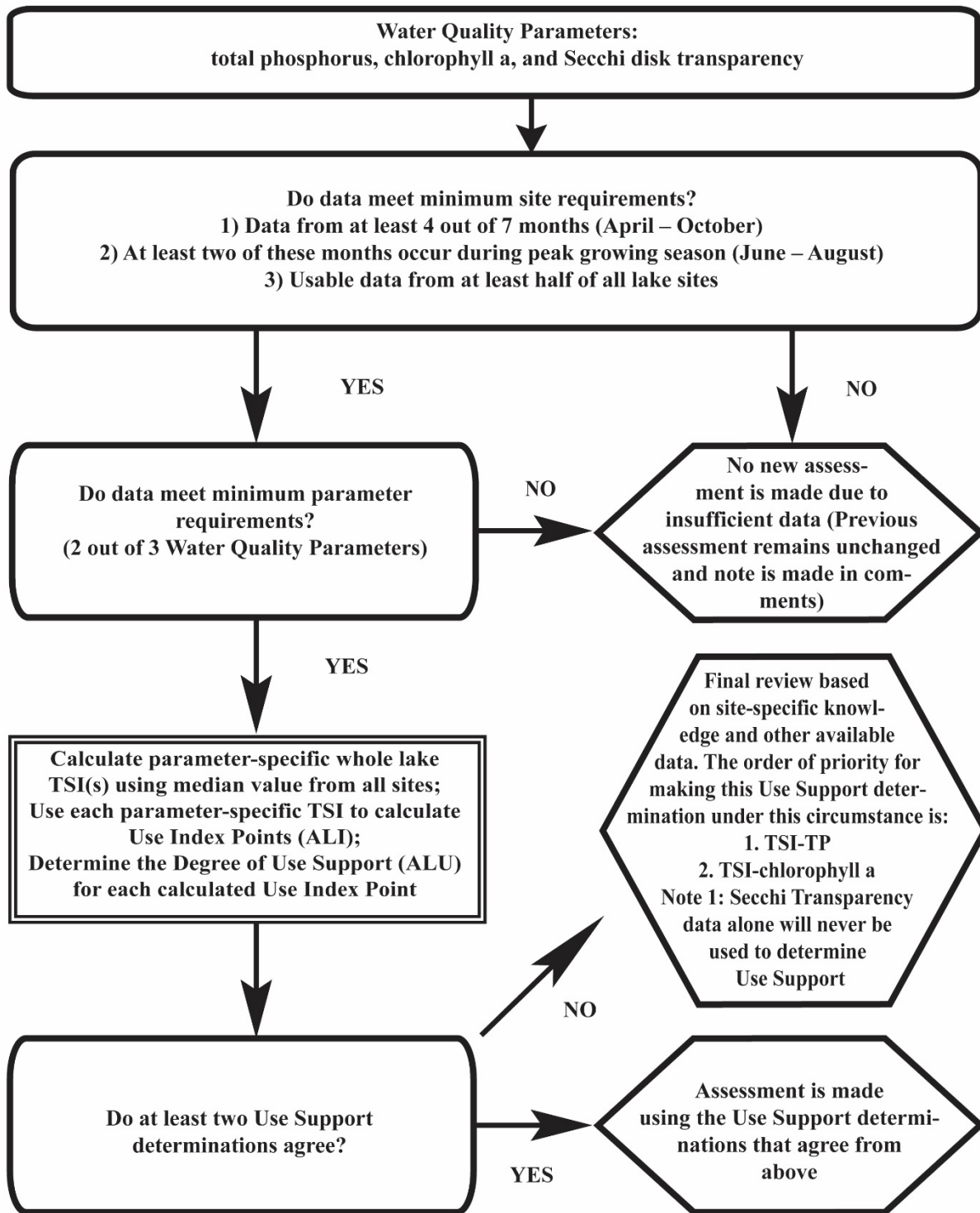
1. The applicable narrative standard in 35 Ill. Adm. Code 302.203, 35 Ill. Adm. Code 302.403 or 35 Ill. Adm. Code 302.515. Water Quality Standards are available at:  
<https://pcb.illinois.gov/SLR/PCBandIEPAEnvironmentalRegulationsTitle35>.

## **Aesthetic Quality – Freshwater Lakes**

The Aesthetic Quality Index (AQI) (Table C-25) is the primary tool used to assess Aesthetic Quality for freshwater lakes. The AQI represents the extent to which pleasure boating, canoeing, and aesthetic enjoyment are attained at a lake. The Trophic State Index (TSI; Carlson 1977), the percent-surface-area macrophyte coverage during the peak growing season (June through August), and the median concentration of nonvolatile suspended solids are used to calculate the AQI score. Higher AQI scores indicate increased impairment (Table C-26).

Assessments of Aesthetic Quality use are based primarily on physical and chemical water quality data collected by the Illinois EPA through the Ambient Lake Monitoring Program or by non-Illinois EPA persons under an approved quality assurance project plan. The physical and chemical data used for Aesthetic Quality use assessments include: Secchi disk transparency, chlorophyll *a*, total phosphorus (epilimnetic samples only), nonvolatile suspended solids (epilimnetic samples only), and percent surface area macrophyte coverage. Data are collected a minimum of five times per year (April through October) from one or more established lake sites. Data are considered usable for assessments if meeting the following minimum requirements (Figure C-3): 1) At least four out of seven months (April through October) of data are available, 2) At least two of these months occurs during the peak growing season of June through August (this requirement does not apply to NVSS), and 3) Usable data are available from at least half of all lakes sites within any given lake each month. As outlined in Figure C-3, a whole-lake TSI value is calculated from the median Secchi disk transparency, median total phosphorus (epilimnetic sample depths only), and median chlorophyll *a* value. A minimum of two parameter-specific TSI values are required to calculate a parameter-specific use support determination. An assessment is then made based on the parameter specific use support determinations. The 0.05 mg/L Illinois General Use Water Quality Standard for total phosphorus in lakes (35 Ill. Adm. Code 302.205) has been incorporated into the weighting criteria used to assign point values for the AQI. Table C-27 lists the guidelines for identifying potential causes of aesthetic quality use impairment.

**Figure C-3. Flow Chart for Assessing Attainment of Aesthetic Quality Use in Lakes**



**Table C-25. Aesthetic Quality Index**

Evaluation Factor	Parameter	Weighting Criteria	Points
1. Median Trophic State Index (TSI)	For data collected May-October: Median lake TSI value calculated from total phosphorus (samples collected at one-foot depth), chlorophyll <i>a</i> , and Secchi disk transparency	Actual Median TSI Value	Actual Median TSI Value
2. Macrophyte Coverage	Average percentage of lake area covered by macrophytes (emergent, floating, and submersed) during peak growing season (June through August). Determined by: a. Macrophyte survey conducted during same water year as the chemical data used in the assessment, <u>or</u> b. Average value based on reported field observations	a. <5 b. $\geq 5 < 15$ c. $\geq 15 < 25$ d. $\geq 25$	a. 0 b. 5 c. 10 d. 15
3. Nonvolatile Suspended Solids (NVSS) Concentration	Median lake surface NVSS concentration for samples collected at one-foot depth (reported in mg/L)	a. <3 b. $\geq 3 < 7$ c. $\geq 7 < 15$ d. $\geq 15$	a. 0 b. 5 c. 10 d. 15

**Table C-26. Guidelines for Assessing Aesthetic Quality Use in Illinois Freshwater Lakes**

Degree of Use Support	Guidelines
Fully Supporting	Total AQI points are <60
Not Supporting	Total AQI points are $\geq 60$

**Table C-27. Guidelines for Identifying Potential Causes of Impairment of Aesthetic Quality Use in Illinois Freshwater Lakes**

