2.0 WATER QUALITY, PUBLIC HEALTH, AND REGULATORY ISSUES

Element 01 | Water Quality, Public Health & Regulatory Issues to be addressed in the Plan

In accordance with Element 1 of USEPA's IPF, this section describes the water quality, public health and regulatory issues that are considered in Akron's integrated planning process.

These critical issues include current water quality impairments and threats to public health in Akron's waterways and the City's challenges in meeting CWA requirements, now and in the future. Based on previous studies and current data, the three primary focus areas for continued restoration of the waterways are: recreational use, flow, and habitat-related aquatic life use impairments.

This section provides a general description of the watersheds that drain upstream of Akron and recommendations for addressing the impairments in the waterways. Historic water quality sampling data (*E. coli* bacteria) is summarized and compared to Ohio's Recreational Water Quality Criteria (RWQC) as well as data collected under the AWR Program in 2014. Data collected in the Cuyahoga Valley National Park (CVNP), which is downstream of Akron, is also discussed in this section. The development of the City's water quality model is described below, and the potential sources of bacteria in the watersheds are discussed. The water quality model was used to evaluate the water quality impacts of alternative LTCP projects, the results of which are presented in Section 6, Integrated Planning Results.

The section also describes the City's challenges in complying with all current and future CWA requirements. This includes the NPDES permits, the CD, USEPA's CSO Control Policy,[15] nutrient controls, Ohio's Integrated Water Quality and Assessment Report,[16] and stormwater regulations. The section concludes with a discussion of public health threats and sensitive areas and proposes metrics for evaluating and meeting public health and water quality objectives.

2.1 Cuyahoga and Tuscarawas River Watersheds Water Quality Issues

The City, which is separated by the Watershed Divide, is tributary to the Great Lakes and Ohio River drainage basins. The four major subbasins within the City consist of approximately 62 square miles. The Cuyahoga River and Little Cuyahoga subbasins, north of the Watershed Divide, are tributary to the Cuyahoga River which flows into Lake Erie and the Great Lakes Basin. The Mud Run and Pigeon Creek Subbasins, which are southwest of the Watershed Divide, are tributary to the Tuscarawas River which flows to the Muskingum River, Ohio River, and eventually the Mississippi River. All of the City's CSOs discharge to the Cuyahoga River watersheds whereas the Mud Run Pump Station is located in the Tuscarawas watershed. The locations of the Cuyahoga and Tuscarawas watersheds are shown in Figure 2-1.

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[15] 59 Fed. Reg. 18688.

[16] Ohio EPA, Division of Surface Water. March 20, 2012. *Ohio 2012 Integrated Water Quality Monitoring and Assessment Report*.

Figure 2-1. Cuyahoga River and Tuscarawas River Watershed Location Map

The Cuyahoga River drains a total of 812 square miles while flowing through six counties. Municipalities that are partially or fully in the Cuyahoga River watershed include (in upstream to downstream order): City of Kent, City of Stow, City of Munroe Falls, City of Cuyahoga Falls, City of Akron, and City of Cleveland. A significant portion (42%) of the watershed is upstream of Akron.

The Tuscarawas River flows through 13 counties and drains 2,589 square miles. The largest municipalities located in the Tuscarawas River watershed include the City of Akron, City of Barberton, City of Canton, City of Massillon, City of Wooster, City of New Philadelphia, and City of Coshocton.

For watershed planning purposes, the Cuyahoga River watershed is typically divided into three subbasins: the Upper, from the headwaters to the Lake Rockwell Dam; the Middle, from below the Lake Rockwell Dam to Waterworks Park[17] (the location of the former Munroe Falls Dam); and the Lower, from below the Waterworks Park to the mouth at Cleveland and Lake Erie.[18]

Each of the Cuyahoga River subbasins is made up of smaller subbasins as shown in Figure 2-2. The portion of the Cuyahoga River in Akron and the Little Cuyahoga River are within the Lower Cuyahoga River subbasin. Twenty-two miles of the Cuyahoga River flows through the CVNP downstream of Akron.

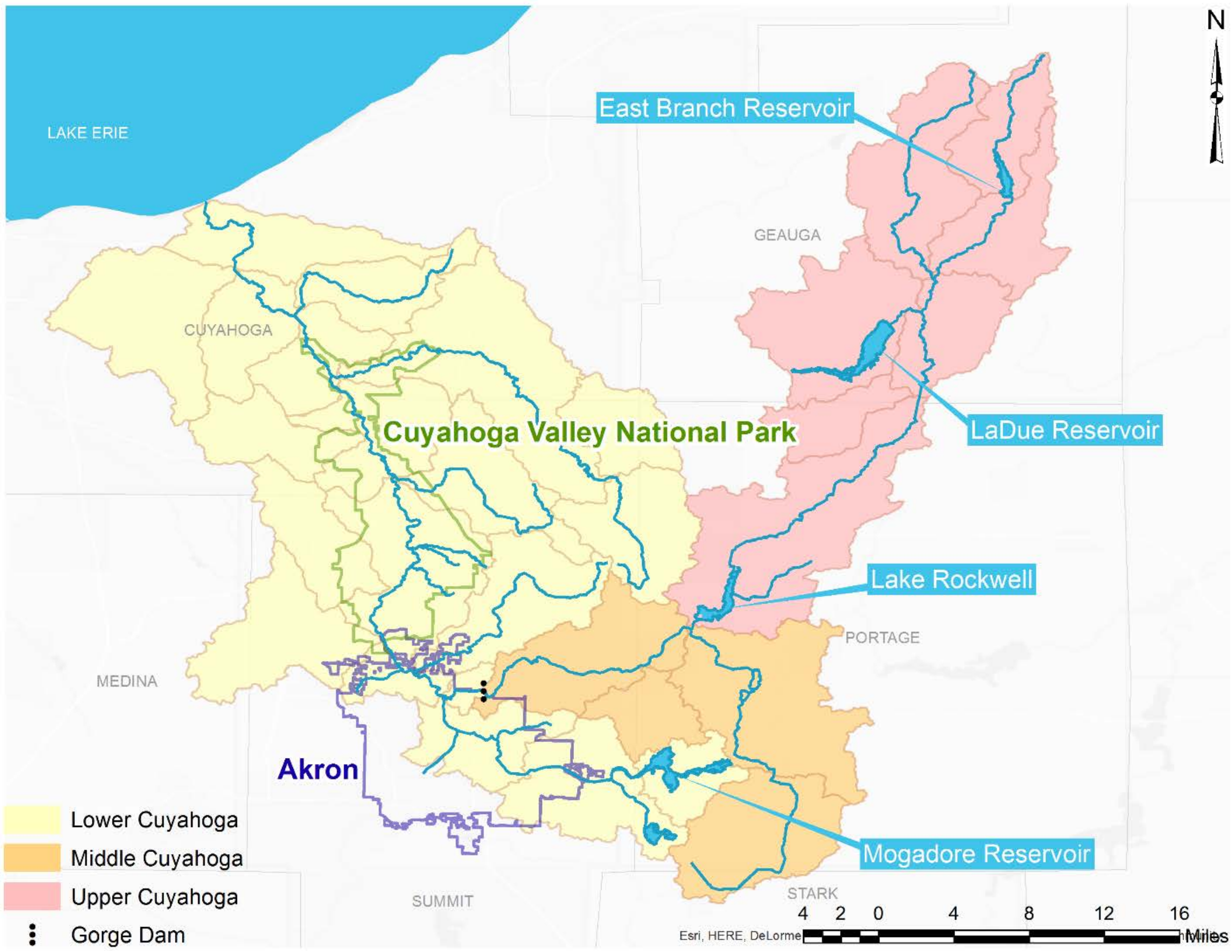

Figure 2-2. Upper, Middle, and Lower Cuyahoga River Subbasins and Watersheds

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[17] In some instances, the boundary of the Middle Cuyahoga has been defined as the Gorge Dam (historically referenced as "the Ohio Edison Dam") instead of Waterworks Park.

[18] Peck, M. December 2012. *Middle Cuyahoga River Watershed Action Plan*. Akron, Ohio: NEFCO.

According to a historical timeline developed by the Friends of the Crooked River, a stewardship group of the Cuyahoga River, the watershed has a long history of being used for agriculture, industrial and urban land use, canals, and transport. Numerous dams have also been constructed in the watershed. As such, the watershed's impairments are numerous and widespread. These impairments are attributable not only to discrete and diffuse sources of pollutants, but also significant flow and habitat alterations.

The watershed's water quality impairments impact aquatic life (fish and macroinvertebrates or bugs) and recreational uses (e.g., swimming, kayaking, and canoeing). This section describes those impairments and the steps that Ohio EPA, the City, and others have taken to link the sources of pollutants and flow alterations with the impairments and identify remedies. In this Integrated Plan, emphasis is placed on the recreational use impairments (the focus of the LTCP) to put the impact of the CSOs in perspective with other sources of bacteria in the watershed. The CSO impacts are also evaluated further in Section 6.3.3, Receiving Water Quality Scenario Evaluation, using the City's Water Quality Model.

2.1.1 Integrated Report and Total Maximum Daily Loads (TMDLs)

The Ohio 2012 Integrated Water Quality Monitoring and Assessment Report (Integrated Report) prepared by Ohio EPA indicates the general condition of Ohio's waters and identifies waters that are not meeting water quality goals.[19]

The Ohio EPA's Integrated Report satisfies the requirements for both CWA Section 305(b) for biennial reports on the condition of the State's waters and CWA Section 303(d) for a prioritized list of impaired waters. From the approved 2012 Integrated Report, the Cuyahoga River meets the aquatic life standards in 77% of the river, partially meets standards in 13% of the river, and does not meet standards in 10% of the river. In the *2002 Monitoring and Assessment Report*, which is Ohio's first integrated monitoring and assessment report, the Cuyahoga River met the aquatic life standards in 22% of the river, partially met standards in 49% of the river, and did not meet standards in 29% of the river.[20]

For each area of impaired water, Ohio EPA typically prepares a TMDL analysis, including additional stream surveys and water quality modeling, to recommend implementation actions to mitigate the impairments. Ohio EPA has prepared three TMDL reports for the Cuyahoga River watershed; one each for the Upper, Middle, and Lower portions of the watershed.[21, 22, 23]

The Middle Cuyahoga River TMDL report was Ohio's first TMDL report to be approved by USEPA. Table 2-1 provides a summary of the Cuyahoga River TMDLs. The table shows the major causes of aquatic life use impairment, major sources of pollutants, and where TMDL targets have been for the Upper, Middle, and Lower portions of the Cuyahoga River. Given that

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[19] Ohio EPA, Division of Surface Water. March 20, 2012. *Ohio 2012 Integrated Water Quality Monitoring and Assessment Report*.
[20] Ohio EPA, Division of Surface Water. October 1, 2002. *Ohio 2002 Integrated Water Quality Monitoring and Assessment Report*.
[21] Ohio EPA, Division of Surface Water. September 2004. *Total Maximum Daily Loads for the Upper Cuyahoga River*.
[22] Ohio EPA, Division of Surface Water. March 2000. *Total Maximum Daily Loads for the Middle Cuyahoga River*.
[23] Ohio EPA, Division of Surface Water. September 2003. *Total Maximum Daily Loads for the Lower Cuyahoga River*.

a portion of the City's service area is in the Tuscarawas River watershed, information from the Tuscarawas River watershed is also included in Table 2-1.[24]

Table 2-1. Total Maximum Daily Loads for the Cuyahoga River and Tuscarawas River Watersheds

TMDL Component		Watershed (Date of TMDL)			
		Cuyahoga River			Tuscarawas River (7/2009)
		Upper (9/2004)	Middle (3/2000)	Lower (9/2003)	
Major Causes of Aquatic Life Use Impairment	Nutrient/organic enrichment	●	●	●	●
	Low dissolved oxygen	●	●	●	●
	Flow alteration (hydromodification)	●	●	●	●
	Habitat alteration	●	●		●
	Toxicity			●	
	Nutrients			●	●
Major Sources	Impoundments	●	●		
	Flow alterations	●	●		●
	Municipal discharges	●	●	●	●
	Combined sewer overflows			●	
	Urban runoff			●	●
	Industrial discharges	●		●	
	Septic systems	●			●
	Agriculture	●			●
	Water supply reservoir releases	●			
	Channelization	●			●
	Natural conditions	●			
	Acid mine drainage				●
TMDL Targets	Total phosphorus	●		●	●
	Total nitrogen			●	
	Dissolved oxygen	●	●	●	●
	Bacteria			●	●
	Biological and habitat indices	●		●	●

2.1.2 Aquatic Life Use Impairments

<u>Positive Actions Taken</u>

The recommended implementation actions to improve aquatic life use identified in the Cuyahoga River and Tuscarawas River TMDLs are listed in Table 2-2.

The Lower Cuyahoga River TMDL states: "The CSO allocations were determined based on the LTCP for Akron and Cleveland" and "These values are based on the DRAFT Akron Long Term

[24] Ohio EPA, Division of Surface Water. July 27, 2009. *Total Maximum Daily Loads for the Tuscarawas River Watershed.*

Control Plan as of December, 2002. The 2002 Akron Plan was based on 94% capture with the CSOs in the range of 0 (for separation projects) to 13 after implementation. Any changes that are required to finalize the Akron LTCP would need to be reflected here. The intent of the TMDL is to reflect the LTCP not to drive it." In the TMDL, Ohio EPA allocated 0.07% of the total allowable fecal coliform load to Akron's CSOs and bypass. The majority (99.8%) of the load was allocated to runoff and 0.10% was allocated to septic system loads.

Table 2-2. Recommended Implementation Actions for the Cuyahoga River and Tuscarawas River Watersheds

Recommended Implementation Actions	Watershed (Date of TMDL)			
	Cuyahoga River			Tuscarawas River (7/2009)
	Upper (9/2004)	Middle (3/2000)	Lower (9/2003)	
Long term operation plans for reservoir releases	●			
Modify dams and flow releases		●		●
Decrease oxygen-consuming pollutant loads		●		●
Habitat protection and restoration	●		●	●
Septic system improvements	●		●	●
Point source controls	●		●	●
Agricultural conservation practices				●
Develop Acid Mine Drainage Abatement Plans				●
Long-term control plans for CSOs			●	
Urban runoff controls			●	●
Public education	●		●	●

A number of recommended implementation actions have been completed and the attainment of aquatic life uses in the rivers has improved. These actions include:

- Implementation of elements in the Akron LTCP, most notably including the installation of the Cuyahoga Street Storage Facility (CSSF) that effectively eliminated nearly one-third of the total annual CSO overflow volumes from the City's system.
- Maintaining minimum releases from Lake Rockwell Dam by the City of Akron on a volunteer basis.
- Modification of the Kent Dam.
- Removal of the Munroe Falls Dam.
- Demolition of the Sheraton and LeFever Dams in the City of Cuyahoga Falls.

By removing dams, a river ecosystem can return to natural conditions and improve the habitat by providing uninhibited flow, increasing the oxygen content in the water, and allowing for fish and mussel passage. Figure 2-3 presents the locations of dams within the Cuyahoga River watershed.

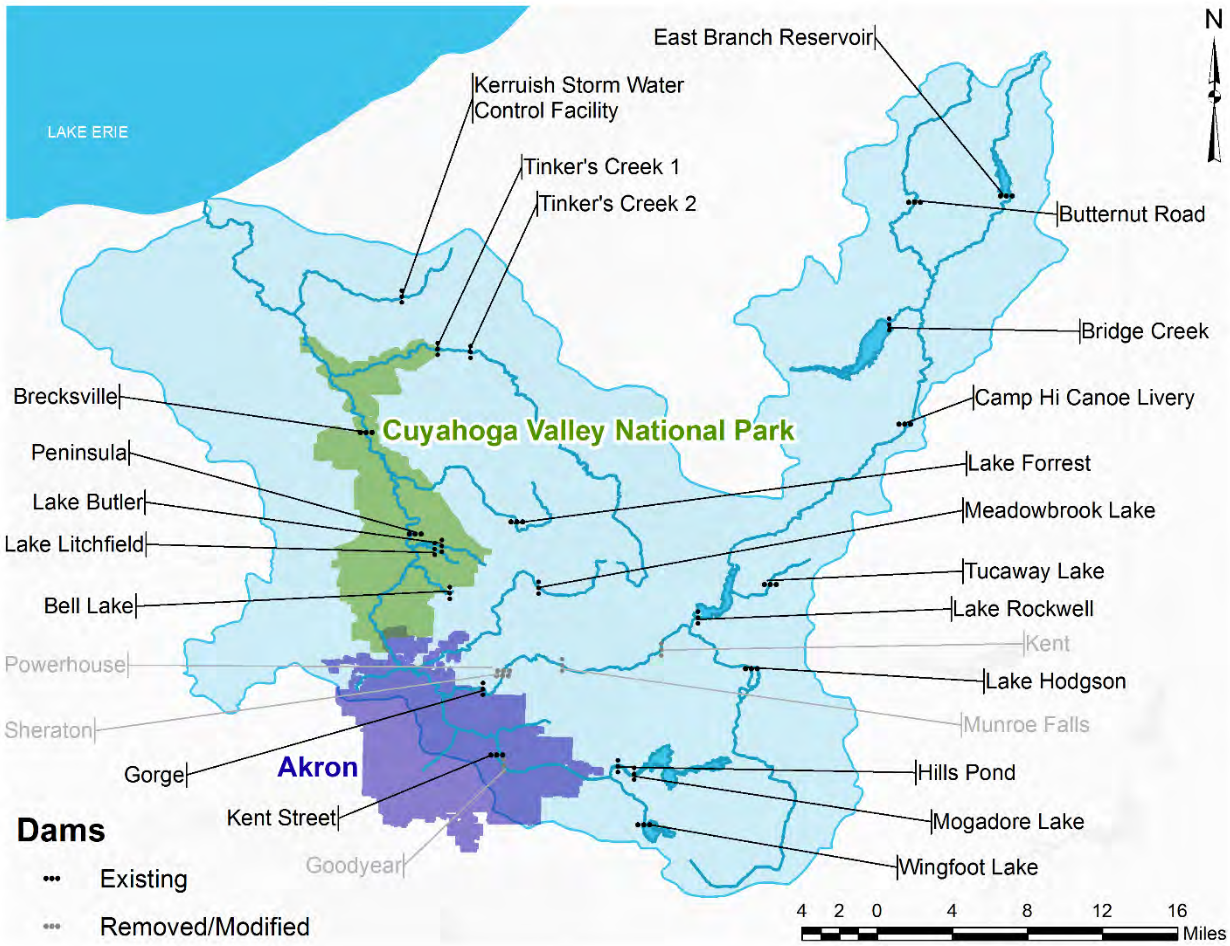

Figure 2-3. Locations of Dams in the Cuyahoga River Watershed

The Middle Cuyahoga River downstream of the Kent Dam is now in full aquatic life attainment. However, the portion of the river below Munroe Falls is experiencing a longer recovery period following the dam removal, and has not yet reached full attainment.[25]

Several actions have also been implemented, are underway, or are proposed to improve the Little Cuyahoga River. These actions include, but are not limited to:

- Restoration, by the City, of approximately 4,500 feet of the Little Cuyahoga River from east of Seiberling Street to the Goodyear (or Kelly Avenue) Dam. This approximately $5 million project included restoration of the stream channel and riparian corridor and modification (i.e., lowering) of the Goodyear dam. Pre- and post-evaluations of the project have shown improvements in both habitat (Qualitative Habitat Evaluation Index) and fish community (Index of Biotic Integrity).

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[25] Ohio EPA. August 6, 2008. *Cuyahoga River Aquatic Life Use Attainment Following the Kent and Munroe Falls Dam Modifications: Portage and Summit Counties*. Ohio EPA Biological and Water Quality Report NEDO/2008-08-01.

- Restoration of Haley's Run, a tributary to the Little Cuyahoga River that discharges 0.8 miles upstream of Akron's water quality model domain. This project, which was funded by the Lockheed Martin Corporation, included the restoration of approximately 2,000 feet of stream channel, one acre of wetlands, 1.6 acres of floodplain, and 3.4 acres of upland areas.[26] Pre- and post-construction evaluations of this project have also indicated improvements of aquatic habitat.[27]

- On-going development of the Little Cuyahoga River Balanced Growth Plan. The City, along with other regional communities is participating in this effort to develop a comprehensive plan to address water quality issues at a watershed scale. The effort is being led by the Northeast Ohio Four County Regional Planning and Development Organization (NEFCO).

- Planned restoration of the Little Cuyahoga River at the outfall of the proposed Ohio Canal Interceptor Tunnel (OCIT). This restoration effort will include the removal of a utility crossing that is currently acting as a low-head dam.

- Restoration of approximately 407 linear feet of Camp Brook using natural channel design techniques as part of the Camp Brook Storage Basin (CSO Rack 12) project.

- Planned removal of an existing utility crossing causing damming in the Little Cuyahoga River as part of the proposed Uhler Optimized Conveyance Alternative. In its place, the City will construct an aerial crossing to convey the flow to the Little Cuyahoga Interceptor.

- Collaboration with the United States Army Corps of Engineers (USACE) to conduct a study of the Little Cuyahoga River to identify potential riparian and aquatic ecosystem restoration alternatives. The Detailed Project Report and Environmental Assessment (DPR/EA) measures and documents alternatives in detail and, through coordination between the USACE, the non-Federal Local Sponsor (City of Akron), and participating agencies, develops a recommended National Ecosystem Restoration plan for the proposed study site. The limits for this study are south of East North Street (river mile (RM) 3.49) to East Market Street (RM 5.44). The study is currently 75% complete. In 2014, the City was granted Clean Ohio funds for land acquisition to accomplish a portion of the work outlined in the DPR/EA. The land that is acquired will be set aside for future restoration of the river in the project area.

In addition, the mainstem of the Cuyahoga River has seen significant improvements in ecological condition in recent years. In the early 1970s, the biological community of the Cuyahoga River had been severely impacted by pollution and consisted mostly of pollution tolerant fish and macroinvertebrate species. In 1973 and 1974 there were only 30 species present near the City of Independence and only 10% of the species between Akron and Independence were not pollution tolerant.

Biological monitoring in recent years has indicated that the fish and macroinvertebrate communities in many segments of the river are attaining or partially attaining the biocriteria associated with the Warm Water Habitat aquatic life use designation assigned by the Ohio EPA. In 2008, the Index of Biotic Integrity (IBI) score at RM 16 (downstream of Tinkers Creek in the CVNP) was in the Very Good range (Figure 2-4) and the Modified Index of Wellbeing (MIwb)

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[26] EnviroScience, Inc. December 31, 2011. *Haley's Run Restoration Report*.
[27] *Ibid.*

score was in the Exceptional range (Figure 2-5). This progress is attributed to improvements in wastewater collection and treatment, wet weather overflow control, the implementation of industrial pretreatment, and many other remedial actions. These improvements have led to the Ohio EPA requesting delisting of river segments for the impairments of degraded fish populations, degraded benthos, loss of fish habitat, and fish tumors or other deformities.

