



Biological and Water Quality Study of Southwest Ohio River Tributaries - Appendices

Brown, Adams, and Scioto Counties

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Division of Surface Water
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Notice to Users, Biosurvey Background information, Mechanisms for Water Quality Impairment, and Methods

NOTICE TO USERS

Ohio EPA incorporated biological criteria into the Ohio Water Quality Standards (WQS; Ohio Administrative Code 3745-1) regulations in February 1990 (effective May 1990). These criteria consist of numeric values for the Index of Biotic Integrity (IBI) and Modified Index of Well-Being (MIwb), both of which are based on fish assemblage data, and the Invertebrate Community Index (ICI), which is based on macroinvertebrate assemblage data. Criteria for each index are specified for each of Ohio's five ecoregions (as described by Omernik and Gallant 1988), and are further organized by organism group, index, site type, and aquatic life use designation. These criteria, along with the existing chemical and whole effluent toxicity evaluation methods and criteria, figure prominently in the monitoring and assessment of Ohio's surface water resources.

The following documents support the use of biological criteria by outlining the rationale for using biological information, the methods by which the biocriteria were derived and calculated, the field methods by which sampling must be conducted, and the process for evaluating results:

Ohio Environmental Protection Agency. 1987a. Biological criteria for the protection of aquatic life: Volume I. The role of biological data in water quality assessment. Div. Water Qual. Monit. & Assess., Surface Water Section, Columbus, Ohio.

____. 1987b. Biological criteria for the protection of aquatic life: Volume II. Users manual for biological field assessment of Ohio surface waters. Div. Water Qual. Monit. & Assess., Surface Water Section, Columbus, Ohio.

____. 1989a. Addendum to Biological criteria for the protection of aquatic life: Volume II. Users manual for biological field assessment of Ohio surface waters. Div. Water Qual. Plan. & Assess., Ecological Assessment Section, Columbus, Ohio.

____. 1989b. Biological criteria for the protection of aquatic life: Volume III. Standardized biological field sampling and laboratory methods for assessing fish and macroinvertebrate communities. Div. Water Quality Plan. & Assess., Ecol. Assess. Sect., Columbus, Ohio.

____. 1990. The use of biological criteria in the Ohio EPA surface water monitoring and assessment program. Div. Water Qual. Plan. & Assess., Ecol. Assess. Sect., Columbus, Ohio.

Rankin, E.T. 1989. The qualitative habitat evaluation index (QHEI): rationale, methods, and application. Div. Water Qual. Plan. & Assess., Ecol. Assess. Sect., Columbus, Ohio.

Since the publication of the preceding guidance documents, the following new publications by the Ohio EPA have become available. These publications should also be consulted as they represent the latest information and analyses used by the Ohio EPA to implement the biological criteria.

DeShon, J.E. 1995. Development and application of the invertebrate community index (ICI), pp. 217-243. in W.S. Davis and T. Simon (eds.). Biological Assessment and Criteria: Tools for Risk-based Planning and Decision Making. Lewis Publishers, Boca Raton, FL.

Ohio Environmental Protection Agency. 2006. Methods for assessing habitat in flowing waters: Using the Qualitative Habitat Evaluation Index (QHEI). Ohio EPA Tech. Bull. EAS/2006-06-1. Revised by the Midwest Biodiversity Institute for Div. of Surface Water, Ecol. Assess. Sect., Groveport, Ohio.

_____. 2015a. 2015 Updates to Biological criteria for the protection of aquatic life: Volume II and Volume II Addendum. Users manual for biological field assessment of Ohio surface waters. Division of Surface Water, Ecological Assessment [Section](#), Columbus, Ohio. May 8, 2015.

_____. 2015b. Biological criteria for the protection of aquatic life: Volume III. Standardized biological field sampling and laboratory methods for assessing fish and macroinvertebrate communities. Division of Surface Water, Ecological Assessment Section, Columbus, Ohio. September 23, 2015.

Rankin, E. T. 1995. The use of habitat assessments in water resource management programs, pp. 181-208. in W. Davis and T. Simon (eds.). Biological Assessment and Criteria: Tools for Water Resource Planning and Decision Making. Lewis Publishers, Boca Raton, FL.

Yoder, C.O. 1995. Policy issues and management applications for biological criteria, pp. 327-344. in W. Davis and T. Simon (eds.). Biological Assessment and Criteria: Tools for Water Resource Planning and Decision Making. Lewis Publishers, Boca Raton, FL.

Yoder, C.O. and E.T. Rankin. 1995a. Biological criteria program development and implementation in Ohio, pp. 109-144. in W. Davis and T. Simon (eds.). Biological Assessment and Criteria: Tools for Water Resource Planning and Decision Making. Lewis Publishers, Boca Raton, FL.

Yoder, C.O. and E.T. Rankin. 1995b. Biological response signatures and the area of degradation value: new tools for interpreting multimetric data, pp. 263-286. in W. Davis and T. Simon (eds.). Biological Assessment and Criteria: Tools for Water Resource Planning and Decision Making. Lewis Publishers, Boca Raton, FL.

Yoder, C.O. and E.T. Rankin. 1995c. The role of biological criteria in water quality monitoring, assessment, and regulation. Environmental Regulation in Ohio: How to Cope With the Regulatory Jungle. Inst. of Business Law, Santa Monica, CA. 54 pp.

Yoder, C.O. and M.A. Smith. 1999. Using fish assemblages in a State biological assessment and criteria program: essential concepts and considerations, pp. 17-63. in T. Simon (ed.). Assessing the Sustainability and Biological Integrity of Water Resources Using Fish Communities. CRC Press, Boca Raton, FL.

These documents and this report may be obtained by contacting:

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Ecological Assessment Section
4675 Homer Ohio Lane Groveport, Ohio 43125
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FOREWORD

What is a Biological and Water Quality Survey?

A biological and water quality survey, or “biosurvey”, is an interdisciplinary monitoring effort coordinated on a waterbody specific or watershed scale. This effort may involve a relatively simple setting focusing on one or two small streams, one or two principal stressors, and a handful of sampling sites or a much more complex effort including entire drainage basins, multiple and overlapping stressors, and tens of sites. Each year the Ohio EPA conducts biosurveys in 4-5 watersheds study areas with an aggregate total of 250-300 sampling sites.

The Ohio EPA employs biological, chemical, and physical monitoring and assessment techniques in biosurveys in order to meet three major objectives: 1) determine the extent to which use designations assigned in the Ohio Water Quality Standards (WQS) are either attained or not attained; 2) determine if use designations assigned to a given water body are appropriate and attainable; and 3) determine if any changes in key ambient biological, chemical, or physical indicators have taken place over time, particularly before and after the implementation of point source pollution controls or best management practices. The data gathered by a biosurvey is processed, evaluated, and synthesized in a biological and water quality report. Each biological and water quality study contains a summary of major findings and recommendations for revisions to WQS, future monitoring needs, or other actions which may be needed to resolve existing impairment of designated uses. While the principal focus of a biosurvey is on the status of aquatic life uses, the status of other uses such as recreation and water supply, as well as human health concerns are also addressed.

The findings and conclusions of a biological and water quality study may factor into regulatory actions taken by the Ohio EPA (e.g., NPDES permits, Director’s Orders, the Ohio Water Quality Standards [OAC 3745-1], Water Quality Permit Support Documents [WQPSDs]), and are eventually incorporated into State Water Quality Management Plans, the Ohio Nonpoint Source Assessment, and the biennial Integrated Water Quality Monitoring and Assessment Report (305[b] and 303[d]).

Hierarchy of Indicators

A carefully conceived ambient monitoring approach, using cost-effective indicators consisting of ecological, chemical, and toxicological measures, can ensure that all relevant pollution sources are judged objectively on the basis of environmental results. Ohio EPA relies on a tiered approach in attempting to link the results of administrative activities with true environmental measures. This integrated approach includes a hierarchical continuum from administrative to true environmental indicators (Figure 1). The six “levels” of indicators include: 1) actions taken by regulatory agencies (permitting, enforcement, grants); 2) responses by the regulated community (treatment works, pollution prevention); 3) changes in discharged quantities (pollutant loadings); 4) changes in ambient conditions (water quality, habitat); 5) changes in uptake and/or assimilation (tissue contamination, biomarkers, wasteload allocation); and, 6) changes in health, ecology, or other effects (ecological condition, pathogens). The results of administrative activities (levels 1 and 2) can be linked to efforts to improve water quality (levels 3, 4, and 5) which should translate into the environmental “results” (level 6). Thus, the aggregate effect of billions of dollars spent on water pollution control since the early 1970s can now be determined with quantifiable measures of environmental condition.

Superimposed on this hierarchy is the concept of stressor, exposure, and response indicators. *Stressor* indicators generally include activities which have the potential to degrade the aquatic environment such as pollutant discharges (permitted and unpermitted), land use effects, and habitat modifications. *Exposure* indicators are those which measure the effects of stressors and can include whole effluent toxicity tests, tissue residues, and biomarkers, each of which provides evidence of biological exposure to

a stressor or bioaccumulative agent. *Response* indicators are generally composite measures of the cumulative effects of stress and exposure and include the more direct measures of community and population response that are represented here by the biological indices which comprise Ohio's biological criteria. Other response indicators could include target assemblages, *i.e.*, rare, threatened, endangered, special status, and declining species or bacterial levels which serve as surrogates for the recreational uses. These indicators represent the essential technical elements for watershed-based management approaches. The key, however, is to use the different indicators *within* the roles which are most appropriate for each.

Describing the causes and sources associated with observed impairments revealed by the biological criteria and linking this with pollution sources involves an interpretation of multiple lines of evidence including water chemistry data, sediment data, habitat data, effluent data, biomonitoring results, land use data, and biological response signatures within the biological data itself. Thus the assignment of principal causes and sources of impairment represents the association of impairments (defined by response indicators) with stressor and exposure indicators. The principal reporting venue for this process on a watershed or subbasin scale is a biological and water quality report. These reports then provide the foundation for aggregated assessments such as the Integrated Report, the Ohio Nonpoint Source Assessment, and other technical bulletins.

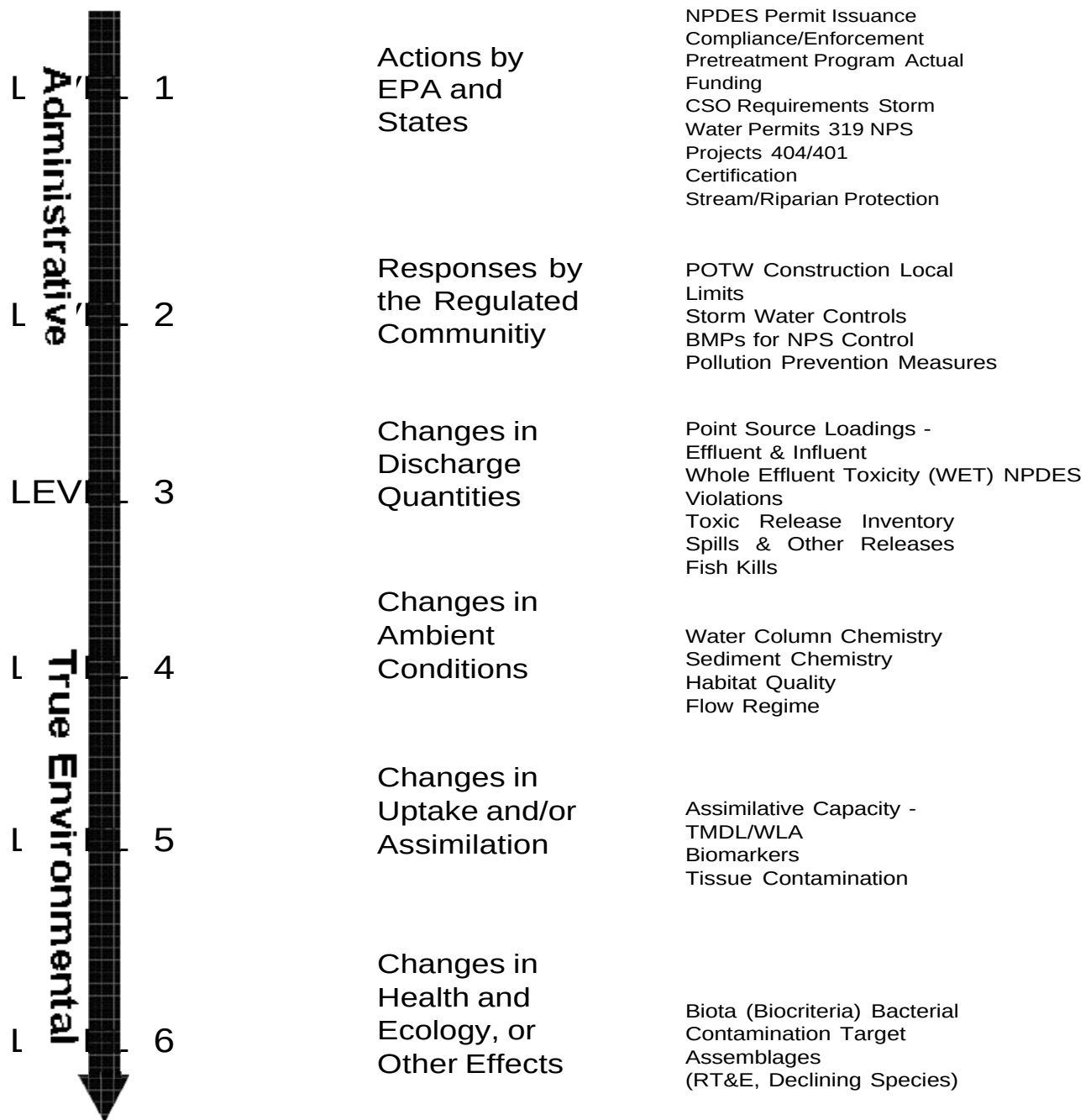


Figure 1. Hierarchy of administrative and environmental indicators which can be used for water quality management activities such as monitoring and assessment, reporting, and the evaluation of overall program effectiveness. This is patterned after a model developed by the U.S. EPA.

Ohio Water Quality Standards: Designated Aquatic Life Use

The Ohio Water Quality Standards (WQS; Ohio Administrative Code 3745-1) consist of designated uses and chemical, physical, and biological criteria designed to represent measurable properties of the environment that are consistent with the goals specified by each use designation. Use designations consist of two broad groups, aquatic life and non-aquatic life uses. In applications of the Ohio WQS to the management of water resource issues in Ohio's rivers and streams, the aquatic life use criteria frequently result in the most stringent protection and restoration requirements, hence their emphasis in biological and water quality reports. Also, an emphasis on protecting for aquatic life generally results in water quality suitable for all uses. The five different aquatic life uses currently defined in the Ohio WQS are described as follows:

Warmwater Habitat (WWH) - this use designation defines the "typical" warmwater assemblage of aquatic organisms for Ohio rivers and streams; *this use represents the principal restoration target for the majority of water resource management efforts in Ohio.*

Exceptional Warmwater Habitat (EWH) - this use designation is reserved for waters which support "unusual and exceptional" assemblages of aquatic organisms which are characterized by a high diversity of species, particularly those which are highly intolerant and/or rare, threatened, endangered, or special status (*i.e.*, declining species); *this designation represents a protection goal for water resource management efforts dealing with Ohio's best water resources.*

Coldwater Habitat (CWH) - this use is intended for waters which support assemblages of coldwater organisms and/or those which are stocked with salmonids with the intent of providing a put- and-take fishery on a year round basis which is further sanctioned by the Ohio DNR, Division of Wildlife; this use should not be confused with the Seasonal Salmonid Habitat (SSH) use which applies to the Lake Erie tributaries which support periodic "runs" of salmonids during the spring, summer, and/or fall.