Potential Cause	Basis for Identifying Causes <sup>(1)</sup>
	Criteria based on Water Quality Standards <sup>(2)</sup>
Sludge	The presence of sludge that violates the narrative standard <sup>(4)</sup>
Bottom Deposits	The presence of bottom deposits that violates the narrative standard <sup>(4)</sup>
Floating Debris	The presence of floating debris that violates the narrative standard <sup>(4)</sup>
Visible Oil	The presence of visible oil that violates the narrative standard <sup>(4)</sup>
Odor	The presence of odor that violates the narrative standard <sup>(4)</sup>
Specific Odor Causing Pollutant	If identified, the specific pollutant causing odor that violates the narrative standard <sup>(4)</sup>
Aquatic Algae	The presence of aquatic algae that violates the narrative standard <sup>(4)</sup>
Aquatic Plants (Macrophytes)	The presence of aquatic macrophytes that violates the narrative standard <sup>(4)</sup>



**Table C-27. (Cont.) Guidelines for Identifying Potential Causes of Impairment of  
Aesthetic Quality Use in Illinois Freshwater Lakes**

Potential Cause	Basis for Identifying Causes <sup>(1)</sup>
	Criteria based on Water Quality Standards <sup>(2)</sup>
Phosphorus (Total)	In lakes $\geq$ 20 acres, total phosphorus exceeds 0.05 mg/L <sup>(3)</sup> , <u>or</u> In lakes < 20 acres, when the narrative standard <sup>(4)</sup> is not attained due in part to aquatic plant or algal growth, phosphorus (total) is listed as a contributing cause <sup>(3)</sup>
Color	The presence of color that violates the narrative standard <sup>(4)</sup>
Turbidity	The presence of turbidity that violates the narrative standard <sup>(4)</sup>

1. In general, a single exceedance of the criteria results in listing the parameter as a potential cause of impairment. Determination of causes is normally based on the most recent year of data from the Ambient Lake Monitoring Program (ALMP) or Source Water Assessment Program.
2. From Illinois General Use Water Quality Standards 35 Illinois Administrative Code, Part 302, Subpart B. Water Quality Standards are available at:  
<https://pcb.illinois.gov/SLR/PCBandIEPAEnvironmentalRegulationsTitle35>.
3. The total phosphorus standard at 35 Ill. Adm. Code 302.205 applies to lakes of 20 acres or larger. In smaller lakes, phosphorus (total) is listed when the narrative standard in 35 Ill. Adm. Code 302.203 is not attained due to aquatic plant or algal growth.
4. The Offensive Condition narrative standard in 35 Ill. Adm. Code 302.203.

### **Aesthetic Quality – Lake Michigan Open Waters**

The open waters of Lake Michigan mean all of the waters within Lake Michigan in Illinois jurisdiction lakeward from a line drawn across the mouth of tributaries to Lake Michigan, but not including waters enclosed by constructed breakwaters (35 Ill. Adm. Code 303.443 a). Assessments of Aesthetic Quality use in Lake Michigan Open Waters employ both the Offensive Conditions narrative standard in 35 Ill. Adm. Code 302.515, and the Lake Michigan Basin open waters total phosphorus standard (35 Ill. Adm. Code 302.504 c) intended to protect aesthetic quality. Attainment of the narrative standard is assessed by trained biologists experienced with the natural conditions and expectations for Lake Michigan Open Waters. The assessment involves comparing the observed conditions to the specific narrative language in the standard. If the standard is judged as not attained, one or more of nine specific conditions are noted as the cause of non-attainment. These conditions are based on the language in the standard and include: “sludge, bottom deposits, floating debris, visible oil, odor, plant or algal growth [aquatic macrophytes or aquatic algae], color, or turbidity of other than natural origin.” These conditions are the basis for listing causes of non-attainment. Also, when greater than 10% of the samples exceed the Lake Michigan open water standard for total phosphorus, aesthetic quality use is assessed as Not Supporting and phosphorus is listed as a cause of the impairment. The guidelines for assessing Aesthetic Quality use in Lake Michigan open waters are shown in Table C-28. Causes for non-attainment are shown in Table C-29.

**Table C-28. Assessing Aesthetic Quality Use in Lake Michigan Open Waters**

Use Support Rating	Criteria
Fully Supporting	Narrative Standard in 35 Ill. Adm. Code 302.515 is attained, <u>and</u> , ≤ 10 % of samples exceed 7 µg/L total phosphorus.
Not Supporting	Narrative Standard in 35 Ill. Adm. Code 302.515 is not attained, <u>or</u> , > 10 % of samples exceed 7 µg/L total phosphorus.

**Table C-29. Causes of Aesthetic Quality Use Impairment in Lake Michigan Open Waters**

Potential Cause	Criteria based on Water Quality Standards <sup>(1)</sup>
Sludge	The presence of sludge that violates the narrative standard <sup>(2)</sup>
Bottom Deposits	The presence of bottom deposits that violates the narrative standard <sup>(2)</sup>
Floating Debris	The presence of floating debris that violates the narrative standard <sup>(2)</sup>
Visible Oil	The presence of visible oil that violates the narrative <sup>(2)</sup>
Odor	The presence of odor that violates the narrative standard <sup>(2)</sup>
Specific Odor Causing Pollutant	If identified, the specific pollutant causing odor that violates the narrative standard <sup>(2)</sup>
Aquatic Plants, Macrophytes	The presence of aquatic macrophytes that violates the narrative standard <sup>(2)</sup>
Aquatic Algae	The presence of aquatic algae that violates the narrative standard <sup>(2)</sup>
Phosphorus (Total)	> 10 % of samples exceed 7 µg/L total phosphorus <sup>(3)</sup> , <u>or</u> When the narrative standard <sup>(2)</sup> is not attained due in part to aquatic plant or algal growth, phosphorus (total) is listed as a contributing cause
Color	The presence of color that violates the narrative standard <sup>(2)</sup>
Turbidity	The presence of turbidity that violates the narrative standard <sup>(2)</sup>

1. Illinois Lake Michigan Basin Water Quality Standards, 35 Ill. Adm. Code, Subpart E. Water Quality Standards are available at: <https://pcb.illinois.gov/SLR/IPCBandIEPAEnvironmentalRegulationsTitle35>.
2. The Offensive Condition narrative standard in 35 Ill. Adm. Code 302.515.
3. For applying these guidelines, Illinois EPA typically uses data from the Lake Michigan Monitoring Program (LMMP) (most recent three years).

### **Aesthetic Quality – Lake Michigan Harbors and Shoreline Waters**

Attainment of Aesthetic Quality use in Lake Michigan harbors and shoreline waters is based on the attainment of the Offensive Conditions narrative standard in 35 Ill. Adm. Code 302.515. Attainment of the narrative standard is assessed by trained biologists experienced with the natural conditions and expectations for these Lake Michigan Basin waters. The assessment involves comparing the observed conditions to the specific narrative language in the standard. If the standard is judged as not attained, one or more of nine specific conditions are noted as the cause of non-attainment. These conditions are based on the language in the standard and include: “sludge, bottom deposits, floating debris, visible oil, odor, plant or algal growth [aquatic macrophytes or aquatic algae], color or turbidity of other than natural origin.” These conditions are the basis for listing causes of non-attainment.

The above Lake Michigan waters are not regulated for total phosphorus. However, if aquatic plants or algae are identified as a cause of aesthetic quality impairment, then total phosphorus is listed as a contributing cause.

The guidelines for assessing *Aesthetic Quality* use in these Lake Michigan basin waters are shown in Table C-30. Causes for non-attainment are shown in Table C-31.