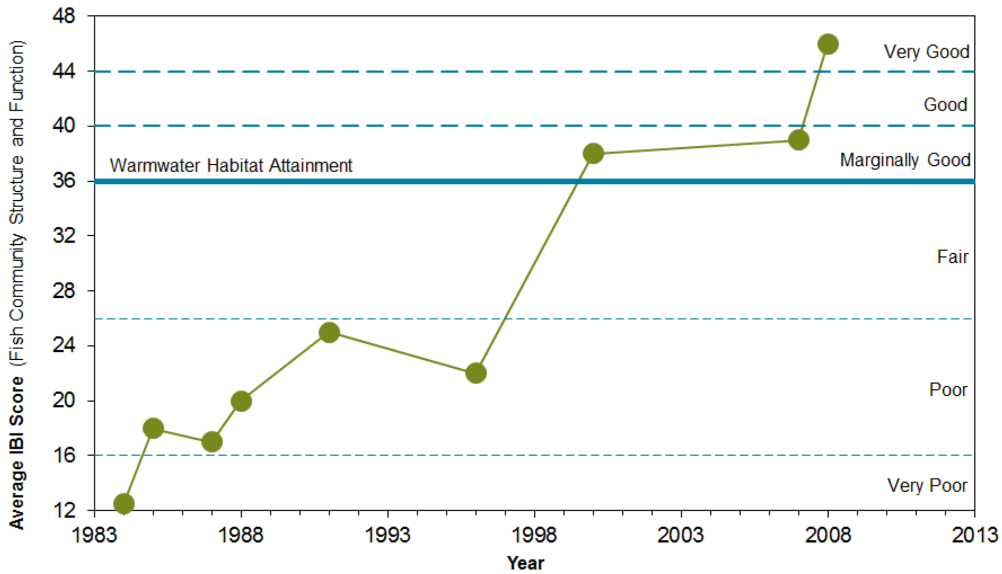

Figure 2-4. Cuyahoga River IBI Scores Downstream of Tinkers Creek (RM 16), 1984 – 2008

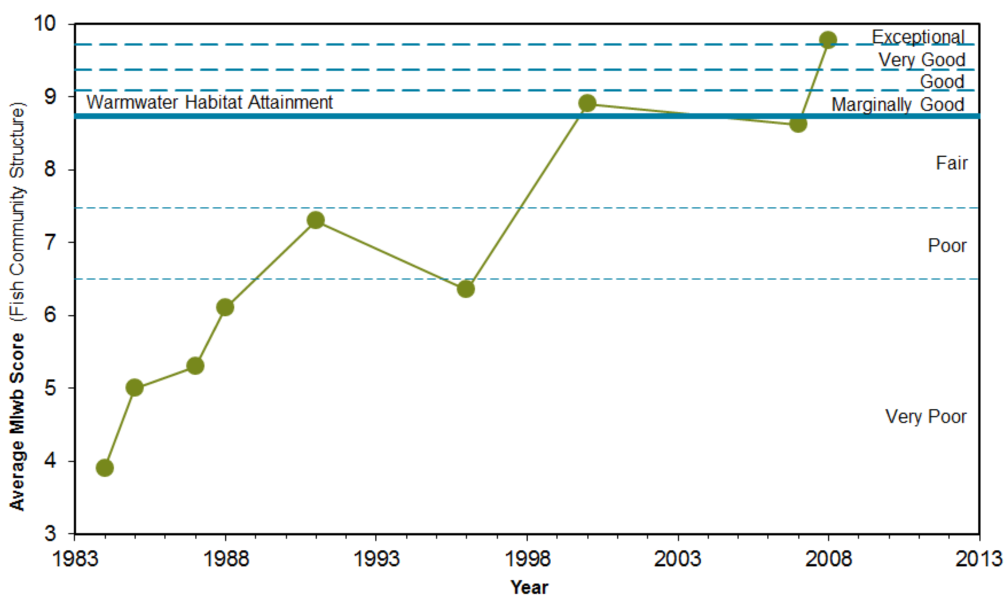

Figure 2-5. Cuyahoga River MIwb Scores Downstream of Tinkers Creek (RM 16), 1984 - 2008

To continue the improving trend in aquatic life, dam removal projects for the Cuyahoga River remain high priority projects. Ohio EPA concluded that the 8-foot high, 183-foot long Brecksville Dam located in the CVNP negatively impacts water quality and interrupts aquatic communities by restricting fish passage.[28] In 2010, Ohio EPA and the Cuyahoga River Remedial Action Plan Coordinating Committee requested that the Area of Concern (AOC) be extended to include the Gorge Dam so that this project could receive funding under the Great Lakes Legacy Act to remove sediment and increase remediation. In that request, Ohio EPA stated that once the "Brecksville Dam is removed, the Gorge Dam [will be] the last impediment to unrestricted fish passage in the lower 59 miles of the Cuyahoga River mainstem." The restoration of the habitat and hydrology of the Cuyahoga River is critical to the continued restoration of the AOC and is expected to result in delisting of most of the beneficial use impairments in the entire mainstem portion of the AOC.[29]

Studies to remove the Brecksville Dam and the Gorge Dam are expected to conclude in 2015. Akron has agreed to contribute $900,000 towards the removal of the Brecksville Dam as a supplemental environmental project in the CD. The City's contribution is currently being held in escrow as per CD requirements.

2.1.3 Recreational Use Impairments

Ohio's RWQC are based on pathogen indicators (*E. coli*) that are found in humans and animals. The indicators do not cause illnesses, however they indicate that bacteria are likely to be present. Ohio EPA utilizes tiered recreational uses with different RWQC for bathing waters, for primary contact recreation and for secondary contact recreation. There are three classes of primary contact recreation, which is defined as "full-body contact recreation activities such as, but not limited to, wading, swimming, boating, water skiing, canoeing, kayaking, and scuba diving."[30] Ohio adopted the three classes to reflect differences in the observed and potential frequency and intensity of usage:

- Class A are "waters that support, or potentially support, frequent primary contact recreation activities" including lakes and portions of rivers and streams that "are popular paddling streams with public access points developed, maintained, and publicized by governmental entities"

- Class B are "waters that support, or potentially support, occasional primary contact recreation activities"

- Class C are "water bodies that support, or potentially support, infrequent primary contact recreation activities such as, but not limited to, wading"

Ohio EPA has defined secondary contact as, "waters that result in minimal exposure potential to water borne pathogens because the waters are: rarely used for water based recreation such as, but not limited to, wading; situated in remote, sparsely populated areas; have restricted access points; and have insufficient depth to provide full body immersion, thereby greatly limiting the potential for water based recreation activities."

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[28] National Park Service, Department of the Interior; Federal Register. 2009, 74, 36739.
[29] Ohio EPA. May 26, 2010. Cuyahoga River Area of Concern Boundary Expansion Request.
[30] Ohio Administrative Code 3745-1-07.

Table 2-3 lists Ohio's *E. coli* standards related to recreational use. The primary impact of Akron's CSOs is potential contributions to exceedances of *E. coli*.

Table 2-3. Ohio's *E. coli* Standards Related to Recreational Use

Recreational Use[1]	*E. coli* (colony forming units per 100 milliliters)	
	Seasonal Geometric Mean	Maximum Exceedance[2]
Primary Contact Recreation Class A (Cuyahoga River)	126	298
Primary Contact Recreation Class B (Little Cuyahoga River, Camp Brook, and sampled portions of the Ohio Canal)	161	523
Secondary Contact (applies to portion of the Ohio Canal which was not sampled)	1,030	1,030

[1] Recreation season is defined as May 1 to October 31.

[2] Not to be exceeded in more than 10% of samples during a 30-day period.

Ohio EPA is currently seeking public input on proposed revisions to the RWQC.[31]

Figure 2-6 on the following page shows the recreational use designations for the rivers and streams within the vicinity of Akron, and the locations of Akron's CSO Racks.

[31] Ohio EPA, Division of Surface Water. July 2015. Proposed Rules – Recreational Water Criteria: Water Quality Standards (OAC Chapter 3745-1).

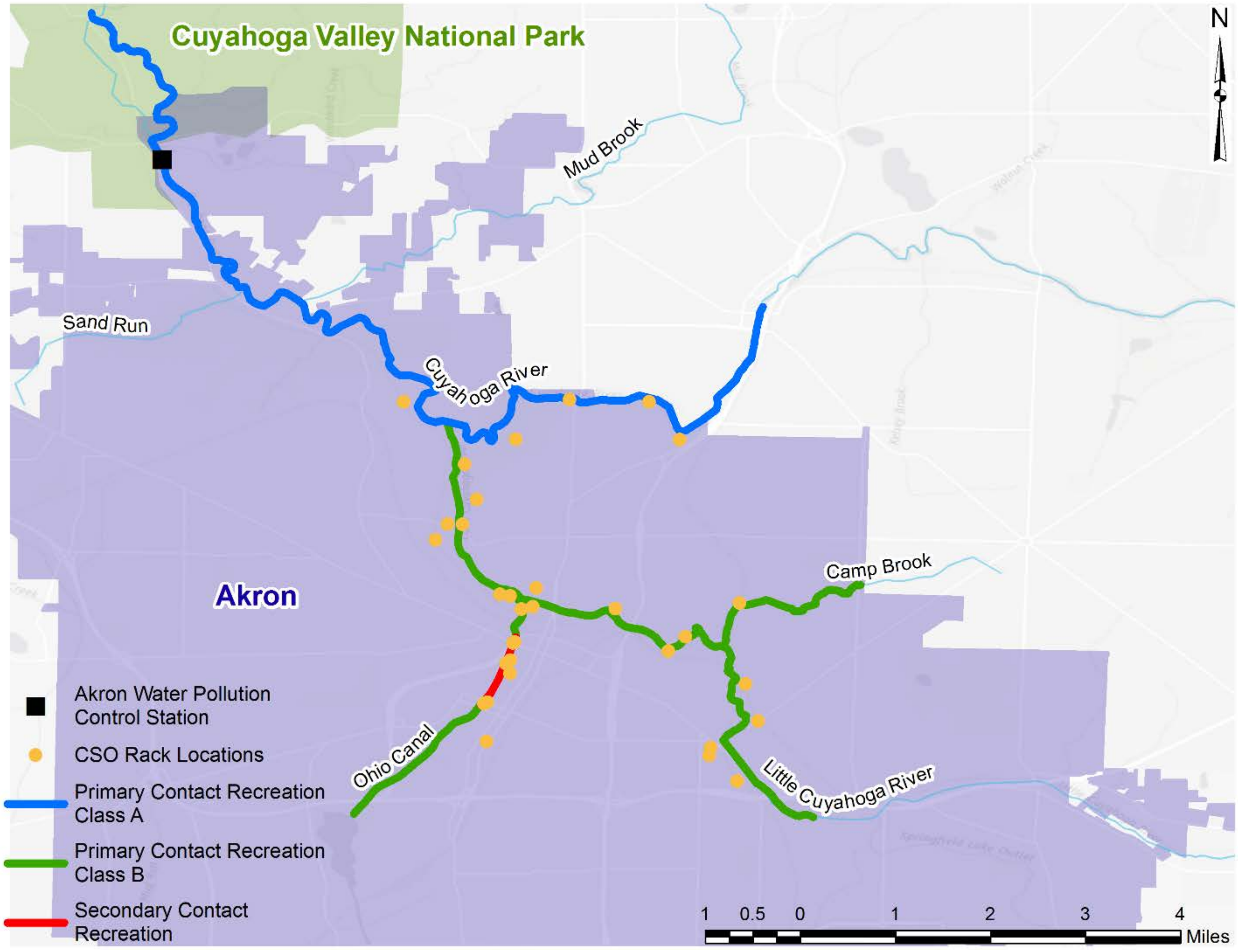


Figure 2-6. Recreational Water Quality Use Designations in Akron and CSO Rack Locations

The Ohio EPA's 2014 Integrated Report stated that a significant portion of the Cuyahoga River watershed is not meeting Ohio's criteria for primary contact recreation designated uses.[32] This includes areas upstream of Akron on the Cuyahoga River main stem, the Little Cuyahoga River and the Ohio Canal. Portions of the watershed that are not meeting the criteria, broken down into hydrologic units, are shown in the colors orange and white in Figure 2-7.[33]

[32] Ohio EPA, Division of Surface Water. March 25, 2014. *Ohio 2014 Integrated Water Quality Monitoring and Assessment Report.* Report submitted to USEPA on April 1, 2014.
[33] Figure excerpted from: Ohio EPA, Division of Surface Water. March 25, 2014. *Ohio 2014 Integrated Water Quality Monitoring and Assessment Report.* Report submitted to USEPA on April 1, 2014.

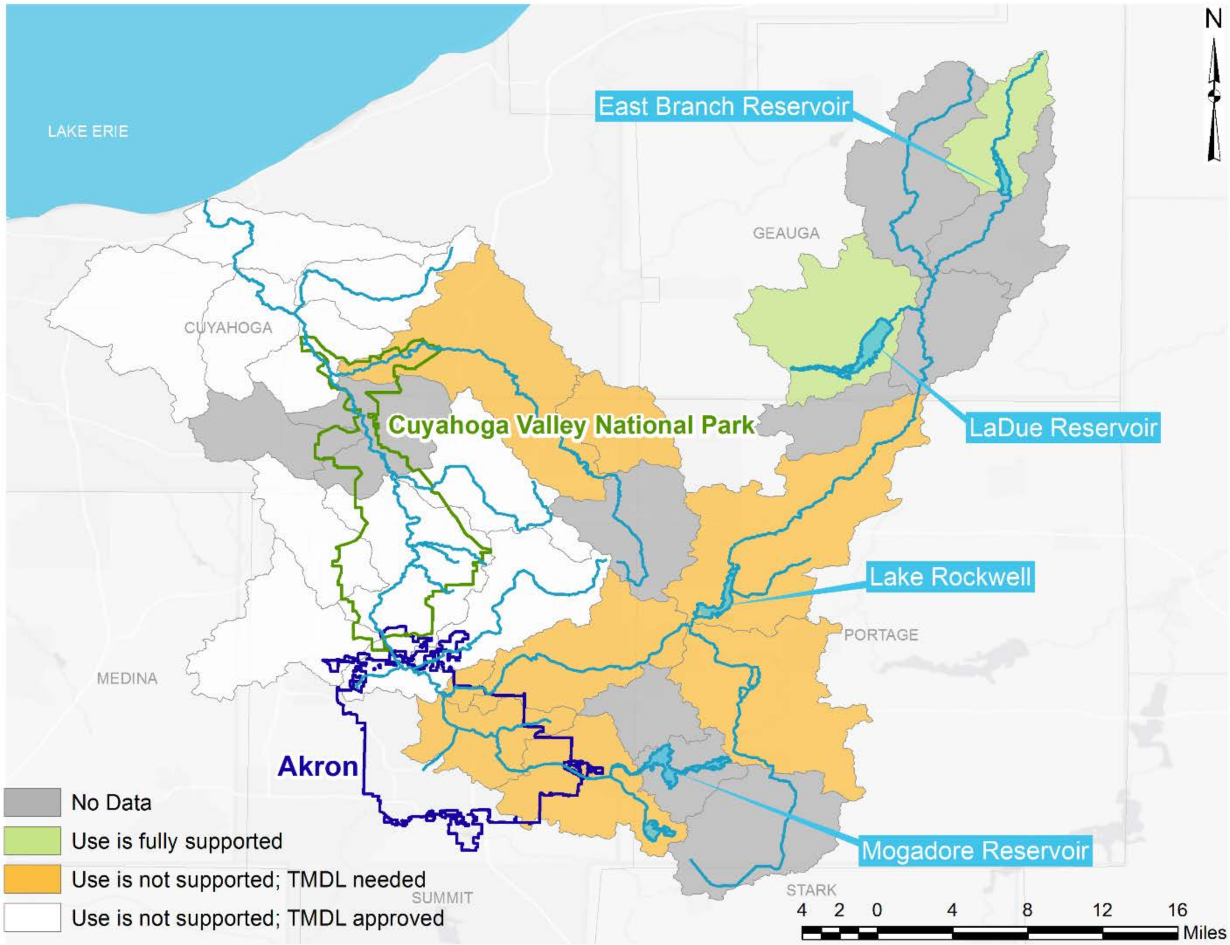


Figure 2-7. Non-Attainment of Recreational Uses in the Cuyahoga River Watershed

2.1.4 Existing *E. coli* Data from 2007 to 2014

The City compiled and evaluated existing *E. coli* data in the watershed immediately upstream of the CSO discharges, within the City, and downstream in the CVNP. Information from the following sources was compiled:

- Akron's receiving water sampling program defined in the City's NPDES permit (2010 through 2014).
- US Geological Survey National Water Information System data (2008 to 2014).[34]
- CVNP data (2009 to 2014).[35]

[34] U.S. Geological Survey. 2014. National Water Information System data available on the World Wide Web (Water Data for the Nation). Ongoing effort.

[35] Ohio Nowcast. 2015. A system that uses near real-time information to "nowcast" water-quality conditions at eight Lake Erie beaches, and one recreational river. Ongoing effort.

Figure 2-8 shows the location of the sampling stations where historic data was available. The data was grouped into “wet weather” and “dry weather” data, as a screening assessment for evaluating whether samples collected within Akron’s waterways were potentially impacted by CSO discharges. For the existing data, a sample was flagged as a “wet weather” sample if the City recorded a CSO discharge to that waterway; otherwise it was flagged as a “dry weather” sample.

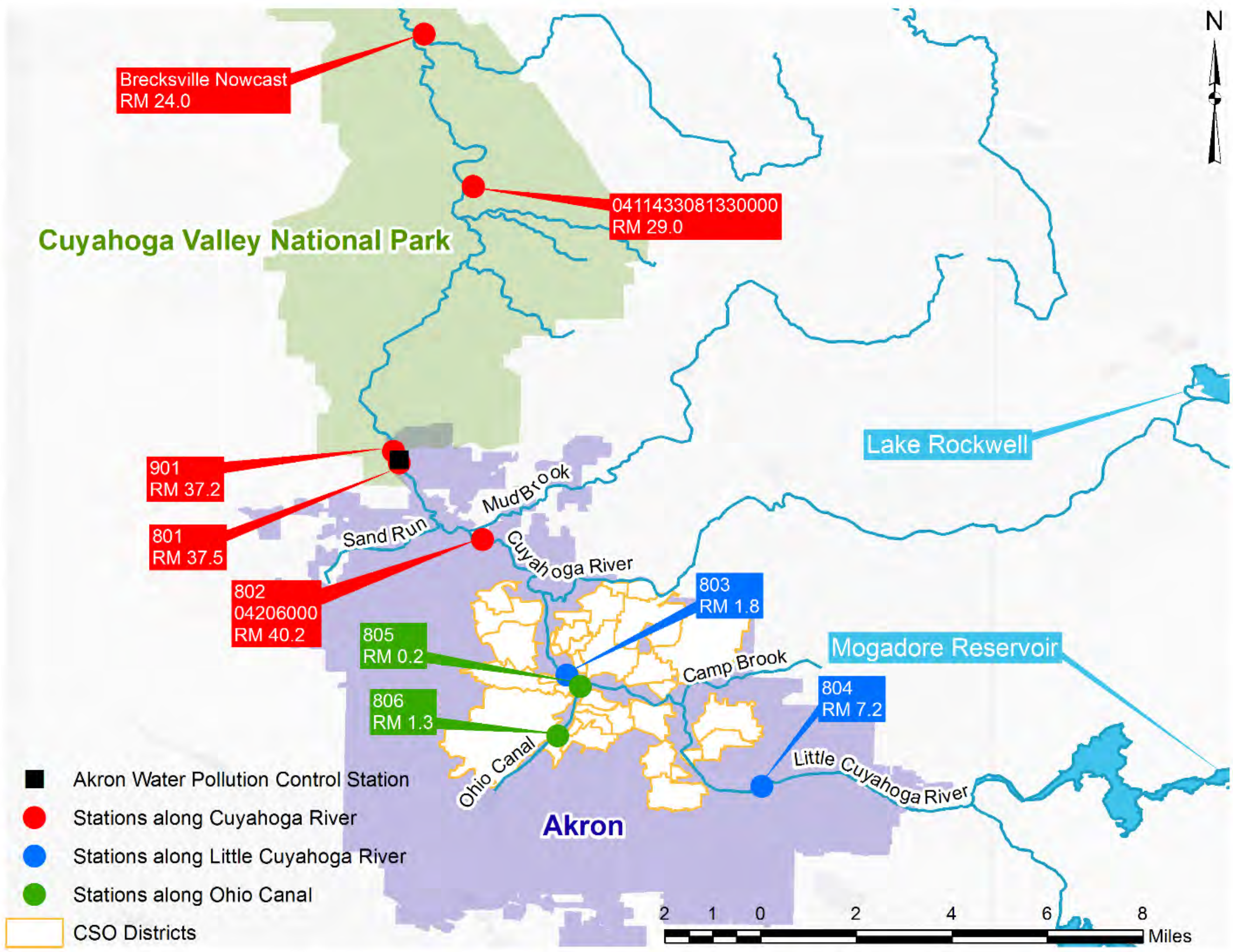


Figure 2-8. Sampling Locations and Recreation Season *E. coli* Existing Data

Another way to evaluate data is a “box-and-whisker” graph, as shown in Figure 2-9 to evaluate the distribution of data. In the graph, the “whiskers” represent the minimum and maximum values that were observed. The box represents the 25th and 75th percentile of the values and the line in the middle of the box represents the median. The orange diamond represents the geometric mean of the data.

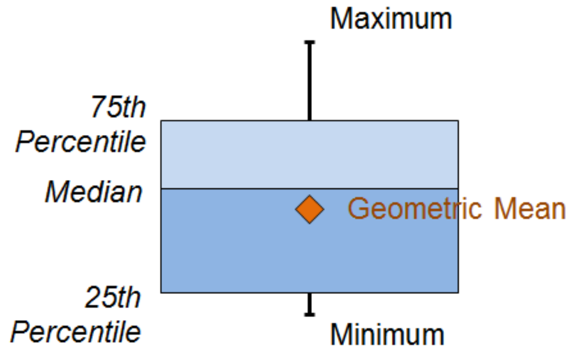


Figure 2-9. Legend for "Box and Whisker" Graphs

For bacteria, the geometric mean is a better representation of "average" levels as there can be extremely high outliers (very high levels of *E. coli*) that are not representative of the true average. The geometric mean is an accepted statistic for water quality parameters like bacteria that exhibit log-normal distributions in the natural environment.

Figure 2-10 on the following page shows the distribution of data from the existing sources for the Cuyahoga River, Little Cuyahoga River, and the Ohio Canal for the recreation seasons from 2008 to 2014.

Cuyahoga River

Figure 2-10 shows that there are high *E. coli* levels at RM 40.2, which is 1.7 miles downstream of Akron's CSO discharges. The figure also shows that almost all of the samples, which include dry weather samples, are above the single sample maximum threshold, which is 298 colony forming units/100 milliliters (cfu/100 mL).

Table 2-4 provides a summary of the data shown in Figure 2-10 for the Cuyahoga River with the number of samples and geometric mean of the *E. coli* data as they were collected. The "dry weather" samples exceed the geometric mean criterion (126 cfu/100 mL) at all of the stations.

Table 2-4. Existing Data for the Cuyahoga River from 2008 to 2014

Station Name	River Mile	Wet Weather Data		Dry Weather Data		All Weather Data	
		Count	Geometric mean (cfu/100 mL)	Count	Geometric mean (cfu/100 mL)	Count	Geometric mean (cfu/100 mL)
USGS Station 04206000 & 802	40.2	20	15,091	8	426	28	5,447
801[1]	37.48	9	851	15	445	24	567
901[2]	37.22	7	526	15	278	22	341
USGS Station 0411433081330000	28.98	61	780	177	435	238	506
Brecksville Nowcast Station	24	61	901	175	467	236	554

[1] Data from 2010 onward. [2] Data from 2009 onward.

The finding suggests that there is a need for a watershed approach to control non-CSO sources to make the Akron waterways and the CVNP safe for recreation, particularly during dry weather conditions when people are more likely to recreate in the river. This conclusion is supported by forecasts of *E. coli* conditions from the Ohio Nowcast for the Cuyahoga River,[36] which showed that from May 26, 2009 to June 1, 2015 that water quality was projected to be "poor" 65% of the time.

Little Cuyahoga River

Table 2-5 provides a summary of the *E. coli* data for the 2010 to 2014 recreation seasons for the Little Cuyahoga River. Data for dry weather conditions was not available.

Table 2-5. Existing Data for the Little Cuyahoga River from 2010 to 2014

Station Name	River Mile	Wet Weather Data		Dry Weather Data		All Weather Data	
		Count	Geometric mean (cfu/100 mL)	Count	Geometric mean (cfu/100 mL)	Count	Geometric mean (cfu/100 mL)
804	7.2	17	**10,521**	-	-	17	**10,521**
803	1.85	17	**44,496**	-	-	17	**44,496**

The data shows that upstream levels are well above the thresholds that are used for calculating compliance with water quality standards. The data also show that levels are higher downstream of the CSOs.

Ohio Canal

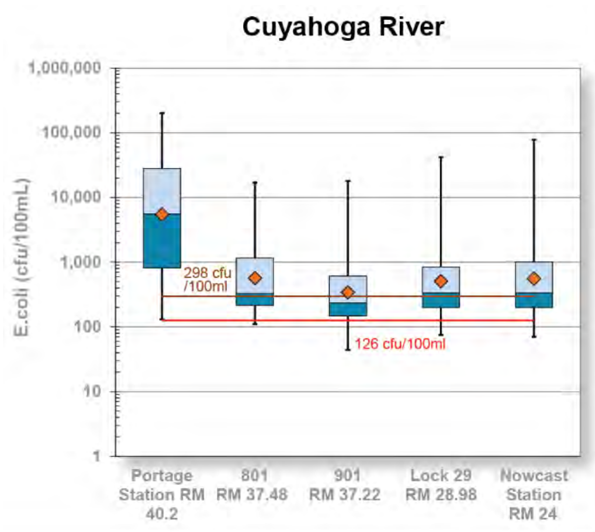
Table 2-6 provides a summary of the *E. coli* data for the 2010 to 2014 recreation seasons for the Ohio Canal. Data for dry weather conditions are not available.