Modified Warmwater Habitat (MWH) - this use applies to streams and rivers which have been subjected to extensive, maintained, and essentially permanent hydromodifications such that the biocriteria for the WWH use are not attainable *and where the activities have been sanctioned by state or federal law*; the representative aquatic assemblages are generally composed of species which are tolerant to low dissolved oxygen, silt, nutrient enrichment, and poor quality habitat.

Limited Resource Water (LRW) - this use applies to small streams (usually <3 mi² drainage area) and other water courses which have been irretrievably altered to the extent that no appreciable assemblage of aquatic life can be supported; such waterways generally include small streams in extensively urbanized areas, those which lie in watersheds with extensive drainage modifications, those which completely lack water on a recurring annual basis (*i.e.*, true ephemeral streams), or other irretrievably altered waterways.

Chemical, physical, and/or biological criteria are generally assigned to each use designation in accordance with the broad goals defined by each. As such the system of use designations employed in the Ohio WQS constitutes a "tiered" approach in that varying and graduated levels of protection are provided by each. This hierarchy is especially apparent for parameters such as dissolved oxygen, ammonia-nitrogen, temperature, and the biological criteria. For other parameters such as heavy metals,

the technology to construct an equally graduated set of criteria has been lacking, thus the same WQS criteria may apply to two or three different use designations.

Ohio Water Quality Standards: Non-Aquatic Life Uses

In addition to assessing the appropriateness and status of aquatic life uses, each biological and water quality survey also addresses non-aquatic life uses such as recreation, water supply, and human health concerns as appropriate. The recreation uses most applicable to rivers and streams are the Primary Contact Recreation (PCR) and Secondary Contact Recreation (SCR) uses. The criterion for designating the PCR use can be having a water depth of at least one meter over an area of at least 100 square feet or, lacking this, where frequent human contact is a reasonable expectation. If a water body does not meet either criterion, the SCR use applies. The attainment status of PCR and SCR is determined using bacterial indicators (*e.g.*, fecal coliform, *E. coli*) and the criteria for each are specified in the Ohio WQS.

Attainment of recreation uses are evaluated based on monitored bacteria levels. The Ohio Water Quality Standards state that all waters should be free from any public health nuisance associated with raw or poorly treated sewage (Administrative Code 3745-1-04, Part F). Additional criteria (Administrative Code 3745-1-07) apply to waters that are designated as suitable for full body contact such as swimming (PCR) or for partial body contact such as wading (SCR). These standards were developed to protect human health, because even though fecal coliform bacteria are relatively harmless in most cases, their presence indicates that the water has been contaminated with fecal matter.

Water supply uses include Public Water Supply (PWS), Agricultural Water Supply (AWS), and Industrial Water Supply (IWS). Public Water Supplies are simply defined as segments within 500 yards of a potable water supply or food processing industry intake. The Agricultural Water Supply (AWS) and Industrial Water Supply (IWS) use designations generally apply to all waters unless it can be clearly shown that they are not applicable. An example of this would be an urban area where livestock watering or pasturing does not take place, thus the AWS use would not apply. Chemical criteria are specified in the Ohio WQS for each use and attainment status is based primarily on chemical-specific indicators. Human health concerns are additionally addressed with fish tissue data, but any consumption advisories are issued by the Ohio Department of Health.

MECHANISMS FOR WATER QUALITY IMPAIRMENT

The following paragraphs are provided to present the varied causes of impairment that affect the resource quality of lotic systems in Ohio. While the various perturbations are presented under separate headings, it is important to remember that they are often interrelated and cumulative in terms of the detrimental impact that can result.

Habitat and Flow Alterations

Habitat alteration, such as channelization, negatively impacts biological communities directly by limiting the complexity of living spaces available to aquatic organisms. Consequently, fish and macroinvertebrate communities are not as diverse. Indirect impacts include the removal of riparian trees and field tiling to facilitate drainage. Following a rain event, most of the water is quickly removed from tiled fields rather than filtering through the soil, recharging ground water, and reaching the stream at a lower volume and more sustained rate. As a result, small streams more frequently go dry or become intermittent. Urbanization impacts include removal of riparian trees, influx of storm water runoff, straightening and piping of stream channels, and riparian vegetation removal.

Tree shade is important because it limits the energy input from the sun, moderates water temperature, and limits evaporation. Removal of the tree canopy further degrades conditions because it eliminates an important source of coarse organic matter essential for a balanced ecosystem. Riparian vegetation aids in nutrient uptake, may decrease runoff rate into streams, and helps keep soil in place. Erosion impacts channelized streams more severely due to the lack of a riparian buffer zone to slow runoff, trap sediment and stabilize banks. Additionally, deep trapezoidal channels lack a functioning flood plain and therefore cannot expel sediment as would occur during flood events along natural watercourses. The confinement of flow within an artificially deep channel accelerates the movement of water downstream, exacerbating flooding of neighboring properties.

The lack of water movement under low flow conditions can exacerbate impacts from organic loading and nutrient enrichment by limiting re-aeration of the stream. The amount of oxygen soluble in water decreases as temperature increases. This is one reason why tree shade is so important. The two main sources of oxygen in water are diffusion from the atmosphere and plant photosynthesis. Turbulence at the water surface is critical because it increases surface area and promotes diffusion, but channelization eliminates turbulence produced by riffles, meanders, and debris snags. Plant photosynthesis produces oxygen, but at night, respiration reverses the process and consumes oxygen. Conversely, oxygen concentrations can become supersaturated during the day, due to abnormally high amounts of photosynthesis, causing gas bubble stress to both fish and invertebrate communities. Oxygen is also used by bacteria that decay dead organic matter. Nutrient enrichment can promote the growth of nuisance algae that subsequently dies and serves as food for bacteria. Under these conditions, oxygen can be depleted unless it is replenished from the air.

Siltation and Sedimentation

Whenever the natural flow regime is altered to facilitate drainage, increased amounts of sediment are likely to enter streams either by overland transport or increased bank erosion. The removal of wooded riparian areas furthers the erosion process. Channelization keeps all but the highest flow events confined within the artificially high banks. As a result, areas that were formerly flood plains and allowed for the removal of sediment from the primary stream channel no longer serve this function. As water

levels fall following a rain event, interstitial spaces between larger rocks fill with sand and silt and the diversity of available habitat to support fish and macroinvertebrates is reduced. Silt also can clog the gills of both fish and macroinvertebrates, reduce visibility thereby excluding site feeding fish species, and smother the nests of lithophilic fishes. Lithophilic spawning fish require clean substrates with interstitial voids in which to deposit eggs. Conversely, pioneering species benefit. They are generalists and best suited for exploiting disturbed and less heterogeneous habitats. The net result is a lower diversity of aquatic species compared with a typical warmwater stream with natural habitats.

Sediment also impacts water quality, recreation, and drinking water. Nutrients absorbed to soil particles remain trapped in the watercourse. Likewise, bacteria, pathogens, and pesticides which also attach to suspended or bedload sediments become concentrated in waterways where the channel is functionally isolated from the landscape. Community drinking water systems address these issues with more costly advanced treatment technologies.

Nutrient Enrichment

The element of greatest concern is phosphorus because it is critical for plant growth and is often the limiting nutrient. The form that can be readily used by plants and therefore can stimulate nuisance algae blooms is orthophosphate (PO_4^{3-}). The amount of phosphorus tied up in the nucleic acids of food and waste is actually quite low. This organic material is eventually converted to orthophosphate by bacteria. The amount of orthophosphate contained in synthetic detergents is a great concern however. It was for this reason that the General Assembly of the State of Ohio enacted a law in 1990 to limit phosphorus content in household laundry detergents sold in the Lake Erie drainage basin to 0.5% by weight. Inputs of phosphorus originate from both point and nonpoint sources. Most of the phosphorus discharged by point sources is soluble. Another characteristic of point sources is they have a continuous impact and are human in origin, for instance, effluents from municipal sewage treatment plants. The contribution from failed on-lot septic systems can also be significant, especially if they are concentrated in a small area. The phosphorus concentration in raw waste water is generally 8-10 mg/l and after secondary treatment is generally 4-6 mg/l. Further removal requires the added cost of chemical addition. The most common methods use the addition of lime or alum to form a precipitate, so most phosphorus (80%) ends up in the sludge.

A characteristic of phosphorus discharged by nonpoint sources is that the impact is intermittent and associated with storm water runoff. Most of this phosphorus is bound tightly to soil particles and enters streams from erosion, although some comes from tile drainage. Urban storm water is more of a concern if combined sewer overflows are involved. The impact from rural storm water varies depending on land use and management practices and includes contributions from livestock feedlots and pastures and row crop agriculture. Crop fertilizer includes granular inorganic types and organic types such as manure or sewage sludge. Pasture land is especially a concern if the livestock have access to the stream. Large feedlots with manure storage lagoons create the potential for overflows and accidental spills. Land management is an issue because erosion is worse on streams without any riparian buffer zone to trap runoff. The impact is worse in streams that are channelized because they no longer have a functioning flood plain and cannot expel sediment during flooding. Oxygen levels must also be considered, because phosphorus is released from sediment at higher rates under anoxic conditions.

There is no numerical phosphorus criterion established in the Ohio Water Quality Standards, but there is a narrative criterion that states phosphorus should be limited to the extent necessary to prevent nuisance growths of algae and weeds (Administrative Code, 3745-1-04, Part E). Phosphorus loadings from large volume point source dischargers in the Lake Erie drainage basin are regulated by NPDES permit limits. The permit limit is a concentration of 1.0 mg/l in final effluent. Research conducted by the Ohio EPA indicates that a significant correlation exists between phosphorus and the health of aquatic communities (Miltner and Rankin, 1998). It was concluded that biological community performance in

headwater and wadeable streams was highest where phosphorus concentrations were lowest. It was also determined that the lowest phosphorus concentrations were associated with the highest quality habitats, supporting the notion that habitat is a critical component of stream function. The report recommends WWH total phosphorus targets of 0.08 mg/l in headwater streams (<20 mi² watershed size), 0.10 mg/l in wadeable streams (>20-200 mi²) and 0.17 mg/l in small rivers (>200-1000 mi²).

Organic Enrichment and Low Dissolved Oxygen

The amount of oxygen soluble in water is low and it decreases as temperature increases. This is one reason why tree shade is so important. The two main sources of oxygen in water are diffusion from the atmosphere and plant photosynthesis. Turbulence at the water surface is critical because it increases surface area and promotes diffusion. Drainage practices such as channelization eliminate turbulence produced by riffles, meanders, and debris snags. Although plant photosynthesis produces oxygen by day, it is consumed by the reverse process of respiration at night. Oxygen is also consumed by bacteria that decay organic matter, so it can be easily depleted unless it is replenished from the air. Sources of organic matter include poorly treated waste water, sewage bypasses, and dead plants and algae. Dissolved oxygen criteria are established in the Ohio Water Quality Standards to protect aquatic life. The minimum and average limits are tiered values and linked to use designations (Administrative Code 3745-1-07, Table 7-1).

Ammonia

Ammonia enters streams as a component of fertilizer and manure run-off and wastewater effluent. Ammonia gas (NH₃) readily dissolves in water to form the compound ammonium hydroxide (NH₄OH). In aquatic ecosystems, equilibrium is established as ammonia shifts from a gas to undissociated ammonium hydroxide to the dissociated ammonium ion (NH₄⁺). Under normal conditions (neutral pH 7.0 and temperature 25°C), almost none of the total ammonia is present as gas, only 0.55% is present as ammonium hydroxide, and the rest is ammonium ion. Alkaline pH shifts the equation toward gaseous ammonia production, so the amount of ammonium hydroxide increases. This is important because while the ammonium ion is almost harmless to aquatic life, ammonium hydroxide is very toxic and can reduce growth and reproduction or cause mortality.

The concentration of ammonia in raw sewage is high, sometimes as much as 20-30 mg/l. Treatment to remove ammonia involves gaseous stripping to the atmosphere, biological nitrification and de-nitrification, and assimilation into plant and animal biomass. The nitrification process requires a long detention time and aerobic conditions like that provided in extended aeration treatment plants. Under these conditions, bacteria first convert ammonia to nitrite (*Nitrosomonas*) and then to nitrate (*Nitrobacter*). Nitrate can then be reduced by the de-nitrification process (*Pseudomonas*) and nitrogen gas and carbon dioxide are produced as by-products.

Ammonia criteria are established in the Ohio Water Quality Standards to protect aquatic life. The maximum and average limits are tiered values based on sample pH and temperature and linked to use designations (Administrative Code 3745-1-07, Tables 7-2 through 7-8).

Metals

Metals can be toxic to aquatic life and hazardous to human health. Although they are naturally occurring elements many are extensively used in manufacturing and are byproducts of human activity. Certain metals like copper and zinc are essential in the human diet, but excessive levels are usually detrimental. Lead and mercury are of particular concern because they often trigger fish consumption advisories. Mercury is used in the production of chlorine gas and caustic soda and in the manufacture of batteries and fluorescent light bulbs. In the environment it forms inorganic salts, but bacteria convert these to methyl-mercury and this organic form builds up in the tissues of fish. Extended exposure can damage

the brain, kidneys, and developing fetus. The Ohio Department of Health (ODH) issued a statewide fish consumption advisory in 1997 advising women of child bearing age and children six and under not to eat more than one meal per week of any species of fish from waters of the state because of mercury. Lead is used in batteries, pipes, and paints and is emitted from burning fossil fuels. It affects the central nervous system and damages the kidneys and reproductive system. Copper is mined extensively and used to manufacture wire, sheet metal, and pipes. Ingesting large amounts can cause liver and kidney damage. Zinc is a by-product of mining, steel production, and coal burning and used in alloys such as brass and bronze. Ingesting large amounts can cause stomach cramps, nausea, and vomiting.

Metals criteria are established in the Ohio Water Quality Standards to protect human health, wildlife, and aquatic life. Three levels of aquatic life standards are established (Administrative Code 3745-1-07, Table 7-1) and limits for some elements are based on water hardness (Administrative Code 3745-1-07, Table 7-9). Human health and wildlife standards are linked to either the Lake Erie (Administrative Code 3745-1-33, Table 33- 2) or Ohio River (Administrative Code 3745-1-34, Table 34-1) drainage basins. The drainage basins also have limits for additional elements not established elsewhere that are identified as Tier I and Tier II values.

Bacteria

High concentrations of either fecal coliform bacteria or *Escherichia coli* (*E. coli*) in a lake or stream may indicate contamination with human pathogens. People can be exposed to contaminated water while wading, swimming, and fishing. Fecal coliform bacteria are relatively harmless in most cases, but their presence indicates that the water has been contaminated with feces from a warm-blooded animal. Although intestinal organisms eventually die off outside the body, some will remain virulent for a period of time and may be dangerous sources of infection. This is especially a problem if the feces contained pathogens or disease producing bacteria and viruses. Reactions to exposure can range from an isolated illness such as skin rash, sore throat, or ear infection to a more serious wide spread epidemic. Some types of bacteria that are a concern include *Escherichia*, which cause diarrhea and urinary tract infections, *Salmonella*, which cause typhoid fever and gastroenteritis (food poisoning), and *Shigella*, which cause severe gastroenteritis or bacterial dysentery. Some types of viruses that are a concern include polio, hepatitis A, and encephalitis. Disease causing microorganisms such as cryptosporidium and giardia are also a concern.

Since fecal coliform bacteria are associated with warm-blooded animals, there are both human and animal sources. Human sources, including effluent from sewage treatment plants or discharges by on-lot septic systems, are a more continuous problem. Bacterial contamination from combined sewer overflows are associated with wet weather events. Animal sources are usually more intermittent and are also associated with rainfall, except when domestic livestock have access to the water. Large livestock farms store manure in holding lagoons and this creates the potential for an accidental spill. Liquid manure applied as fertilizer is a runoff problem if not managed properly and it sometimes seeps into field tiles.