**Table C-30. Assessing *Aesthetic Quality* Use in Lake Michigan Harbors and Shoreline Waters**

Use Support Rating	Criteria
Fully Supporting	Narrative Standard in 35 Ill. Adm. Code 302.515 is attained
Not Supporting	Narrative Standard in 35 Ill. Adm. Code 302.515 is not attained

**Table C-31. Causes of *Aesthetic Quality* Use Impairment in Lake Michigan Harbors and Shoreline Waters**

Potential Cause	Criteria based on Water Quality Standards <sup>(1)</sup>
Sludge	The presence of sludge that violates the narrative standard <sup>(2)</sup>
Bottom Deposits	The presence of bottom deposits that violates the narrative standard <sup>(2)</sup>
Floating Debris	The presence of floating debris that violates the narrative standard <sup>(2)</sup>
Visible Oil	The presence of visible oil that violates the narrative <sup>(2)</sup>
Odor	The presence of odor that violates the narrative standard <sup>(2)</sup>
Specific Odor Causing Pollutant	If identified, the specific pollutant causing odor that violates the narrative standard <sup>(2)</sup>
Aquatic Plants, Macrophytes	The presence of aquatic macrophytes that violates the narrative standard <sup>(2)</sup>
Aquatic Algae	The presence of aquatic algae that violates the narrative standard <sup>(2)</sup>
Phosphorus (Total)	When the narrative standard <sup>(2)</sup> is not attained due in part to aquatic plant or algal growth, phosphorus (total) is listed as a contributing cause.
Color	The presence of color that violates the narrative standard <sup>(2)</sup>
Turbidity	The presence of turbidity that violates the narrative standard <sup>(2)</sup>

1. Illinois Lake Michigan Basin Water Quality Standards, 35 Ill. Adm. Code, Subpart E. Water Quality Standards are available at: <https://pcb.illinois.gov/SLR/IPCBAandIEPAEnvironmentalRegulationsTitle35>.
2. The Offensive Condition narrative standard in 35 Ill. Adm. Code 302.515

### Identifying Potential Sources of Impairment for All Uses and Water Types

Once a use is assessed as impaired (Not Supporting) we attempt to identify the sources related to the impairment. Table C-32 contains guidelines for identifying potential sources of use impairment in Illinois streams, freshwater lakes, and Lake Michigan-basin waters. Illinois EPA defines potential sources as known or suspected activities, facilities, or conditions that may be contributing to a cause of impairment of a designated use. Each potential source identified is linked to at least one specific cause of impairment. Information used to identify potential sources of impairment include Facility-Related Stream Survey data, ambient-monitoring data, effluent-monitoring data, facility discharge monitoring reports, review of National Pollutant

Discharge Elimination System permits and compliance records, land use data, personal observations, and documented site-specific knowledge.

**Table C-32. Guidelines for Identifying Potential Sources of Use Impairment in Illinois Streams, Freshwater Lakes, and Lake Michigan-Basin Waters**

<b>Potential Source<sup>(1)</sup></b>	<b>Guidelines</b>
Acid Mine Drainage	Low pH and iron deposition due to mine drainage based upon actual observation and/or other existing data.
Agriculture	General agricultural related activities based upon satellite land use, actual observation and/or other existing data.
Animal Feeding Operations (NPS)	Open area feedlots or animal holding buildings and impervious areas based upon satellite land use, actual observation and/or other existing data.
Aquaculture (Not Permitted) or Aquaculture (Permitted)	Fish production facility based upon actual observation and/or other existing data.
Atmospheric Deposition – Acidity, or Atmospheric Deposition – Nitrogen, or Atmospheric Deposition – Toxics	Atmospheric deposition of nutrients, minerals, etc. based upon actual observation and/or other existing data.
Channelization	Straightening of stream meanders based upon actual observation and/or other existing data.
Combined Sewer Overflows	Combined sanitary and storm sewer overflow based upon Facility-Related Stream Survey, Agency effluent monitoring, Discharge Monitoring Reports and/or other existing data.
Contaminated Sediments	High concentrations of metals and organic compounds in sediment based upon actual observation or other existing data.
Crop Production (Crop Land or Dry Land)	Nonirrigated crop production based upon satellite land use, actual observation and/or other existing data.
Dam Construction (Other than Upstream Flood Control Projects)	Dam construction activities based upon actual observation and/or other existing data.
Discharges from Biosolids storage, application or disposal	Storage, application or disposal of sludge based upon actual observation and/or other existing data.
Drainage/Filling/Loss of Wetlands	Draining or filling in of wetland areas based upon actual observation and/or other existing data.
Dredge Mining	Underwater mining (e.g., sand and gravel) activities based upon satellite land use, actual observation and/or other existing data.
Dredging (e.g., for Navigation Channels)	Deepening of stream channels based upon actual observation and/or other existing data.
Golf Courses	Golf course runoff directly to water body.
Habitat Modification - other than Hydromodification	General alteration of riparian habitat based upon actual observation and/or other existing data.
Highway/Road/Bridge Runoff (Nonconstruction Related)	Salt and pesticide runoff from highways, roads & bridges based upon actual observation and/or other existing data.
Highways, Roads, Bridges, Infrastructure (New Construction)	Highway/road/bridge construction activities based upon actual observation and/or other existing data.
Impacts from Abandoned Mine Lands (Inactive)	Abandoned mining operation based upon actual observation and/or other existing data.

**Table C-32. (Cont.) Guidelines for Identifying Potential Sources of Use Impairment in Illinois Streams, Freshwater Lakes, and Lake Michigan-Basin Waters**

<b>Potential Source<sup>(1)</sup></b>	<b>Guidelines</b>
Impacts from Hydrostructure Flow Regulation/Modification	Alteration of normal flow regimes (e.g., dams, channelization, impervious surfaces, water withdrawal) based upon actual observation and/or other existing data.
Inappropriate Waste Disposal	Illegal waste disposal sites based upon actual observation and/or other existing data.
Industrial Land Treatment	Land application of industrial wastes based upon actual observation and/or other existing data.
Industrial Point Source Discharge	Industrial point source discharge based upon Facility-Related Stream Survey, Agency effluent, DMR or other existing data.
Irrigated Crop Production	Irrigated crop production based upon satellite land use, actual observation and/or other existing data.
Lake Fertilization	Artificial fertilization activities (e.g., addition of triple super-phosphate to create algal blooms for macrophyte control or enhance lake fertility) based upon actual observation and/or other existing data.
Leaking Underground Storage Tank Leaks	Leaks from storage tanks based upon actual observation and/or other existing data.
Livestock (Grazing or Feeding Operations)	Riparian and/or upland pastureland grazing based upon satellite land use, actual observation and/or other existing data.
Loss of Riparian Habitat	Removal of riparian vegetation based upon actual observation and/or other existing data.
Marina Boat Construction, or Marina Boat Maintenance, or Marina Dredging Operations, or Marina Fueling Operations, or Marina-related Shoreline Erosion, or Marina/Boating Pump Out releases, or Marina/Boating Sanitary On-vessel Discharges	In-water and on-land releases based upon actual observation and/or other existing data.
Mill Tailings	Milling operations based upon satellite land use, actual observation and/or other existing data.
Mine Tailings	Mine processing activities (e.g., gob piles) based upon satellite land use, actual observation and/or other existing data.
Municipal Point Source Discharges	Municipal point source discharge based upon Facility-Related Stream Survey, Agency effluent, DMR or other existing data.
Natural Sources <sup>(2)</sup>	See source methodology notes below <sup>(2)</sup> .
On-site Treatment Systems (Septic Systems and Similar Decentralized Systems)	Septic system leachate or surface runoff based upon actual observation and/or other existing data.
Other Recreational Pollution Sources	Other recreational impacts based upon actual observation and/or other existing data.
Other Spill Related Impacts	Accidental spills based upon actual observation and/or other existing data.