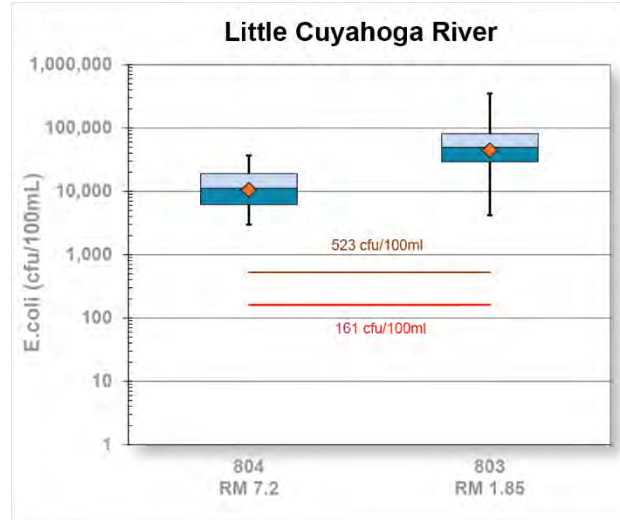
Table 2-6. Existing Data for the Ohio Canal from 2010 to 2015

Station Name	River Mile	Wet Weather Data		Dry Weather Data		All Weather Data	
		Count	Geometric mean (cfu/100 mL)	Count	Geometric mean (cfu/100 mL)	Count	Geometric mean (cfu/100 mL)
806	1.3	17	**1,946**	-	-	17	**1,946**
805	0.175	17	**71,641**	-	-	17	**71,641**

Again, the data points are well above the thresholds for calculating compliance with water quality standards and levels downstream of the CSOs are higher than upstream.

[36] Brady, A.M.G., Bushon, R.N., and Plona, M.G., 2009. *Predicting recreational water quality using turbidity in the Cuyahoga River, Cuyahoga Valley National Park, Ohio 2004—7*. U.S. Geological Survey (USGS) Scientific Investigations Report 2009–4192.





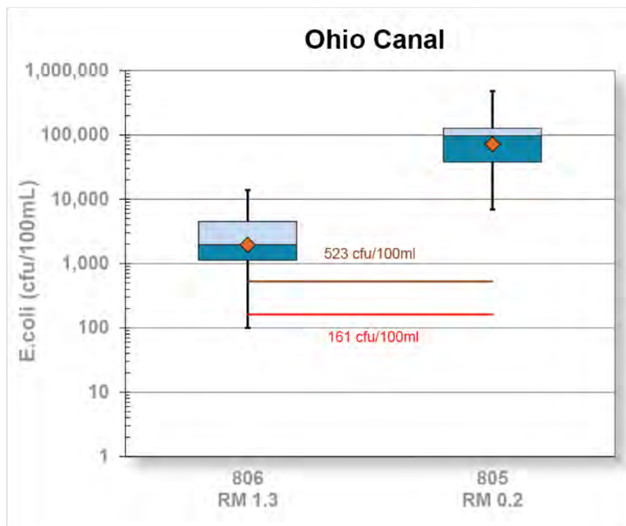


Figure 2-10. Existing Data for the Cuyahoga River, Little Cuyahoga River, and Ohio Canal (2008 to 2014)

2.1.5 Akron Waterways Renewed Sampling Data (2014)

The AWR sampling was conducted to help address data gaps identified in the other sampling programs and to develop a water quality model of *E. coli*. Figure 2-11 shows the 11 stations that were selected for the 2014 monitoring. Monitoring was conducted three days per week from August 15 to October 30, 2014, for a total of 34 events (goal was to sample every Monday, Tuesday, and Thursday). Locations of CSO discharges are shown in Figure 2-11.

Figure 2-12 provides box and whisker graphs of the *E. coli* data collected from the Akron waterways (see Figure 2-9 for the legend to interpret the graphs). As shown in the graphs, *E. coli* levels exceed the RWQC at the stations upstream of Akron's CSOs for all of the waterways. For the Cuyahoga River and Camp Brook, *E. coli* levels are generally higher at stations upstream of CSOs. The data strengthens the need to adopt a watershed approach, including the use of water quality and watershed models, to establish water quality management strategies that will attain the RWQC within the City's waterways.

Tables 2-7 to 2-10 summarize the AWR data according to wet weather and dry weather. Samples were flagged as "wet weather" if CSOs were observed to have discharged to that particular waterway on that day; all other samples were flagged as "dry weather".

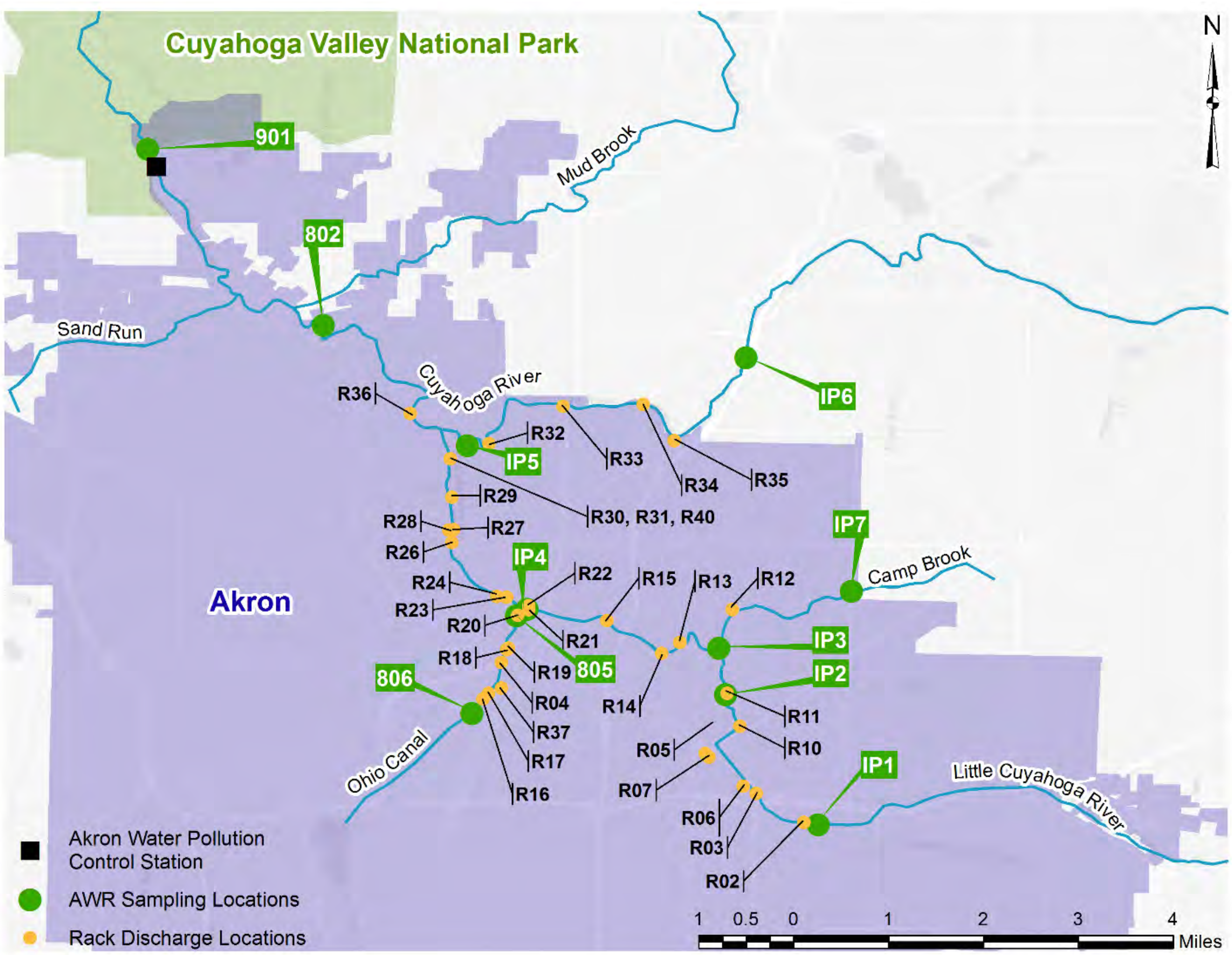


Figure 2-11. AWR Sampling Locations for 2014

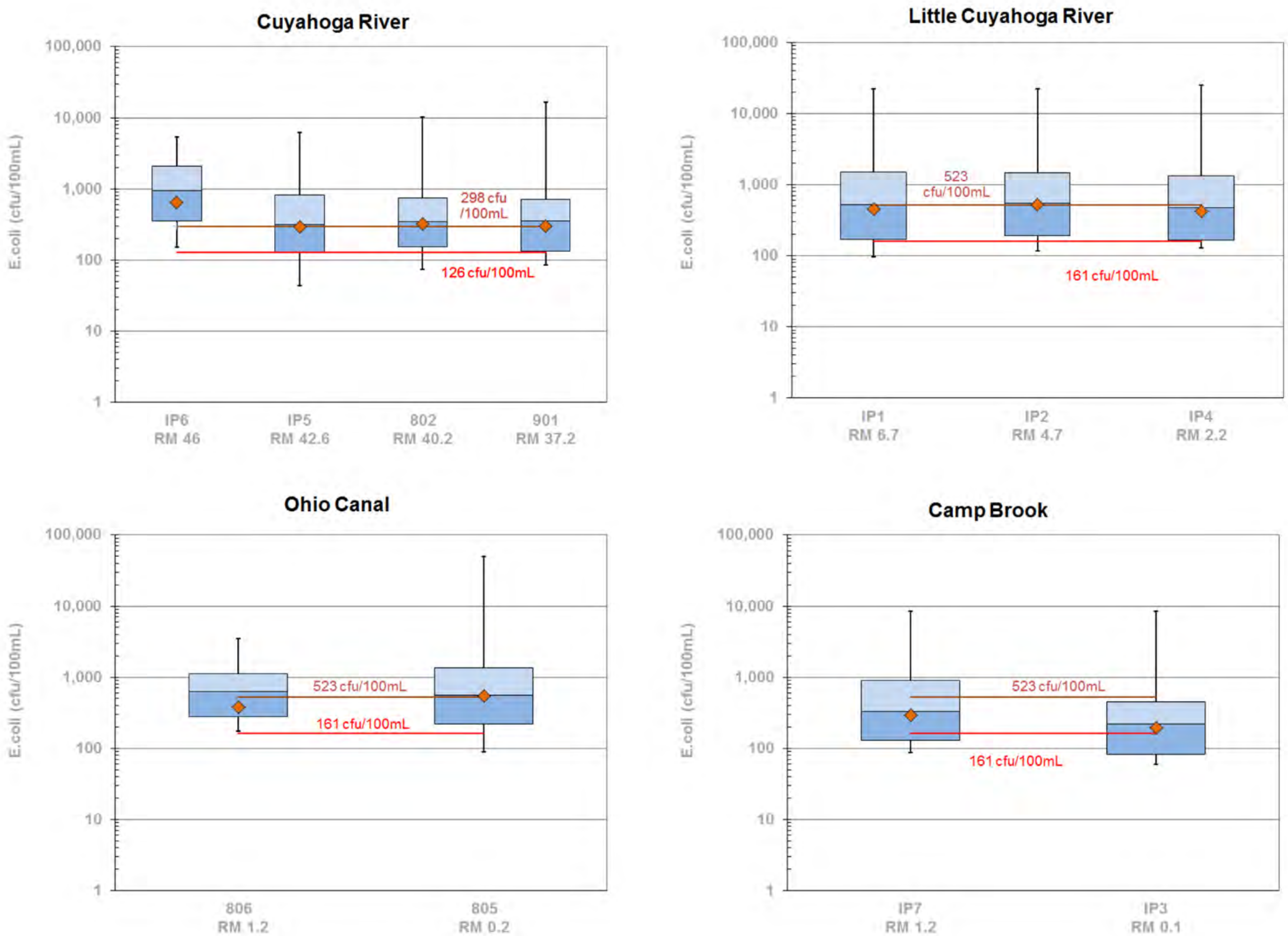


Figure 2-12. Recreation Season *E. coli* Data from the AWR Sampling (2014)

Table 2-7. Recreation Season *E. coli* Data from the AWR Sampling (2014) for the Cuyahoga River

Station Name	River Mile	Wet Weather Data		Dry Weather Data		All Weather Data	
		Count	Geometric mean (cfu/100 mL)	Count	Geometric mean (cfu/100 mL)	Count	Geometric mean (cfu/100 mL)
IP6 (Upstream)	46.0	4	618	30	651	34	647
IP5	42.6	4	288	30	293	34	292
802	40.2	4	321	30	317	34	317
901	37.22	4	503	30	281	34	301

Table 2-8. Recreation Season *E. coli* Data from the AWR Sampling (2014) for the Little Cuyahoga River

Station Name	River Mile	Wet Weather Data		Dry Weather Data		All Weather Data	
		Count	Geometric mean (cfu/100 mL)	Count	Geometric mean (cfu/100 mL)	Count	Geometric mean (cfu/100 mL)
IP1	6.7	9	1,262	25	315	34	455
IP2	4.65	9	1,222	25	381	34	518
IP4	2.2	9	1,194	25	287	34	427

Table 2-9. Recreation Season *E. coli* Data from the AWR Sampling (2014) for the Ohio Canal

Station Name	River Mile	Wet Weather Data		Dry Weather Data		All Weather Data	
		Count	Geometric mean (cfu/100 mL)	Count	Geometric mean (cfu/100 mL)	Count	Geometric mean (cfu/100 mL)
806	1.3	5	696	29	346	34	383
805	0.175	5	1,686	28	441	33	541

Table 2-10. Recreation Season *E. coli* Data from the AWR Sampling (2014) for Camp Brook

Station Name	River Mile	Wet Weather Data		Dry Weather Data		All Weather Data	
		Count	Geometric mean (cfu/100 mL)	Count	Geometric mean (cfu/100 mL)	Count	Geometric mean (cfu/100 mL)
IP7	1.6	2	1,267	32	263	34	288
IP3	0.1	2	1,335	32	171	34	193

2.1.6 Water Quality Model Development and Calibration

The City developed a receiving water quality model to evaluate the impact of CSOs and other pollutant sources on receiving water quality, specifically with respect to *E. coli*. The receiving water model was used to evaluate the relative benefits of alternative integrated planning scenarios to the existing LTCP. The model also provides a platform for other modeling efforts, including future TMDL analyses.

The development of the water quality model entailed creating a model grid, specifying model bathymetry, and specifying other model inputs such as flow rates and bacteria densities at the model boundaries. The modeling framework is shown in Figure 2-13.

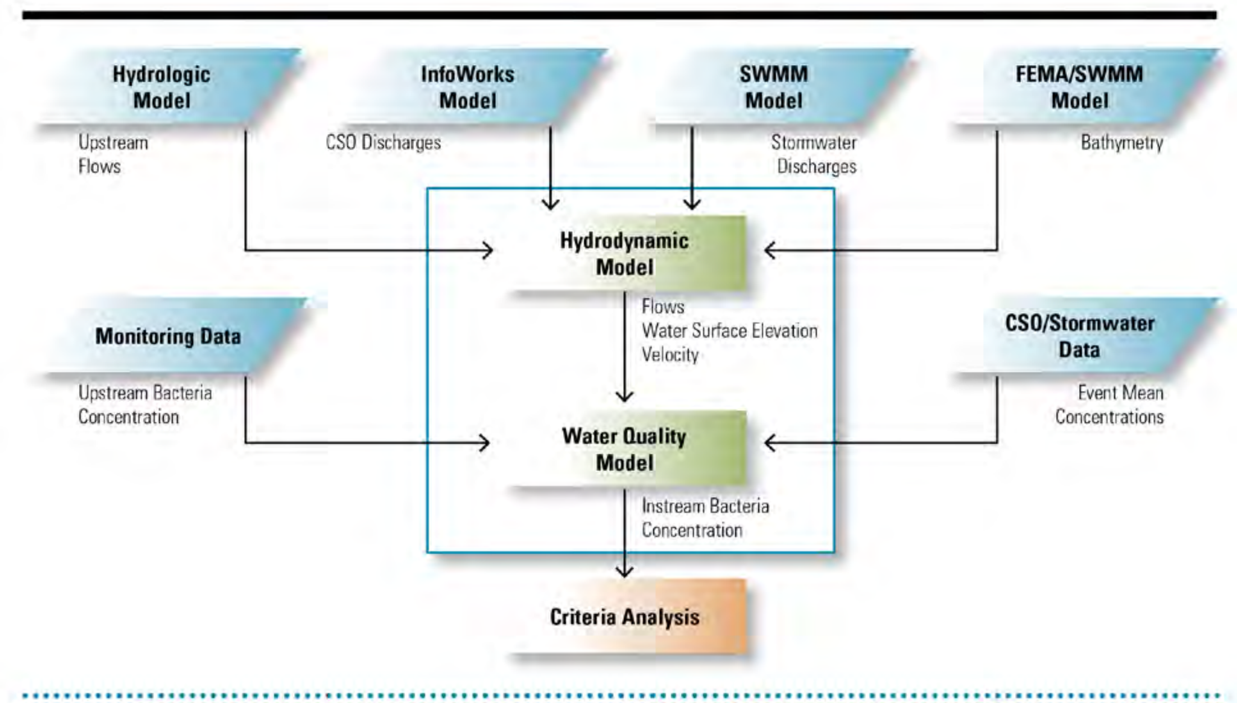


Figure 2-13. Modeling Framework

The upstream boundary flows were predicted by developing a hydrologic model for the Cuyahoga River watershed upstream of the CVNP.

The City's collection system model and a recently-developed stormwater model were used to provide the CSO and stormwater input discharges.

The receiving water model predicted the river hydrodynamics such as flows, velocity, and water surface elevations based on these inputs. The receiving model uses the predicted hydrodynamics and specified *E. coli* densities at the model boundaries to simulate in stream *E. coli* densities.

The results of the water quality model can be used to assess whether a particular river segment is in compliance with the RWQC.

Hydrology Model

The hydrology model was constructed using the model Hydrologic Engineering Center Hydrologic Modeling System (HEC-HMS), version 4.0. The development of the HEC-HMS model required watershed delineation, specifying model inputs such as reservoir storage capacity, precipitation, and model parameters such as imperviousness and runoff coefficients.

The Cuyahoga River watershed was divided into 28 smaller subbasins for modeling purposes. Portions of the subbasins draining to CSOs and City stormwater outfalls were removed from the HEC-HMS drainage area and replaced with inputs from the collection system and stormwater models described below. Long-term historical precipitation data was obtained from the National Oceanic and Atmospheric Administration (NOAA), via NOAA's Climate Data Online web archive. NOAA metadata were reviewed to determine the rainfall gauges that are geographically best-suited to use for simulation purposes.

The HEC-HMS model requires specification of model parameters for calculation of runoff and losses (i.e. interception, infiltration, storage, evaporation, and transpiration), hydrograph transformation, and channel routing. These parameters were estimated based on literature, available data, and best professional judgment.

Stormwater Model

A large portion of the watersheds within the City's service area drain into the combined sewer system; however, some of these flows are routed to separate stormwater systems that discharge into the receiving waters. The City developed an overland flow model using the USEPA Stormwater Management Model (SWMM) to account for the overland flows within the City that were not routed to the collection system. Development of the model did not include a calibration dataset due to limited data sources.

The primary objective of the SWMM model was to provide reasonable stormwater flow inputs to the receiving water quality model based on general hydrologic assumptions. The development of the SWMM model entailed the delineation of land areas into discrete subcatchments. Each subcatchment was characterized with relevant parameters including area, percent imperviousness, slopes, infiltration rates, and flow width. The results of SWMM model were used as an input into the receiving water model.

Collection System Model

The City's updated collection system model, InfoWorks, was used to estimate the discharges from CSOs into the waterways. The results of the InfoWorks model were used as an input into the receiving water model.

Receiving Water Model

The City developed a receiving water model for the Cuyahoga River, Little Cuyahoga River, Ohio Canal, and Camp Brook in the Akron vicinity. The hydrodynamic and water quality model framework selected for this purpose is the Environmental Fluid Dynamics Code (EFDC),[37] which has been approved by USEPA. The extent of the receiving water model is shown in Figure 2-14.

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[37] Hamrick, J. M. 1992. *A three-dimensional environmental fluid dynamics computer code: theoretical and computational aspects*. The College of William and Mary, Virginia Institute of Marine Science, Special Report 317, 63 pp.

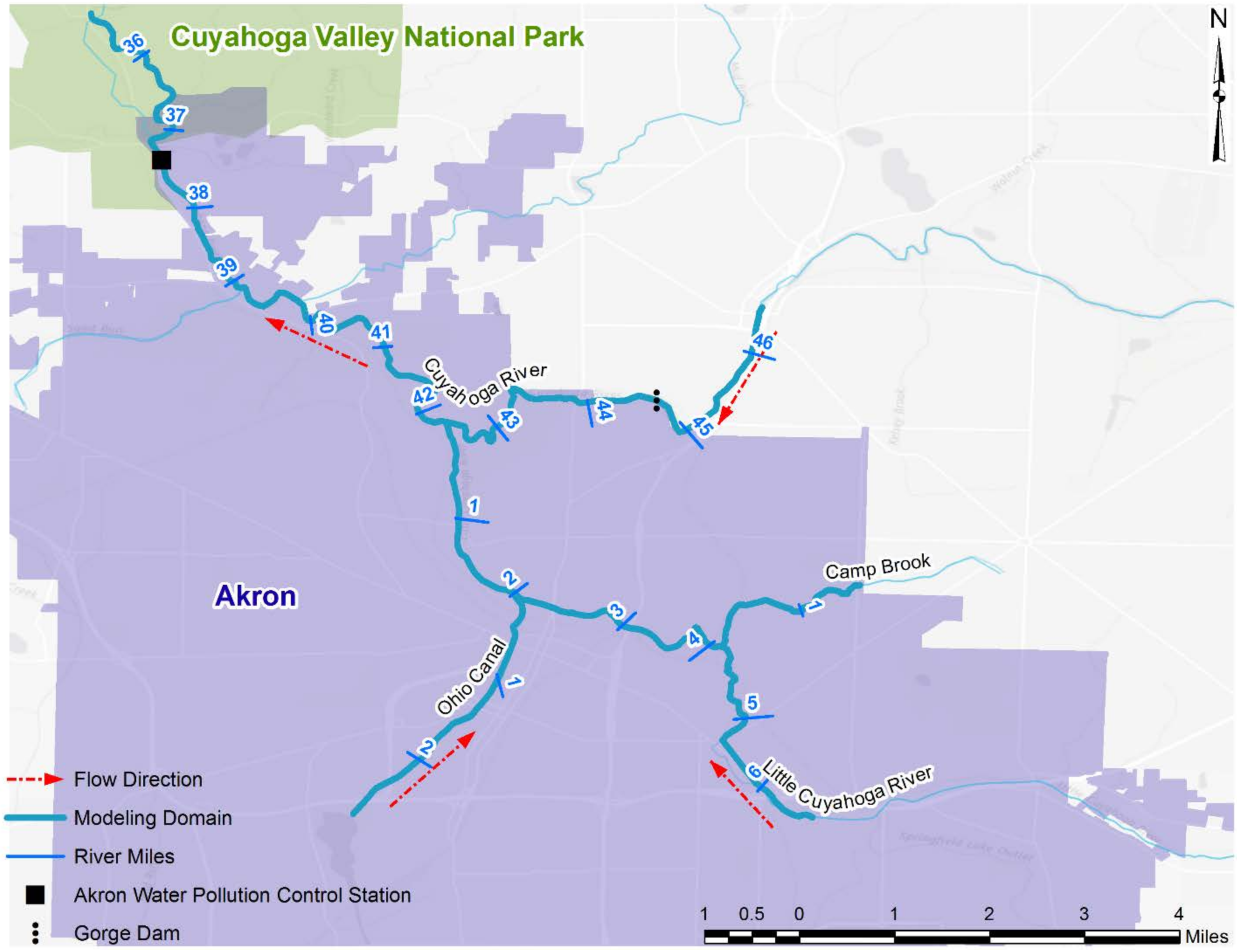

Figure 2-14. Receiving Water Quality Modeling Domain

The receiving water model predicted the river hydrodynamics such as flows, velocity, and water surface elevations based on the flow inputs provided by the stormwater and CSO models. The receiving water model was calibrated for the period of August through October 2014. The model predicted river flows and water surface elevations were calibrated using the data from USGS gauge on the Cuyahoga River at Old Portage OH (04206000) (also known as 802, USGS Station and RM 40.2). Figure 2-15 shows the time series comparisons respectively of daily average water surface elevations at the USGS gauge on Cuyahoga River at Old Portage OH (04206000).