Bacteria criteria for the recreational use are established in the Ohio Water Quality Standards to protect human health. The maximum and average limits are tiered *E. coli* values and linked to use designation, but only apply during the May 1-October 15 recreation season (Administrative Code 3745-1-07, Table 7-13). The standards also state that streams must be free of any public health nuisance associated with raw or poorly treated sewage during dry weather conditions (Administrative Code 3745-1-04, Part F).

Sediment Contamination

Chemical quality of sediment is a concern because many pollutants bind strongly to soil particles and are persistent in the environment. Some of these compounds accumulate in the aquatic food chain and trigger fish consumption advisories, but others are simply a contact hazard because they cause skin cancer and tumors. The physical and chemical nature of sediment is determined by local geology, land use, and contribution from manmade sources. As some materials enter the water column they are attracted to the surface electrical charges associated with suspended silt and clay particles. Others simply sink to the bottom due to their high specific gravity. Sediment layers form as suspended particles settle, accumulate, and combine with other organic and inorganic materials. Sediment is the most physically, chemically, and biologically reactive at the water interface because this is where it is affected by sunlight, current, wave action, and benthic organisms. Assessment of the chemical nature of this layer can be used to predict ecological impact.

Sediment data are evaluated using Ohio Sediment Reference Values (SRVs; Ohio EPA 2008), along with guidelines established in *Development and Evaluation of Consensus-Based Sediment Quality Guidelines for Freshwater Ecosystems* (MacDonald *et.al.* 2000), and *Ecological Screening Levels (ESLs)* (U.S. EPA 2003). The Ohio EPA system was derived from samples collected at ecoregional reference sites. Specific SRVs are site specific ecoregional based metals concentrations and are used to identify contaminated stream reaches. The MacDonald guidelines are consensus based using previously developed values. The system predicts that sediments below the threshold effect concentration (TEC) are absent of toxicity and those greater than the probable effect concentration (PEC) are toxic. ESL values, considered protective benchmarks, were derived by US EPA Region 5 using a variety of sources and methods.

Sediment samples collected by the Ohio EPA are measured for a number of physical and chemical properties. Physical attributes included percent particle size distribution (sand 60 μ , silt 5-59 μ , clay 4 μ), percent solids, and percent organic carbon. Most locations sampled had an abundance of sediment, and no difficulties were experienced in locating ample volumes of sediment for analysis. Fine grained sediments are deposited in flood plains of natural streams during periods of high flow. This scenario changes if the stream is impounded by a dam or channelized. Chemical attributes included metals, volatile and semi-volatile organic compounds, pesticides, and polychlorinated biphenyls (PCBs).

MATERIALS and METHODS

All biological, chemical, and physical habitat data collection, processing, and analysis methods and procedures adhere to those specified in the Surface Water Field Sampling Manual for water column chemistry, bacteria and flows (Ohio EPA 2013), Biological Criteria for the Protection of Aquatic Life, Volumes II - III (Ohio EPA 1987b, 1989a, 1989b, 2015a, 2015b), and The Qualitative Habitat Evaluation Index (QHEI): Rationale, Methods, and Application (Rankin 1989).

Determining Use Attainment Status

Use attainment status is a term describing the degree to which environmental indicators are either above or below criteria specified by the Ohio Water Quality Standards (WQS; Ohio Administrative Code 3745-1). Assessing aquatic use attainment status involves a primary reliance on the Ohio EPA biological criteria (OAC 3745-1-07; Table 7-15). These are confined to ambient assessments and apply to rivers and streams outside of mixing zones. Numerical biological criteria are based on multimetric biological indices including the IBI and MIwb, indices measuring the response of the fish community, and the ICI, which indicates the response of the macroinvertebrate community. Three attainment status results are possible at each sampling location - full, partial, or non-attainment. Full attainment means that all of the applicable indices meet the biocriteria. Partial attainment means that one or more of the applicable indices fails to meet the biocriteria. Non-attainment means that none of the applicable indices meet the biocriteria or one of the organism groups reflects poor or very poor performance. An aquatic life use

attainment table is constructed based on the sampling results and is arranged from upstream to downstream and includes the sampling locations indicated by river mile, the applicable biological indices, the use attainment status (*i.e.*, full, partial, or non), the Qualitative Habitat Evaluation Index (QHEI), and a sampling location description.

Habitat Assessment

Physical habitat was evaluated using the QHEI developed by the Ohio EPA for streams and rivers in Ohio (Rankin 1989 and 1995, Ohio EPA 2006). Various attributes of the habitat are scored based on the overall importance of each to the maintenance of viable, diverse, and functional aquatic faunas. The type(s) and quality of substrates, amount and quality of instream cover, channel morphology, extent and quality of riparian vegetation, pool, run, and riffle development and quality, and gradient are some of the habitat characteristics used to determine the QHEI score which generally ranges from 20 to less than 100. The QHEI is used to evaluate the characteristics of a stream segment, as opposed to the characteristics of a single sampling site. As such, individual sites may have poorer physical habitat due to a localized disturbance yet still support aquatic communities closely resembling those sampled at adjacent sites with better habitat, provided water quality conditions are similar. QHEI scores from hundreds of segments around the state have indicated that values greater than 60 are *generally* conducive to the existence of warmwater faunas whereas scores less than 45 generally cannot support a warmwater assemblage consistent with the WWH biological criteria. Scores greater than 75 frequently reflect habitat conditions which have the ability to support exceptional warmwater faunas.

Sediment and Surface Water Assessment

Fine grain sediment samples were collected in the upper 4 inches of bottom material at each location using decontaminated stainless steel scoops and excavated using nitrile gloves. Decontamination of sediment sampling equipment followed the procedures outlined in the Ohio EPA sediment sampling guidance manual (Ohio EPA 2012). Sediment grab samples were homogenized in stainless steel pans (material for VOC analysis was not homogenized), transferred into glass jars with teflon® lined lids, placed on ice (to maintain 4°C) in a cooler, and shipped to Ohio EPA Division of Environmental Services. Sediment data is reported on a dry weight basis. Surface water samples were collected, preserved and delivered in appropriate containers to Ohio EPA Division of Environmental Services. Surface water samples were evaluated using comparisons to Ohio Water Quality Standards criteria, reference conditions, or published literature. Sediment evaluations were conducted using guidelines established in MacDonald et al. (2000), U.S. EPA (2003) and Ohio EPA (2008).

Recreation Use Assessment

Recreation use attainment was determined using the criteria established in OAC 3745-1-41:

E. coli is the only indicator organism used to evaluate recreation.

The recreation season extends from May 1 – Oct. 31.

Geometric mean content is computed on a seasonal basis.

Geometric mean content is the sole basis of use attainment status when 2 or more samples are taken.

Primary Contact Recreation (PCR) includes three separate categories each with specific numerical criteria: Class A – high use paddling streams, Class B – most typical streams and Class C – historically channelized streams that drain < 3.1 mi².

Macroinvertebrate Community Assessment

Macroinvertebrates were collected from artificial substrates and from the natural habitats. The artificial substrate collection provided quantitative data and consisted of a composite sample of five modified Hester-Dendy multiple-plate samplers colonized for six weeks. At the time of the artificial substrate collection, a qualitative multihabitat composite sample was also collected. This sampling effort consisted of an inventory of all observed macroinvertebrate taxa from the natural habitats at each site with no

attempt to quantify populations other than notations on the predominance of specific taxa or taxa groups within major macrohabitat types (e.g., riffle, run, pool, margin). Detailed discussion of macroinvertebrate field and laboratory procedures is contained in Biological Criteria for the Protection of Aquatic Life: Volume III, Standardized Biological Field Sampling and Laboratory Methods for Assessing Fish and Macroinvertebrate Communities (Ohio EPA 1989b, 2015b).

Fish Community Assessment

Fish were sampled using pulsed DC electrofishing methods. Fish were processed in the field, and included identifying each individual to species, counting, weighing, and recording any external abnormalities. Discussion of the fish community assessment methodology used in this report is contained in Biological Criteria for the Protection of Aquatic Life: Volume III, Standardized Biological Field Sampling and Laboratory Methods for Assessing Fish and Macroinvertebrate Communities (Ohio EPA 1989b, 2015b).

Causal Associations

Using the results, conclusions, and recommendations of this report requires an understanding of the methodology used to determine the use attainment status and assigning probable causes and sources of impairment. The identification of impairment in rivers and streams is straightforward - the numerical biological criteria are used to judge aquatic life use attainment and impairment (partial and non-attainment). The rationale for using the biological criteria, within a weight of evidence framework, has been extensively discussed elsewhere (Karr *et al.* 1986; Karr 1991; Ohio EPA 1987a, Ohio EPA 1987b; Yoder 1989; Miner and Borton 1991; Yoder 1991; Yoder 1995). Describing the causes and sources associated with observed impairments relies on an interpretation of multiple lines of evidence including water chemistry data, sediment data, habitat data, effluent data, land use data, and biological results (Yoder and Rankin 1995a, 1995b, and 1995c). Thus the assignment of principal causes and sources of impairment in this report represent the association of impairments (based on response indicators) with stressor and exposure indicators. The reliability of the identification of probable causes and sources is increased where many such prior associations have been identified, or have been experimentally or statistically linked together. The ultimate measure of success in water resource management is the restoration of lost or damaged ecosystem attributes including aquatic community structure and function. While there have been criticisms of misapplying the metaphor of ecosystem “health” compared to human patient “health” (Suter 1993), in this document we are referring to the process for evaluating biological integrity and causes or sources associated with observed impairments, not whether human health and ecosystem health are analogous concepts.

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Appendix B

Macroinvertebrate Collection Results

LWH/SRW Assessments (FFY12/13 106 Supplemental Gr.) 2013-17

Station: 302931

CORNICK RUN ADJ. OLD U.S. RT. 68 (RD. 30)

0:00 8/11/15

Rivercode: 10-038-000

River Mile: 0.70

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
43	17	9	1	43		9		Good	NORMAL

Taxa	Quant/Qual
01801 Turbellaria	+
03600 Oligochaeta	+
05800 Caecidotea sp	+
05900 Lirceus sp	+
06904 Synurella dentata	+
11120 Baetis flavistriga	+
11130 Baetis intercalaris	+
11200 Callibaetis sp	+
11250 Neocloeon sp	+
11430 Diphetor hageni	+
11650 Procloeon sp (w/ hindwing pads)	+
11651 Procloeon sp (w/o hindwing pads)	+
13400 Stenacron sp	+
13521 Stenonema femoratum	+
17200 Caenis sp	+
45300 Sigara sp	+
50301 Chimarra aterrima	+
51600 Polycentropus sp	+
52200 Cheumatopsyche sp	+
52315 Diplectrona modesta	+
52530 Hydropsyche depravata group	+
53800 Hydroptila sp	+
59310 Mystacides sepulchralis	+
63300 Hydroporini	+
63900 Laccophilus sp	+
67500 Laccobius sp	+
67800 Tropisternus sp	+
68025 Ectopria sp	+
68075 Psephenus herricki	+
71300 Limonia sp	+
71800 Pseudolimnophila sp	+
72700 Anopheles sp	+
74100 Simulium sp	+
77120 Ablabesmyia mallochi	+
78601 Pentaneura inyoensis	+
79210 Thienemannimyia (T.) norena	+
80420 Cricotopus (C.) bicinctus	+
82730 Chironomus (C.) decorus group	+
84450 Polypedilum (Uresipedilum) flavum	+
84470 Polypedilum (P.) illinoense	+
85625 Rheotanytarsus sp	+
85800 Tanytarsus sp	+
85821 Tanytarsus glabrescens group sp 7	+

Station: 302933

REDOAK CREEK @ RD. 231A

0:00 8/18/15

Rivercode: 10-040-000

River Mile: 7.20

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
44	13	9	0	44		9		Good	NORMAL

Taxa	Quant/Qual
01801 Turbellaria	+
03360 Plumatella sp	+
03600 Oligochaeta	+
04964 Erpobdella microstoma	+
05900 Lirceus sp	+
06904 Synurella dentata	+
08245 Orconectes (Procericambarus) raymondi	+
08601 Hydrachnidia	+
11120 Baetis flavistriga	+
11130 Baetis intercalaris	+
11651 Proclonus sp (w/o hindwing pads)	+
12200 Isonychia sp	+
13400 Stenacron sp	+
13521 Stenonema femoratum	+
15000 Paraleptophlebia sp	+
17200 Caenis sp	+
48410 Corydalus cornutus	+
50301 Chimarra aterrima	+
50315 Chimarra obscura	+
51600 Polycentropus sp	+
52200 Cheumatopsyche sp	+
52530 Hydropsyche depravata group	+
65501 Hydrophilidae	+
68075 Psephenus herricki	+
68708 Dubiraphia vittata group	+
69400 Stenelmis sp	+
74100 Simulium sp	+
77120 Ablabesmyia mallochii	+
77500 Conchapelopia sp	+
77750 Thienemannimyia sp	+
78401 Natarsia species A (sensu Roback, 1978)	+
82730 Chironomus (C.) decorus group	+
84210 Paratendipes albimanus or P. duplicatus	+
84450 Polypedilum (Uresipedilum) flavum	+
84470 Polypedilum (P.) illinoense	+
84540 Polypedilum (Tripodura) scalaenum group	+
84750 Stictochironomus sp	+
85615 Rheotanytarsus pellucidus	+
85625 Rheotanytarsus sp	+
85840 Tanytarsus sepp	+
86100 Chrysops sp	+
93900 Elimia sp	+
95100 Physella sp	+
98600 Sphaerium sp	+

Station: 302932

REDOAK CREEK DST. W. FK. REDOAK CREEK

0:00 8/12/15

Rivercode: 10-040-000

River Mile: 6.30

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
49	12	8	1	49		8		Good	NORMAL

Taxa	Quant/Qual
01801 Turbellaria	+
05900 Lirceus sp	+
06904 Synurella dentata	+
08245 Orconectes (Procericambarus) raymondi	+
11020 Acerpenna pygmaea	+
11120 Baetis flavistriga	+
11200 Callibaetis sp	+
11250 Neocloeon sp	+
11651 Procloeon sp (w/o hindwing pads)	+
13400 Stenacron sp	+
13521 Stenonema femoratum	+
17200 Caenis sp	+
22001 Coenagrionidae	+
47600 Sialis sp	+
50315 Chimarra obscura	+
52200 Cheumatopsyche sp	+
52315 Diplectronea modesta	+
52530 Hydropsyche depravata group	+
60900 Peltodytes sp	+
63900 Laccophilus sp	+
68075 Psephenus herricki	+
68201 Scirtidae	+
69400 Stenelmis sp	+
71910 Tipula abdominalis	+
72700 Anopheles sp	+
74100 Simulium sp	+
77120 Ablabesmyia mallochii	+
77500 Conchapelopia sp	+
77800 Helopelopia sp	+
78401 Natarsia species A (sensu Roback, 1978)	+
78601 Pentaneura inyoensis	+
80420 Cricotopus (C.) bicinctus	+
82730 Chironomus (C.) decorus group	+
82820 Cryptochironomus sp	+
83040 Dicrotendipes neomodestus	+
83820 Microtendipes "caelum" (sensu Simpson & Bode, 1980)	+
83840 Microtendipes pedellus group	+
84450 Polypedilum (Uresipedilum) flavum	+
84470 Polypedilum (P.) illinoense	+
84540 Polypedilum (Tripodura) scalaenum group	+
84750 Stictochironomus sp	+
84960 Pseudochironomus sp	+
85625 Rheotanytarsus sp	+
85720 Stempellinella fimbriata	+
85800 Tanytarsus sp	+
85818 Tanytarsus glabrescens group sp 4	+
89716 Limnophora discreta	+
93900 Elimia sp	+
95100 Physella sp	+

Station: X03W01

RED OAK CREEK AT STRINGTOWN @ RIPLEY RD.