**Table C-32. (Cont.) Guidelines for Identifying Potential Sources of Use Impairment in Illinois Streams, Freshwater Lakes, and Lake Michigan-Basin Waters**

<b>Potential Source<sup>(1)</sup></b>	<b>Guidelines</b>
Permitted Silvicultural Activities	General forest management related runoff based upon satellite land use, actual observation and/or other existing data.
Pesticide Application	Herbicide/algicide applications (e.g., eradication of a beneficial macrophyte community, reduced dissolved oxygen levels after application) based upon actual observation and/or other existing data.
Petroleum/Natural Gas Activities	Oil and gas production activities based upon satellite land use, actual observation and/or other existing data.
RCRA Hazardous Waste Sites	Hazardous waste leachate or surface runoff based upon actual observation and/or other existing data.
Runoff from Forest/Grassland/Parkland	Watershed related nonpoint source runoff other than from previously specified sources (e.g., lawn or parkland fertilization, leaf litter/forest bed runoff) based upon actual observation and/or other existing data.
Salt Storage Sites	Salt storage for winter highway maintenance based upon actual observation and/or other existing data.
Sanitary Sewer Overflows (Collection System Failures)	Broken sanitary sewer line or overflow based upon Facility-Related Stream Survey, Agency effluent and/or other existing data.
Septage Disposal	Disposal of septic tank sludge based upon actual observation and/or other existing data.
Site Clearance (Land Development or Redevelopment)	New residential/commercial construction activities based upon actual observation and/or other existing data.
Source Unknown	No identifiable source based upon available information.
Specialty Crop Production	Truck farming, orchards, or horticultural areas based upon satellite land use, actual observation and/or other existing data.
Streambank Modifications/Destabilization or Littoral/Shore Area Modifications (Nonriverine)	Shoreline modification/destabilization activities (e.g., bank erosion, rip rap, loss of habitat) based upon actual observation and/or other existing data.
Subsurface (Hardrock) Mining	Subsurface coal mining activities based upon satellite land use, actual observation and/or other existing data.
Surface Mining	Surface mining (e.g., coal, limestone) activities based upon satellite land use, actual observation and/or other existing data.
Unpermitted Discharge (Domestic Wastes)	Wildcat sewer discharge based upon Facility-Related Stream Survey, Agency effluent and/or other existing data.
Upstream Impoundments (e.g., PL-566 NRCS Structures)	Upstream impoundment based upon actual observation and/or other existing data.
Urban Runoff/Storm Sewers	Urban and storm sewer runoff based upon actual observation and/or other existing data
Waterfowl	Nutrient enrichment from waterfowl wastes based upon actual observation and/or other existing data.

1. Other rare or uncommon sources in addition to those listed here are available in the Assessment Database and may be used when appropriate.

2. The Natural Sources category is reserved for waters impaired due to naturally occurring conditions (i.e., not caused by or related to past or present human activity) or due to catastrophic conditions. Clearly defined cases include: 1) metals due to naturally occurring deposits, 2) dissolved oxygen or pH associated with aeration or natural organic materials, where no human-related sources are present, 3) habitat loss or pollutant loads due to catastrophic floods, which are excluded from water quality standards or other regulations, and 4) high temperature, low dissolved oxygen, or high concentrations of pollutants due to catastrophic droughts with flows less than the average minimum seven-day low flow that occurs once every 10 years.

### **C-3. Assessment Results**

This section presents the results of Illinois' surface water assessments, including the five-part categorization of all surface waters, the Section 303(d) List, state level summaries of designated use support, and CWA Section 314 (Lakes Program) reporting requirements.

#### **Five-Part Categorization of Surface Waters**

USEPA's latest Integrated Report guidance (USEPA 2005) calls for all waters of the state to be reported in a five-category system as below. Although the guidance allows waters to be placed into more than one category, Illinois EPA treats all categories as mutually exclusive.

**Category 1:** Segments are placed into Category 1 if all designated uses are supported, and no use is threatened. (Note: Illinois does not assess any waters as threatened)

**Category 2:** Segments are placed in Category 2 if all designated uses that were assessed are supported. (All other uses are reported as Not Assessed or Insufficient Information).

**Category 3:** Segments are placed in Category 3 when there is insufficient available data and/or information to make a use-support determination for any use.

**Category 4:** Contains segments that have at least one impaired use but a TMDL is not required. Category 4 is further subdivided as follows based on the reason a TMDL is not required.

**Category 4a:** Segments are placed in Category 4a when a TMDL to address a specific segment/pollutant combination has been approved or established by USEPA. Illinois EPA places water bodies in category 4a only if TMDLs have been approved for all pollutant causes of impairment.

**Category 4b:** Segments are placed in Category 4b if technology-based effluent limitations required by the Act, more stringent effluent limitations required by state, local, or federal authority, or other pollution control requirements (e.g., best management practices) required by local, state or federal authority are stringent enough to implement applicable water quality standards (see 40 CFR 130.7(b)(1)) within a reasonable period of time.

**Category 4c:** Segments are placed in Category 4c when the state demonstrates that the failure to meet an applicable water quality standard is not caused by a pollutant, but instead is caused by other types of pollution (i.e., only nonpollutant causes of impairment). Water bodies placed in this category are usually those where Aquatic Life use is impaired by habitat related conditions. (See discussion in Section C-2 Assessment Methodology, Aquatic Life-Streams.)

**Category 5:** Segments are placed in Category 5 if available data and/or information indicate that at least one designated use is not being supported and a TMDL is needed. Water bodies in Category 5 (and their pollutant causes of impairment) constitute the 303(d) List that USEPA will review and approve or disapprove pursuant to 40 CFR 130.7.

**Category 5-alt:** Waters are placed in category 5-alt when alternative restoration approaches are used to address impairments instead of traditional TMDLs. An alternative restoration approach is a plan or a set of actions pursued in the near-term designed to attain water quality standards. Waters in category 5-alt remain on the 303(d) list until water quality standards are achieved or a TMDL is developed. When a State decides to pursue an alternative restoration approach for waters on its 303(d) list, USEPA expects the State to provide documentation that such an approach is designed to meet water quality standards and is a more immediately beneficial or practicable way to achieve water quality standards than the development of a TMDL in the near future. USEPA considers the adequacy of the State’s documentation for pursuing an alternative restoration approach in determining whether to give credit to such an approach. For this cycle, Illinois has no waters in category 5-alt.

Table C-33 shows the results of this categorization for all Illinois surface waters. The category for each individual water body is shown in Appendices B2-B4

**Table C-33. Size of Surface Waters Assigned to Reporting Categories<sup>(1)</sup>**

Water Body Type	Category							Total in State	Total Assessed
	1	2	3	4a	4b	4c	5		
Streams (miles)	0	6,635	101,020	444	0	855	10,290	119,244	18,224
Freshwater Lakes (acres)	0	2,729	165,199	1,087	0	0	149,462	318,477	153,278
Lake Michigan Harbors (sq. miles)	0	1.98	0	0	0	0	0.28	2.26	2.26
Lake Michigan Open Waters (sq. miles)	0	0	1,330	0	0	0	196	1,526	196
Lake Michigan Shoreline (miles)	0	0	0	0	0	0	64	64	64

1. Categories are mutually exclusive. Illinois does not report water bodies in more than one category.

### Section 303(d) List

The Clean Water Act and USEPA regulations require states to submit a list of water-quality-limited waters still requiring TMDLs, pollutants causing the impairment, and a priority ranking for TMDL development (including waters targeted for TMDL development within the next two years. This integrated report combines all of the requirements of sections 305(b), 303(d), and 314 into a single document.

Category 5 waters constitute Illinois’ 303(d) List. The complete list is found in Appendix A-1 and A-2. The development of this list is based on the assessment methodology for determining attainment of designated uses for each water body segment as described previously in Section C-2. Those waters that have at least one Not Supporting designated use and at least one pollutant cause of impairment are included on the 303(d) List unless they fall under the specific exceptions described in categories 4a, 4b, or 4c. Waters included on previous lists are also included on the current list unless new information is available to update the assessment or there is other “good cause” for delisting them (see below). A complete list of all water bodies, all use attainment assessments, all identified potential causes of impairment (both pollutant and nonpollutant), and potential sources of impairment is found in Appendices B2-B4.