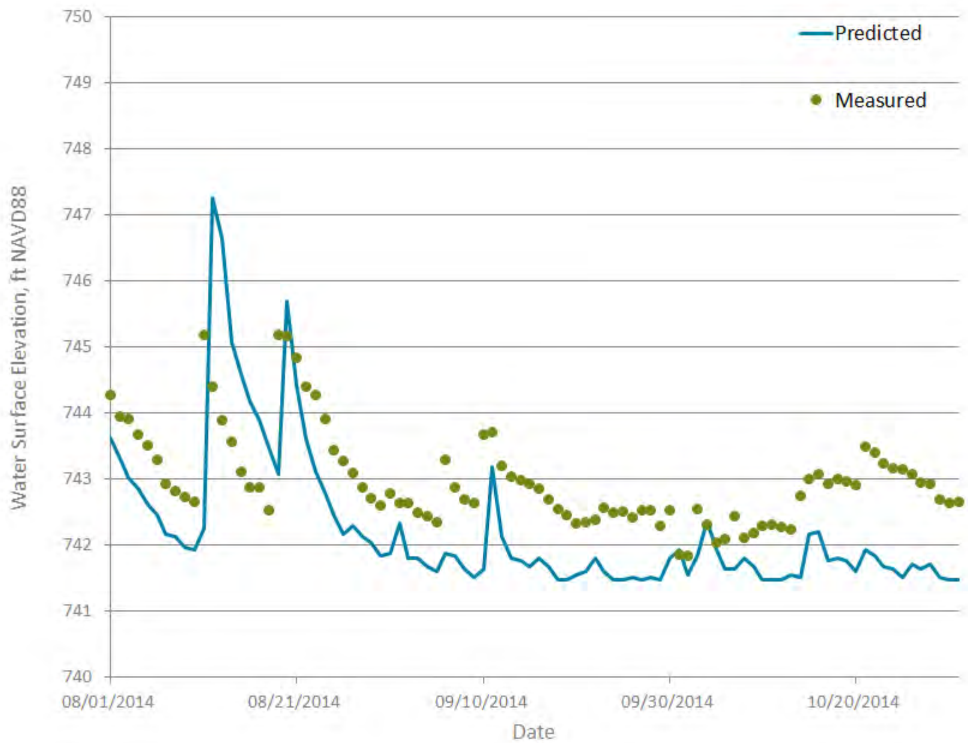

Figure 2-15. Time Series Plot of Predicted and Measured Water Surface Elevation at USGS Gauge on Cuyahoga River at Old Portage OH (04206000) (August through October 2014)

The model under-predicted the measured water surface elevations. This could be attributed to an underestimation of upstream flows by the HEC-HMS model. In addition to this, the water surface elevation prediction of the model was highly sensitive to bathymetry data. For the purpose of evaluating scenarios for compliance with the RWQC, the model can still be used with this level of calibration.

The receiving water model used the predicted hydrodynamics and the densities at the model boundaries to simulate instream bacteria levels. Measured instream *E. coli* data for the period of August through October 2014 were used to calibrate the model predicted *E. coli*. The locations of the stations used for calibration of bacteria levels are shown in Figure 2-16.

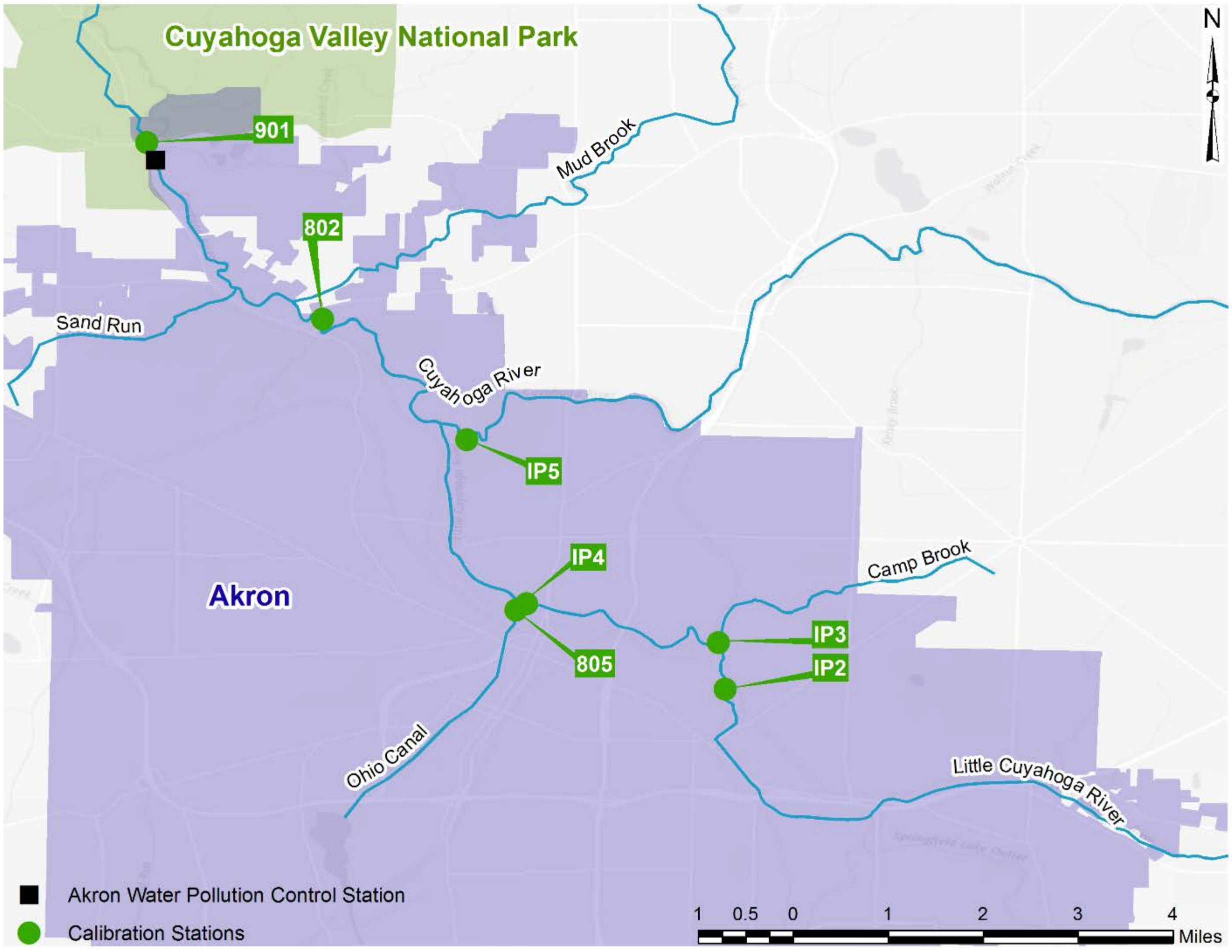

Figure 2-16. Locations Used in Receiving Water Quality Model Calibration

The predicted instream *E. coli* levels were compared to measured data at calibration stations. The value of the decay coefficient that allowed for the best model-data agreement was 1/day. Figure 2-17 through Figure 2-20 show model-data comparisons of instream bacteria levels at the most downstream stations of Cuyahoga River, Ohio Canal, Little Cuyahoga River, and Camp Brook. These figures show that the model comparisons models predict the measured baseline and peak densities fairly well. The model-predicted geometric means for bacteria are within an order of magnitude of the measured values.

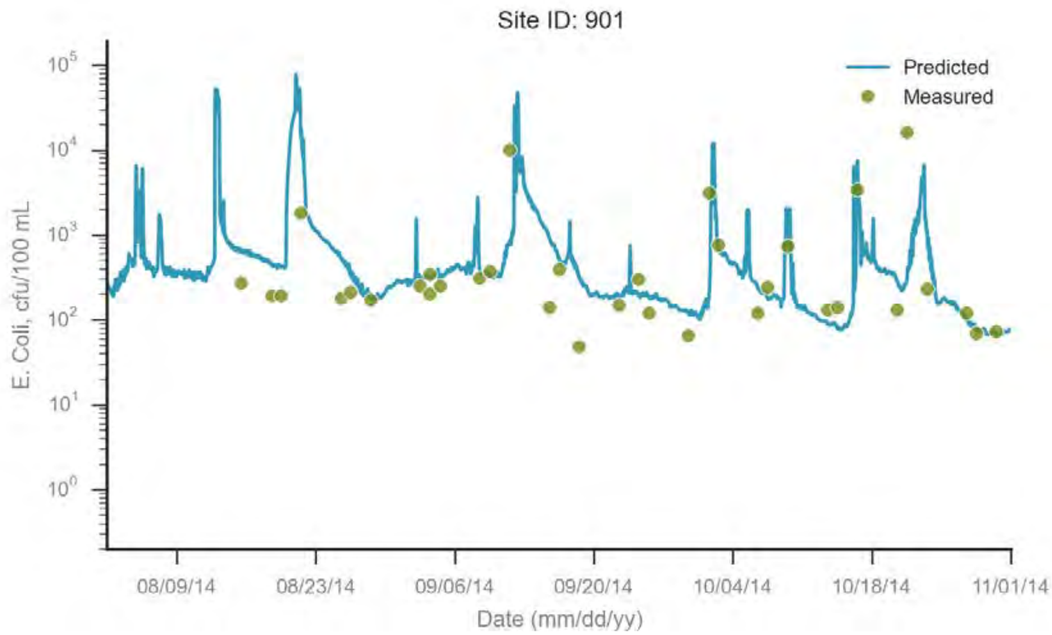

Figure 2-17. Predicted and Measured Bacteria Densities at Station 901 on the Cuyahoga River just downstream of WPCS (August through October 2014)

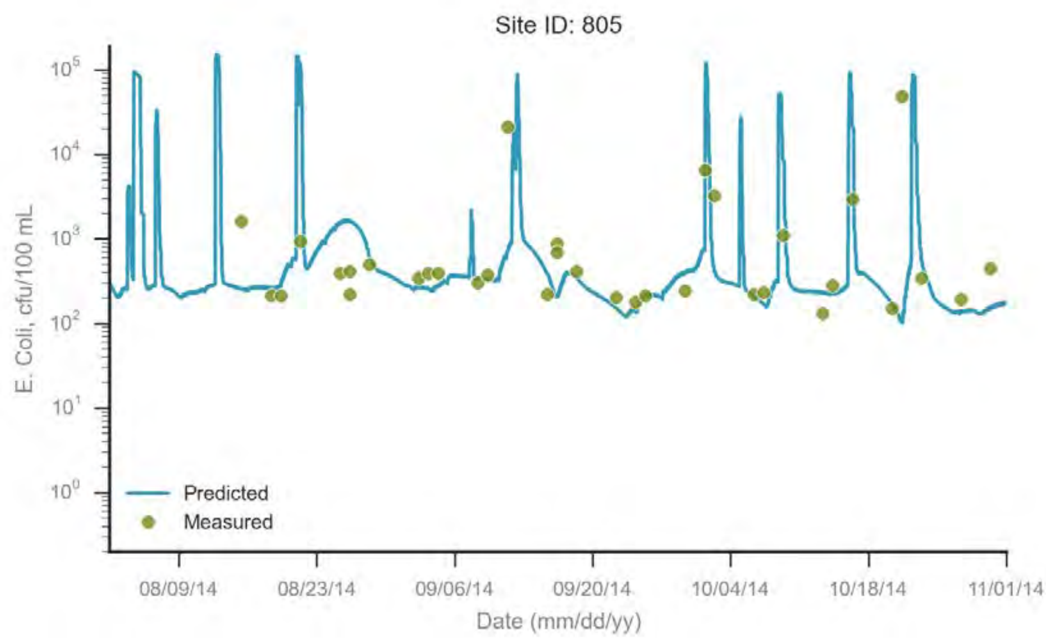

Figure 2-18. Predicted and Measured Bacteria Densities at Station 805 on the Ohio Canal just upstream of the Little Cuyahoga River (August through October 2014)

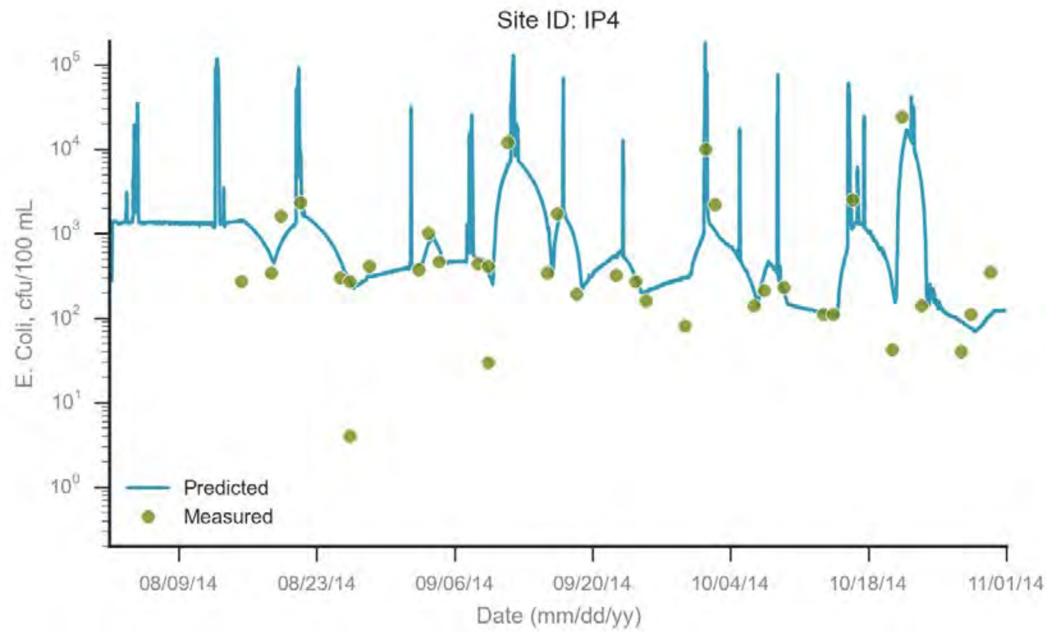

Figure 2-19. Predicted and Measured Bacteria Densities at Station IP4 on the Little Cuyahoga River just before Confluence with the Ohio Canal (August through October 2014)

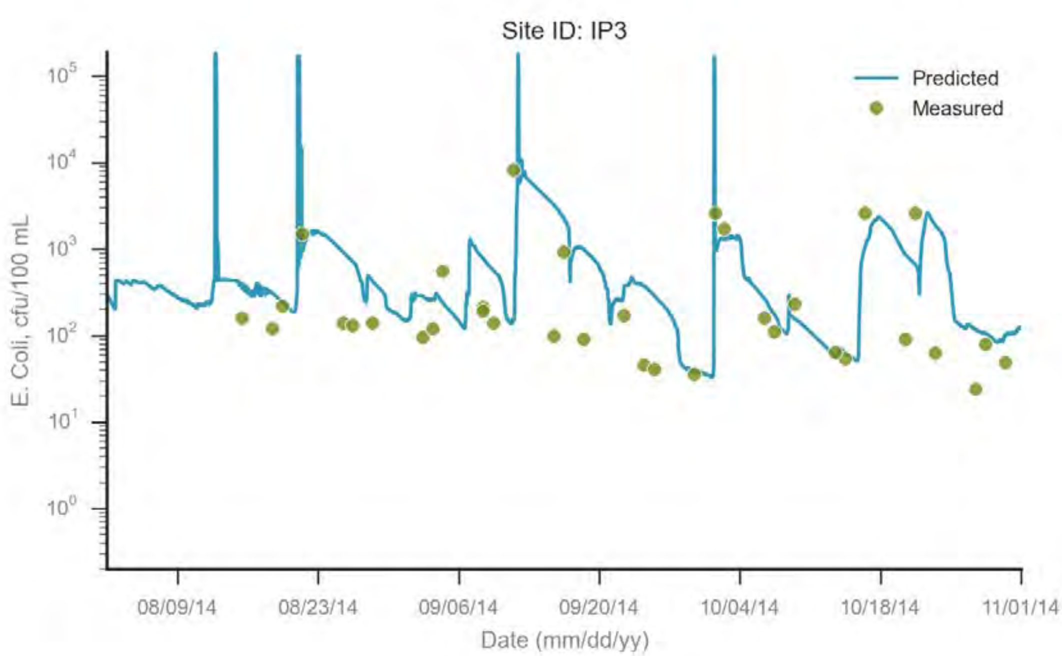

Figure 2-20. Predicted and Measured Bacteria at Station IP3 on Camp Brook Located just before Confluence with the Little Cuyahoga River (August through October 2014)

2.1.7 Bacteria Sources to the Cuyahoga River

Understanding the sources of bacteria that contribute to impairments in the segments of the Cuyahoga River is important. This allows for the identification of opportunities, actions, and additional steps that may be taken by the City and its neighbors to continue being good stewards of the environment.

The major sources of bacteria into the Cuyahoga River can be broadly classified into point sources and nonpoint sources:

- Point sources include discharges from municipal WWTPs; small package plants; CSOs; and MS4s. Discharges for these sources are authorized by NPDES permits. Permits for WWTPs and package plants require disinfection of the effluent to meet water quality standards; however, under-performing plants can at times be significant sources of bacteria. According to Ohio EPA there are about 164 individual public NPDES permitted WWTPs in Portage, Summit and Cuyahoga Counties.[38] Requirements for CSO controls are established through LTCPs. Requirements for MS4s are established through activities specified in NPDES permits and Best Management Practices (BMPs) to reduce pollution. Permit requirements for MS4s include activities to identify and eliminate illicit discharges. Illicit discharges are generally any discharge into a storm drain system that is not composed entirely of stormwater (exceptions include water from firefighting activities and discharges from facilities already under an NPDES permit).
- Nonpoint sources of bacteria into Cuyahoga River are made up of several diffuse sources. Manure from agricultural operations is a source of bacteria and can enter the waterways with stormwater runoff from manure storage or after being applied to agricultural fields as a fertilizer. Unrestricted access of livestock to stream also contributes to the bacterial load to the Cuyahoga River. Wildlife and campgrounds in the national park and the forest areas located in the Cuyahoga River watershed are also potential sources of bacteria. Nonpoint sources also include polluted runoff from unsewered communities with failing septic systems. A survey conducted by the Ohio Department of Health estimated that about the about 31 percent of septic tanks in Ohio are failing due to maintenance and installation issues.[39]

The above sources of bacteria are located in the four watersheds discussed below: Upper Cuyahoga River, Middle Cuyahoga River, Little Cuyahoga River, and Lower Cuyahoga River. These sources are not exhaustive rather they are intended to illustrate the many sources of bacteria in the Cuyahoga River watershed using readily available information.

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[38] Ohio EPA. Individual Wastewater Discharge Permit Information.

[39] Ohio Department of Health. Bureau of Environmental Health. January 2013. A report on Local Health Department survey responses for the 2012 Clean Watershed Needs Survey.

2.1.8 Bacteria Sources in the Upper Cuyahoga River Watershed

Potential sources of bacteria upstream of Akron in the Upper Cuyahoga watershed are shown in Figure 2-21 and include:[40]

- WWTP discharges from the Village of Middlefield, Village of Burton, Village of Mantua, and Portage County (Bolingbrook, Red Fox, and Twin Lakes) as well as discharges from other small municipal and private plants.
- Municipalities with unsewered areas and stormwater runoff including the Village of Mantua, Shalersville Township, City of Streetsboro, City of Ravenna, and Ravenna Township.
- Onsite septic systems and wastewater disposal systems.
- Agricultural practices (including manure spreading and unrestricted access to streams by livestock).
- Wildlife, waterfowl, and domestic pets.

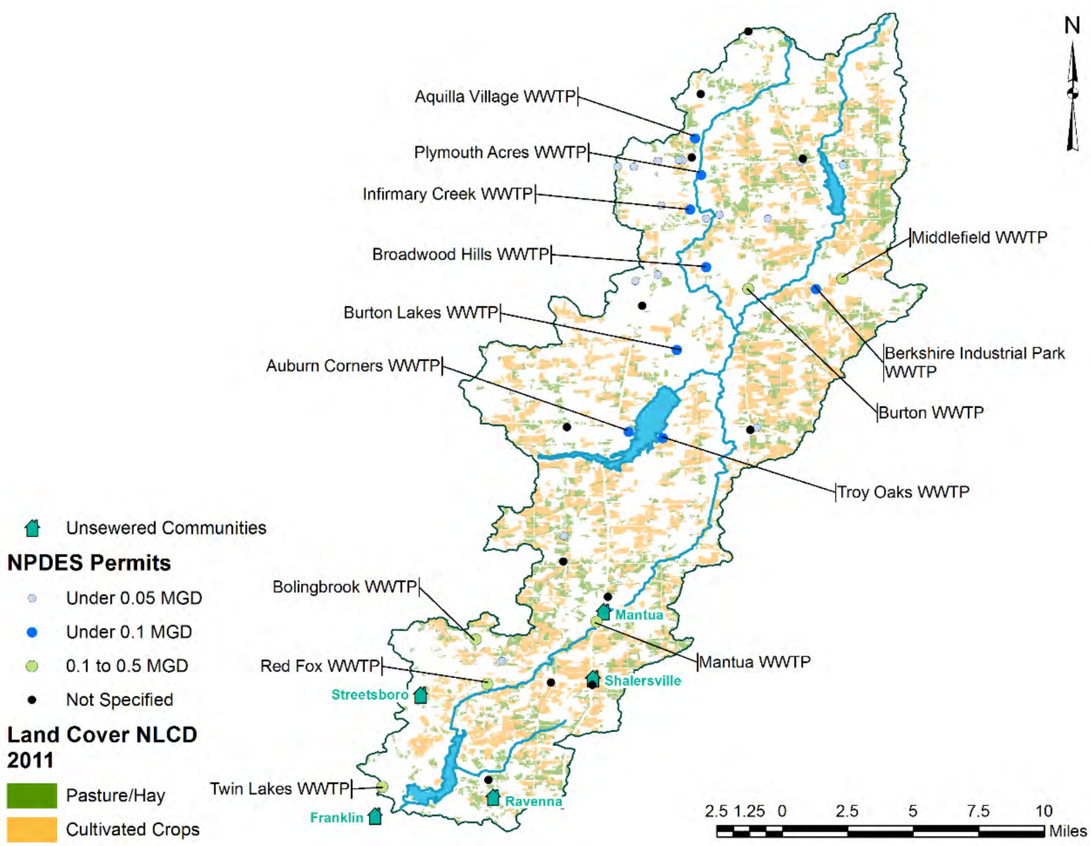

Figure 2-21. Potential Bacteria Sources in the Upper Cuyahoga River Watershed

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[40] Ohio EPA, Division of Surface Water. September 2004. *Total Maximum Daily Loads for the Upper Cuyahoga River*.

2.1.9 Bacteria Sources in the Middle Cuyahoga River Watershed

Sources of bacteria upstream of Akron in the Middle Cuyahoga River watershed are shown in Figure 2-22 and include:[41, 42]

- Unrestricted livestock access to streams and manure application. Agricultural areas were identified in seven jurisdictions in the Middle Cuyahoga Watershed basin: Franklin Township, City of Kent, Brimfield Township, Suffield Township, Randolph Township, Rootstown Township, and Ravenna Township. The Natural Resource Conservation Service (NRCS) estimates that 90% of farmers in the Middle Cuyahoga Watershed allow unrestricted access to streams, including small farms in urbanized subwatersheds.
- Municipalities with non-sewered areas and stormwater runoff. Fifteen jurisdictions were identified: Marlboro Township, Lake Township, Randolph Township, Suffield Township, Rootstown Township, Brimfield Township, City of Ravenna, Ravenna Township, City of Kent, Freedom Township, Shalersville Township, City of Streetsboro, Village of Hiram, Village of Mantua, and City of Aurora. Several of these areas are expected to be sewered in the next 15 to 20 years.
- Seven municipal WWTPs: Kent Water Reclamation Facility, Fishcreek WWTP, Fairlane WWTP, St. Joseph Parish WWTP, Randolph WWTP, Ravenna WWTP, and Franklin Hills WWTP.
- Livestock, wildlife, waterfowl, and deer.
- Failing septic systems.