0:00 8/18/15

Rivercode: 10-040-000

River Mile: 2.32

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
53	20	16	1	53		16		Exceptional	NORMAL
Taxa		Quant/Qual							
01801	Turbellaria	+							
03600	Oligochaeta	+							
05800	Caecidotea sp	+							
06904	Synurella dentata	+							
08245	Orconectes (Procericambarus) raymondi	+							
08601	Hydrachnidia	+							
11120	Baetis flavistriga	+							
11130	Baetis intercalaris	+							
11200	Callibaetis sp	+							
11250	Neocloeon sp	+							
11670	Procloeon viridoculare	+							
12200	Isonychia sp	+							
13000	Leucrocuta sp	+							
13400	Stenacron sp	+							
13521	Stenonema femoratum	+							
15000	Paraleptophlebia sp	+							
17200	Caenis sp	+							
22001	Coenagrionidae	+							
48410	Corydalus cornutus	+							
50301	Chimarra aterrima	+							
50315	Chimarra obscura	+							
51300	Neureclipsis sp	+							
51600	Polycentropus sp	+							
52200	Cheumatopsyche sp	+							
52315	Diplectrona modesta	+							
52430	Ceratopsyche morosa group	+							
52530	Hydropsyche depravata group	+							
54160	Ochrotrichia sp	+							
68075	Psephenus herricki	+							
69400	Stenelmis sp	+							
72700	Anopheles sp	+							
74100	Simulium sp	+							
74501	Ceratopogonidae	+							
77120	Ablabesmyia mallochi	+							
77800	Helopelopia sp	+							
80410	Cricotopus (C.) sp	+							
80420	Cricotopus (C.) bicinctus	+							
80430	Cricotopus (C.) tremulus group	+							
82101	Thienemanniella taurocapita	+							
82730	Chironomus (C.) decorus group	+							
83040	Dicrotendipes neomodestus	+							
83840	Microtendipes pedellus group	+							
84450	Polypedilum (Uresipedilum) flavum	+							
85615	Rheotanytarsus pellucidus	+							
85625	Rheotanytarsus sp	+							
85720	Stempellinella fimbriata	+							
85800	Tanytarsus sp	+							
85821	Tanytarsus glabrescens group sp 7	+							
85840	Tanytarsus sepp	+							
87400	Stratiomys sp	+							
89716	Limnophora discreta	+							
93900	Elimia sp	+							
95100	Physella sp	+							

Station: 302934

W. FK. REDOAK CREEK @ END OF BEALER RD. (RD. 231)

0:00 8/12/15

Rivercode: 10-041-000

River Mile: 0.05

Sensitive

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
44	9	3	1	44		3		Marginally Good	NORMAL

Taxa	Quant/Qual
01801 Turbellaria	+
03600 Oligochaeta	+
05900 Lirceus sp	+
06904 Synurella dentata	+
07820 Cambarus (Cambarus) sp A	+
11020 Acerpenna pygmaea	+
11120 Baetis flavistriga	+
11200 Callibaetis sp	+
13521 Stenonema femoratum	+
17200 Caenis sp	+
22001 Coenagrionidae	+
22300 Argia sp	+
28208 Erythemis simplicicollis	+
28805 Pantala hymenaea	+
42700 Belostoma sp	+
45300 Sigara sp	+
45900 Notonecta sp	+
50301 Chimarra aterrima	+
52200 Cheumatopsyche sp	+
52315 Diplectrona modesta	+
52530 Hydropsyche depravata group	+
60900 Peltodytes sp	+
63900 Laccophilus sp	+
67800 Tropisternus sp	+
68025 Ectopria sp	+
68075 Psephenus herricki	+
68201 Scirtidae	+
68708 Dubiraphia vittata group	+
69400 Stenelmis sp	+
74100 Simulium sp	+
77120 Ablabesmyia mallochi	+
77500 Conchapelopia sp	+
77750 Thienemannimyia sp	+
78655 Procladius (Holotanypus) sp	+
80420 Cricotopus (C.) bicinctus	+
82730 Chironomus (C.) decorus group	+
83002 Dicrotendipes modestus	+
83840 Microtendipes pedellus group	+
84450 Polypedilum (Uresipedilum) flavum	+
84470 Polypedilum (P.) illinoense	+
84540 Polypedilum (Tripodura) scalaenum group	+
85800 Tanytarsus sp	+
85821 Tanytarsus glabrescens group sp 7	+
95100 Physella sp	+

Station: 302936

BIG THREEMILE CREEK @ ROUSH HILL RD. (RD. 20)

0:00 8/27/15

Rivercode: 10-043-000

River Mile: 11.12

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
50	16	12	0	50		12		Good	NORMAL

Taxa	Quant/Qual
01801 Turbellaria	+
03600 Oligochaeta	+
05900 Lirceus sp	+
06904 Synurella dentata	+
08250 Orconectes (Procericambarus) rusticus	+
08601 Hydrachnidia	+
11020 Acerpenna pygmaea	+
11120 Baetis flavistriga	+
11130 Baetis intercalaris	+
11430 Diphetor hageni	+
11651 Proclleon sp (w/o hindwing pads)	+
13000 Leucrocota sp	+
13400 Stenacron sp	+
13521 Stenonema femoratum	+
14600 Choroterpes basalis	+
15000 Paraleptophlebia sp	+
17200 Caenis sp	+
22001 Coenagrionidae	+
22300 Argia sp	+
34130 Acroneuria frisoni	+
47600 Sialis sp	+
48410 Corydalus cornutus	+
48620 Nigronia serricornis	+
50315 Chimarra obscura	+
51600 Polycentropus sp	+
52200 Cheumatopsyche sp	+
59700 Triaenodes sp	+
63300 Hydroporini	+
68025 Ectopria sp	+
68075 Psephenus herricki	+
68708 Dubiraphia vittata group	+
69400 Stenelmis sp	+
71100 Hexatoma sp	+
72700 Anopheles sp	+
74100 Simulium sp	+
74501 Ceratopogonidae	+
77120 Ablabesmyia mallochii	+
77500 Conchapelopia sp	+
78140 Labrundinia pilosella	+
80351 Corynoneura caudicula	+
82820 Cryptochironomus sp	+
83300 Glyptotendipes (G.) sp	+
83840 Microtendipes pedellus group	+
84450 Polypedilum (Uresipedilum) flavum	+
84470 Polypedilum (P.) illinoense	+
84750 Stictochironomus sp	+
85625 Rheotanytarsus sp	+
86100 Chrysops sp	+
96900 Ferrissia sp	+
98600 Sphaerium sp	+

Station: 302935

BIG THREEMILE CREEK @ ST. RT. 41

0:00 8/27/15

Rivercode: 10-043-000

River Mile: 8.07

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
49	17	11	0	49		11		Good	NORMAL

Taxa	Quant/Qual
00401 Spongillidae	+
01801 Turbellaria	+
03360 Plumatella sp	+
03600 Oligochaeta	+
05900 Lirceus sp	+
06904 Synurella dentata	+
08250 Orconectes (Procericambarus) rusticus	+
11020 Acerpenna pygmaea	+
11120 Baetis flavistriga	+
11130 Baetis intercalaris	+
11650 Procloeon sp (w/ hindwing pads)	+
11651 Procloeon sp (w/o hindwing pads)	+
11670 Procloeon viridoculare	+
13400 Stenacron sp	+
13521 Stenonema femoratum	+
13561 Maccaffertium pulchellum	+
14600 Choroterpes basalis	+
17200 Caenis sp	+
22300 Argia sp	+
34130 Acroneuria frisoni	+
48410 Corydalus cornutus	+
50315 Chimarra obscura	+
51600 Polycentropus sp	+
52200 Cheumatopsyche sp	+
52530 Hydropsyche depravata group	+
53800 Hydroptila sp	+
60900 Peltodytes sp	+
63300 Hydroporini	+
65800 Berosus sp	+
67500 Laccobius sp	+
67800 Tropisternus sp	+
68025 Ectopria sp	+
69400 Stenelmis sp	+
69713 Lutrochus laticeps	+
71300 Limonia sp	+
74501 Ceratopogonidae	+
77115 Ablabesmyia janta	+
77120 Ablabesmyia mallochi	+
77500 Conchapelopia sp	+
77750 Thienemannimyia sp	+
77800 Helopelopia sp	+
78655 Procladius (Holotanypus) sp	+
82730 Chironomus (C.) decorus group	+
82820 Cryptochironomus sp	+
85625 Rheotanytarsus sp	+
85821 Tanytarsus glabrescens group sp 7	+
85840 Tanytarsus sepp	+
95100 Physella sp	+
98600 Sphaerium sp	+

Station: X03W02

BIG THREEMILE CREEK NE OF ABERDEEN @ ST. RT. 763

0:00 8/26/15

Rivercode: 10-043-000

River Mile: 4.18

Sensitive

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
52	20	16	0	52		16		Exceptional	NORMAL
Taxa				Quant/Qual					
00401	Spongillidae					+			
03600	Oligochaeta					+			
05800	Caecidotea sp					+			
05900	Lirceus sp					+			
06904	Synurella dentata					+			
08250	Orconectes (Procericambarus) rusticus					+			
11020	Acerpenna pygmaea					+			
11120	Baetis flavistriga					+			
11130	Baetis intercalaris					+			
11650	Procloeon sp (w/ hindwing pads)					+			
11651	Procloeon sp (w/o hindwing pads)					+			
11670	Procloeon viridoculare					+			
12200	Isonychia sp					+			
13000	Leucrocuta sp					+			
13400	Stenacron sp					+			
13521	Stenonema femoratum					+			
14600	Choroterpes basalis					+			
15000	Paraleptophlebia sp					+			
17200	Caenis sp					+			
22300	Argia sp					+			
34130	Acroneuria frisoni					+			
47600	Sialis sp					+			
48410	Corydalus cornutus					+			
50301	Chimarra aterrima					+			
50315	Chimarra obscura					+			
51600	Polycentropus sp					+			
52200	Cheumatopsyche sp					+			
52530	Hydropsyche depravata group					+			
54160	Ochrotrichia sp					+			
60900	Peltodytes sp					+			
63300	Hydroporini					+			
68075	Psephenus herricki					+			
68708	Dubiraphia vittata group					+			
69400	Stenelmis sp					+			
71100	Hexatoma sp					+			
72700	Anopheles sp					+			
74100	Simulium sp					+			
74501	Ceratopogonidae					+			
77115	Ablabesmyia janta					+			
77120	Ablabesmyia mallochi					+			
77500	Conchapelopia sp					+			
77800	Helopelopia sp					+			
78401	Natarsia species A (sensu Roback, 1978)					+			
80370	Corynoneura lobata					+			
82820	Cryptochironomus sp					+			
83840	Microtendipes pedellus group					+			
84450	Polypedilum (Uresipedilum) flavum					+			
84470	Polypedilum (P.) illinoense					+			
84750	Stictochironomus sp					+			
85625	Rheotanytarsus sp					+			
85720	Stempellinella fimbriata					+			
87501	Empididae					+			

Station: 302937

SLICKAWAY RUN @ STRINGTOWN RD. (RD. 251)

0:00 8/26/15

Rivercode: 10-044-000

River Mile: 0.10

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
42	14	9	3	42		9		Good	LOW
Taxa					Quant/Qual				
01900	Nemertea				+				
03600	Oligochaeta				+				
05800	Caecidotea sp				+				
05900	Lirceus sp				+				
08250	Orconectes (Procericambarus) rusticus				+				
08601	Hydrachnidia				+				
11120	Baetis flavistriga				+				
11200	Callibaetis sp				+				
11250	Neocloeon sp				+				
11650	Procloeon sp (w/ hindwing pads)				+				
11651	Procloeon sp (w/o hindwing pads)				+				
13521	Stenonema femoratum				+				
17200	Caenis sp				+				
34130	Acroneuria frisoni				+				
45400	Trichocorixa sp				+				
48410	Corydalus cornutus				+				
50301	Chimarra aterrima				+				
51600	Polycentropus sp				+				
52200	Cheumatopsyche sp				+				
52315	Diplectrona modesta				+				
52530	Hydropsyche depravata group				+				
53800	Hydroptila sp				+				
68025	Ectopria sp				+				
68075	Psephenus herricki				+				
69400	Stenelmis sp				+				
72700	Anopheles sp				+				
74100	Simulium sp				+				
74501	Ceratopogonidae				+				
77120	Ablabesmyia mallochii				+				
77500	Conchapelopia sp				+				
77750	Thienemannimyia sp				+				
77800	Helopelopia sp				+				
78450	Nilotanytus fimbriatus				+				
79400	Zavrelimyia (Z.) sp				+				
81650	Parametriocnemus sp				+				
83003	Dicrotendipes fumidus				+				
83840	Microtendipes pedellus group				+				
84300	Phaenopsectra obediens group				+				
84470	Polypedilum (P.) illinoense				+				
85720	Stempellinella fimbriata				+				
85800	Tanytarsus sp				+				
95100	Physella sp				+				

Station: 302938

ELLIS RUN @ ELLIS RUN RD. (RD. 44) NR. ELLSBERRY

0:00 8/26/15

Rivercode: 10-047-000

River Mile: 0.05

Sensitive

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
46	17	11	0	46		11		Good	LOW

Taxa	Quant/Qual
01801 Turbellaria	+
03600 Oligochaeta	+
05900 Lirceus sp	+
06904 Synurella dentata	+
08250 Orconectes (Procericambarus) rusticus	+
08601 Hydrachnidia	+
11120 Baetis flavistriga	+
11250 Neocloeon sp	+
11430 Diphetor hageni	+
11650 Procloeon sp (w/ hindwing pads)	+
11651 Procloeon sp (w/o hindwing pads)	+
13400 Stenacron sp	+
13521 Stenonema femoratum	+
14600 Choroterpes basalis	+
15000 Paraleptophlebia sp	+
17200 Caenis sp	+
34130 Acroneuria frisoni	+
47600 Sialis sp	+
48410 Corydalus cornutus	+
48620 Nigronia serricornis	+
50301 Chimarra aterrima	+
50315 Chimarra obscura	+
51600 Polycentropus sp	+
52200 Cheumatopsyche sp	+
52530 Hydropsyche depravata group	+
53800 Hydroptila sp	+
68075 Psephenus herricki	+
69400 Stenelmis sp	+
72700 Anopheles sp	+
74100 Simulium sp	+
74501 Ceratopogonidae	+
77120 Ablabesmyia mallochii	+
77500 Conchapelopia sp	+
77750 Thienemannimyia sp	+
78601 Pentaneura inyoensis	+
80350 Corynoneura sp	+
82820 Cryptochironomus sp	+
83040 Dicrotendipes neomodestus	+
83840 Microtendipes pedellus group	+
84450 Polypedilum (Uresipedilum) flavum	+
84750 Stictochironomus sp	+
85625 Rheotanytarsus sp	+
85800 Tanytarsus sp	+
85821 Tanytarsus glabrescens group sp 7	+
85840 Tanytarsus sepp	+
95100 Physella sp	+

Station: 302939

MEFFORDS RUN ADJ. MEFFORDS RUN RD. (RD. 248)