## **Prioritization of the Illinois Section 303(d) List**

All pollutant causes of impairment associated with impaired designated uses require TMDL development. USEPA regulations at 40 CFR Part 130.7(b)(4) require establishing a priority ranking of 303(d) listed waters for the development of TMDLs that accounts for the severity of pollution and the designated uses. The prioritization of Illinois Section 303(d) List was done on a watershed basis instead of on individual water body segments. Illinois EPA watershed boundaries are based on USGS ten-digit hydrologic units (HUC). Developing prioritization for severity of pollution at the watershed scale provides Illinois with the ability to address watershed issues at a manageable level and document improvements to a watershed's health. The Illinois Section 303(d) List was prioritized based on the steps listed below:

Step 1- A high priority is given to waters where public water supply use is impaired by atrazine, simazine, or nitrate. For those waters, TMDLs will be developed based on the entire watershed, whether smaller or larger than a ten-digit HUC.

Step 2- Watersheds with no approved or ongoing TMDLs were given medium priority. Ranking within this group is based on the total number of potential causes in each watershed that require TMDL development. The more potential causes of impairment identified, the higher the priority given to the watershed.

Step 3- Watersheds that have approved or ongoing TMDLs are given the lowest priority. However, TMDL implementation still occurs in watersheds with a low priority. The prioritization process for TMDL development does not affect TMDL implementation.

Illinois Section 303(d) waters are listed in order of priority in Appendix A-1.

## **Scheduling of TMDL Development**

In accordance with USEPA regulations under 40 CFR Part 130.7(b)(4), "the priority ranking shall specifically include the identification of waters targeted for TMDL development in the next two years." In addition, USEPA guidance encourages states to ensure that the schedule provides that all TMDLs for every pollutant-segment combination listed on previous Section 303(d) Lists be established in a time frame that is no longer than 8 to 13 years from the time the pollutant-segment combination is first identified in Category 5.

In Illinois, development of TMDLs will be conducted on a watershed basis (i.e., USGS 10-digit hydrologic units) meaning that impaired waters upstream of a particular segment will have all TMDLs conducted at the same time. In order to ensure that all TMDLs are completed in a reasonable time frame, Illinois' TMDL development schedule calls for the initiation of efforts in approximately six TMDL watersheds in each year in the next 13 years. Appendix A-3 shows the watersheds, water bodies and pollutants for which TMDLs will be developed in the next two years. The TMDL development schedule provided in Appendix A-3 replaces all schedules previously submitted by the Illinois EPA to USEPA. The schedule will be reviewed and updated in the future, as needed, to ensure timely development of TMDLs, given available resources.

The Illinois EPA's long-term schedule for TMDL development for all waters on the 2018 Section 303(d) List, projected over a 13-year period, is consistent with other Illinois EPA program cycles that are typically five years, including statewide monitoring programs such as the rotational intensive river basin surveys and issuance of NPDES permits. The long-term TMDL development schedule will be reviewed and revised, as needed, in conjunction with future Section 303(d) Lists submitted to USEPA.

In August of 2011, USEPA's Office of Water, in cooperation with the Association of Clean Water Administrators (ACWA), and the Environmental Law Institute (ELI), started developing the framework for the Long-Term Vision for Assessment, Restoration, and Protection under the CWA Section 303(d) Program (The Vision). The Vision is intended to help states, tribes, and territories prioritize impaired waterbodies for TMDL development, or use alternative approaches, and adaptive implementation plans for waterbodies to meet their designated uses and applicable water quality standards. Illinois EPA has worked with USEPA to develop The Vision prioritization goals for the TMDL development program in Illinois.

Illinois EPA's Vision for Assessment, Restoration, and Protection under the CWA Section 303(d) Program is two-fold. The two strategies are referred as:

- 1) **TMDL Development/Alternative Approach - Short-Term Vision Goal (2015-2018)**
- 2) **Nutrient Priority Watersheds - Long-Term Vision Goal (2016-2022)**

The logic behind each of these two strategies and the way each strategy will be implemented are discussed in detail in the **LONG-TERM VISION FOR ASSESSMENT, RESTORATION, AND PROTECTION UNDER THE CWA SECTION 303(d) PROGRAM (The Vision)** as outlined in Appendix A-5 of this report. The report is also available at the Agency's TMDL website: <https://www2.illinois.gov/epa/topics/water-quality/watershed-management/tmdls/Pages/303d-list.aspx>

### **Removal of Waters on Illinois' 2016 Section 303(d) List**

USEPA's Integrated Report guidance explains what constitutes good cause for not including in the current submission, segments that were included on the previous Section 303(d) List. These include:

1. The assessment and interpretation of more recent or more accurate data in the record demonstrate that the applicable WQS(s) is being met.
2. The results of more sophisticated water quality modeling demonstrate that the applicable WQS(s) is being met.
3. Flaws in the original analysis of data and information led to the segment being incorrectly listed.
4. A demonstration pursuant to 40 CFR 130.7(b)(1)(ii) that there are effluent limitations required by state or local authorities that are more stringent than technology-based effluent

limitations, required by the CWA, and that these more stringent effluent limitations will result in the attainment of WQSs for the pollutant causing the impairment.

5. A demonstration pursuant to 40 CFR 130.7(b)(1)(iii) that there are other pollution control requirements required by state, local, or federal authority that will result in attainment of WQSs for a specific pollutant(s) within a reasonable time (i.e., 4b).
6. Documentation that the state included on a previous Section 303(d) List an impaired segment that was not required to be listed by EPA regulations, (e.g., segments where there is no pollutant associated with the impairment).
7. Approval or establishment by USEPA of a TMDL since the last Section 303(d) List.
8. A state inappropriately listed a segment that is within Indian country, as defined in 18 U.S.C. Section 1151.
9. Other relevant information that supports the decision not to include the segment on the Section 303(d) List.

All water body/pollutant combinations on Illinois' Section 303(d) List from 2016 are included on the 2018 Section 303(d) List except the water body/pollutant combinations removed under the criteria cited above. Illinois EPA delists entire water bodies if all the designated uses are assessed as fully supporting or if all pollutant causes of impairment have been addressed by approved TMDLs. Listed causes of impairment may change when uses are reassessed even if the water is still considered impaired.

In a few instances when pollutant causes are delisted, there is a potential for an entire water body segment to be moved from Category 5 (the 303d List) to Category 4C (waters impaired by pollution but not by any pollutant, Appendix A-7). When any delisting results in a water body being moved from Category 5 to Category 4C, a review is conducted to determine whether any pollutant may still be causing impairment in that water body. If it is suspected that the water body is still impaired by a pollutant, cause unknown is listed and the water body remains on the 303(d) List.

Illinois' 2008 Section 303(d) list was partially disapproved by USEPA on October 22, 2008. Illinois EPA objected to the partial disapproval and sent a letter to USEPA on February 11, 2009, explaining in detail the reasons for those objections. The three main issues were: 1) Illinois' removal of total nitrogen from its 2008 303(d) List as a cause of aquatic life use impairment; 2) a change in one of the guidelines Illinois uses to identify sedimentation/siltation as a cause of aquatic life use impairment that resulted in the removal of some listings of sedimentation/siltation; and 3) the reclassification of dissolved oxygen as a nonpollutant cause of impairment and the subsequent removal of this cause from Illinois' 2008 303(d) List. In the 2012 cycle, Illinois reclassified dissolved oxygen as a pollutant and all dissolved oxygen impairments appear on Illinois' 2018 List unless covered by an approved TMDL or determined to be caused by non-pollutant issues. Since USEPA has yet to make a final determination on the remaining issues, most of the other disputed waters and causes that Illinois removed from its

2008 303(d) List have not been included on subsequent Lists including Illinois' 2018 303(d) List.

Illinois EPA's 2008 Integrated Report, USEPA's decision document and Illinois EPA's detailed comments and legal analysis regarding USEPA's partial disapproval of the 2008 303(d) list and proposal to list additional waters are available on the Agency's website at <https://www2.illinois.gov/epa/topics/water-quality/watershed-management/tmdls/Pages/303d-list.aspx>.

Appendix A-4 lists all segment/pollutant combinations included in Illinois' 2016 303(d) List (submitted to USEPA on July 11, 2016) but not included on the 2018 303(d) List submission.