2.1.10 Bacteria Sources in the Little Cuyahoga River Watershed

Sources of bacteria to the Little Cuyahoga River watershed are shown in Figure 2-23 and include:[43, 44]

- Akron CSOs and stormwater outfalls.
- Agricultural areas with unrestricted livestock access were identified in four jurisdictions: Brimfield Township, Suffield Township, City of Mogadore, and City of Lakemore.
- Four jurisdictions with unsewered areas and stormwater runoff: Brimfield Township, Suffield Township, City of Mogadore, and City of Lakemore.
- Wildlife, waterfowl, and deer.
- Failing septic systems.

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[41] Ohio EPA, Division of Surface Water. March 2000. Total Maximum Daily Loads for the Middle Cuyahoga River.
[42] Peck, M. December, 2012. *Middle Cuyahoga River Watershed Action Pl*an. Akron, Ohio: NEFCO.
[43] Ohio EPA, Division of Surface Water. September 2003. *Total Maximum Daily Loads for the Lower Cuyahoga River*.
[44] NEFCO. Ongoing effort. Information prepared for the *Little Cuyahoga River Balanced Growth Plan*. Akron, Ohio: NEFCO.

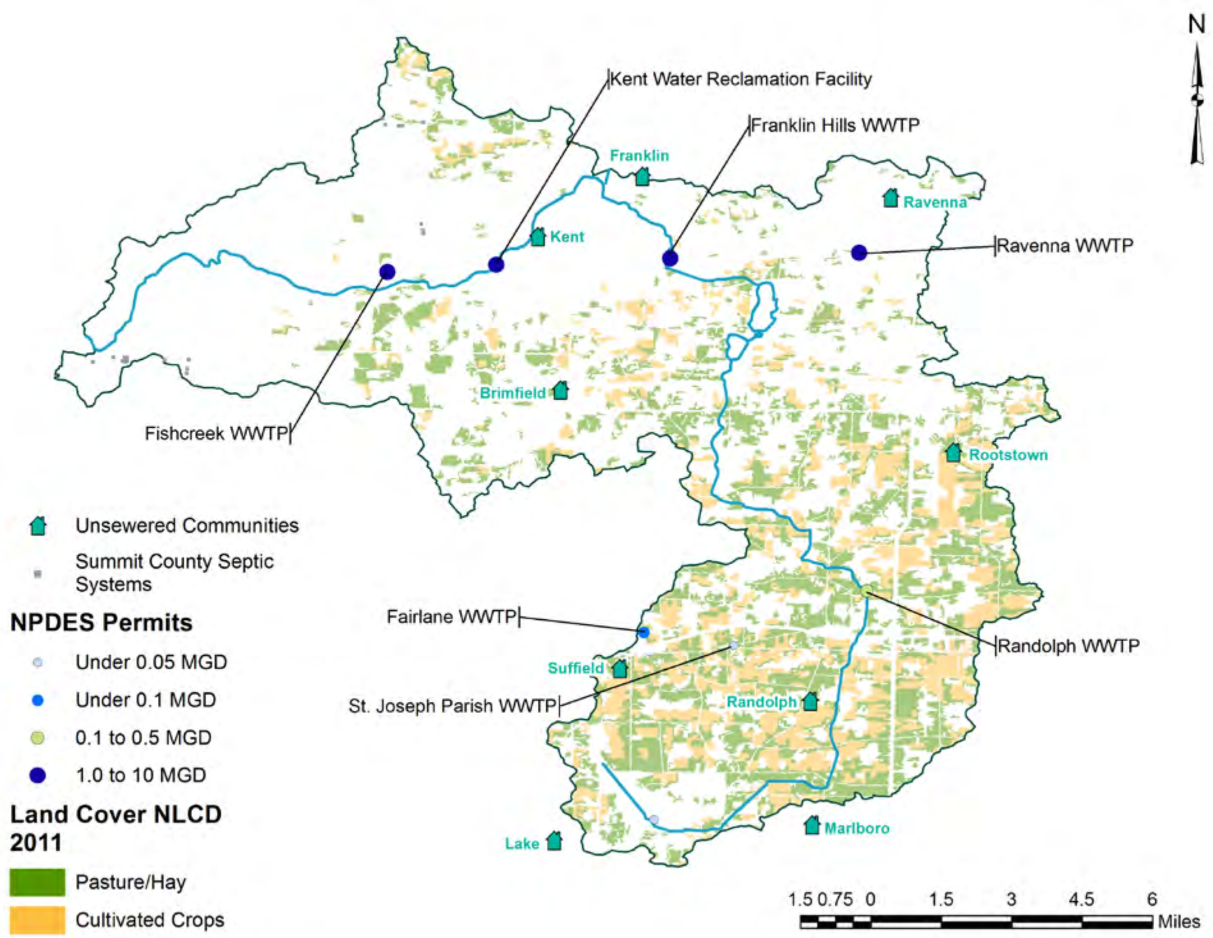

Figure 2-22. Potential Bacteria Sources in the Middle Cuyahoga River Watershed

2.1.11 Bacteria Sources in the Lower Cuyahoga Watershed

Potential sources of bacteria in the Lower Cuyahoga River watershed are shown in Figure 2-23 and include:[45, 46]

- Akron CSOs.
- Stormwater runoff.
- Major municipal WWTPs that discharge more than one million gallons per day (MGD): there are two WWTPs that discharge directly to the Cuyahoga River and six WWTPs that discharge to tributaries to the Cuyahoga River.

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[45] Ohio EPA, Division of Surface Water. September 2003. *Total Maximum Daily Loads for the Lower Cuyahoga River*.
[46] NEFCO. December 21, 2011. *Clean Water Plan Update; Water Quality Management Plan*.

- Minor municipal WWTPs: minor WWTPs discharge within the Lower Cuyahoga River watershed. NEFCO indicated that several of these communities are programmed for new sewers within the next 15 to 20 years.
- Agriculture and domestic livestock: 51% of land in the watershed is used for agriculture and there are small farms with livestock and residences with livestock as pets or a hobby in areas directly adjacent to surface water bodies.
- Unrestricted livestock access to streams and manure application.
- Wildlife (waterfowl, whitetail deer, beaver).
- Failing septic systems: much of the watershed is rural and not connected to municipal sewer systems.
- Campgrounds, wineries, ski resorts, horse parks, pet waste and golf parks with portable toilet facilities within the CVNP.

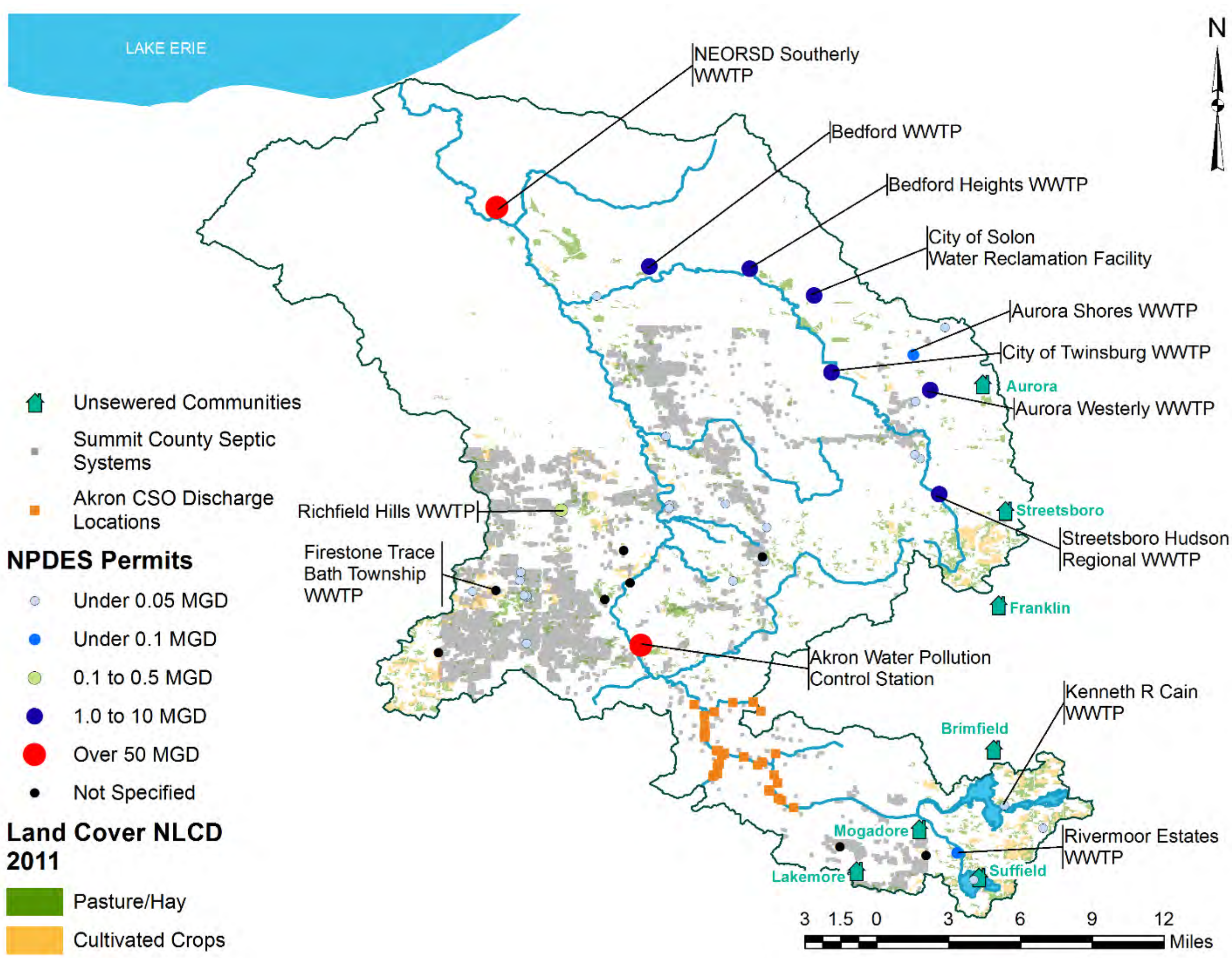

Figure 2-23. Potential Bacteria Sources in the Lower Cuyahoga River Watersheds

2.2 Challenges in Meeting Current and Future CWA Requirements

This section looks at a number of CWA requirements that Akron is facing now and may face in the future. These requirements include provisions of the CD, nutrient control and phosphorus reduction, Ohio EPA's 303(d) listing, and stormwater regulations. Many of these provisions that were not addressed in Akron's LTCP are now addressed in the integrated planning process.

Since the City does not currently know what these future requirements may be, there is no way to include specific projects for these potential NPDES changes in the Integrated Plan. It may be possible to incorporate these future requirements within the financial constraints anticipated at this time, or it may be necessary to adjust the project prioritization and funding plan to accommodate these potential new projects as they become necessary. In addition, the City continues to pursue grant funding for projects such as stream restoration which require matching funds. This is the reason that Akron proposes to use the adaptive management approach to re-visit all of the projects on a regular basis to re-prioritize and adjust the plan to meet ever-changing conditions.

2.2.1 National Pollutant Discharge Elimination System Permit (NPDES)

The City has a NPDES permit[47] for discharges from the Akron Water Reclamation Facility (WRF), which is referred to as the Akron Water Pollution Control Station (WPCS) in the CD and is used for consistency in the text of this Integrated Plan. This permit is issued by Ohio EPA and regulates discharges from the WPCS and the combined sewer system. The permit also includes instream monitoring station requirements in addition to effluent limits.

2.2.2 Consent Decree

The City is operating under a CD to settle alleged violations of the CWA. Prior to entering the CD, the City voluntarily made substantial investments of well over $300 million, including constructing the CSSF at Racks 40, 31, and 30 which captured over one-third of the CSO volume from the system. However, to avoid complicated, protracted, and expensive litigation, the City agreed to the CD to further improve the City's wastewater infrastructure and reduce CSO discharges.

2.2.3 CSO Control Policy

USEPA's CSO Control Policy (CSO Policy) was published April 19, 1994, and presents the national framework for the control of CSOs. The CSO Policy provides guidance on how communities with combined sewers can meet the CWA goals and typically requires development of a LTCP. The CSO Policy allows communities to take a presumption approach or a demonstration approach to establishing appropriate levels of control. Under the presumption approach, communities can show that the LTCP will achieve 85% capture of pollutant mass (with treatment at the WWTP); 85% capture of CSO volume; or on average 4 to 6 overflow events per year.

USEPA is continuing to require reduction of CSO discharges for CSO communities. Under the current CD, the City is required to achieve zero untreated CSOs during a Typical Year. Achieving a "zero" CSO discharge level of performance in the Typical Year is more stringent

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[47]Ohio EPA Permit No. 3PF00000*ND, *Ohio Environmental Protection Agency Authorization to Discharge Under the National Pollutant Discharge Elimination System,* Modified March 11, 2014, Modified June 1, 2014, Expiration date of July 31, 2015.

than the level of performance imposed by USEPA and Ohio EPA for other Ohio and national combined sewer utilities. The level of performance in other combined sewer utilities tends to be two to four CSO discharges in a Typical Year. This is especially true in the case of the Northeast Ohio Regional Sewer District that discharges to the same receiving river and is allowed two overflows in the Typical Year.

2.2.4 Nutrient Control and Phosphorus Reduction

Additional CWA obligations that may be imposed on the wastewater system in the future include a reduction in phosphorus loading to local receiving waters. Ohio is actively developing nutrient rules for streams and small rivers[48] (see http://epa.ohio.gov/dsw/wqs/NutrientReduction/NutrientTAG.aspx) and has developed a statewide nutrient reduction strategy.[49] Both of these efforts contemplate additional phosphorus removal at publicly owned treatment works, such as the WPCS.

Ohio EPA submitted the 2014 Integrated Water Quality and Assessment Report to USEPA for approval on April 1, 2014. USEPA has taken no action on the report to date. Consequently, the 2012 Integrated Report's 303(d) list is still the approved version of the prioritized impaired waters list.

Preparation of the 2016 Integrated Report is already underway and is scheduled for submittal to USEPA on April 1, 2016. This report will reflect changes in the Cuyahoga River segments that will be included in the 303(d) list.

Since the City does not currently know what these future requirements may be, there is no way to include specific projects for these potential NPDES changes in the Integrated Plan. It may be possible to incorporate these future requirements within the financial constraints anticipated at this time, or it may be necessary to adjust the project prioritization and funding plan to accommodate these potential new projects as they become necessary. This is the reason that Akron proposes to use the Adaptive Management approach to re-visit all of the projects on a regular basis to re-prioritize and adjust the plan to meet ever-changing conditions.

[48] Ohio EPA. November 19, 2013 – March 6, 2015. Nutrient Technical Advisory Group. Meeting Agendas, Minutes, and Documentation.
[49] Ohio EPA. June 28, 2013. *Ohio Nutrient Reduction Strategy*. Prepared in collaboration with Ohio Department of Agriculture and Ohio Department of Natural Resources.

2.3 Stormwater Regulations

The City's stormwater system operates under an Ohio EPA MS4 Permit[50] The Akron WPCS is considered an "industrial" facility under federal and state stormwater permitting programs and operates under General Permit OHR000005.[51] Individual development and construction projects are also required to operate under Ohio EPA NPDES General Permits for stormwater discharges. These construction-related projects are authorized to discharge under Ohio EPA's General Permit OHC000004.[52]

The main requirement in the City's MS4 Permit is to implement a Stormwater Management Program. This program includes several elements intended to reduce pollutants in urban runoff and stormwater. The elements include the following:

- Public Education and Outreach on Stormwater Impacts: distribute educational materials to the public regarding stormwater discharges and ways to reduce stormwater pollutants.
- Public Involvement/Participation: involve public groups in activities associated with stormwater pollution reduction and prevention.
- Illicit Discharge Detection and Elimination: maintain and enforce a program to detect and eliminate illicit discharges such as cross connections between the storm and sanitary collection systems, and illegal dumping of pollutants into the storm system.
- Construction Site Stormwater Control: maintain and enforce a program to reduce stormwater pollutants discharging from construction sites.
- Post Construction/Redevelopment: implement and enforce a program to prevent or minimize water quality and quantity impacts after construction project completion.
- Pollution Prevention and Good Housekeeping: develop and implement an operations and maintenance (O&M) program to reduce stormwater pollution from municipal operations.
- Industrial and Related Facilities: implement and enforce a program to address stormwater runoff from industrial facilities.
- Monitoring and Reporting: perform wet weather monitoring at instream stations once per month and at Outfalls 30, 65, and 102 three times per year.

The overall purpose of this stormwater regulatory framework is to protect public health and the environment from the impacts of pollutants in various sources of stormwater runoff. The City is similarly committed to achieving public health and environmental protection by meeting the regulatory framework requirements. Additional resources are needed to increase asset

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[50] Ohio EPA Permit No. 3P100002*CD, *Ohio Environmental Protection Agency Authorization to Discharge Under the National Pollutant Discharge Elimination System,* Issued June 13, 2011, Effective July 1, 2011, through June 30, 2015.
[51] Ohio EPA Permit No. OHR000005, *Ohio Environmental Protection Agency Authorization to Discharge Storm Water Associated with Industrial Activity Under the National Pollutant Discharge Elimination System Multi-Sector General Permit,* Issued December 15, 2011, Effective January 1, 2012, through December 31, 2016.
[52] Ohio EPA Permit No. OHC000004, *Ohio Environmental Protection Agency General Permit Authorization for Storm Water Discharges Associated with Construction Activity Under the National Pollutant Discharge Elimination System,* Issued April 11, 2013, Effective April 21, 2013, through April 20, 2018.

management for the storm sewer system and make improvements to localized stormwater issues such as stream restoration, bank stabilization, and water quality improvements.

The City's integrated planning goals for the stormwater system improvements are to:

- Continue compliance with its MS4 permit.
- Identify cost-effective alternatives that meet City goals.
- Implement BMPs and green infrastructure project components that enhance urban livability as well as control year-round urban runoff pollutant sources.
- Minimize the potential localized flooding stormwater sources.
- Ensure the local community's needs and input play a significant role in determining the most beneficial projects.

The City has addressed emergency stormwater issues associated with localized flooding and in a limited number of instances when grant funding was available, stream restoration and bank repair needs. Since limited funding is presently available for O&M and system renewal of stormwater conveyance assets, it can be expected that those assets will continue to deteriorate.

The City recognizes that it must increasingly fund routine asset management efforts to extend the useful life of both separated, combined, and storm sewer assets. It is also expected that the current MS4 permit governing stormwater discharges within the City will become increasingly more stringent in coming years and will require additional resources and budgets.

2.4 Public Health Threats

As noted previously, impaired segments of the Cuyahoga River are caused by exceedances of RWQC that may be attributed in part to the City's CSO discharges. These impairments represent a potential health threat to recreational users of the receiving waters. If CSOs are controlled to a limited number and volume of discharges a year, this potential threat from CSOs is reduced and/or eliminated. The discharges will occur during only the largest storm events when recreational activities in the receiving waters, and the areas adjacent to the receiving waters, are unsafe due to high flows and public contact with the polluted water is unlikely. Further, for these large events, the water discharged from the CSO structures is highly diluted sewage due to the amount of stormwater entering the combined sewer system (CSS).

Forecasted improvements based on CSO control are presented in Section 6, Integrated Planning Results. Even under the currently approved LTCP improvements, receiving water quality will not improve enough to meet RWQC due to other sources of bacteria. Conversely, removing dams to allow for a more free-flowing Cuyahoga River will result in increased recreational opportunities and a better distribution of fish populations within the river.

2.4.1 Sensitive Areas

The LTCP identified that all of the City's CSOs discharge, either directly to sensitive areas or to waters that enter sensitive areas (Lake Erie).[53] Thus, all of the CSOs receive equal priority under the sensitive area analysis during the integrated planning process. The CSO Policy states that permittees should "[e]liminate or relocate overflows that discharge to sensitive areas wherever physically possible and economically achievable… [w]here elimination or relocation is not physically possible and economically achievable, or would provide less environmental protection than additional treatment, provide the level of treatment for remaining overflows deemed necessary to meet water quality standards for full protection of existing and designated uses."[54]

2.4.2 Metrics for Evaluating and Meeting Public Health and Water Quality Objectives

USEPA's IPF guidance notes that the IPF process is designed to assist municipalities in "addressing instances where competing or overlapping government requirements for protecting water quality have the unintended consequences of constraining a municipality from implementing the most cost-effective solution in a sequence that addresses the most serious water quality issues first."

Under the City's proposed adaptive management approach, discussed in Section 8, Improving the Plan, completed projects will be evaluated in terms of CSO reduction, green infrastructure, and BMP effectiveness. The adaptive management approach facilitates continuous improvements in decision-making processes by basing future decisions on the best and most recent data available. Under adaptive management, the City will also continue to periodically evaluate instream public health and water quality objectives. Table 2-11 shows the water quality metric and the criteria. Based on five-year evaluations of those parameters, the City will continue to improve subsequent project designs and implementation measures to maximize the environmental and secondary benefits of those projects.

Table 2-11. Instream Public Health and Water Quality Objective Metrics

Metric	Criteria
Aquatic Life[1]	Invertebrate Community Index (ICI), IBI, MIWb, Ephemeroptera, Plecoptera, and Trichoptera (EPT) Taxa and Qualitative Habitat Evaluation Index (QHEI)
Recreation	*E. coli*
Nutrients	Total phosphorus, dissolved inorganic nitrogen, dissolved oxygen (DO) and benthic algae

[1] Ohio EPA (1987, updated 1988, 1989, 2006, 2015). *Biological Criteria for the Protection of Aquatic Life: Volume II: User's Manual for Biological Field Assessment of Ohio Surface Waters."*

More information on the measures of success and continuous improvement process is provided in Section 7, Measuring Success, and Section 8, Improving the Plan, of this report.

[53] City of Akron, *Akron Consent Decree 2010, Final CSO Long Term Control Plan Update Report*, Volumes I and II (February 28, 2011).
[54] 59 Fed. Reg. 18692.

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3.0 EXISTING SYSTEMS & PERFORMANCE

Element 02 Existing Systems & Performance

Element 2 of USEPA's IPF requires a description of the current performance of the utility's existing wastewater and stormwater systems. The City operates a wastewater treatment plant, pump stations, separate sanitary sewers, combined sewers, and a stormwater conveyance system.

Descriptions of these facilities are provided in this section, along with a characterization of system flows and performance.

3.1 Wastewater System

The City's collection system consists of approximately 679 miles of sanitary sewers, 169 miles of combined sewers, 22 miles of force mains, more than 18,850 sanitary and combined manholes, 36 pump stations, 32 CSO racks, two CSO storage basins, and the 90 MGD (average daily design flow with secondary treatment up to a 130 MGD flow) wastewater treatment plant.

Each of these components, and its system performance, are described in more detail in the remainder of this section.

3.1.1 Wastewater Service Area

The City's wastewater collection and treatment system serve the City and many neighboring communities in a 110 square mile service area as shown in Figure 3-1. There are approximately 85,000 active accounts, and sewer service is provided to a population of approximately 350,000.

In addition to metered retail customers, the City supplies wastewater treatment service for five existing master meter (MM) communities. Table 3-1 identifies current MM customers and shows 2014 metered discharges. The areas where MM customers are located are also shown in Figure 3-1. The City provides retail wastewater services outside city limits to the City of Fairlawn, the Village of Mogadore and Springfield Township.