0:00 8/26/15

Rivercode: 10-048-000

River Mile: 0.05

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
37	13	7	2	37		7		Good	LOW

Taxa	Quant/Qual
01801 Turbellaria	+
06904 Synurella dentata	+
08250 Orconectes (Procericambarus) rusticus	+
08601 Hydrachnidia	+
11120 Baetis flavistriga	+
11130 Baetis intercalaris	+
11250 Neocloeon sp	+
11430 Diphetor hageni	+
13400 Stenacron sp	+
13521 Stenonema femoratum	+
14600 Choroterpes basalis	+
17200 Caenis sp	+
34130 Acroneuria frisoni	+
47600 Sialis sp	+
48410 Corydalus cornutus	+
51600 Polycentropus sp	+
52200 Cheumatopsyche sp	+
52315 Dipletrona modesta	+
52530 Hydropsyche depravata group	+
63300 Hydroporini	+
65501 Hydrophilidae	+
68025 Ectopria sp	+
68075 Psephenus herricki	+
72700 Anopheles sp	+
74100 Simulium sp	+
77120 Ablabesmyia mallochi	+
77500 Conchapelopia sp	+
78655 Procladius (Holotanypus) sp	+
79210 Thienemannimyia (T.) norena	+
79400 Zavrelimyia (Z.) sp	+
82820 Cryptochironomus sp	+
83840 Microtendipes pedellus group	+
85201 Cladotanytarsus species group A	+
85625 Rheotanytarsus sp	+
85818 Tanytarsus glabrescens group sp 4	+
87540 Hemerodromia sp	+
95100 Physella sp	+

Station: X03W13

FISHING GUT CREEK E OF ABERDEEN, NEAR OLD ST. RT. 249

0:00 7/27/16

Rivercode: 10-049-000

River Mile: 1.70

Sensitive

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
52	14	12	3	52		12		Good	NORMAL
Taxa				Quant/Qual					
01801	Turbellaria					+			
01900	Nemertea					+			
03600	Oligochaeta					+			
05900	Lirceus sp					+			
06904	Synurella dentata					+			
07800	Cambarus sp					+			
08601	Hydrachnidia					+			
11120	Baetis flavistriga					+			
11250	Neocloeon sp					+			
11430	Diphetor hageni					+			
11651	Procloeon sp (w/o hindwing pads)					+			
13400	Stenacron sp					+			
13521	Stenonema femoratum					+			
14600	Choroterpes basalis					+			
17200	Caenis sp					+			
44501	Corixidae					+			
47600	Sialis sp					+			
48620	Nigronia serricornis					+			
50301	Chimarra aterrima					+			
51400	Nyctiophylax sp					+			
51600	Polycentropus sp					+			
52200	Cheumatopsyche sp					+			
52315	Diplectrona modesta					+			
52530	Hydropsyche depravata group					+			
63300	Hydroporini					+			
65501	Hydrophilidae					+			
68025	Ectopria sp					+			
68075	Psephenus herricki					+			
68130	Helichus sp					+			
69400	Stenelmis sp					+			
71100	Hexatoma sp					+			
71800	Pseudolimnophila sp					+			
72180	Telmatoscopus sp					+			
74100	Simulium sp					+			
74501	Ceratopogonidae					+			
77120	Ablabesmyia mallochi					+			
77500	Conchapelopia sp					+			
77750	Thienemannimyia sp					+			
79400	Zavrelimyia (Z.) sp					+			
82820	Cryptochironomus sp					+			
83003	Dicrotendipes fumidus					+			
83040	Dicrotendipes neomodestus					+			
83840	Microtendipes pedellus group					+			
85500	Paratanytarsus sp					+			
85501	Paratanytarsus longistilus					+			
85720	Stempellinella fimbriata					+			
85800	Tanytarsus sp					+			
85818	Tanytarsus glabrescens group sp 4					+			
87540	Hemerodromia sp					+			
87601	Dolichopodidae					+			
95100	Physella sp					+			
96900	Ferrissia sp					+			

Station: X99Q01

L. THREEMILE CREEK E OF MAYSVILLE @ U.S. RT. 52

0:00 7/27/16

Rivercode: 10-050-000

River Mile: 1.30

Sensitive

Qual Taxa

Qual EPT

Qual Sensitive

Coldwater

Total Taxa

Total Number

Taxa

ICI

Narrative

Flow

48

13

9

0

48

9

Good

NORMAL

Taxa

Quant/Qual

01801	Turbellaria	+
03600	Oligochaeta	+
05800	Caecidotea sp	+
06904	Synurella dentata	+
07820	Cambarus (Cambarus) sp A	+
08250	Orconectes (Procericambarus) rusticus	+
11120	Baetis flavistriga	+
11200	Callibaetis sp	+
11430	Diphetor hageni	+
11651	Proclonia sp (w/o hindwing pads)	+
13400	Stenacron sp	+
13521	Stenonema femoratum	+
14600	Choroterpes basalis	+
17200	Caenis sp	+
23804	Basiaeschna janata	+
45300	Sigara sp	+
48620	Nigronia serricornis	+
50301	Chimarra aterrima	+
51600	Polycentropus sp	+
52200	Cheumatopsyche sp	+
52530	Hydropsyche depravata group	+
53501	Hydroptilidae	+
63300	Hydroporini	+
68075	Psephenus herricki	+
68708	Dubiraphia vittata group	+
69400	Stenelmis sp	+
71100	Hexatoma sp	+
71900	Tipula sp	+
72700	Anopheles sp	+
77120	Ablabesmyia mallochii	+
77500	Conchapelopia sp	+
77750	Thienemannimyia sp	+
77800	Helopelopia sp	+
78401	Natarsia species A (sensu Roback, 1978)	+
78601	Pentaneura inyoensis	+
81530	Orthocladius (Symposiocladius) lignicola	+
82730	Chironomus (C.) decorus group	+
83040	Dicrotendipes neomodestus	+
83820	Microtendipes "caelum" (sensu Simpson & Bode, 1980)	+
83840	Microtendipes pedellus group	+
84210	Paratendipes albimanus or P. duplicatus	+
84315	Phaenopsectra flavipes	+
84470	Polypedilum (P.) illinoense	+
84700	Stenochironomus sp	+
84750	Stictochironomus sp	+
85625	Rheotanytarsus sp	+
87540	Hemerodromia sp	+
95100	Physella sp	+

Station: 303612

ISAACS CREEK IN MANCHESTER @ BROADWAY ST.

0:00 8/3/16

Rivercode: 10-056-000

River Mile: 1.43

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
41	11	10	1	41		10		Good	NORMAL

Taxa	Quant/Qual
03600 Oligochaeta	+
05900 Lirceus sp	+
06904 Synurella dentata	+
08250 Orconectes (Procericambarus) rusticus	+
08601 Hydrachnidia	+
11018 Acerpenna macdunnoughi	+
11120 Baetis flavistriga	+
11130 Baetis intercalaris	+
11250 Neocloeon sp	+
11650 Procloeon sp (w/ hindwing pads)	+
11670 Procloeon viridoculare	+
13521 Stenonema femoratum	+
17200 Caenis sp	+
21200 Calopteryx sp	+
47600 Sialis sp	+
48410 Corydalus cornutus	+
48620 Nigronia serricornis	+
50301 Chimarra aterrima	+
52200 Cheumatopsyche sp	+
52530 Hydropsyche depravata group	+
63300 Hydroporini	+
68025 Ectopria sp	+
68075 Psephenus herricki	+
69225 Optioservus fastiditus	+
69400 Stenelmis sp	+
71100 Hexatoma sp	+
71900 Tipula sp	+
74100 Simulium sp	+
77500 Conchapelopia sp	+
78601 Pentaneura inyoensis	+
78655 Procladius (Holotanypus) sp	+
82820 Cryptochironomus sp	+
83040 Dicrotendipes neomodestus	+
84210 Paratendipes albimanus or P. duplicatus	+
84440 Polypedilum (Uresipedilum) aviceps	+
84450 Polypedilum (Uresipedilum) flavum	+
84460 Polypedilum (P.) fallax group	+
84700 Stenochironomus sp	+
84960 Pseudochironomus sp	+
85201 Cladotanytarsus species group A	+
93200 Hydrobiidae	+

Station: 303598

ISLAND CREEK @ ISLAND CREEK RD.

0:00 8/3/16

Rivercode: 10-057-000

River Mile: 1.10

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
43	18	14	1	43		14		Very Good	NORMAL

Taxa	Quant/Qual
01801 Turbellaria	+
03600 Oligochaeta	+
05800 Caecidotea sp	+
08250 Orconectes (Procericambarus) rusticus	+
11018 Acerpenna macdunnoughi	+
11020 Acerpenna pygmaea	+
11120 Baetis flavistriga	+
11130 Baetis intercalaris	+
11650 Procloeon sp (w/ hindwing pads)	+
11651 Procloeon sp (w/o hindwing pads)	+
12200 Isonychia sp	+
13000 Leucrocuta sp	+
13400 Stenacron sp	+
13521 Stenonema femoratum	+
14600 Choroterpes basalis	+
17200 Caenis sp	+
21200 Calopteryx sp	+
22300 Argia sp	+
34130 Acroneuria frisoni	+
45300 Sigara sp	+
47600 Sialis sp	+
48410 Corydalus cornutus	+
48620 Nigronia serricornis	+
50301 Chimarra aterrima	+
50315 Chimarra obscura	+
51600 Polycentropus sp	+
52200 Cheumatopsyche sp	+
52530 Hydropsyche depravata group	+
63300 Hydroporini	+
68075 Psephenus herricki	+
69400 Stenelmis sp	+
71100 Hexatoma sp	+
74100 Simulium sp	+
77120 Ablabesmyia mallochi	+
77500 Conchapelopia sp	+
77800 Helopelopia sp	+
79400 Zavrelimyia (Z.) sp	+
82820 Cryptochironomus sp	+
84210 Paratendipes albimanus or P. duplicatus	+
84540 Polypedilum (Tripodura) scalaenum group	+
85625 Rheotanytarsus sp	+
85840 Tanytarsus sepp	+
95100 Physella sp	+

Station: 303595

DONALDSON CREEK @ US 52

0:00 8/3/16

Rivercode: 10-060-000

River Mile: 0.45

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
44	15	15	3	44		15		Good	NORMAL

Taxa	Quant/Qual
01801 Turbellaria	+
03600 Oligochaeta	+
05800 Caecidotea sp	+
06502 Crangonyctidae	+
08250 Orconectes (Procericambarus) rusticus	+
11018 Acerpenna macdunnoughi	+
11120 Baetis flavistriga	+
11130 Baetis intercalaris	+
11430 Diphetor hageni	+
13400 Stenacron sp	+
13521 Stenonema femoratum	+
13590 Maccaffertium vicarium	+
17200 Caenis sp	+
18600 Ephemera sp	+
33100 Leuctra sp	+
34120 Acroneuria carolinensis	+
34130 Acroneuria frisoni	+
47600 Sialis sp	+
48410 Corydalus cornutus	+
51400 Nyctiophylax sp	+
51600 Polycentropus sp	+
52200 Cheumatopsyche sp	+
68075 Psephenus herricki	+
69225 Optioservus fastiditus	+
69400 Stenelmis sp	+
71100 Hexatoma sp	+
74501 Ceratopogonidae	+
77120 Ablabesmyia mallochii	+
77800 Helopelopia sp	+
78401 Natarsia species A (sensu Roback, 1978)	+
78655 Procladius (Holotanypus) sp	+
79400 Zavrelimyia (Z.) sp	+
82820 Cryptochironomus sp	+
83840 Microtendipes pedellus group	+
84210 Paratendipes albimanus or P. duplicatus	+
84440 Polypedilum (Uresipedilum) aviceps	+
84450 Polypedilum (Uresipedilum) flavum	+
84750 Stictochironomus sp	+
85201 Cladotanytarsus species group A	+
85500 Paratanytarsus sp	+
85625 Rheotanytarsus sp	+
85720 Stempellinella fimbriata	+
85840 Tanytarsus sepp	+
95100 Physella sp	+

Station: 200741

STOUT RUN N OF ROME ADJ. BLUE CREEK RD, DST. PUNTENNEY RUN

0:00 8/3/16

Rivercode: 10-067-000

River Mile: 3.00

Sensitive

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
60	23	24	2	60		24		Exceptional	NORMAL

Taxa	Quant/Qual	
01801 Turbellaria	+ 85720 Stempellinella fimbriata	+
07840 Cambarus (Cambarus) sciotensis	+ 85802 Tanytarsus n. sp. near curticornis	+
08260 Orconectes (Crockerinus) sanbornii sanbornii	+ 85821 Tanytarsus glabrescens group sp 7	+
11012 Acentrella nadineae	+ 85840 Tanytarsus sepp	+
11018 Acerpenna macdunnoughi	+	
11120 Baetis flavistriga	+	
11130 Baetis intercalaris	+	
11430 Diphetor hageni	+	
11650 Proclleon sp (w/ hindwing pads)	+	
11651 Proclleon sp (w/o hindwing pads)	+	
13521 Stenonema femoratum	+	
13590 Maccaffertium vicarium	+	
17200 Caenis sp	+	
18600 Ephemera sp	+	
21200 Calopteryx sp	+	
22300 Argia sp	+	
23909 Boyeria vinosa	+	
25510 Stylogomphus albistylus	+	
27500 Somatochlora sp	+	
33100 Leuctra sp	+	
34130 Acroneuria frisoni	+	
47600 Sialis sp	+	
48620 Nigronia serricornis	+	
50301 Chimarra aterrima	+	
50804 Lype diversa	+	
51400 Nyctiophylax sp	+	
51600 Polycentropus sp	+	
52200 Cheumatopsyche sp	+	
52530 Hydropsyche depravata group	+	
53800 Hydroptila sp	+	
57900 Pycnopsyche sp	+	
59580 Oecetis persimilis	+	
59720 Triaenodes ignitus	+	
63300 Hydroporini	+	
68075 Psephenus herricki	+	
68130 Helichus sp	+	
68601 Ancyronyx variegata	+	
68708 Dubiraphia vittata group	+	
68901 Macronychus glabratus	+	
69400 Stenelmis sp	+	
71100 Hexatoma sp	+	
71900 Tipula sp	+	
77120 Ablabesmyia mallochii	+	
77800 Helopelopia sp	+	
78450 Nilotanytus fimbriatus	+	
79300 Trissopelopia ogemawi	+	
81530 Orthocladius (Symposiocladius) lignicola	+	
82100 Thienemanniella sp	+	
83820 Microtendipes "caelum" (sensu Simpson & Bode, 1980)	+	
83840 Microtendipes pedellus group	+	
84210 Paratendipes albimanus or P. duplicatus	+	
84300 Phaenopsectra obediens group	+	
84540 Polypedilum (Tripodura) scalaenum group	+	
84700 Stenochironomus sp	+	
85500 Paratanytarsus sp	+	
85625 Rheotanytarsus sp	+	

Station: 303605

RUSSELL FORK @ POINT CEMETERY ROAD

0:00 8/2/16

Rivercode: 10-069-000

River Mile: 0.10

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
32	14	10	1	32		10		Good	NORMAL

Taxa	Quant/Qual
03600 Oligochaeta	+
08260 Orconectes (Crockerinus) sanbornii sanbornii	+
11012 Acentrella nadineae	+
11120 Baetis flavistriga	+
11130 Baetis intercalaris	+
13400 Stenacron sp	+
13521 Stenonema femoratum	+
13590 Maccaffertium vicarium	+
17200 Caenis sp	+
21200 Calopteryx sp	+
23900 Boyeria sp	+
33100 Leuctra sp	+
48620 Nigronia serricornis	+
50301 Chimarra aterrima	+
50804 Lype diversa	+
52200 Cheumatopsyche sp	+
53501 Hydroptilidae	+
57900 Pycnopsyche sp	+
59720 Triaenodes ignitus	+
68075 Psephenus herricki	+
68708 Dubiraphia vittata group	+
68901 Macronychus glabratus	+
69225 Optioservus fastiditus	+
69400 Stenelmis sp	+
71100 Hexatoma sp	+
74100 Simulium sp	+
77500 Conchapelopia sp	+
77800 Helopelopia sp	+
81825 Rheocricotopus (Psilocricotopus) robacki	+
83840 Microtendipes pedellus group	+
85625 Rheotanytarsus sp	+
96900 Ferrissia sp	+