### **TMDL Development and Implementation Status**

In Illinois, most TMDLs are developed by individual contractors that have been selected through a competitive bidding process. Illinois EPA personnel manage the contracts. There are three stages in the TMDL development process.

#### **Stage 1- Watershed Characterization, Data Analysis, and Methodology Selection**

- Description of the watershed
- Collection/analysis of available data
- Identify methodologies, procedures, and models
- Determine if additional data is needed

#### **Stage 2- Data Collection (optional stage)\***

- Evaluate Stage 1 and collect additional data as needed
- The Agency or a contractor will collect data

#### **Stage 3- Model calibration, TMDL Scenarios, Implementation Plan**

- Develop TMDLs with data from Stages 1 and 2
- Develop and evaluate several scenarios
- Develop an implementation plan

\*Stage 2 was added in the 2003 round of TMDLs. If Stage 1 identifies data as lacking, additional data may be collected for a more accurate TMDL development.

Appendix A-6 shows the implementation status of all TMDLs for the state of Illinois and includes the TMDL watersheds in progress. We anticipate that TMDL development for each watershed will be completed approximately three years from the initiation date. Stage 1 is scheduled to take a maximum of 12 months. Stage 2 is optional, and the time frame will depend on the type and quantity of additional data required. Stage 3 has a maximum time frame of 18 months. To date, contractors are doing most of the TMDL development work for Illinois EPA.

The Illinois EPA views TMDLs as a tool for developing water-quality-based solutions that are incorporated into an overall watershed management approach. The TMDL establishes the link

between water quality standards attainment and water-quality-based control actions. For these control actions to be successful, they must be developed in conjunction with local involvement, which incorporates regulatory, voluntary and incentive-based approaches with existing applicable laws and programs. The three Illinois programs that have provided funds for implementation of TMDL watersheds include: Illinois EPA's Nonpoint Source Management Program, Illinois Priority Lake and Watershed Implementation Program (PLWIP), as well as the Illinois Department of Agriculture's Conservation Practices Program (CPP).

The Illinois EPA administers the Illinois Nonpoint Source Management Program and the PLWIP. The Illinois Nonpoint Source Management Program was developed to meet the requirements of Section 319 of the Clean Water Act (CWA). Section 319 projects can include educational programs and nonpoint source pollution control projects such as Best Management Practices (BMPs). The PLWIP supports lake protection/restoration activities at priority lakes where causes and sources of problems are apparent, project sites are highly accessible, project size is relatively small, and local entities are in a position to quickly implement needed treatments.

## Statewide Summary of Designated Use Support

### Streams

Of the total 119,244 stream miles in Illinois, 18,224 miles (15%) were assessed for attainment of at least one of these five uses: aquatic life, fish consumption, primary contact, indigenous aquatic life, and public and food processing water supply (Table C-34). Potential causes of impairment of designated uses in streams are summarized in Table C-35. Potential sources of impairment of designated uses in streams are summarized in Table C-36. Results of individual use-attainment assessments are in Appendix B-2.

**Table C-34. Statewide Individual-Use-Support Summary for Streams, Reporting Cycle 2018**

<b>Designated Use</b>	<b>Miles Designated</b>	<b>Miles Assessed</b>	<b>Miles Assessed as Fully Supporting</b>	<b>Miles Assessed as Not Supporting</b>	<b>Miles Not Assessed</b>
Aesthetic Quality	119,244	12,197	11,841	356	107,047
Aquatic Life	119,154	17,948	10,438	7,510	101,206
Fish Consumption	119,244	4,582	0	4,582	114,662
Indigenous Aquatic Life	90	90	35	55	0
Primary Contact	118,668	4,523	498	4,025	114,146
Public and Food Processing Water Supply	898	898	535	363	0

**Table C-34. Statewide Individual-Use-Support Summary for Streams,  
Reporting Cycle 2018**

<b>Designated Use</b>	<b>Miles Assessed</b>	<b>Percent of Miles Assessed</b>	<b>Percent of Miles Assessed as Fully Supporting</b>	<b>Percent of Miles Assessed as Not Supporting</b>	<b>Percent of Miles Not Assessed</b>
Aesthetic Quality	12,197	10.2	97.1	2.9	89.8
Aquatic Life	17,948	15.1	58.2	41.8	84.9
Fish Consumption	4,582	3.8	0	100	96.2
Indigenous Aquatic Life	90	100	38.8	61.2	0
Primary Contact	4,523	3.8	11.0	89.0	96.2
Public and Food Processing Water Supply	898	100	59.6	40.4	0

Note: Slight rounding errors may exist.

**Table C-35. Summary of Potential Causes of All Use Impairments in Streams,  
Reporting Cycle 2018**

<b>Potential Cause of Impairment</b>	<b>Stream Miles Impaired</b>
Oxygen, Dissolved	4,602
Mercury	4,157
Fecal Coliform	4,046
Polychlorinated biphenyls	2,909
Alteration in stream-side or littoral vegetative covers	2,813
Phosphorus (Total)	1,900
Loss of Instream Cover	1,759
Sedimentation/Siltation	1,601
Changes in Stream Depth and Velocity Patterns	994
Total Suspended Solids (TSS)	884
Other flow regime alterations	815
Cause Unknown	795
pH	600
Iron	535
Manganese	505
Chloride	472
Aquatic Algae	424
Atrazine	303
Dioxin (including 2,3,7,8-TCDD)	168
Fish-Passage Barrier	167
Aldrin	157

**Table C-35. (Cont.) Summary of Potential Causes of All Use Impairments in Streams,  
Reporting Cycle 2018**

<b>Potential Cause of Impairment</b>	<b>Stream Miles Impaired</b>
Hexachlorobenzene	156
Bottom Deposits	152
Arsenic	136
Methoxychlor	129
Aquatic Plants (Macrophytes)	129
Chlordane	99
DDT	98
Temperature, water	89
Nickel	78
Alterations in wetland habitats	67
Zinc	64
Copper	60
Color	60
Simazine	58
Endrin	58
Low flow alterations	54
Sludge	51
Sulfates	49
Nitrogen, Nitrate	49
Barium	43
Turbidity	42
Ammonia (Total)	41
Cadmium	35
Odor	34
Silver	34
Total Dissolved Solids	30
Chromium (total)	29
Nonnative Fish, Shellfish, or Zooplankton	28
Visible Oil	28
Boron	27
Lindane	22
Dieldrin	21
Debris/Floatables/Trash	20
Chlorine	14
Heptachlor	13
Fluoride	13
Terbufos	12

**Table C-35. (Cont.) Summary of Potential Causes of All Use Impairments in Streams,  
Reporting Cycle 2018**

<b>Potential Cause of Impairment</b>	<b>Stream Miles Impaired</b>
Lead	11
Petroleum Hydrocarbons	11
.alpha.-BHC	8
Ammonia (Un-ionized)	6
Oil and Grease	4
Fish Kills	4
Ethanol	3

**Table C-36. Summary of Potential Sources of All Use Impairments in Streams,  
Reporting Cycle 2018**

<b>Potential Source of Impairment</b>	<b>Stream Miles Impaired</b>
Atmospheric Deposition - Toxics	3,900
Crop Production (Crop Land or Dry Land)	3,008
Channelization	2,577
Agriculture	2,502
Loss of Riparian Habitat	1,906
Municipal Point Source Discharges	1,168
Urban Runoff/Storm Sewers	1,165
Animal Feeding Operations (NPS)	623
Streambank Modifications/destabilization	612
Natural Sources	520
Dam or Impoundment	496
Contaminated Sediments	481
Impacts from Hydrostructure Flow Regulation/modification	474
Habitat Modification - other than Hydromodification	327
Surface Mining	315
Livestock (Grazing or Feeding Operations)	312
Combined Sewer Overflows	260
Site Clearance (Land Development or Redevelopment)	217
Acid Mine Drainage	205
Impacts from Abandoned Mine Lands (Inactive)	195
Highway/Road/Bridge Runoff (Non-construction Related)	179
Petroleum/natural Gas Activities	167
Upstream Impoundments (e.g., PI-566 NRCS Structures)	150
Irrigated Crop Production	147
Non-irrigated Crop Production	63
Mine Tailings	52
Drainage/Filling/Loss of Wetlands	51
Runoff from Forest/Grassland/Parkland	46
Industrial Point Source Discharge	37