Table 3-1. Master Meter Communities in the Akron Service Area

Master Meter Communities	2014 Metered Discharge (MG/Year)
Cuyahoga Falls	926
Montrose	394
MudBrook (includes Stow, Silver Lake, and Munroe Falls)	2,045
Lakemore	326
Tallmadge	880
Total MM Discharge	**5,123**
Total Customer Metered Discharge	**10,814**

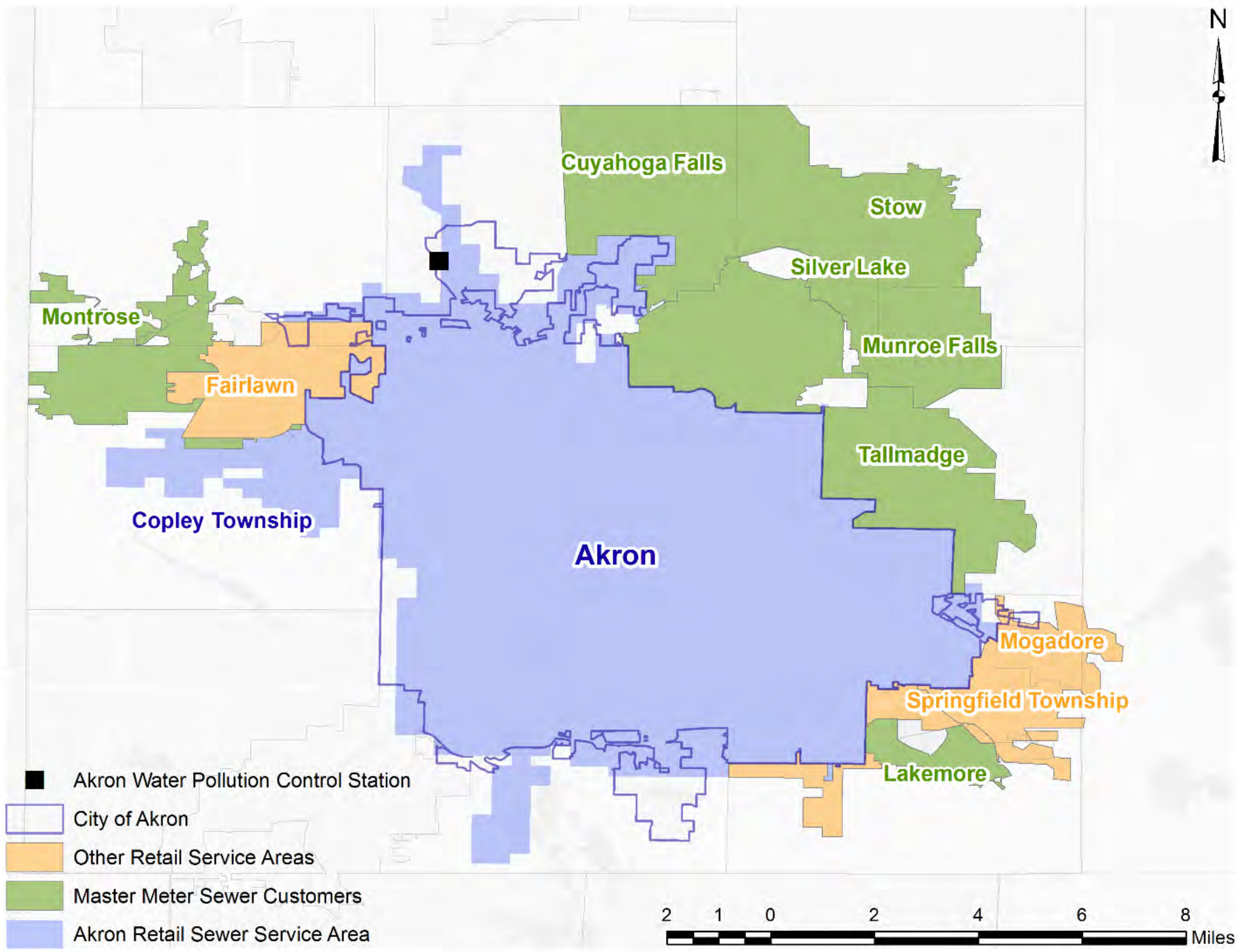


Figure 3-1. Akron's Wastewater Service Area

The MM communities currently account for approximately 45% of the total metered and billed flow discharged to the City. The remainder of the metered flow is discharged by retail customers. Each MM community owns, operates, and maintains its own local collection systems. However, it should be noted that MM communities' metered flows are metered sewer flows, while all other metered flows are water consumption flows. In cases where customers are on private wells, assumed water consumption may be used in lieu of actual metered water flows. The MM metered sewer flows already include the unbilled flows and inflow and infiltration (I/I) from the MM community.

3.1.2 Wastewater Infrastructure

The existing wastewater collection system, shown in Figure 3-2, consists of sanitary sewers ranging from 6-inch to 78-inch diameter and combined sewers that range from 6-inch diameter pipe to 144-inch by 90-inch outfall sewer. Sanitary and combined sewers are constructed of vitrified clay, reinforced concrete pipe, brick, polyvinyl chloride (PVC), segmental block, truss, corrugated metal, fiberglass reinforced pipe, A2000 pipe, high density polyethylene (HDPE), and other materials. A summary of the recently completed condition assessment of the sewers is provided in Section 3.1.5, Five-Year Cleaning and Inspection Cycle and Findings.

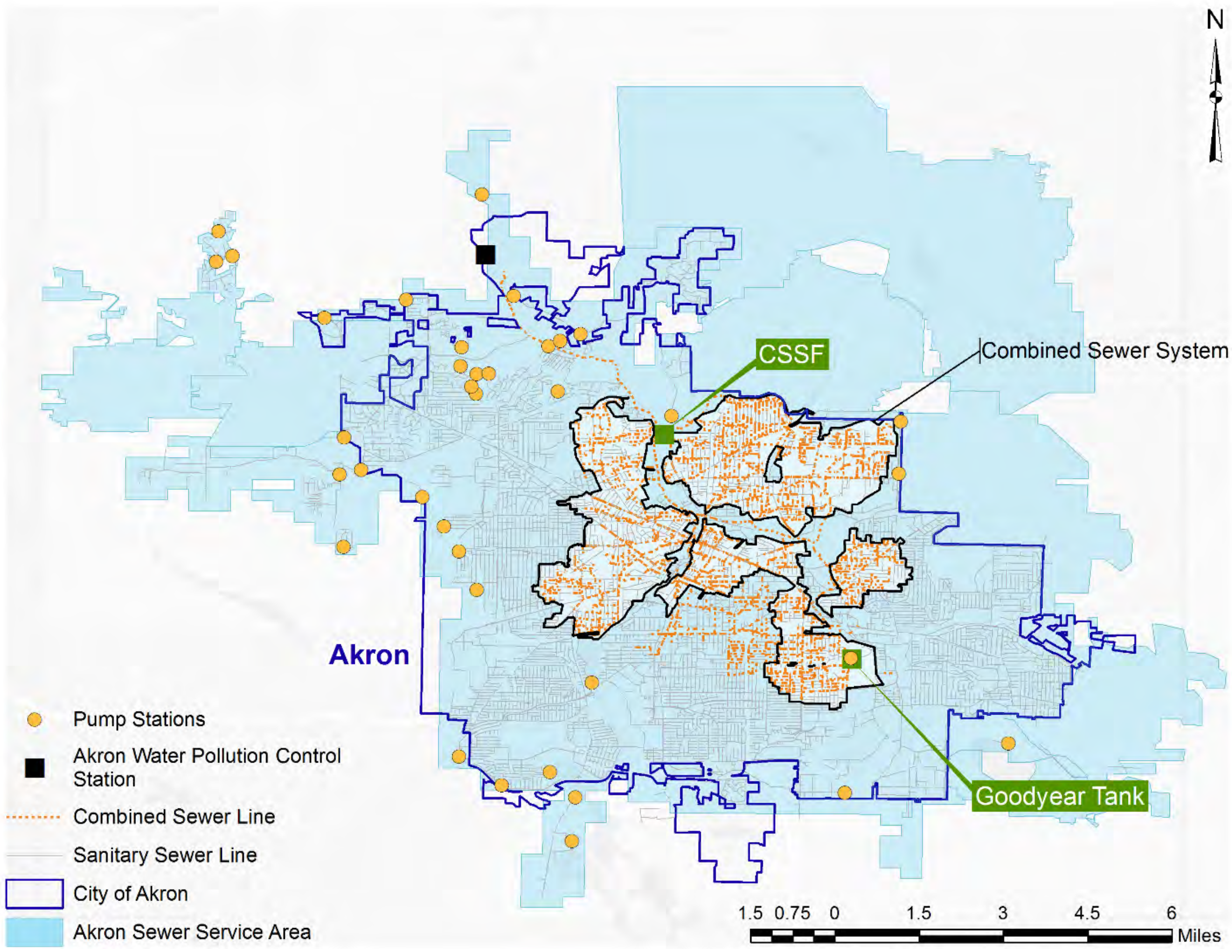


Figure 3-2. Akron's Wastewater Collection System

The collection and conveyance system includes two retention tanks (shown on Figure 3-2): the CSSF and Goodyear Retention Tank #2. The CSSF has a volume of 10 million gallons (MG) and the Goodyear Tank has a volume of 4.8 MG. In addition, the City owns and maintains the 36 pump stations listed in Table 3-2.

Table 3-2. Akron's Pump Stations

Name	Address
Bellevue	1450 Bellevue Avenue
Brittain #1	1489 Brittain Road
Brittain #2	1963 Brittain Road
Brookfield	1828 1/2 Brookfield Drive
Brookshire	1836 Brookshire Road
Canfield	2535 Canfield Road
Clearfield	2966 Clearfield Avenue
Cleveland-Massillon	870 N Cleveland Massillon Road
Cormany	3324 Cormany Road
Cromwell	1881 Cromwell Drive
Cuyahoga	1021 Cuyahoga Street
Eagles Lane	1645 Eagles Lane
Fairhill	639 Fairhill Drive
Fairlawn Knolls	1813 Fairlawn Knolls Drive
Fox	949 Fox Road
Granger	3676 Granger Road
Hampton Ridge	754 Hampton Ridge
Kibler	2592 Kibler Road
Lake of the Woods	600 Lake of the Woods Boulevard
Manchester	2923 Manchester Road
Merriman	1863 Merriman Road
Mud Run	2664 Cordelia Avenue
Quaker Ridge	45 Quaker Ridge Drive
Rambling	1100 Rambling Way
Schocalog	706 Schocalog Road
Second	1887 Second Street
Shoreline	2689 Shoreline Drive
Shullo Drive	887 Shullo Drive
Sourek	2545 Sourek Road
St. Michaels	1021 St. Michaels Avenue
Sycamore Lane	1625 Akron Peninsula Road
Timber Trail	2234 Akron Peninsula Road
Towpath	3250 Akron Peninsula Road
Wealthy	1836 Brookshire Road
Weathervane	1317 Weathervane Lane
White Pond	720 White Pond Drive

As previously shown in Figure 2-6, there are currently 32 permitted CSO outfall structures in the City's CSS. Overflows occur when wastewater from a combined sewer is discharged at a point prior to the treatment plant whenever flows exceed the carrying capacity of the underflow pipe at each rack (see the illustration in Figure 3-3).

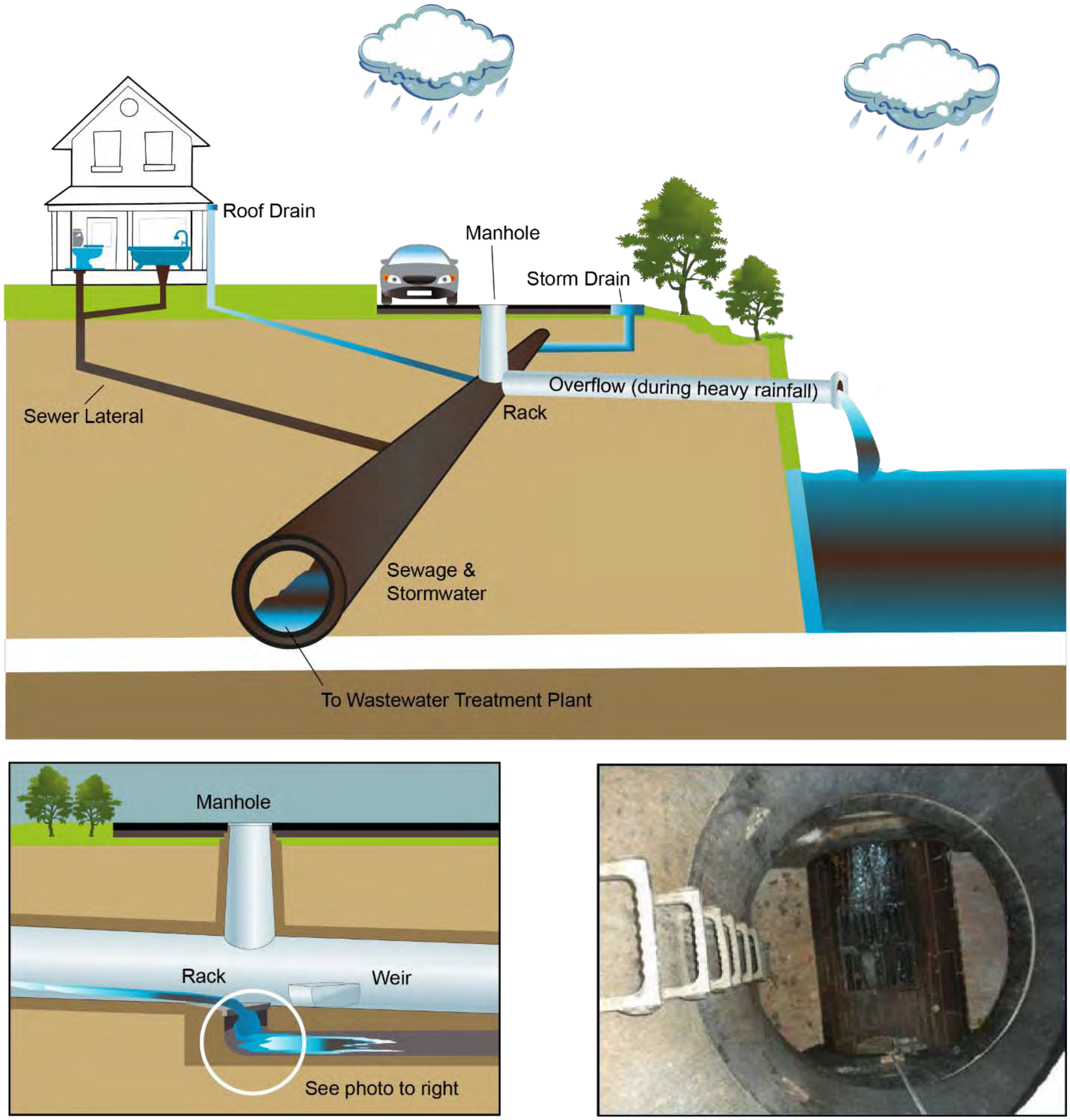


Figure 3-3. Combined System Flows

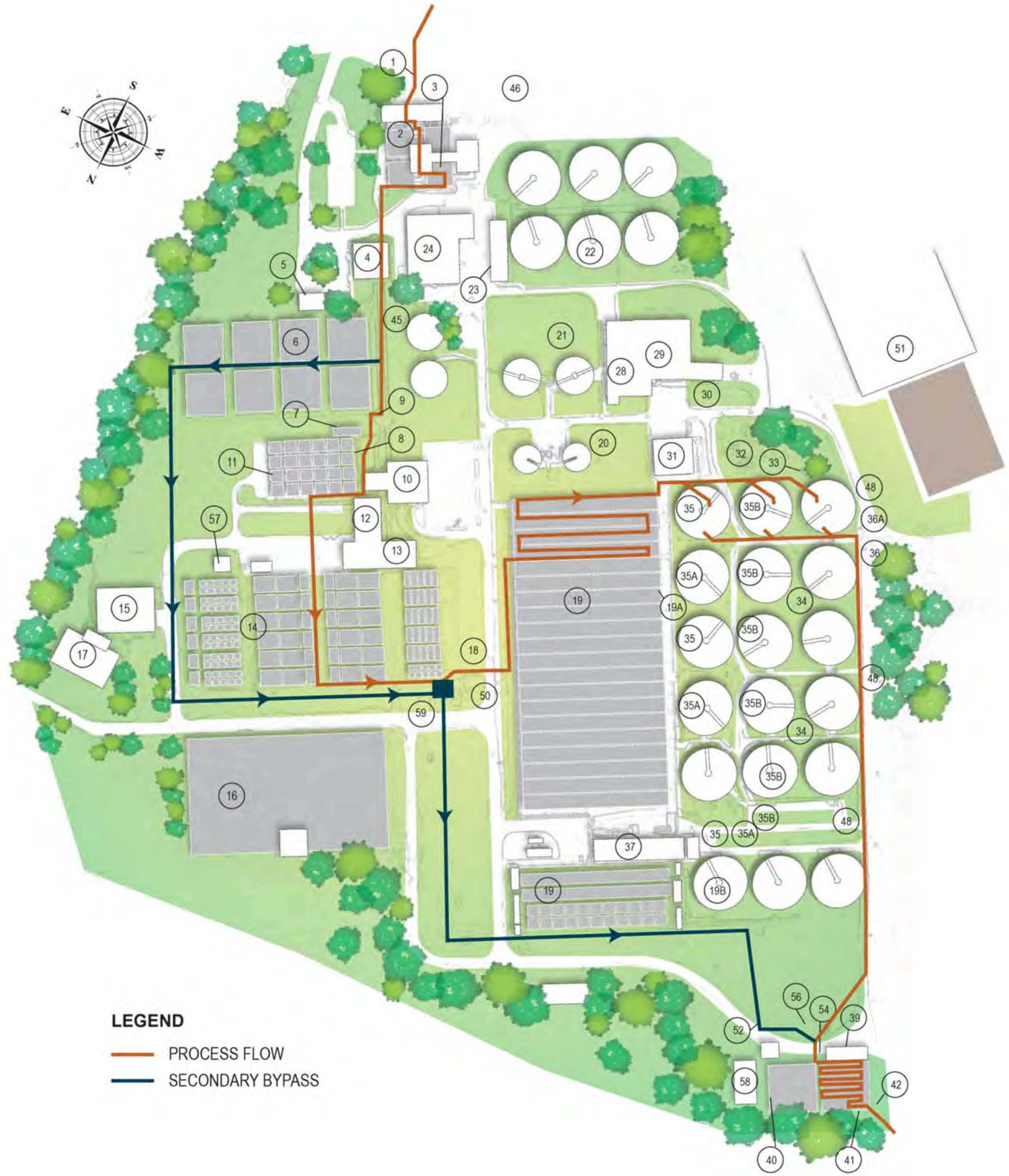
The City's CSO structures consist of a rack, which is a static regulator structure that receives combined sewer flows. Each rack consists of a combined sewer inlet, a bar grate over a drop inlet to an underflow pipe, and a weir with a CSO (see Figure 3-3). More information on the performance of these racks is presented in Section 3.1.4, Combined and Separate Sanitary Sewer System Performance.

Dry weather flows and wet weather flows to a certain flow rate pass through the grate into the underflow pipe. The underflow pipe then transports the flows to the interceptor for conveyance to the City's wastewater treatment plant for treatment. During more intense rain events when the stormwater entering the combined sewer system increases, the grate and underflow pipe capacity are exceeded and the flow level within the structure rises until it passes over the weir. The weir overflow is directed to the overflow pipe and discharged at a point source location to the environment.

The WPCS, located in the Cuyahoga River Valley at 2460 Akron Peninsula Road, provides primary and advanced secondary treatment of wastewater, followed by disinfection prior to discharge to the Cuyahoga River. The site layout of the WPCS is shown in Figure 3-4 on the following page, and the process flow through the WPCS is depicted in Figure 3-5.

The WPCS treats approximately 75 MGD of wastewater on an average daily flow basis. Peak flows to the plant can approach 280 MGD due to rain or snow melt. Despite the influx of peak flows, plant operators have been able to meet effluent permit requirements on a consistent basis.

The City recently expanded the secondary treatment flow of the WPCS from 110 MGD to 130 MGD. Flows in excess of the secondary treatment capacity are stored in the 10 MG Stormwater Retention Tank (SRT), and flows above the storage capacity are bypassed around the secondary treatment process. Prior to the expansion, the annual volume of bypass flows was approximately 473 MG during the Typical Year. After the expansion, the volume was reduced to approximately 300 MG during the Typical Year. The City has preliminary success at operating secondary treatment up to 142 MGD peak capacity, which results in 226 MG during the Typical Year. During 2014, the Akron WPCS treated over 27 billion gallons (BG) of wastewater for an average of 74 MGD, which was slightly under the plant's 10-year average flow of 76 MGD. The plant removed 96.1% of incoming suspended solids and 96.6% of incoming carbonaceous biochemical oxygen demand.



Legend

1 Influent Chamber (Ic)
2 Influent Screening (Is)
3 Grit Removal Complex (Grc)
4 Training Facility (Tf)
5 Storm Retention Influent (Srips)
6 Storm Retention Tanks (Srt)
7 Storm Retention Effluent (Sreps)
8 Recycle Water Flume (Rwf)
9 Bypass Junction Chamber (Bjc)
10 Central Locker Facility
11 Preaeration Tanks (Pt) (Decommissioned)
12 Chemical Handling And Blower Building (Chbb)
13 Primary Control Building (Pcb)
14 Primary Settling Tanks (Pst)
15 Laboratory Building (Lab)
16 Decant Basins(Db)
17 Administration Building (Ab)
18 Aeration Influent Flume (Aif)
19 Aeration Tanks (At) (Aeration Basins)
19a Aeration Gallery (Ag)
19b Aeration Gallery Tank No.6 (Agt6)
20 Lime Stabilization Plant (Lsp) (Out Of Service)
21 Gravity Thickeners (Gt)
22 Mixing And Holding Tanks (Mht)
23 Vehicle Storage Building (Vsb)
24 Maintenance Building And Storeroom (Mbs)
28 Gravity Belt Thickeners
29 Zimpro Building (Zb) (Decommissioned)
30 Standby Generator Building (Sgb)
31 South Blower Building (Sbb) (Decommissioned)
32 69kv Outdoor Substation
33 Equipment Storage Building (Esb)
34 Final Settling Tanks (Fst)
35 Return Sludge Screw Pumps
35a Return Sludge Well (Rsw)
35b Ras Metering Chamber (Rasmc)
36 Bypass Chamber (Bc)
36a 84" Bypass Gate Station
37 North Blower Building (Nbb)
38 Abandoned Palnt River Water Pumphouse (Abrwp)
39 Chlorination And Plant Water Facilities (Cpwf)
40 Chlorine Contact Tanks (Cct)
41 Final Effluent Monitoring (Fem)
42 Outfall Sewer (Os)
42a Final Effluent Outfall (Feo)
45 Recycle Water Equalization Tank (Rwet) (Out Of Service)
46 Plant Utility Access Road (Puar)
48 Final Settling Tank Effluent Monitoring (Femb)
50 Primary Effluent Sample Building (Pesb)
51 Compost Facility (Cf)
52 Secondary Bypass Manhole (Sbm)
54 Flash Mixer (Fm)
55 Combustible Gas Analyzer Building
56 Final Tank Effluent Sampling Station
57 Generator Building
58 Dechlorination Building
59 Bypass Diversion Structure

Figure 3 4. Akron WPCS Facility Site Map

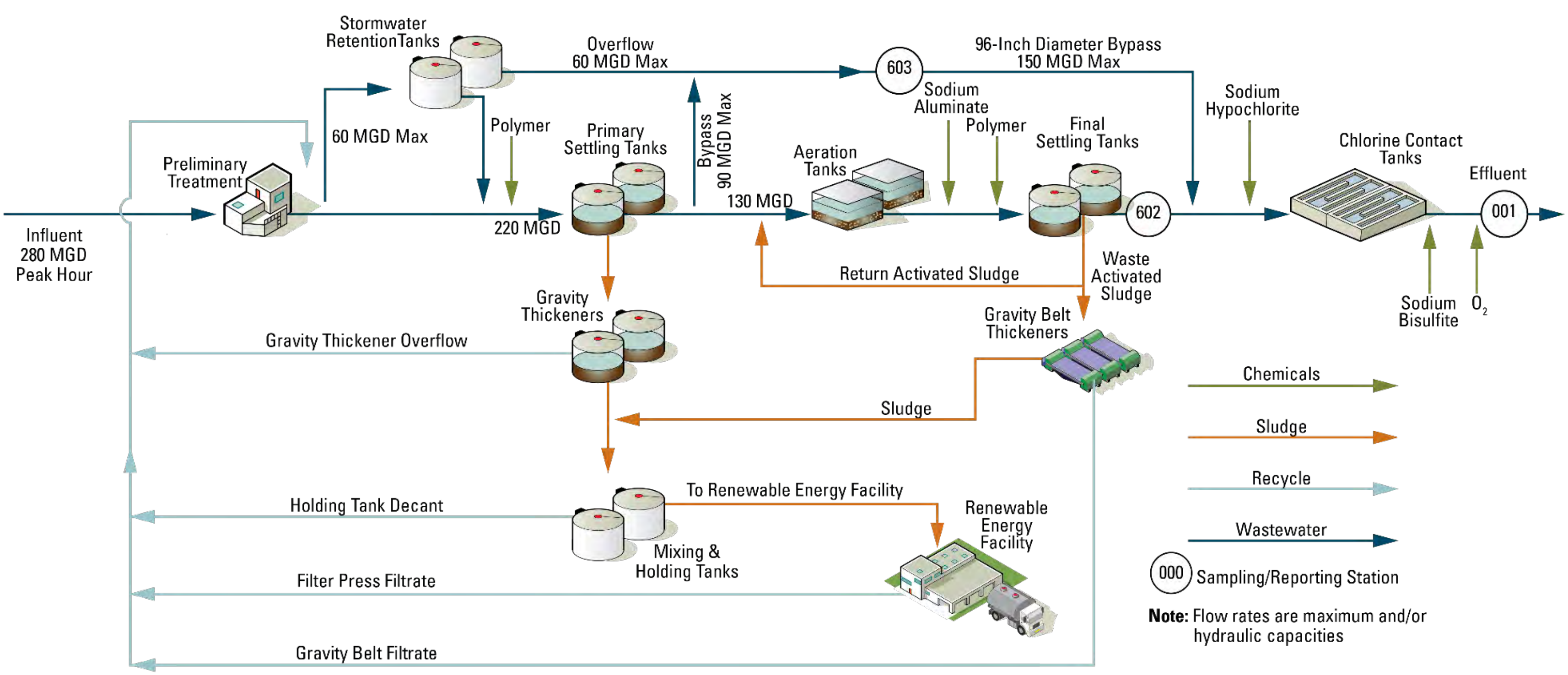


Figure 3-5. Akron WPCS Process Flow

3.1.3 Wastewater Treatment Plant Performance

The City measures flow in compliance with its NPDES permit, and provides required information in a Monthly Operating Report that is submitted to Ohio EPA.