Station: 302195

PUNTENNEY RUN N OF SQUIRREL TOWN, ADJ PUNTENNEY RUN RD

0:00 4/4/13

Rivercode: 10-071-000

River Mile: 1.35

Sensitive

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Taxa	ICI	Narrative	Flow
16	11	8	5	16		8		Good	NORMAL

Taxa	Quant/Qual
01801 Turbellaria	+
03600 Oligochaeta	+
05900 Lirceus sp	+
06700 Crangonyx sp	+
10550 Ameletus sp	+
12800 Epeorus sp	+
13400 Stenacron sp	+
14900 Leptophlebia sp	+
16200 Eurylophella sp	+
33100 Leuctra sp	+
35250 Diploperla robusta	+
35540 Isoperla montana	+
52330 Homoplectra doringa or monticola	+
57000 Ironoquia sp	+
57900 Pycnopsyche sp	+
71910 Tipula abdominalis	+

Rivercode: 10-075-000

River Mile: 1.23

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
65	27	29	9	65		29		Exceptional	NORMAL

Taxa	Quant/Qual	
03600 Oligochaeta	+ 83840 Microtendipes pedellus group	+
05900 Lirceus sp	+ 84300 Phaenopsectra obediens group	+
07840 Cambarus (Cambarus) sciotensis	+ 84302 Phaenopsectra punctipes	+
08201 Orconectes (Procericambarus) cristavarius	+ 84315 Phaenopsectra flavipes	+
08601 Hydrachnidia	+ 84430 Polypedilum (P.) albicorne	+
11012 Acentrella nadineae	+ 84460 Polypedilum (P.) fallax group	+
11014 Acentrella turbida	+ 84540 Polypedilum (Tripodura) scalaenum group	+
11015 Acerpenna sp	+ 85500 Paratanytarsus sp	+
11120 Baetis flavistriga	+ 85625 Rheotanytarsus sp	+
11130 Baetis intercalaris	+	
11430 Diphetor hageni	+	
11651 Procloeon sp (w/o hindwing pads)	+	
13000 Leucrocota sp	+	
13400 Stenacron sp	+	
13590 Maccaffertium vicarium	+	
14700 Habrophlebiodes sp	+	
16200 Eurylophella sp	+	
17200 Caenis sp	+	
18600 Ephemera sp	+	
21200 Calopteryx sp	+	
23905 Boyeria grafiana	+	
25510 Stylogomphus albistylus	+	
27500 Somatochlora sp	+	
33100 Leuctra sp	+	
34120 Acroneuria carolinensis	+	
34130 Acroneuria frisoni	+	
34300 Neoperla sp	+	
48620 Nigronia serricornis	+	
50301 Chimarra aterrima	+	
50410 Dolophilodes distinctus	+	
50804 Lype diversa	+	
51600 Polycentropus sp	+	
52200 Cheumatopsyche sp	+	
52530 Hydropsyche depravata group	+	
53800 Hydroptila sp	+	
57400 Neophylax sp	+	
57900 Pycnopsyche sp	+	
67100 Hydrobius sp	+	
68075 Psephenus herricki	+	
68708 Dubiraphia vittata group	+	
71100 Hexatoma sp	+	
72330 Dixa sp	+	
72340 Dixella sp	+	
74100 Simulium sp	+	
74501 Ceratopogonidae	+	
77500 Conchapelopia sp	+	
77750 Thienemannimyia sp	+	
77800 Helopelopia sp	+	
79300 Trissopelopia ogemawi	+	
79720 Diamesa sp	+	
80350 Corynoneura sp	+	
81600 Parachaetocladius sp	+	
82300 Xylotopus par	+	
82820 Cryptochironomus sp	+	
83040 Dicrotendipes neomodestus	+	
83820 Microtendipes "caelum" (sensu Simpson & Bode, 1980)	+	

Station: 303608

SULPHUR CREEK @ SULPHUR CREEK RD.

0:00 7/20/16

Rivercode: 10-077-000

River Mile: 0.35

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
61	23	24	8	61		24		Exceptional	NORMAL

Taxa	Quant/Qual	
01801 Turbellaria	+ 85625 Rheotanytarsus sp	+
03600 Oligochaeta	+ 85800 Tanytarsus sp	+
05900 Lirceus sp	+ 85802 Tanytarsus n. sp. near curticornis	+
06700 Crangonyx sp	+ 85840 Tanytarsus sepp	+
07840 Cambarus (Cambarus) sciotensis	+ 95100 Physella sp	+
11014 Acentrella turbida	+	
11018 Acerpenna macdunnoughi	+	
11120 Baetis flavistriga	+	
11130 Baetis intercalaris	+	
11250 Neocloeon sp	+	
11430 Diphetor hageni	+	
11650 Procloeon sp (w/ hindwing pads)	+	
11651 Procloeon sp (w/o hindwing pads)	+	
13521 Stenonema femoratum	+	
13590 Maccaffertium vicarium	+	
14600 Choroterpes basalis	+	
15000 Paraleptophlebia sp	+	
21001 Calopterygidae	+	
22001 Coenagrionidae	+	
23700 Anax sp	+	
25510 Stylogomphus albistylus	+	
33100 Leuctra sp	+	
34120 Acroneuria carolinensis	+	
47600 Sialis sp	+	
48610 Nigronia fasciata	+	
50301 Chimarra aterrima	+	
50410 Dolophilodes distinctus	+	
50804 Lype diversa	+	
51600 Polycentropus sp	+	
52200 Cheumatopsyche sp	+	
52530 Hydropsyche depravata group	+	
53501 Hydroptilidae	+	
57400 Neophylax sp	+	
57900 Pycnopsyche sp	+	
66200 Cymbiodyta sp	+	
68075 Psephenus herricki	+	
68130 Helichus sp	+	
71100 Hexatoma sp	+	
71800 Pseudolimnophila sp	+	
71900 Tipula sp	+	
74100 Simulium sp	+	
77120 Ablabesmyia mallochi	+	
77800 Helopelopia sp	+	
79400 Zavrelimyia (Z.) sp	+	
79720 Diamesa sp	+	
81650 Parametrioctenemus sp	+	
82820 Cryptochironomus sp	+	
83040 Dicrotendipes neomodestus	+	
83840 Dicrotendipes pedellus group	+	
84300 Phaenopsectra obediens group	+	
84315 Phaenopsectra flavipes	+	
84440 Polypedilum (Uresipedilum) aviceps	+	
84469 Polypedilum (P.) illinoense group	+	
84800 Tribelos jucundum	+	
85481 Neozavrelia sp 1	+	
85500 Paratanytarsus sp	+	

Station: 303604

ROCK RUN IN SHAWNEE S.F. OFF TRAM ROAD

0:00 8/2/16

Rivercode: 10-081-000

River Mile: 1.80

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
43	20	24	8	43		24		Exceptional	NORMAL

Taxa	Quant/Qual
03600 Oligochaeta	+
05800 Caecidotea sp	+
05900 Lirceus sp	+
07840 Cambarus (Cambarus) sciotensis	+
11430 Diphetor hageni	+
11650 Procloeon sp (w/ hindwing pads)	+
13400 Stenacron sp	+
13521 Stenonema femoratum	+
13590 Maccaffertium vicarium	+
14600 Choroterpes basalis	+
16200 Eurylophella sp	+
18630 Ephemera varia	+
21001 Calopterygidae	+
23905 Boyeria grafiana	+
33100 Leuctra sp	+
34120 Acroneuria carolinensis	+
34130 Acroneuria frisoni	+
47600 Sialis sp	+
48610 Nigronia fasciata	+
50301 Chimarra aterrima	+
50410 Dolophilodes distinctus	+
51400 Nyctiophylax sp	+
52200 Cheumatopsyche sp	+
52315 Diplectrona modesta	+
52530 Hydropsyche depravata group	+
57400 Neophylax sp	+
57900 Pycnopsyche sp	+
58410 Molanna sp	+
68075 Psephenus herricki	+
69400 Stenelmis sp	+
71100 Hexatoma sp	+
71800 Pseudolimnophila sp	+
79300 Trissopelopia ogemawi	+
79400 Zavrelimyia (Z.) sp	+
82300 Xylotopus par	+
82820 Cryptochironomus sp	+
83840 Microtendipes pedellus group	+
84700 Stenochironomus sp	+
84800 Tribelos jucundum	+
85615 Rheotanytarsus pellucidus	+
85800 Tanytarsus sp	+
85802 Tanytarsus n. sp. near curticornis	+
86100 Chrysops sp	+

Station: 303600

LOWER TWIN CREEK (RM 5.2) ADJ. LOWER TWIN CREEK RD.

0:00 7/12/16

Rivercode: 10-082-000

River Mile: 5.20

Sensitive

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
57	26	32	10	57		32		Exceptional	NORMAL

Taxa	Quant/Qual
01801 Turbellaria	+ 87510 Neoplasta sp +
03600 Oligochaeta	+
05900 Lirceus sp	+
06700 Crangonyx sp	+
11012 Acentrella nadineae	+
11014 Acentrella turbida	+
11018 Acerpenna macdunnoughi	+
11118 Plauditus dubius	+
11130 Baetis intercalaris	+
11430 Diphetor hageni	+
11650 Procloeon sp (w/ hindwing pads)	+
11651 Procloeon sp (w/o hindwing pads)	+
13000 Leucrocuta sp	+
13400 Stenacron sp	+
13521 Stenonema femoratum	+
13590 Maccaffertium vicarium	+
14600 Choroterpes basalis	+
15000 Paraleptophlebia sp	+
17200 Caenis sp	+
23905 Boyeria grafiana	+
25510 Stylogomphus albistylus	+
33100 Leuctra sp	+
34120 Acroneuria carolinensis	+
36500 Sweltsa sp	+
48620 Nigronia serricornis	+
50301 Chimarra aterrima	+
50410 Dolophilodes distinctus	+
50804 Lype diversa	+
51400 Nyctiophylax sp	+
51600 Polycentropus sp	+
52200 Cheumatopsyche sp	+
57900 Pycnopsyche sp	+
58020 Lepidostoma sp	+
68075 Psephenus herricki	+
68130 Helichus sp	+
69400 Stenelmis sp	+
71100 Hexatoma sp	+
71800 Pseudolimnophila sp	+
71900 Tipula sp	+
72340 Dixella sp	+
77120 Ablabesmyia mallochii	+
77800 Helopelopia sp	+
79300 Trissopelopia ogemawi	+
79400 Zavrelimyia (Z.) sp	+
81650 Parametrioctenemus sp	+
82300 Xylotopus par	+
83040 Dicrotendipes neomodestus	+
83840 Microtendipes pedellus group	+
83860 Microtendipes rydalensis	+
84210 Paratendipes albimanus or P. duplicatus	+
84750 Stictochironomus sp	+
85481 Neozavrelia sp 1	+
85500 Paratanytarsus sp	+
85615 Rheotanytarsus pellucidus	+
85720 Stempellinella fimbriata	+
85802 Tanytarsus n. sp. near curticornis	+

Station: X99Q02

LOWER TWIN CREEK NW OF BUENA VISTA, ADJ. LOWER TWIN CREEK RD

0:00 7/12/16

Rivercode: 10-082-000

River Mile: 2.10

Sensitive

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Taxa	ICI	Narrative	Flow
47	23	31	4	47		31		Exceptional	NORMAL

Taxa	Quant/Qual
07840 Cambarus (Cambarus) sciotensis	+
11012 Acentrella nadineae	+
11014 Acentrella turbida	+
11018 Acerpenna macdunnoughi	+
11118 Plauditus dubius	+
11130 Baetis intercalaris	+
11265 Anafroptilum minor group sp 2	+
11430 Diphetor hageni	+
11650 Procloeon sp (w/ hindwing pads)	+
11651 Procloeon sp (w/o hindwing pads)	+
13000 Leucrocuta sp	+
13400 Stenacron sp	+
13590 Maccaffertium vicarium	+
18630 Ephemera varia	+
23905 Boyeria grafiana	+
25510 Stylogomphus albistylus	+
33100 Leuctra sp	+
34120 Acroneuria carolinensis	+
34130 Acroneuria frisoni	+
34300 Neoperla sp	+
48620 Nigronia serricornis	+
50301 Chimarra aterrima	+
50410 Dolophilodes distinctus	+
51400 Nyctiophylax sp	+
51600 Polycentropus sp	+
52200 Cheumatopsyche sp	+
57900 Pycnopsyche sp	+
68075 Psephenus herricki	+
69400 Stenelmis sp	+
70600 Antocha sp	+
71100 Hexatoma sp	+
74100 Simulium sp	+
74501 Ceratopogonidae	+
77120 Ablabesmyia mallochi	+
77500 Conchapelopia sp	+
77800 Helopelopia sp	+
80420 Cricotopus (C.) bicinctus	+
82900 Demicryptochironomus sp	+
83820 Microtendipes "caelum" (sensu Simpson & Bode, 1980)	+
83840 Microtendipes pedellus group	+
83860 Microtendipes rydalensis	+
84440 Polypedilum (Uresipedilum) aviceps	+
85500 Paratanytarsus sp	+
85625 Rheotanytarsus sp	+
85706 Stempellina johannsenii	+
85802 Tanytarsus n. sp. near curticornis	+
85840 Tanytarsus sepp	+

Station: X04P01

UPPER TWIN CREEK AT MCGAW @ U.S. RT. 52

0:00 7/19/16

Rivercode: 10-085-000

River Mile: 2.55

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
52	25	26	3	52		26		Exceptional	NORMAL
Taxa					Quant/Qual				
01801	Turbellaria				+				
01900	Nemertea				+				
03600	Oligochaeta				+				
05900	Lirceus sp				+				
07840	Cambarus (Cambarus) sciotensis				+				
08260	Orconectes (Crockerinus) sanbornii sanbornii				+				
11014	Acentrella turbida				+				
11018	Acerpenna macdunnoughi				+				
11118	Plauditus dubius				+				
11130	Baetis intercalaris				+				
11250	Neocloeon sp				+				
11650	Procloeon sp (w/ hindwing pads)				+				
11651	Procloeon sp (w/o hindwing pads)				+				
12200	Isonychia sp				+				
13000	Leucrocuta sp				+				
13400	Stenacron sp				+				
13590	Maccaffertium vicarium				+				
17200	Caenis sp				+				
21200	Calopteryx sp				+				
22300	Argia sp				+				
24501	Gomphidae				+				
27500	Somatochlora sp				+				
33100	Leuctra sp				+				
34120	Acroneuria carolinensis				+				
34130	Acroneuria frisoni				+				
47600	Sialis sp				+				
48410	Corydalus cornutus				+				
50301	Chimarra aterrima				+				
50410	Dolophilodes distinctus				+				
50804	Lype diversa				+				
51400	Nyctiophylax sp				+				
52200	Cheumatopsyche sp				+				
52530	Hydropsyche depravata group				+				
53800	Hydroptila sp				+				
57900	Pycnopsyche sp				+				
59310	Mystacides sepulchralis				+				
59730	Trienodes melaca				+				
63300	Hydroporini				+				
68075	Psephenus herricki				+				
69400	Stenelmis sp				+				
71100	Hexatoma sp				+				
74100	Simulium sp				+				
77120	Ablabesmyia mallochi				+				
77800	Helopelopia sp				+				
80351	Corynoneura caudicula				+				
80410	Cricotopus (C.) sp				+				
82300	Xylotopus par				+				
83040	Dicrotendipes neomodestus				+				
83820	Microtendipes "caelum" (sensu Simpson & Bode, 1980)				+				
84210	Paratendipes albimanus or P. duplicatus				+				
84440	Polypedilum (Uresipedilum) aviceps				+				
85625	Rheotanytarsus sp				+				