**Table C-36. (Cont.) Summary of Potential Sources of All Use Impairments in Streams**

Potential Source of Impairment	Stream Miles Impaired
Inappropriate Waste Disposal	37
Coal Mining (Subsurface)	35
Municipal (Urbanized High-Density Area)	29
Golf Courses	24
Silviculture Harvesting	22
Pesticide Application	22
Other Recreational Pollution Sources	21
Dredging (E.g., for Navigation Channels)	20
Sanitary Sewer Overflows (Collection System Failures)	19
Wet Weather Discharges (Point Source and Combination of Stormwater, SSO or CSO)	13
Subsurface (Hardrock) Mining	13
Industrial Land Treatment	7
Unpermitted Discharge (Domestic Wastes)	7
Sediment Resuspension (Contaminated Sediment)	6
Highways, Roads, Bridges, Infrastructure (New Construction)	5
Landfills	4
RCRA Hazardous Waste Sites	4
Managed Pasture Grazing	3
Spills from Trucks or Trains	3

### Freshwater Lakes

Of the total 318,477 acres of lakes and ponds in Illinois, 153,278 acres were assessed for at least one of the following six uses: *aquatic life*, *fish consumption*, *primary contact*, *public and food processing water supply*, *aesthetic quality*, and *indigenous aquatic life* uses (Table C-37). *Aquatic life* use was attained (i.e., "Fully Supporting") in 90% of lake acres assessed for this use. Tables C-38 and C-39 provide summaries of causes and sources of use impairments for inland lakes. Table C-40 provides a summary of Trophic Status for all inland lakes.

**Table C-37. Statewide Individual Use-Support Summary for Inland Lakes,  
Reporting Cycle 2018**

Designated Use	Statewide Designate <sup>(1)</sup>	Acres				
		Assessed	Fully Supporting	Not Supporting	Not Assessed	Insufficient Information
Aesthetic Quality	318,477	146,356	14,623	131,733	166,012	6,109
Aquatic Life	316,877	146,557	131,978	14,578	164,211	6,109
Fish Consumption	318,477	125,197	4,000	121,197	193,280	0

**Table C-37. (Cont.) Statewide Individual Use-Support Summary for Inland Lakes,  
Reporting Cycle 2018**

Designated Use	Statewide Designate <sup>(1)</sup>	Acres				
		Assessed	Fully Supporting	Not Supporting	Not Assessed	Insuf. Info.
Fish Consumption	318,477	125,197	4,000	121,197	193,280	0
Indigenous Aquatic Life	1,600	1,600	1,600	0	0	0
Primary Contact	316,877	1,814	1,092	722	315,063	0
Public and Food Processing Water Supply	74,349	74,349	68,478	5,871	0	0

Designated Use	Acres Assessed	Percent of Statewide Acres Assessed	Percent of Assessed Acres		Percent of Statewide Acres	
			Fully Supporting	Not Supporting	Not Assessed	Insuf. Info
Aesthetic Quality	146,356	46	10	90	52	2
Aquatic Life	146,557	46.2	90	10	51.8	2
Fish Consumption	125,197	39.3	3.2	96.8	60.7	0
Indigenous Aquatic Life	1,600	100	100	0	0	0
Primary Contact	1,814	0.6	60.2	39.8	99.4	0
Public and Food Processing Water Supply	74,349	100	92.1	7.9	0	0

Designated Use <sup>(1)</sup>	Number of Lakes Assessed	Percent of Statewide Lakes Assessed	Percent of Assessed Lakes		Percent of Statewide Lakes	
			Fully Supporting	Not Supporting	Not Assessed	Insuf. Info
Aesthetic Quality	386	0.4	15.5	84.5	99.5	0.1
Aquatic Life	386	0.4	89.9	10.1	99.5	0.1
Fish Consumption	141	0.2	0.7	99.3	99.8	0
Indigenous Aquatic Life	1	100	100	0	0	0
Primary Contact	15	0	46.7	53.3	100	0
Public and Food Processing Water Supply	64	100	78.1	21.9	0	0

Note: Insuf. Info = insufficient information. Numbers and percentages may not add up due to rounding.

1. Statewide, Illinois has 91,456 lakes and ponds designated for general uses, one lake designated for Indigenous Aquatic Life Use, and 64 lakes designated for Public and Food Processing Water Supply Use.

**Table C-38. Summary of Potential Causes of All Use Impairments in  
Illinois Inland Lakes, Reporting Cycle 2018**

<b>Potential Cause of Impairment</b>	<b>Acres Impaired</b>
Phosphorus (Total)	130,092
Mercury	118,548
Total Suspended Solids (TSS)	109,133
Polychlorinated biphenyls	27,302
Aquatic Algae	23,574
Oxygen, Dissolved	13,946
Aquatic Plants (Macrophytes)	8,626
Cause Unknown	6,579
Chlordane	4,820
pH	4,389
Sedimentation/Siltation	4,246
Silver	4,173
Aldrin	3,324
Nitrogen, Nitrate	3,072
Turbidity	1,531
Simazine	1,388
Terbufos	929
Manganese	915
Fecal Coliform	722
Nonnative Fish, Shellfish, or Zooplankton	634
Atrazine	599
Cadmium	524
Endrin	524
Zinc	524
Nickel	325
Fluoride	172
Hexachlorobenzene	172
Non-Native Aquatic Plants	86
Odor	75
Color	35
Debris/Floatables/Trash	35
Total Dissolved Solids	22
Copper	4

**Table C-39. Summary of Potential Sources of All Use Impairments in Illinois Inland Lakes, Reporting Cycle 2018**

<b>Potential Source of Impairment</b>	<b>Acres Impaired</b>
Source Unknown	133,763
Atmospheric Deposition - Toxics	104,007
Crop Production (Crop Land or Dry Land)	95,258
Littoral/shore Area Modifications (Non-riverine)	91,537
Runoff from Forest/Grassland/Parkland	86,632
Other Recreational Pollution Sources	76,957
Internal Nutrient Recycling	41,754
Urban Runoff/Storm Sewers	40,706
Agriculture	28,289
Municipal Point Source Discharges	26,602
Animal Feeding Operations (NPS)	25,355
Contaminated Sediments	12,874
Golf Courses	11,037
RCRA Hazardous Waste Sites	9,156
On-site Treatment Systems (Septic Systems and Similar Decentralized Systems)	9,054
Industrial Point Source Discharge	7,048
Dredging (e.g., for Navigation Channels)	5,966
Yard Maintenance	2,522
Waterfowl	2,243
Rural (Residential Areas)	1,928
Dam or Impoundment	1,513
Impacts from Hydrostructure Flow Regulation/modification	940
Other Turf Management	816
Natural Sources	778
Pesticide Application	752
Highway/Road/Bridge Runoff (Non-construction Related)	727
Site Clearance (Land Development or Redevelopment)	588
Residential Districts	538
Streambank Modifications/destabilization	235
Wet Weather Discharges (Point Source and Combination of Stormwater, SSO or CSO)	225
Sediment Resuspension (Clean Sediment)	222
Landfills	172
Wildlife Other than Waterfowl	148
Lake Fertilization	143
Impervious Surface/Parking Lot Runoff	132
Unspecified Urban Stormwater	129

**Table C-39. (Cont.) Summary of Potential Sources of All Use Impairments in Illinois Inland Lakes, Reporting Cycle 2018**