Over the past 18 years, the City has received many awards from the National Association of Clean Water Agencies (NACWA) and the Ohio Water Environment Association (OWEA) for the performance of its WPCS as shown in Table 3-3. These awards demonstrate the City's commitment to efficient, effective, and high quality wastewater treatment plant operation and maintenance practices. However, as with all aging infrastructure, it will be expected to be repaired and rehabilitated to ensure sustainable operation.

Table 3-3. Akron's NACWA and OWEA Performance Awards

Award Type[1]	Definition
Platinum Awards	Platinum Awards recognize 100% compliance with permits over a consecutive five-year period. Platinum Awards will be given to facilities with a consistent record of full compliance for a consecutive five year period.
Gold Awards	Gold Awards are presented to facilities with no permit violations for the entire calendar year.
Silver Awards	Silver Awards are presented to facilities with no more than five violations per calendar year.
Year	**Award**
1997	NACWA Silver Award
1999	NACWA Silver Award
2000	NACWA Gold Award
2001	NACWA Gold Award
2002	NACWA Silver Award
2003	NACWA Silver Award
2004	NACWA Silver Award
2005	NACWA Gold Award
2006	NACWA Gold Award
2007	NACWA Silver Award
2008	NACWA Silver Award
2009	NACWA Silver Award
2010	NACWA Silver Award
2011	NACWA Silver Award
2012	NACWA Gold Award OWEA Engineering Excellence Award for the Renewable Energy Facility Biogas Project
2013	NACWA Silver Award Northeast Section OWEA Outstanding Facility Award
2014	NACWA Silver Award

[1]All treatment facility applicants must be publicly owned by a current NACWA member agency and be in operation for one month during a calendar year. Treatment facilities must provide, at minimum, secondary treatment, or advanced primary treatment with a 301(h) waiver.

3.1.4 Combined and Separate Sanitary Sewer System Performance

As part of the integrated planning effort, the City undertook substantial efforts to update its InfoWorks collection system model. These efforts are documented in a separate Technical Memorandum dated June 15, 2015.[55]

Combined Sewer Overflows

Table 3-4 provides a listing of the CSO Racks in the City's combined sewer system. This table presents modeled overflows for the Typical Year for each CSO Rack. Under the City's CD, the Typical Year overflows must be zero for each CSO Rack by 2027.

Table 3-4. Akron's CSO Racks

CSO Rack #[1]	Estimated Typical Year Values		CSO Rack #	Estimated Typical Year Values	
	# of Overflows	Overflow Volume (MG)		# of Overflows	Overflow Volume (MG)
2	0	0.0	20	37	10.4
3	10	28.1	21	39	4.1
4	01	4.7	22	51	46.0
5	26	8.3	23	0	0.0
6	0	0.0	24	53	48.1
7	30	9.2	25[1]	-	-
8[2]	-	-	26	31	2.9
10	30	4.8	27	5	1.6
11	20	23.9	28	37	8.9
12	15	50.4	29	33	7.2
13	7	1.2	32	13	4.4
14	43	21.6	33	7	0.1
15	35	11.8	34	36	6.0
16	45	160.9	35	41	38.9
17	48	72.3	36	33	11.2
18	35	150.7	37	6	2.8
19	39	30.1	CSSF (30/31/40)	0	0
Total Volume				**771 MG**	
			OCI Racks Total Volume	**480.1 MG**	
			NSI Racks Total Volume	**49.4 MG**	

[1] Racks 9 and 39 were eliminated prior to the LTCP.

[2] Rack 8 and 25 sewer separations have been completed.

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[55] Conway, Shannon et. al., June 2, 2015. Draft Technical Memorandum to File: Integrated Planning/Modeling. "InfoWorks CS collection system model updates and recalibration through April 30, 2015". Akron Waterways Renewed Program.

CMOM Program

As experienced by all other sewer utilities across the country, the City's sewer system sometimes experiences sanitary sewer overflows (SSOs) and combined sewer system (CSS) releases due to unplanned events such as mainline blockages, mechanical or electrical problems at pump stations, broken or collapsed pipes, accidental pipe damage (i.e., "contractor hits"), and vandalism. Federal and state regulatory agencies consider the SSO and CSS release events to be "unpermitted discharges" that are not allowed by the CWA.

Pursuant to Section VII of the City's CD, the City developed a CMOM Program that consists of elements listed in Attachment C of the CD, paragraph 2. The City's CMOM Program is documented in a written plan, approved by USEPA, which is directed at reducing unplanned SSOs and CSS releases through stated goals and objectives. It also lists the strategies and tactics that are being employed to achieve the goals. Details of the City's CMOM Program are provided in Semi-Annual Reports that are submitted to USEPA. The City is in full compliance with its NPDES permit and CD, and it is meeting its current needs for appropriate collection systems O&M efforts.

Since the commencement of the CMOM program, the City has seen a decrease in unplanned SSOs, CSS releases, and property backups caused by mainline blockages. A mainline blockage is defined in the 2007 American Water Works Association (AWWA) Benchmarking report as follows:

> "…created by conditions within the collection system components under the control of the utility such as overflows from sanitary sewers and dry weather overflows from combined sanitary/storm sewers, excluding the following situations, which are deemed outside of a utility's control:
>
> - General flooding that results in an overflow in an otherwise separate sanitary sewer;
> - Conditions within a facility for which a customer is responsible, including building plumbing or service sewer deterioration, failure, and flow restrictions; and
> - Wet weather conditions, such as precipitation, snowmelt, and natural flooding, when they are clearly the cause of overflows in combined sewers."[56]

The AWWA Benchmarking report identifies a wastewater operations performance metric for Sewer Overflows (Overflow Events per 100 Miles of Pipe). The rate of sewer overflows per 100 miles of collection system is an indicator that is intended to provide a measure of the wastewater collection system condition and of the effectiveness of routine sewer system maintenance. This can be a meaningful metric since a higher overflow rate would be expected in a system where the collection system was in disrepair or was not being properly maintained.

For sewer utilities serving a population between 100,000 and 500,000, the benchmark is between four to seven overflow events/100 miles of pipe. As evidenced in Figure 3-6, the City has consistently exceeded this performance metric. The City's reported overflow rate was 2.4 overflows per 100 miles of pipe for the calendar year 2014 (based on 25 spills and 848 miles of

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[56] AWWA. 2007. *Benchmarking Performance Indicators for Water and Wastewater Utilities: Survey Data and Analyses*.

collection system. The reported performance levels place the City in the top quartile compared to other similarly sized combined utilities.[57]

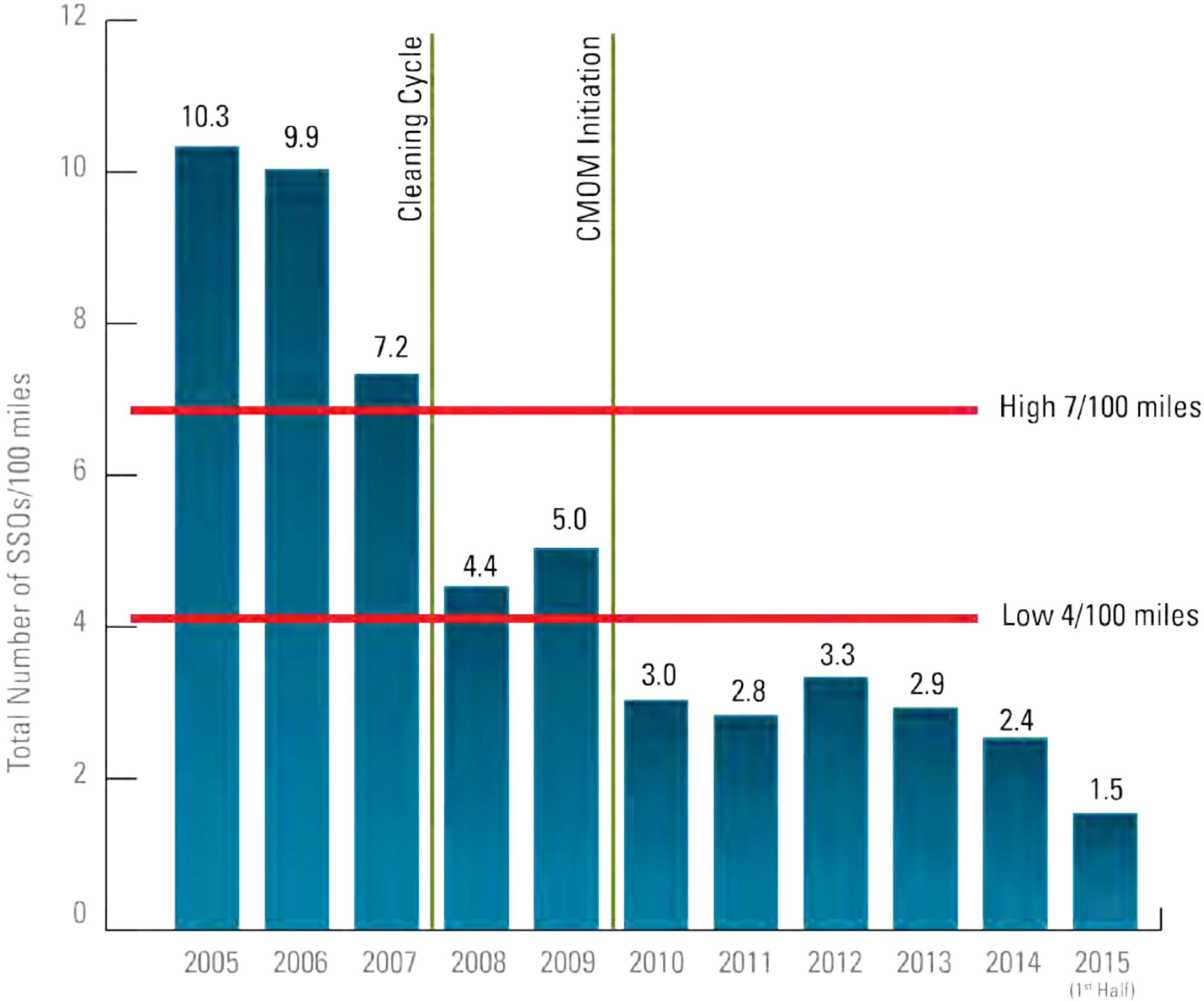

Figure 3-6. SSOs, CSS Releases, and Property Backups Due to Mainline Blockages (2005 – June 30, 2015)

[57] *Ibid.*

3.1.5 Five-Year Cleaning and Inspection Cycle and Findings

The City completed with the exception of the inaccessible areas, the first five-year cycle of sanitary and combined sewer cleaning and closed-circuit television (CCTV) inspections from 2010 through 2014.[58] In general, most of the sewers and manholes were found to be in fair to good condition, both in terms of structural condition and O&M issues (debris, roots, grease, and I/I).

Table 3-5 summarizes the cleaning and inspection totals for years 2010 through 2014 (2008 and 2009 cleaning and inspection work are included in 2010 totals). The total length of sanitary and combined sewers is 848 miles. The total number of manholes is more than 18,850.

Table 3-5. Cleaning and Inspection Progress During First Cycle (2010-2014)

Year	System Inspection		System Cleaning		Manhole Inspection	
	Miles Inspected	Accumulative % Inspected	Miles Cleaned	Accumulative % Cleaned	No. MHs Inspected	Accumulative % Inspected
2010	193.1	22.8%	176.3	20.8%	2,456	13.0%
2011	165.8	42.3%	135.4	36.8%	4,270	35.6%
2012	198.3	65.7%	219.9	62.7%	2,928	51.2%
2013	133.8	81.5%	169.6	82.7%	6,971	88.1%
2014	144.7	98.6%[1]	137.6	98.6%[1]	2,119	99.3%[1]

[1] Inaccessible sewers and manholes to be cleaned and inspected in 2015 will bring accumulative total to 100%.

Some sewer segments and manholes were found to be inaccessible (e.g., no manhole existed or the manhole was buried) and were identified in the CMOM section of the Semi-Annual Reports submitted to USEPA. Additional work, such as manhole raising or construction, is required so that these sewers can be cleaned and inspected. The required additional work, including cleaning and inspecting of the inaccessible sewers and manholes, is included in the City's Sanitary Sewer Reconstruction 2014 Phase II and Sanitary Sewer Reconstruction 2015 projects that are to be completed by the end of 2015.

<u>Level of Cleaning Required</u>

City and contractor crews reported the type of cleaning performed based on the required National Association of Sewer Service Companies (NASSCO) Pipeline Assessment and Certification Program (PACP) cleaning attribute code for each sewer segment inspected. For small diameter sewers (less than or equal to 18-inch diameter), the crews would clean the sewer first and then conduct the CCTV inspection. For large diameter sewers (greater than 18-inch diameter), the crews would often inspect first, clean if required, and then conduct a post cleaning inspection.

For this general summary of findings, the PACP categories of cleaning are:

- No cleaning required (already 95% clean prior to cleaning).
- Light cleaning was performed (jetting).

[58] It should be noted that beyond regular cleaning and inspection of problem sewers, the City started a comprehensive cleaning and inspection program for the entire system starting in 2003 and ramping up in 2008.

- Heavy cleaning required (special tools or techniques may be required to complete the work (e.g., multiple cleaning passes, manual removal of debris, or other).

Approximately 89% of the small diameter sewers in the City's gravity collection system were jetted, and only 11% required heavy cleaning. There was no cleaning necessary for approximately 61% of the large diameter gravity sewers; approximately 19% required jetting; and the remaining 20% required heavy cleaning.[59]

General Structural Condition

City and contractor CCTV inspection crews use NASSCO PACP standards for identification of O&M and structural sewer defects. The PACP defect grading scale is 1 to 5 with 1 being the least severe defects and 5 being the most severe defects (zero means no defects found).

Table 3-6 presents summaries of structural grade conditions from the first round of system inspections. This table indicates that 42% of the small diameter sewer segments have no structural defects, and 15% have at least one Grade 5 structural defect within the pipe segment. Additionally, 57% of the large diameter sewers have no structural defects and 8% have at least one Grade 5 structural defect.

Table 3-6. Gravity Sewer Structural Grade Condition Summary

Diameter	Grade 0	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
Small	42%	3%	13%	12%	15%	15%
Large	57%	1%	10%	15%	9%	8%

Acute Defect Repairs

When City or contractor CCTV inspection crews identified pipe segments with acute defects, City crews or contractors made the necessary repairs as soon as possible but no later than within one year of discovery. Acute defects identified and repaired are included in the Semi-Annual Reports and are summarized in Table 3-7.

Table 3-7. Summary of Acute Defect Repairs Performed

Year	Number Identified and Repaired
2010 [1]	175
2011	66
2012	16
2013	17
2014	16
TOTAL	**290**

[1] 2008 and 2009 acute defect repairs are included in 2010 totals.

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[59] Percentages are based on the total small and total large diameter pipe footage in Akron's gravity collection system.

I/I Observed in Sewers

The following figures present summaries of the I/I observed in the gravity sewer system during the CCTV inspections expressed in the following NASSCO I/I grade conditions: gusher, runner, dripper, weeper and none (no evidence of I/I).

Figure 3-7 shows that there was no observable I/I at the time of inspection in a very high percentage (89%) of the small diameter sewers. As shown in Figure 3-8, there was no I/I observed in 76% of the large diameter sewers at the time of inspection.

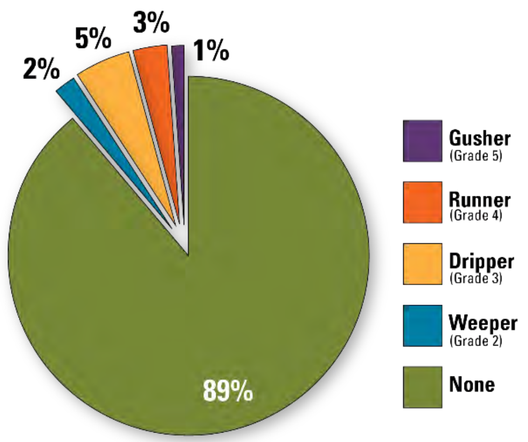

Figure 3-7. I/I Conditions of Small Diameter Gravity Sewers

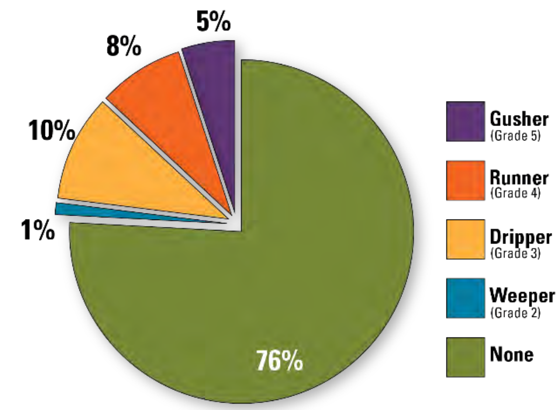

Figure 3-8. I/I Conditions of Large Diameter Gravity Sewers

Manhole Condition Assessment

Figures 3-9 and 3-10 provide summaries of observed manhole conditions. Approximately 98% of the manholes were found to be in fair to excellent condition. Approximately 75% of the manholes had no observable I/I at the time of the inspection. Further, only 3% of the City's manholes were observed to have medium to high rates of I/I at the time of inspection.

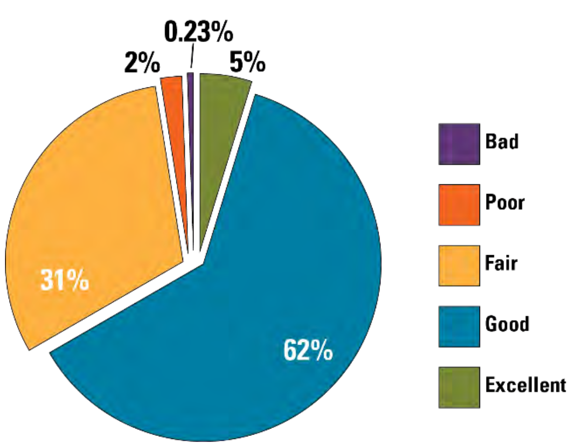

Figure 3-9. Overall Condition of Akron's Manholes

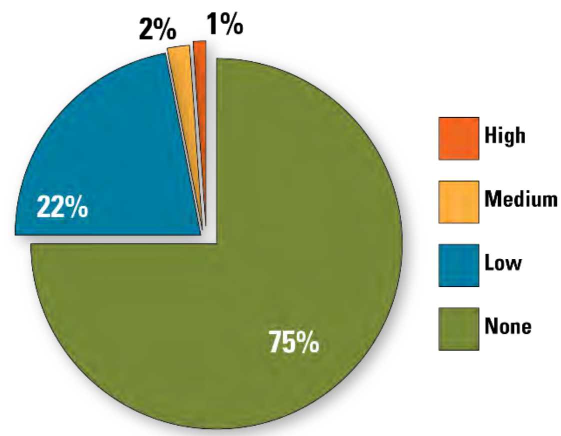

Figure 3-10. I/I Observations in Akron's Manholes

3.2 Stormwater Conveyance System

The City's stormwater infrastructure consists of approximately 361 miles of storm sewers and 140 miles of storm sewer inlet lead connections; 169 miles of combined sewers; approximately 23,467 inlets, 9,957 storm sewer manholes, 4,007 combined sewer manholes, 650 outlets; and roughly 33 miles of ditches. Storm sewers are constructed of segmental block, brick, vitrified clay pipe, and concrete pipe.

Storm sewers convey stormwater to points of discharge in nearby waterways. Within the combined sewer areas, stormwater is directed to combined sewers and is eventually treated at the Akron WPCS or discharged at one of the CSO locations. However, within partially separated areas within the CSS, some stormwater flow is discharged directly to a nearby stream.

There are more than 57 storm sewer interconnections[60] between Akron and adjacent jurisdictions, including the City of Barberton, Bath Township, Coventry Township, City of Cuyahoga Falls, City of Fairlawn, Village of Mogadore, City of Tallmadge, and Springfield Township.

As has been typical in similar communities across the country, the City has had programs to investigate and, when funding allows, resolve localized flooding (i.e., flooded streets, rivers, ditches, streams, and creeks) and other quantity-related stormwater issues. The localized flooding and stormwater problem areas were generally identified due to citizen complaints.

In addition to the maintenance of drainage ditches that are subject to siltation and sedimentation, which reduces drainage capacity, other stormwater infrastructure components that require periodic improvement or replacement include inlets, outlets, manholes, culverts, detention basins, and erosion protection.

The City's MS4-related activities are summarized in its Stormwater Management Program Annual Status Report.

3.2.1 Inspections

As part of the MS4 Permit compliance efforts, the City has identified 134 major outfalls in the City's GIS database. Major outfalls are storm water outfalls with pipes 36-inches in diameter or greater or with pipes 12-inches in diameter or greater where industrial zoning exists upstream of the outfall. The City performs the required number of inspections in compliance with its MS4 permit, and 100% of the outfalls were inspected during the first four years.

The City is implementing and enforcing a program to address stormwater runoff from industrial facilities. The Industrial Facilities Program is coordinated with the City's Industrial Pretreatment Program. Under this program, Storm Water Discharge and Disclosure Declarations are being updated to ensure each facility either has NPDES industrial stormwater permit coverage or a No Exposure Certification from Ohio EPA. The City is also required to inspect facilities on the Industrial Users list at least once during the 5-year permit cycle.

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[60] An interconnection occurs when a storm sewer discharges from an adjacent jurisdiction into the Akron stormwater system.

3.2.2 Construction Program

The City is implementing and enforcing a program to reduce pollutants in any stormwater runoff from construction activities that result in a land disturbance that is greater or equal to one acre. In response to the NPDES Construction and Post-Construction Program requirements, Section 50.80, Erosion and Sediment Control – Post-Construction Stormwater Quality, was added to Chapter 50 of the Code of Ordinances of the City of Akron on September 18, 2006.

The City has an agreement with the Summit SWCD to review construction site Storm Water Pollution Prevention Plans (SW3Ps) and to inspect construction sites in accordance with its MS4 Permit requirements. Before a building permit can be issued, owners and operators are required to obtain coverage under Ohio EPA general permit for stormwater discharges associated with construction activities, and obtain the SWCD's approval of the SWP3. The owner/operator is also required to maintain post construction controls after the property has been developed. A copy of the City of Akron Storm Water Application and Procedures Manual is available on the City's website.

4.0 STAKEHOLDER INVOLVEMENT

Element 03 | Stakeholder Involvement

Element 3 of USEPA's IPF requires the implementation of a process to open and maintain channels of communication with relevant community stakeholders in order to give full consideration of the views of others in the planning process and during implementation of the plan.

Under the AWR Program, the City has existing public outreach activities that include identifying and engaging community stakeholders. This general public outreach program has been expanded to include identification of a specific Akron Integrated Plan Stakeholders Group. As detailed in this section, the City has provided multiple opportunities for both the AWR Program and the Integrated Plan stakeholders to provide meaningful input. In the case of the AWR Program, input is more frequently focused on project-specific implementation items such as siting, construction impacts, and aesthetic issues. In the case of the Integrated Plan, input is more frequently focused on policy issues, management decisions, and costs. The City is committed to continuing these stakeholder engagement activities through the conclusion of the AWR Program and the Integrated Plan implementation.