Station: 303597

E. FORK UPPER TWIN CR. @ UPPER TWIN CREEK RD.

0:00 7/20/16

Rivercode: 10-089-000

River Mile: 0.10

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
50	26	31	8	50		31		Exceptional	NORMAL

Taxa	Quant/Qual
03600 Oligochaeta	+
05900 Lirceus sp	+
07840 Cambarus (Cambarus) sciotensis	+
11012 Acentrella nadineae	+
11018 Acerpenna macdunnoughi	+
11120 Baetis flavistriga	+
11430 Diphetor hageni	+
11650 Proclleon sp (w/ hindwing pads)	+
11651 Proclleon sp (w/o hindwing pads)	+
13000 Leucrocuta sp	+
13400 Stenacron sp	+
13521 Stenonema femoratum	+
13590 Maccaffertium vicarium	+
14600 Choroterpes basalis	+
15000 Paraleptophlebia sp	+
18630 Ephemera varia	+
25510 Stylogomphus albistylus	+
33100 Leuctra sp	+
34120 Acroneuria carolinensis	+
34130 Acroneuria frisoni	+
47600 Sialis sp	+
48610 Nigronia fasciata	+
48620 Nigronia serricornis	+
50301 Chimarra aterrima	+
50410 Dolophilodes distinctus	+
51400 Nyctiophylax sp	+
51600 Polycentropus sp	+
52200 Cheumatopsyche sp	+
52315 Dipletrona modesta	+
57400 Neophylax sp	+
57900 Pycnopsyche sp	+
58020 Lepidostoma sp	+
59310 Mystacides sepulchralis	+
68075 Psephenus herricki	+
68708 Dubiraphia vittata group	+
71100 Hexatoma sp	+
77800 Helopelopia sp	+
79300 Trissopelopia ogemawi	+
79400 Zavrelimyia (Z.) sp	+
82300 Xylotopus par	+
83820 Microtendipes "caelum" (sensu Simpson & Bode, 1980)	+
83840 Microtendipes pedellus group	+
83860 Microtendipes rydalensis	+
83900 Nilothauma sp	+
84300 Phaenopsectra obediens group	+
84440 Polypedilum (Uresipedilum) aviceps	+
84470 Polypedilum (P.) illinoense	+
85500 Paratanytarsus sp	+
85625 Rheotanytarsus sp	+
85706 Stempellina johannsenii	+

Station: 303603

MCATEE RUN @ US 52

0:00 7/19/16

Rivercode: 10-096-000

River Mile: 0.66

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
39	19	20	5	39		20		Exceptional	NORMAL

Taxa	Quant/Qual
01801 Turbellaria	+
01900 Nemertea	+
05900 Lirceus sp	+
07840 Cambarus (Cambarus) sciotensis	+
11014 Acentrella turbida	+
11018 Acerpenna macdunnoughi	+
11130 Baetis intercalaris	+
11430 Diphetor hageni	+
11651 Procloeon sp (w/o hindwing pads)	+
13000 Leucrocuta sp	+
13400 Stenacron sp	+
13521 Stenonema femoratum	+
13590 Maccaffertium vicarium	+
14600 Choroterpes basalis	+
17200 Caenis sp	+
33100 Leuctra sp	+
34120 Acroneuria carolinensis	+
48610 Nigronia fasciata	+
50301 Chimarra aterrima	+
50410 Dolophilodes distinctus	+
51600 Polycentropus sp	+
52200 Cheumatopsyche sp	+
52315 Diplectrona modesta	+
57900 Pycnopsyche sp	+
68075 Psephenus herricki	+
69400 Stenelmis sp	+
71100 Hexatoma sp	+
71800 Pseudolimnophila sp	+
71910 Tipula abdominalis	+
77500 Conchapelopia sp	+
77800 Helopelopia sp	+
82820 Cryptochironomus sp	+
83040 Dicrotendipes neomodestus	+
83840 Microtendipes pedellus group	+
84440 Polypedilum (Uresipedilum) aviceps	+
84540 Polypedilum (Tripodura) scalaenum group	+
85500 Paratanytarsus sp	+
85720 Stempellinella fimbriata	+
85840 Tanytarsus sepp	+

Station: 303613

POND RUN OFF SF RD 1 (POND RUN RD.) AT BACKPACK TRAIL

0:00 7/19/16

Rivercode: 10-099-000

River Mile: 4.64

Sensitive

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
50	21	25	8	50		25		Exceptional	NORMAL

Taxa	Quant/Qual
01801 Turbellaria	+
03600 Oligochaeta	+
05900 Lirceus sp	+
07840 Cambarus (Cambarus) sciotensis	+
08601 Hydrachnidia	+
11012 Acentrella nadineae	+
11018 Acerpenna macdunnoughi	+
11118 Plauditus dubius	+
11120 Baetis flavistriga	+
11130 Baetis intercalaris	+
11430 Diphetor hageni	+
11651 Procloeon sp (w/o hindwing pads)	+
13000 Leucrocuta sp	+
13400 Stenacron sp	+
13521 Stenonema femoratum	+
13590 Maccaffertium vicarium	+
14600 Choroterpes basalis	+
23905 Boyeria grafiana	+
25510 Stylogomphus albistylus	+
33100 Leuctra sp	+
34120 Acroneuria carolinensis	+
34130 Acroneuria frisoni	+
48620 Nigronia serricornis	+
50410 Dolophilodes distinctus	+
50804 Lype diversa	+
52200 Cheumatopsyche sp	+
53122 Rhyacophila invaria complex	+
53501 Hydroptilidae	+
57900 Pycnopsyche sp	+
63300 Hydroporini	+
66200 Cymbiodyta sp	+
68075 Psephenus herricki	+
70700 Dicranota sp	+
71800 Pseudolimnophila sp	+
71900 Tipula sp	+
74501 Ceratopogonidae	+
77120 Ablabesmyia mallochi	+
79300 Trissopelopia ogemawi	+
82820 Cryptochironomus sp	+
83040 Dicrotendipes neomodestus	+
83840 Microtendipes pedellus group	+
84300 Phaenopsectra obediens group	+
84302 Phaenopsectra punctipes	+
84440 Polypedilum (Uresipedilum) aviceps	+
84460 Polypedilum (P.) fallax group	+
84800 Tribelos jucundum	+
85501 Paratanytarsus longistilus	+
85615 Rheotanytarsus pellucidus	+
85625 Rheotanytarsus sp	+
98200 Pisidium sp	+

Station: 303602

POND RUN @ US 52 SW OF FRIENDSHIP

0:00 7/19/16

Rivercode: 10-099-000

River Mile: 0.38

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
49	27	28	4	49		28		Exceptional	NORMAL
Taxa					Quant/Qual				
03600	Oligochaeta				+				
07840	Cambarus (Cambarus) sciotensis				+				
08260	Orconectes (Crockerinus) sanbornii sanbornii				+				
11012	Acentrella nadineae				+				
11018	Acerpenna macdunnoughi				+				
11118	Plauditus dubius				+				
11120	Baetis flavistriga				+				
11130	Baetis intercalaris				+				
11650	Proclonia sp (w/ hindwing pads)				+				
11651	Proclonia sp (w/o hindwing pads)				+				
13000	Leucrocota sp				+				
13400	Stenacron sp				+				
13521	Stenonema femoratum				+				
13590	Maccaffertium vicarium				+				
14600	Choroterpes basalis				+				
17200	Caenis sp				+				
25510	Stylogomphus albistylus				+				
33100	Leuctra sp				+				
34120	Acroneuria carolinensis				+				
34130	Acroneuria frisoni				+				
34300	Neoperla sp				+				
50301	Chimarra aterrima				+				
50315	Chimarra obscura				+				
50410	Dolophilodes distinctus				+				
51400	Nyctiophylax sp				+				
51600	Polycentropus sp				+				
52200	Cheumatopsyche sp				+				
52530	Hydropsyche depravata group				+				
53122	Rhyacophila invaria complex				+				
57900	Pycnopsyche sp				+				
59310	Mystacides sepulchralis				+				
68075	Psephenus herricki				+				
69400	Stenelmis sp				+				
71100	Hexatoma sp				+				
77120	Ablabesmyia mallochi				+				
77800	Helopelopia sp				+				
81530	Orthocladius (Symposiocladius) lignicola				+				
83003	Dicrotendipes fumidus				+				
83840	Microtendipes pedellus group				+				
83860	Microtendipes rydalensis				+				
83900	Nilothauma sp				+				
84440	Polypedilum (Uresipedilum) aviceps				+				
84460	Polypedilum (P.) fallax group				+				
84700	Stenochironomus sp				+				
84750	Stictochironomus sp				+				
85625	Rheotanytarsus sp				+				
85720	Stempellinella fimbriata				+				
85840	Tanytarsus sepp				+				
96002	Helisoma anceps anceps				+				

Station: 303537

EAGLE CREEK DST CONFL. WITH W FORK AND E FORK EAGLE CR

0:00 8/23/16

Rivercode: 10-100-000

River Mile: 14.43

Sensitive

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Taxa	ICI	Narrative	Flow
54	20	20	0	76	2,316	22	42	N/A	0.00 NORMAL

Taxa	Quant/Qual
03360 Plumatella sp	5+ 83820 Microtendipes "caelum" (sensu Simpson & Bode, 1980) 18
03451 Urnatella gracilis	+ 83840 Microtendipes pedellus group 62
03600 Oligochaeta	220+ 84210 Paratendipes albimanus or P. duplicatus 36
04685 Placobdella ornata	+ 84300 Phaenopsectra obediens group 9
05900 Lirceus sp	+ 84450 Polypedilum (Uresipedilum) flavum 116+
08250 Orconectes (Procericambarus) rusticus	+ 84460 Polypedilum (P.) fallax group 9
08601 Hydrachnidia	+ 84540 Polypedilum (Tripodura) scalaenum group 231
11020 Acerpenna pygmaea	166+ 84750 Stictochironomus sp 9+
11130 Baetis intercalaris	382+ 85201 Cladotanytarsus species group A 27
11650 Procloeon sp (w/ hindwing pads)	+ 85230 Cladotanytarsus mancus group 9
11670 Procloeon viridoculare	+ 85625 Rheotanytarsus sp 9+
12200 Isonychia sp	+ 85720 Stempellinella fimbriata 44+
13000 Leucrocota sp	3+ 85800 Tanytarsus sp +
13400 Stenacron sp	88+ 85821 Tanytarsus glabrescens group sp 7 80+
13521 Stenonema femoratum	17+ 85840 Tanytarsus sepp 53
13561 Maccaffertium pulchellum	13+ 86200 Tabanus sp +
14600 Choroterpes basalis	4+ 87540 Hemerodromia sp 5
17200 Caenis sp	21+ 95100 Physella sp +
21200 Calopteryx sp	+ 97601 Corbicula fluminea 2+
22001 Coenagrionidae	+ 98600 Sphaerium sp 2+
22300 Argia sp	15+
23804 Basiaeschna janata	+
27400 Neurocordulia sp	+
48410 Corydalus cornutus	3+
50315 Chimarra obscura	1+
51400 Nyctiophylax sp	+
51600 Polycentropus sp	1+
52200 Cheumatopsyche sp	72+
52430 Ceratopsyche morosa group	+
52540 Hydropsyche dicantha	3+
53501 Hydroptilidae	+
59310 Mystacides sepulchralis	4+
59580 Oecetis persimilis	+
59970 Petrophila sp	+
60900 Peltodytes sp	+
65800 Berosus sp	8+
68075 Psephenus herricki	+
68130 Helichus sp	+
68700 Dubiraphia sp	4
69400 Stenelmis sp	296+
70502 Limoniinae	8
77115 Ablabesmyia janta	18
77120 Ablabesmyia mallochi	36
77500 Conchapelopia sp	36
77750 Thienemannimyia sp	44
77800 Helopelopia sp	27
78401 Natarsia species A (sensu Roback, 1978)	+
78450 Nilotanytus fimbriatus	37
80351 Corynoneura caudicula	+
80410 Cricotopus (C.) sp	9+
81250 Nanocladius (N.) minimus	+
81280 Nanocladius (Plecopteracoluthus) downesi	1+
82101 Thienemanniella taurocapita	4
82121 Thienemanniella lobapodema	4
82730 Chironomus (C.) decorus group	9
83040 Dicrotendipes neomodestus	36

Rivercode: 10-100-000

River Mile: 6.20

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
59	24	24	0	59		24		Exceptional	ABOVE NO

Taxa	Quant/Qual	
03600 Oligochaeta	+ 93900 Elimia sp	+
04935 Erpobdella punctata punctata	+ 95100 Physella sp	+
05900 Lirceus sp	+ 96264 Planorbella (Pierosoma) pilsbryi	+
08250 Orconectes (Procericambarus) rusticus	+	
11014 Acentrella turbida	+	
11020 Acerpenna pygmaea	+	
11130 Baetis intercalaris	+	
11200 Callibaetis sp	+	
11650 Procloeon sp (w/ hindwing pads)	+	
11670 Procloeon viridoculare	+	
12200 Isonychia sp	+	
13000 Leucrocuta sp	+	
13400 Stenacron sp	+	
13521 Stenonema femoratum	+	
13561 Maccaffertium pulchellum	+	
14600 Choroterpes basalis	+	
16700 Tricorythodes sp	+	
17200 Caenis sp	+	
22001 Coenagrionidae	+	
22300 Argia sp	+	
24900 Gomphus Complex	+	
26700 Macromia sp	+	
34715 Agnetina flavescens	+	
47600 Sialis sp	+	
48410 Corydalus cornutus	+	
50315 Chimarra obscura	+	
51600 Polycentropus sp	+	
52200 Cheumatopsyche sp	+	
52430 Ceratopsyche morosa group	+	
52540 Hydropsyche dicantha	+	
53800 Hydroptila sp	+	
58505 Helicopsyche borealis	+	
59570 Oecetis nocturna	+	
59700 Triaenodes sp	+	
59970 Petrophila sp	+	
60900 Peltodytes sp	+	
65800 Berosus sp	+	
68025 Ectopria sp	+	
68075 Psephenus herricki	+	
68130 Helichus sp	+	
69400 Stenelmis sp	+	
69713 Lutrochus laticeps	+	
74100 Simulium sp	+	
77120 Ablabesmyia mallochi	+	
77800 Helopelopia sp	+	
81280 Nanocladius (Plecopteracoluthus) downesi	+	
82730 Chironomus (C.) decorus group	+	
82820 Cryptochironomus sp	+	
83840 Microtendipes pedellus group	+	
84450 Polypedilum (Uresipedilum) flavum	+	
84750 Stictochironomus sp	+	
84960 Pseudochironomus sp	+	
85625 Rheotanytarsus sp	+	
85720 Stempellinella fimbriata	+	
85815 Tanytarsus glabrescens group sp 1	+	
85840 Tanytarsus sepp	+	

Station: 302940

BAYLOR RUN @ SCOFFIELD RD.