<b>Potential Source of Impairment</b>	<b>Acres Impaired</b>
Introduction of Non-native Organisms (Accidental or Intentional)	112
Municipal (Urbanized High-Density Area)	102
Pollutants from Public Bathing Areas	96
Specialty Crop Production	71
Other Spill Related Impacts	40
Livestock (Grazing or Feeding Operations)	39
Other Marina/Boating On-vessel Discharges	23
Permitted Silvicultural Activities	11
Upstream Impoundments (e.g., PL-566 NRCS Structures)	4

**Table C-40. Trophic Status – All Illinois Freshwater Lakes, Reporting Cycle 2018**

<b>Trophic Status</b>	<b>Number of Lakes</b>	<b>Acres</b>
Hypereutrophic (TSI $\geq 70$ )	128	67,543
Eutrophic (TSI $\geq 50$ & $< 70$ )	301	78,357
Mesotrophic (TSI $\geq 40$ & $< 50$ )	64	8,149
Oligotrophic (TSI $< 40$ )	11	390
Unknown	90,952	164,038
Total:	91,456	318,477

### **Significant Publicly Owned Lakes**

“Significant Publicly Owned Lakes” are defined as having 20 acres or more surface area; however, some smaller lakes, that provide substantial public access and benefits to the citizens of Illinois, have also been defined as ‘significant.’ For summary information regarding “significant publicly owned lakes,” refer to Appendix C.

### **Lake Michigan**

Table C-41 provides a summary of Lake Michigan assessment results for each individual use: aquatic life, fish consumption, primary contact, aesthetic quality, and public and food processing water supply. Tables C-42 and C-43 provide summaries of causes and sources of use impairment for Lake Michigan-basin waters. Of the total 1,526 square miles of Lake Michigan open waters in Illinois jurisdiction, only 196 square miles were assessed. All 196 square miles were rated as Fully Supporting for aquatic life, primary contact, aesthetic quality, and public and food processing water supply use. Complete assessment results for individual segments are shown in Appendix B-4.

**Table C-41. Individual Use-Support Summary for Lake Michigan-Basin Waters,  
Reporting Cycle 2018**

**Lake Michigan Harbors (Square Miles)**

Designated Use	Total Size	Total Assessed		Size Fully Supporting	Size Not Supporting	Size Not Assessed
		Size	%			
Aesthetic Quality	2.26	0.46	20.4	0.40	0.06	1.8
Aquatic Life	2.26	2.26	100	2.20	0.06	0
Fish Consumption	2.26	0.28	12.4	0	0.28	1.98
Primary Contact	2.26	0.78	34.5	0.78	0	1.48

**Lake Michigan Open Water (Square Miles)**

Designated Use <sup>(1)</sup>	Total Size	Total Assessed		Size Fully Supporting	Size Not Supporting	Size Not Assessed
		Size	%			
Aesthetic Quality	1,526	196	12.8	196	0	1,330
Aquatic Life	1,526	196	12.8	196	0	1,330
Fish Consumption	1,526	196	12.8	0	196	1,330
Primary Contact	1,526	196	12.8	196	0	1,330
Public and Food Processing Water Supplies	196	196	100	196	0	0

**Lake Michigan Shoreline (Miles)**

Designated Use <sup>(1)</sup>	Total Size	Total Assessed		Size Fully Supporting	Size Not Supporting	Size Not Assessed
		Size	%			
Aesthetic Quality	64	0	0	0	0	64
Aquatic Life	64	0	0	0	0	64
Fish Consumption	64	64	100	0	64	0
Primary Contact	64	64	100	0	64	0

1. Illinois has jurisdiction over 1,526 square miles of Lake Michigan open water, 3.88 square miles of Lake Michigan harbors, and 64 miles of Lake Michigan shoreline, which are covered under the Lake Michigan Basin Water Quality Standards. Also, 196 square miles of Lake Michigan are designated for Public and Food Processing Water Supply Use.

**Table C-42. Statewide Summary of Potential Causes of All Use Impairments in Lake Michigan-Basin Waters, Reporting Cycle 2018**

**Lake Michigan Harbors (Square Miles)**

<b>Potential Cause of Impairment</b>	<b>Total Size (square miles)</b>
Mercury	0.28
Polychlorinated biphenyls	0.28
Arsenic	0.06
Bottom Deposits	0.06
Cadmium	0.06
Chromium (total)	0.06
Copper	0.06
Lead	0.06
Phosphorus (Total)	0.06
Zinc	0.06

**Lake Michigan Open Water (Square Miles)**

<b>Potential Cause of Impairment</b>	<b>Total Size</b>
Mercury	196
Polychlorinated biphenyls	196

**Lake Michigan Shoreline (Miles)**

<b>Potential Cause of Impairment</b>	<b>Total Size</b>
<i>Escherichia coli</i>	64
Mercury	64
Polychlorinated biphenyls	64

**Table C-43. Statewide Summary of Potential Sources of All Use Impairments in Lake Michigan-Basin Waters, Reporting Cycle 2018**

**Lake Michigan Harbors (Square Miles)**

<b>Source</b>	<b>Total Size</b>
Atmospheric Deposition - Toxics	0.28
Source Unknown	0.28
Contaminated Sediments	0.06
Industrial Point Source Discharge	0.06
Urban Runoff/Storm Sewers	0.06

**Lake Michigan Open Water (Square Miles)**

<b>Source</b>	<b>Total Size</b>
Atmospheric Deposition - Toxics	196
Source Unknown	196

**Lake Michigan Shoreline (Miles)**

<b>Source</b>	<b>Total Size</b>
Atmospheric Deposition - Toxics	64
Source Unknown	64
Combined Sewer Overflows	0.76
Urban Runoff/Storm Sewers	0.76



## PART D: PUBLIC PARTICIPATION

The Agency solicits information from the public to be used in the use assessment process as described in Section A-3.

We also solicited public input on the assessment results. A draft of the 2018 Integrated Report was placed on the Illinois EPA website (<https://www2.illinois.gov/epa/topics/water-quality/watershed-management/tmdls/Pages/303d-list.aspx>) for public review/comment on June 14, 2018, and notices were sent out to all known interested parties of its availability. On July 11, 2018, the public comment period was extended from the previous closing date of July 16, 2018, to the new public comment period closing date of July 31, 2018. Public comments were accepted from June 15, 2018, until 11:59 p.m., July 31, 2018. After the close of the public comment period, the Agency discovered that use-attainment determinations and causes of use impairment for 33 specific stream segments were inaccurately represented in the previously public-noticed draft of the 2018 Integrated Report. A table was developed to show the corrections to the inaccuracies. A 15-day comment period was opened for these 33 specific stream segments. The notice of 15-day public comment period, with the table of corrections attached, was posted on the Illinois EPA Website (<https://www2.illinois.gov/epa/public-notices/Pages/general-notices.aspx>) and distributed to all parties that received the previous public notice as well as those that requested to be added to the contact list for the Integrated Report on May 8, 2019. Public comments for the 15-day comment period were accepted from May 9, 2019, until 11:59 p.m., May 24, 2019. The Agency reviewed all pertinent comments received during both public comment periods and incorporated changes into the existing document. Responses to comments are documented in a Responsiveness Summary (Appendix F).

For TMDL development, the Illinois EPA has a comprehensive approach offering opportunities for stakeholders to participate, review, and comment throughout the TMDL development process. For watersheds in which the development of TMDLs is currently underway, the Illinois EPA holds two public meetings during the Stage 1 and Stage 3 TMDL development process. All public meetings are held at a location within the effected watershed to enable greater local participation. Illinois EPA and its TMDL contractor typically provide an update of the progress made. The final public meeting held within the watershed is on the draft TMDL report. The public/stakeholders have an opportunity to comment 30 days prior to the meeting date, during the meeting and generally 30 days after the meeting. In addition, where applicable, the report is distributed to the Illinois Department of Agriculture, the USDA Natural Resources Conservation Service (NRCS), Soil and Water Conservation Agencies, and other state and federal partners prior to release to the public for technical review and input

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