4.1 Communications Plan

The City's AWR Program Procedures Manual[61] (PPM) establishes standard practices and procedures for delivering the AWR Program and related projects. Section 6 of that PPM details the City's Communications Management Plan, which details standard practices for approving and delivering messages to individuals, neighborhood groups, and other institutions. Additionally, the City's Communications Management Plan identifies ways in which the City facilitates meaningful involvement of stakeholders in the delivery of the AWR Program's initiatives. The Communications Plan was designed to address the project-specific components of the AWR Program.

The following sections identify how the communications procedures were adapted to the policy and management focused Integrated Plan issues. This section also focuses on stakeholder involvement activities with brief summaries of the AWR Program's public outreach activities that relate to the Integrated Plan.

4.2 USEPA Communication Guidelines

The USEPA has published extensive guidelines for public stakeholder involvement. As part of the guidance documents, the Office of Strategic Environmental Management maintains definitions of the most commonly used public stakeholder involvement terms (www.epa.gov/publicinvolvement/index.htm). This document defines "meaningful involvement" as follows:[62]

- Potentially affected community residents have an appropriate opportunity to participate in decisions about a proposed activity that will affect their environment and/or health.
- The public's contribution can influence the regulatory agency's decision.

[61] City of Akron. February 2015. *Akron Waterways Renewed Program Procedures Manual, Section 6 Communications Management Plan*.
[62] USEPA. January, 26, 2011. *Definitions of the Most Commonly Used Public Stakeholder Involvement Terms*.

- Concerns of all participants involved will be considered in the decision-making process.
- Decision-makers seek out and facilitate the involvement of those potentially affected.

In 2003, USEPA published public involvement policy guidelines that describe key steps for various planning and stakeholder involvement options depending upon the desired purpose and outcome.[63, 64] Akron's Integrated Plan used these guidelines to develop the related stakeholder involvement activities. These stakeholder involvement activities incorporate a two-way transfer of information so that data, options, and outputs are provided and exchanged, and advice / input is incorporated.

Table 4-1 provides an overview of the "who," the "what," and the "how" components of the City's stakeholder involvement and public outreach activities.

Table 4-1. Stakeholder Involvement Program Components

Who	What	How
City departments and staff	Explain the purpose of the IPF and receive immediate feedback on their concerns and potential mission overlap	One-on-one Small groups
Elected officials	Describe the impact of integrated planning on sewer rates and the physical impacts or timing of projects in their districts as well as integrated planning-related policy issues, management decisions, schedules, and costs	One-on-one Small groups
Akron Integrated Plan Stakeholders Group	Formally disseminate and receive information, advice, and input including specific discussions on: • Benefit criteria selection • Benefit criteria importance weighting • Alternative project identification and evaluation • Project scenario results comparisons and scenario selection • Rate impacts • Key regulatory agency decision-making issues	One-on-one Small groups Educational events Internet / information portal
Community groups	Present specific project details and obtain community feedback as well as community-wide events such as the Blue Heron Homecoming featuring educational materials and activities for the community	Small groups Educational events Internet / information portal
City Council and Ward meetings	Discuss specific projects and Integrated Planning-related policy issues, management decisions, schedules, and costs	One-on-one Small groups

[63] USEPA. June 2003. *Introducing EPA's Public Involvement Policy.*
[64] USEPA. 2010. *Public Involvement and Collaboration Spectrum*.

Figure 4-1 is a generic time line illustrating the "when" component of the City's stakeholder involvement and public outreach activities.

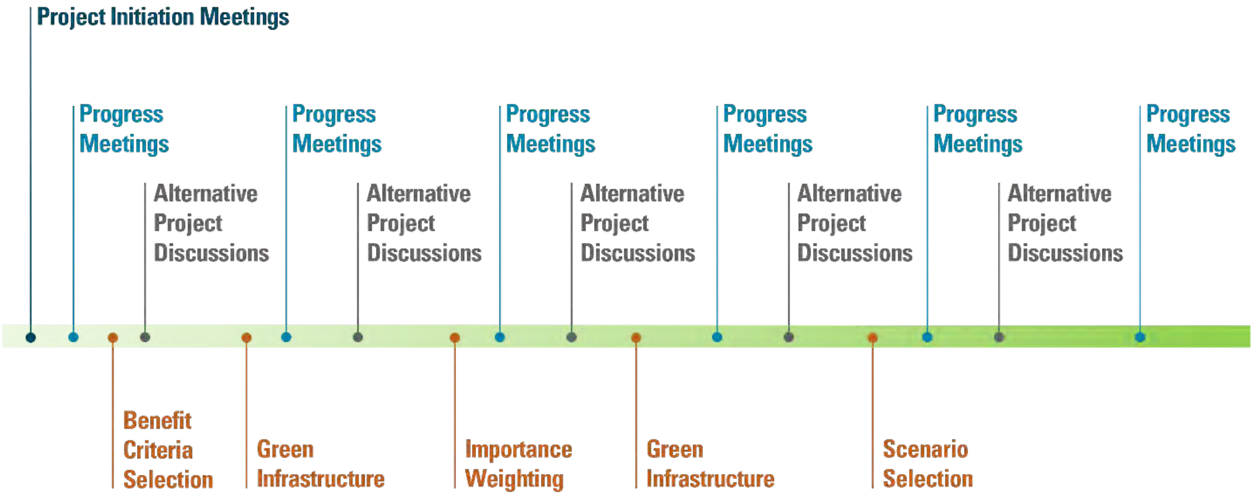

Figure 4-1. Generic Time Line Illustrating Stakeholder Involvement

The internet/informational portal communications channels referenced in Table 4-1 includes the City's AWR website and an Integrated Plan Stakeholders Group SharePoint site. The AWR website, www.akronwaterwaysrenewed.com, is shown in the screen shot in Figure 4-2 on the following page and is primarily used for public outreach purposes. The SharePoint site is described in Section 4.3.3, Stakeholder SharePoint Site.

The City has also used printed information disseminated through channels such as group meetings, public events, newspaper articles, and utility bill stuffers.

Specific events conducted in 2015 for the AWR public outreach are described in Section 4.2.1, Akron Waterways Renewed! Public Outreach following Figure 4-2. Events that were held to encourage Integrated Plan stakeholder involvement are described in Section 4.2.2, Integrated Plan Stakeholder Group.

AkronWaterways Renewed!

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July 18, 2015

City of Akron Home Page

Akron Engineering Bureau

AWR Project Locations

AWR Program Documents

FOG Awareness

Construction News

Main Outfall Concrete Cap

OCIT 36" Waterline Relocation

OCIT Lining Protection of the LCI

Cascade Village Storage Basin Project (Rack 15)

Mud Run Pump Station and Storage Basin Improvements

Towpath Trail Updates

Part of Towpath Trail Could Close for Akron Sewer Project

Maintaining the Towpath

Latest Events

Merriman Sewer Separation Project (Rack 36) Public Meeting

The Blue Heron Homecoming! Environmental Festival & Open House

Contractor Pre-Qualification Meeting & Networking Event

Middlebury Sewer Separation – Green Project (CSO Rack 5&7)

North Hill Sewer Separation – Green (Rack 22) Project

WATER IS WORTH IT! STUDENT CHALLENGE

Welcome to the Akron Waterways Renewed! Website

One of Akron's most valuable assets is its abundant supply of fresh water. It represents an important asset that has benefited the people of Akron for over a century, and which has supported Akron's economic growth and prosperity and provided water resources for its residents.

The Ohio Water Environment Association

Salutes Two of Akron's Own…

During the OWEA 2015 Technical Conference & Exhibition, we are proud to announce two individuals who were celebrated for their excellence!

J. W. Ellms Award

Patrick D. Gsellman, P.E.

City of Akron

The J.W. Ellms Award is presented to an individual who is in an administrative or supervisory position, stressing participation in conference activities, civic affairs, and leadership.

Throughout his 36+ year career Pat has been a leader in the wastewater field. The past 27 years he has been with the City of Akron managing the Environmental Division that includes the Akron Waterways Renewed Program. Pat works tirelessly on optimizing and implementing the Akron CSO Long Term Control Plan. He is involved with organizations concerned with the health of the Cuyahoga River including the Cuyahoga River Area of Concern Advisory Board. He is past president of the Akron-Canton Section of American Society of Civil Engineers, the Wet Weather Chair for the Association of Ohio Metropolitan Wastewater Agencies, and a past member of the OEPA Ad Hoc Committee on Ohio's Combined Sewer Overflow Strategy. Pat has encouraged OWEA involvement for his colleagues and staff along with finding time to be involved in his church and community as scorekeeper for the Cuyahoga Valley Christian Academy's softball team and various church activities.

Recent past winners of the J. W. Ellms Award include Brian Gresser (2014), Darin Wise (2013), and Doug Borkosky (2012).

William D. Hatfield Award

Thomas F. Smith, III, P.E.

City of Akron,

Water Reclamation Services Bureau

Presented to operators of wastewater treatment plants for outstanding performance and professionalism.

Did you know there's a special Never-Seez® just for mating stainless steel hardware? Tom does. Tom, aka "Captain Kilowatt" has saved Akron millions of dollars by implementing a plethora of energy-saving projects. Tom exemplifies this award for outstanding performance and professionalism. Tom's a polymath, able to discuss in detail almost any topic, especially all things mechanical. Tom is a PE and a Class III wastewater operator. He is available 24-7 to address electrical, mechanical, or other process anomalies that affect operation of the Akron Water Reclamation Facility. He's known by vendors for his technical savvy and challenges them to know their products before they call on him. Tom does not accept equipment specs at face value, rather he pours through them adding requirements as they relate to the operation and maintenance of his treatment plant. Tom readily shares that knowledge with co-workers, furthering their understanding of the equipment and process.

Recent past recipients of the William D. Hatfield Award include Frank D'Ambrosia (2014), Douglas Brookhart (2013), and Jim Johnson (2012).

Figure 4-2. Akron Waterways Renewed! Public Website

4.2.1 Akron Waterways Renewed! Public Outreach

The AWR's public information and outreach activities are detailed in the Semi-Annual reports submitted to regulatory agencies documenting CD activities. The public outreach events conducted under the AWR Program in 2015 to date are listed in Table 4-2.

Table 4-2. 2015 Akron Waterways Renewed! Public Outreach Events

Date	Event Name
Jan 24, 2015	Akron Public School Science Fair
Jan 28, 2015	AWR Public Meeting – Merriman Sewer Separation Project (Rack 36)
Feb 15, 2015	Ward 1 Community Meeting
Feb 17, 2015	AWR OCIT Pre-SOQ Meeting and Contractor Networking Event
Feb 18, 2015	Ward 8 Meeting
Feb 18, 2015	AWR Program Update Summit Metro Parks
Feb 24, 2015	University of Akron 2015 Spring Engineering and Science Career Fair
Feb 27, 2015	Professional Design / Engineering Outreach Networking Event
Feb 28, 2015	Women in Engineering Kids Career Day Event
Mar 4, 2015	AWR Professional Consultants Outreach Event
Mar 5, 2015	AWR Pre-Apprenticeship Program Site Tours
Mar 5, 2015	Cascade Village Scholars Club Recognition Event
Mar 10, 2015	AWR Local Contractors Panel Discussion Event
Mar 12, 2015	AWR Construction Workforce Pre-Apprenticeship Outreach Program Graduation Ceremony
Mar 17, 2015	OCIT Hickory Street Towpath Trail Community Meeting
Mar 19, 2015	Ward 8 Community Meeting
Mar 25, 2015	AWR Public Meeting – North Hill Separation Green Project (Rack 22)
Apr 7, 2015	AWR Public Meeting – Middlebury Separation Green Project (Racks 5 and 7)
Apr 9, 2015	AWR Participation - River Rat Revelry
Apr 14, 2015	AWR Business Owners Meeting – Main Outfall Interceptor (MOI) Cap Pilot Project
Apr 18, 2015	AWR Participation - Akron Zoo – Part for the Planet
Apr 18, 2015	AWR Participation - Middlebury Park Cleanup
Apr 25, 2015	Ohio Erie Canalway Canal Cleanup
Apr 25, 2015	Ward 1 Community Meeting
Apr 30, 2015	University of Akron Committee for the Future of Civil Engineering Awards Breakfast
May 1, 2015	AWR Participation - 7th Annual Green Fair Event
May 6, 2015	AWR Community Meeting - Cuyahoga / Hickory Street / Otto Street Community Event
May 9, 2015	AWR 1st Annual Blue Heron Homecoming Event
May 9, 2015	AWR Tree Planting Program (2-for-1) Kick-off
May 12, 2015	AWR OCIT and Local Contractors & DBE/EDGE/MBE/WBE Outreach Event
May 28, 2015	AWR OCIT Pre-Proposal and Networking Event
Jun 3, 2015	AWR Northside Interceptor Tunnel (NSIT) Stakeholders Meeting
Jun 23, 2015	AWR OCIT Boring Machine Downtown Preview
Jul 21, 2015	AWR Public Meeting – Merriman Separation Green Project (Rack 36)

4.2.2 Integrated Plan Stakeholder Group

As noted above, the City expanded the AWR Program's public outreach effort to include the Integrated Plan Stakeholder Group as part of the Integrated Plan development to provide a more formalized communications channel for the policy and decision-making level of this public involvement forum. The CSO Community Action Group (CAG) was re-established and expanded in the Spring of 2014; the group was re-named as the Integrated Stakeholder Group as previously noted. The Integrated Plan Stakeholder Group consists of business, industry leaders, representatives from community and environmental organizations, local government, non-profit groups, quasi-governmental agencies, and other groups and coalitions.

Focused subcommittees, as shown in Figure 4-3, have been formed within the Integrated Plan Stakeholder Group to address key issues such as Business and Industry, Community Engagement and Stewardship, Green Infrastructure, and individual projects. It is expected that additional project-specific subcommittees will be formed as further project details are developed and potential impacts are identified. The stakeholder involvement activities conducted to date are described in further detail in Section 4.3, Integrated Plan Stakeholder Involvement.

Figure 4-3. Integrated Plan Stakeholders Group and Subcommittees

The entities represented in the Integrated Plan Stakeholder Group and subcommittee memberships are listed in Table 4-3.

Table 4-3. Integrated Plan Stakeholder Groups and Subcommittees

Represented Group	Business & Industry Subcommittee	Community Engagement & Stewardship Subcommittee	Green Infrastructure Subcommittee	Hickory Street / Otto Street
Akron City Council Ward 1		X	X	X
Akron City Council Ward 6		X	X	
Akron City Council Ward 9				
Akron-Summit Community Action		X		X
Akron Steel Treating Company				
Akron Urban League				
Akron-Summit County Public Library				
Bridgestone Americas				
Cascade Locks Parks Association		X		X
City of Cuyahoga Falls				
City of Tallmadge				
Cuyahoga River Remedial Action Plan				
Cuyahoga Valley National Park		X	X	
Cuyahoga Valley Regional Council				
Ederer Real Estate and Construction	X			X
Friends of the Crooked River		X	X	
Goodyear Tire and Rubber				
Greater Akron Chamber				
Hickory Street / Otto Street / Cuyahoga Neighborhood	X	X	X	X
Industrial Realty Group (IRG)	X			
Keep Akron Beautiful				
Market Hatch Company (JG Pads)				
Metro Parks Serving Summit County		X		
Mt. Zion Baptist Church				
NEFCO			X	
Ohio and Erie Canalway Coalition		X		X
Ohio EPA – NEDO				
Portage Trail Sierra Club				
Summit County Environmental Services				
Summit Soil & Water Conservation District	X	X	X	
Testa Companies				
The Akron Zoo				
The Ruscoe Company				
The University of Akron				

4.3 Integrated Plan Stakeholder Involvement

The Integrated Plan Stakeholder Group meets on a quarterly basis. The City provides routine updates on the progress of the Integrated Plan development as well as on alternative project identification and evaluation. The group provides input on the presented material and offers suggestions for additional evaluation or identification of other options.

4.3.1 Meetings

The introductory Integrated Plan Stakeholder Group meeting was open to over 30 invited guests as well as an open invitation letter for community leaders who may not have been included on the invitation list. During this meeting, the group was introduced to the Integrated Plan development process and was charged with the following purposes:

- Advise and participate in implementing a more environmentally beneficial plan to reduce CSOs throughout the City.
- Provide feedback on the program's goals and progress.
- Disseminate progress reports to the community or organizations.
- Address and answer questions and concerns from the City's residents and businesses.

Based on the level of interest expressed during the introductory meeting, the Integrated Plan Stakeholder Group was formalized. Since the introductory meeting, the group has been active both through the quarterly meetings and various subcommittee meetings. Examples of the group's active involvement include the identification and selection of the 12 benefit criteria including in the Integrated Plan's benefit measurement and prioritization methodology. The Integrated Plan Stakeholder Group conducted a "brain storming" session to identify roughly 30 possible criteria and voted on the criteria. A subsequent meeting was held to obtain a consensus on the final criteria selection.

The meetings held throughout the Integrated Plan process are listed in Table 4-4.

4.3.2 Correspondence

Akron Integrated Plan Stakeholder Group members are notified of meeting through an email "save the date" notification, a follow-up email and letter with the meeting agenda, and personal telephone calls to obtain RSVP information and remind potential attendees of the planned meetings.

As part of the stakeholder meetings, the stakeholders suggested that the City compile letters of support reflecting the various groups, or individual, opinions on the Integrated Plan development and the suggested LTCP alternative projects. Among other things, the stakeholders were specifically concerned that the City was being treated differently than other CSO communities with the mandate for zero rather than three CSOs during the Typical Year. The stakeholders pointed out the large increase in cost to achieve a zero CSO level without a correspondingly greater environmental benefit.

Table 4-4. Integrated Plan Stakeholder Meetings

Event Date	Event	Approximate Number of Attendees
April 2, 2014	Cuyahoga Valley National Park Service Stakeholder Meeting	7
May 1, 2014	Integrated Plan Stakeholder Group Meeting	25
August 12, 2014	Integrated Plan Stakeholder Group Meeting	27
October 29, 2014	Integrated Plan Stakeholder Group Meeting	30
October 29, 2014	Integrated Plan Stakeholder Benefits Importance Weighting Workshop #1	5
October 30, 2014	Integrated Plan Business and Industry Subcommittee	15
October 30, 2014	Integrated Plan Community Engagement and Stewardship Subcommittee	20
October 30, 2014	Integrated Plan Green Infrastructure Subcommittee	10
December 9, 2014	Integrated Plan Stakeholder Benefits Importance Weighting Workshop #2	16
January 27, 2015	Integrated Plan Green Infrastructure Subcommittee	25
March 19, 2015	Integrated Plan Stakeholder Group Meeting	40
June 4, 2015	Integrated Plan Stakeholder Group Meeting	26
July 24, 2015	Integrated Plan Stakeholder Group Meeting	27

4.3.3 Stakeholder SharePoint Site

Integrated Plan Stakeholder Group members can access information on the Integrated Plan development, subcommittees, meetings, and other topics through a SharePoint site (see Figure 4-4). This site is routinely maintained and frequently updated to allow the stakeholders to continue to be involved and committed to the Integrated Plan activities.

The SharePoint site provides a forum to share Integrated Plan Stakeholder Group preliminary or draft information for discussion purposes and before the information is in a format to be shared with the general public on the AWR Program public website www.akronwaterwaysrenewed.com.

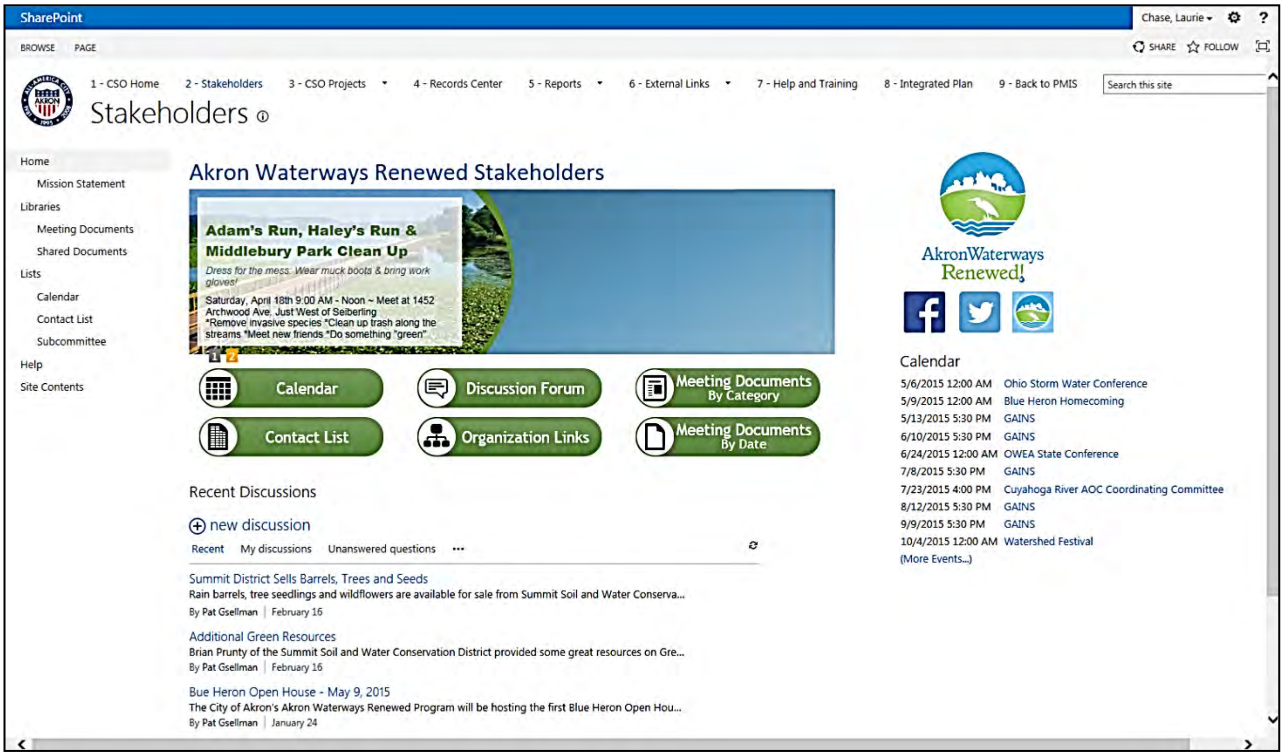

Figure 4-4. Stakeholders SharePoint Site

4.3.4 Green Infrastructure Evaluation Assistance

Element 3 of USEPA's IPF guidance suggests when green infrastructure elements are incorporated into a municipality's Integrated Plan, the municipality allow for public involvement. The purpose of this public involvement is to assist in evaluating the effectiveness of the green infrastructure and its successful implementation. To further facilitate the Integrated Plan Stakeholder Group involvement in incorporating green infrastructure into the LTCP project components where appropriate, a Green Infrastructure Subcommittee was formed, and it has been the most active subcommittee to date.

The Green Infrastructure Subcommittee developed the following goals:

- Develop a better understanding of Green Technology, appropriate applications, and potential funding sources.
- Identify opportunities to incorporate green infrastructure into LTCP projects.
- Identify available green infrastructure resources and gather case studies.
- Develop an understanding of the City's Green Infrastructure Toolbox.

The City facilitates discussions and presents relevant information on the above topics during Green Infrastructure Subcommittee meetings. The participants provide feedback, and are given the opportunity to ask questions and share experiences. For example, during the January 25, 2015 subcommittee meeting, the City explained how elements of its Green Infrastructure

Toolbox are applied, when alternatives containing green infrastructure are evaluated, how constructability reviews are conducted, and how community partnerships are developed to ensure potential options are identified.

Based on the activities conducted to date, the City and the Green Infrastructure Subcommittee have identified the following benefits associated with green infrastructure implementation in Akron:

- Improved water quality and habitats.
- Reduced localized flooding.
- Increased open space and recreational opportunities.
- Reduced energy consumption.
- Reduced or eliminated construction of gray infrastructure.
- Added local jobs for green infrastructure.
- Added public education opportunities.

4.4 Future Integrated Plan Stakeholder Involvement

The City intends to continue the Integrated Plan Stakeholder Group and Subcommittee involvement in Integrated Plan activities, as well as the implementation of the AWR Program public outreach throughout the duration of the CD. As with any dynamic organization or project, the level and degree of Integrated Plan Stakeholder involvement will match the number and complexity of the particular projects under evaluation at any given time.