0:00 8/18/15

Rivercode: 10-101-000

River Mile: 0.15

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
40	12	7	3	40		7		Good	LOW

Taxa	Quant/Qual
01801 Turbellaria	+
03600 Oligochaeta	+
05800 Caecidotea sp	+
05900 Lirceus sp	+
06904 Synurella dentata	+
07820 Cambarus (Cambarus) sp A	+
08601 Hydrachnidia	+
11120 Baetis flavistriga	+
11250 Neocloeon sp	+
11430 Diphetor hageni	+
11650 Procloeon sp (w/ hindwing pads)	+
11651 Procloeon sp (w/o hindwing pads)	+
13400 Stenacron sp	+
13521 Stenonema femoratum	+
15000 Paraleptophlebia sp	+
45300 Sigara sp	+
48610 Nigronia fasciata	+
51600 Polycentropus sp	+
52200 Cheumatopsyche sp	+
52315 Diplectrona modesta	+
52530 Hydropsyche depravata group	+
63300 Hydroporini	+
63900 Laccophilus sp	+
64800 Uvarus sp	+
67200 Hydrochara sp	+
68025 Ectopria sp	+
68075 Psephenus herricki	+
74100 Simulium sp	+
77120 Ablabesmyia mallochi	+
77500 Conchapelopia sp	+
78401 Natarsia species A (sensu Roback, 1978)	+
78601 Pentaneura inyoensis	+
79400 Zavrelimyia (Z.) sp	+
80351 Corynoneura caudicula	+
80370 Corynoneura lobata	+
80410 Cricotopus (C.) sp	+
82730 Chironomus (C.) decorus group	+
83840 Microtendipes pedellus group	+
84470 Polypedilum (P.) illinoense	+
85800 Tanytarsus sp	+

Station: 302942

BEETLE CREEK ADJ. EAST FORK RD.

0:00 8/18/15

Rivercode: 10-102-000

River Mile: 4.85

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
42	12	8	0	42		8		Good	NORMAL

Taxa	Quant/Qual
00401 Spongillidae	+
01801 Turbellaria	+
03600 Oligochaeta	+
04964 Erpobdella microstoma	+
05900 Lirceus sp	+
06904 Synurella dentata	+
08245 Orconectes (Procericambarus) raymondi	+
11020 Acerpenna pygmaea	+
11130 Baetis intercalaris	+
11651 Procloeon sp (w/o hindwing pads)	+
13400 Stenacron sp	+
13521 Stenonema femoratum	+
14600 Choroterpes basalis	+
17200 Caenis sp	+
22300 Argia sp	+
34130 Acroneuria frisoni	+
42700 Belostoma sp	+
45300 Sigara sp	+
47600 Sialis sp	+
50315 Chimarra obscura	+
52200 Cheumatopsyche sp	+
52530 Hydropsyche depravata group	+
57400 Neophylax sp	+
60900 Peltodytes sp	+
63300 Hydroporini	+
67800 Tropisternus sp	+
68025 Ectopria sp	+
68075 Psephenus herricki	+
69400 Stenelmis sp	+
77120 Ablabesmyia mallochii	+
78140 Labrundinia pilosella	+
78401 Natarsia species A (sensu Roback, 1978)	+
78601 Pentaneura inyoensis	+
83840 Microtendipes pedellus group	+
84210 Paratendipes albimanus or P. duplicatus	+
84450 Polypedilum (Uresipedilum) flavum	+
84750 Stictochironomus sp	+
86100 Chrysops sp	+
93900 Elimia sp	+
95100 Physella sp	+
96200 Planorbella sp	+
98600 Sphaerium sp	+

Station: 302941

BEETLE CREEK @ GRIFFITH RD.

0:00 8/18/15

Rivercode: 10-102-000

River Mile: 0.45

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
44	17	11	1	44		11		Good	NORMAL

Taxa	Quant/Qual
01801 Turbellaria	+
03600 Oligochaeta	+
05900 Lirceus sp	+
06904 Synurella dentata	+
08245 Orconectes (Procericambarus) raymondi	+
11120 Baetis flavistriga	+
11130 Baetis intercalaris	+
11250 Neocloeon sp	+
11430 Diphetor hageni	+
11651 Procloeon sp (w/o hindwing pads)	+
13000 Leucrocuta sp	+
13400 Stenacron sp	+
13521 Stenonema femoratum	+
15000 Paraleptophlebia sp	+
17200 Caenis sp	+
21200 Calopteryx sp	+
23804 Basiaeschna janata	+
34130 Acroneuria frisoni	+
47600 Sialis sp	+
48410 Corydalus cornutus	+
50315 Chimarra obscura	+
51600 Polycentropus sp	+
52200 Cheumatopsyche sp	+
52315 Diplectrona modesta	+
52530 Hydropsyche depravata group	+
59730 Triaenodes melaca	+
68075 Psephenus herricki	+
69400 Stenelmis sp	+
74100 Simulium sp	+
77120 Ablabesmyia mallochi	+
77800 Helopelopia sp	+
78401 Natarsia species A (sensu Roback, 1978)	+
82101 Thienemanniella taurocapita	+
82820 Cryptochironomus sp	+
83040 Dicrotendipes neomodestus	+
84210 Paratendipes albimanus or P. duplicatus	+
84450 Polypedilum (Uresipedilum) flavum	+
84750 Stictochironomus sp	+
85625 Rheotanytarsus sp	+
85800 Tanytarsus sp	+
85821 Tanytarsus glabrescens group sp 7	+
85840 Tanytarsus sepp	+
87501 Empididae	+
95100 Physella sp	+

Station: 302943

LAFFERTY RUN @ NORTH POLE RD. (RD. 13B)

0:00 8/25/15

Rivercode: 10-103-000

River Mile: 0.05

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
62	21	17	3	62		17		Exceptional	NORMAL

Taxa	Quant/Qual	
01801 Turbellaria	+ 85625 Rheotanytarsus sp	+
03600 Oligochaeta	+ 85720 Stempellinella fimbriata	+
05800 Caecidotea sp	+ 85800 Tanytarsus sp	+
06904 Synurella dentata	+ 85818 Tanytarsus glabrescens group sp 4	+
08601 Hydrachnidia	+ 85840 Tanytarsus sepp	+
11014 Acentrella turbida	+ 93900 Elimia sp	+
11120 Baetis flavistriga	+	
11130 Baetis intercalaris	+	
11200 Callibaetis sp	+	
11430 Diphetor hageni	+	
11650 Proclaeon sp (w/ hindwing pads)	+	
11651 Proclaeon sp (w/o hindwing pads)	+	
13400 Stenacron sp	+	
13521 Stenonema femoratum	+	
14600 Choroterpes basalis	+	
15000 Paraleptophlebia sp	+	
17200 Caenis sp	+	
21200 Calopteryx sp	+	
22001 Coenagrionidae	+	
22300 Argia sp	+	
23001 Anisoptera	+	
33100 Leuctra sp	+	
34130 Acroneuria frisoni	+	
45300 Sigara sp	+	
48410 Corydalus cornutus	+	
50301 Chimarra aterrima	+	
51600 Polycentropus sp	+	
52200 Cheumatopsyche sp	+	
52315 Diplectrona modesta	+	
52530 Hydropsyche depravata group	+	
53800 Hydroptila sp	+	
59700 Triaenodes sp	+	
67500 Laccobius sp	+	
68025 Ectopria sp	+	
68075 Psephenus herricki	+	
68708 Dubiraphia vittata group	+	
69400 Stenelmis sp	+	
71800 Pseudolimnophila sp	+	
74100 Simulium sp	+	
74501 Ceratopogonidae	+	
77120 Ablabesmyia mallochi	+	
77500 Conchapelopia sp	+	
77800 Helopelopia sp	+	
78601 Pentaneura inyoensis	+	
78655 Procladius (Holotanypus) sp	+	
79400 Zavrelimyia (Z.) sp	+	
80410 Cricotopus (C.) sp	+	
80420 Cricotopus (C.) bicinctus	+	
82730 Chironomus (C.) decorus group	+	
82820 Cryptochironomus sp	+	
82900 Demicryptochironomus sp	+	
83040 Dicrotendipes neomodestus	+	
83820 Microtendipes "caelum" (sensu Simpson & Bode, 1980)	+	
84210 Paratendipes albimanus or P. duplicatus	+	
84470 Polypedilum (P.) illinoense	+	
84750 Stictochironomus sp	+	

Station: 302944

INDIAN LICK @ UPPER EAGLE CREEK RD.

0:00 8/25/15

Rivercode: 10-104-000

River Mile: 0.05

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
50	15	12	3	50		12		Good	LOW

Taxa	Quant/Qual
03600 Oligochaeta	+
05800 Caecidotea sp	+
05900 Lirceus sp	+
06904 Synurella dentata	+
07820 Cambarus (Cambarus) sp A	+
11120 Baetis flavistriga	+
11250 Neocloeon sp	+
11430 Diphetor hageni	+
11650 Procloeon sp (w/ hindwing pads)	+
11651 Procloeon sp (w/o hindwing pads)	+
13400 Stenacron sp	+
13521 Stenonema femoratum	+
14600 Choroterpes basalis	+
17200 Caenis sp	+
45300 Sigara sp	+
48410 Corydalus cornutus	+
50315 Chimarra obscura	+
51600 Polycentropus sp	+
52200 Cheumatopsyche sp	+
52315 Diplectrona modesta	+
52530 Hydropsyche depravata group	+
54160 Ochrotrichia sp	+
63300 Hydroporini	+
68025 Ectopria sp	+
68075 Psephenus herricki	+
69400 Stenelmis sp	+
72700 Anopheles sp	+
74100 Simulium sp	+
74501 Ceratopogonidae	+
77120 Ablabesmyia mallochii	+
77500 Conchapelopia sp	+
78140 Labrundinia pilosella	+
79400 Zavrelimyia (Z.) sp	+
80351 Corynoneura caudicula	+
80410 Cricotopus (C.) sp	+
82730 Chironomus (C.) decorus group	+
82820 Cryptochironomus sp	+
83040 Dicrotendipes neomodestus	+
83820 Microtendipes "caelum" (sensu Simpson & Bode, 1980)	+
83840 Microtendipes pedellus group	+
84440 Polypedilum (Uresipedilum) aviceps	+
84450 Polypedilum (Uresipedilum) flavum	+
84470 Polypedilum (P.) illinoense	+
85201 Cladotanytarsus species group A	+
85500 Paratanytarsus sp	+
85625 Rheotanytarsus sp	+
85800 Tanytarsus sp	+
85818 Tanytarsus glabrescens group sp 4	+
85840 Tanytarsus sepp	+
95100 Physella sp	+

Station: 302945

BRUSHY FORK @ BRUSHY FORK RD. (RD. 241)

0:00 8/19/15

Rivercode: 10-105-000

River Mile: 1.00

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
40	17	13	0	40		13		Good	LOW

Taxa	Quant/Qual
01801 Turbellaria	+
05800 Caecidotea sp	+
06904 Synurella dentata	+
07820 Cambarus (Cambarus) sp A	+
08245 Orconectes (Procericambarus) raymondi	+
08601 Hydrachnidia	+
11020 Acerpenna pygmaea	+
11120 Baetis flavistriga	+
11250 Neocloeon sp	+
11430 Diphetor hageni	+
11650 Procloeon sp (w/ hindwing pads)	+
11651 Procloeon sp (w/o hindwing pads)	+
13400 Stenacron sp	+
13521 Stenonema femoratum	+
14600 Choroterpes basalis	+
17200 Caenis sp	+
22300 Argia sp	+
34130 Acroneuria frisoni	+
44501 Corixidae	+
47600 Sialis sp	+
48410 Corydalus cornutus	+
48620 Nigronia serricornis	+
50301 Chimarra aterrima	+
50315 Chimarra obscura	+
51400 Nyctiophylax sp	+
51600 Polycentropus sp	+
52200 Cheumatopsyche sp	+
52530 Hydropsyche depravata group	+
63300 Hydroporini	+
65501 Hydrophilidae	+
68075 Psephenus herricki	+
69400 Stenelmis sp	+
74501 Ceratopogonidae	+
77120 Ablabesmyia mallochii	+
83040 Dicrotendipes neomodestus	+
83840 Microtendipes pedellus group	+
84470 Polypedilum (P.) illinoense	+
84750 Stictochironomus sp	+
85625 Rheotanytarsus sp	+
95100 Physella sp	+

Station: 302946

SUCK RUN @ EBENEZER RD. (RD. 33)

0:00 8/19/15

Rivercode: 10-106-000

River Mile: 1.70

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
61	21	15	0	61		15		Exceptional	LOW

Taxa	Quant/Qual	
01801 Turbellaria	+ 85720 Stempellinella fimbriata	+
03360 Plumatella sp	+ 85800 Tanytarsus sp	+
03600 Oligochaeta	+ 85821 Tanytarsus glabrescens group sp 7	+
05800 Caecidotea sp	+ 86100 Chrysops sp	+
05900 Lirceus sp	+ 95100 Physella sp	+
06904 Synurella dentata	+	
08245 Orconectes (Procericambarus) raymondi	+	
08601 Hydrachnidia	+	
11020 Acerpenna pygmaea	+	
11120 Baetis flavistriga	+	
11130 Baetis intercalaris	+	
11200 Callibaetis sp	+	
11250 Neocloeon sp	+	
11430 Diphetor hageni	+	
11650 Procloeon sp (w/ hindwing pads)	+	
11651 Procloeon sp (w/o hindwing pads)	+	
12200 Isonychia sp	+	
13000 Leucrocuta sp	+	
13400 Stenacron sp	+	
13521 Stenonema femoratum	+	
14600 Choroterpes basalis	+	
15000 Paraleptophlebia sp	+	
17200 Caenis sp	+	
22001 Coenagrionidae	+	
22300 Argia sp	+	
23804 Basiaeschna janata	+	
24710 Dromogomphus spinosus	+	
34130 Acroneuria frisoni	+	
44501 Corixidae	+	
47600 Sialis sp	+	
48410 Corydalus cornutus	+	
48620 Nigronia serricornis	+	
50315 Chimarra obscura	+	
51400 Nyctiophylax sp	+	
51600 Polycentropus sp	+	
52200 Cheumatopsyche sp	+	
52530 Hydropsyche depravata group	+	
60900 Peltodytes sp	+	
63300 Hydroporini	+	
65800 Berosus sp	+	
67800 Tropisternus sp	+	
68075 Psephenus herricki	+	
69400 Stenelmis sp	+	
72700 Anopheles sp	+	
77120 Ablabesmyia mallochi	+	
77500 Conchapelopia sp	+	
78401 Natarsia species A (sensu Roback, 1978)	+	
78601 Pentaneura inyoensis	+	
82820 Cryptochironomus sp	+	
83040 Dicrotendipes neomodestus	+	
83840 Microtendipes pedellus group	+	
84210 Paratendipes albimanus or P. duplicatus	+	
84450 Polypedilum (Uresipedilum) flavum	+	
84470 Polypedilum (P.) illinoense	+	
85201 Cladotanytarsus species group A	+	
85625 Rheotanytarsus sp	+	

Station: 303607

E. FK. EAGLE CR. SW OF WEST UNION OFF SR 41 @ FARM FORD

0:00 7/26/16

Rivercode: 10-110-000

River Mile: 10.95

Sensitive

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
46	13	11	0	46		11		Good	ABOVE NO

Taxa	Quant/Qual
01801 Turbellaria	+
03600 Oligochaeta	+
04685 Placobdella ornata	+
04930 Erpobdella sp	+
05800 Caecidotea sp	+
05900 Lirceus sp	+
08250 Orconectes (Procericambarus) rusticus	+
11020 Acerpenna pygmaea	+
11130 Baetis intercalaris	+
11650 Proclonon sp (w/ hindwing pads)	+
11651 Proclonon sp (w/o hindwing pads)	+
12200 Isonychia sp	+
13000 Leucrocota sp	+
13400 Stenacron sp	+
13521 Stenonema femoratum	+
14600 Choroterpes basalis	+
17200 Caenis sp	+
21200 Calopteryx sp	+
22001 Coenagrionidae	+
23804 Basiaeschna janata	+
50315 Chimarra obscura	+
51600 Polycentropus sp	+
52200 Cheumatopsyche sp	+
66500 Enochrus sp	+
67700 Paracymus sp	+
68075 Psephenus herricki	+
68708 Dubiraphia vittata group	+
69400 Stenelmis sp	+
74100 Simulium sp	+
77120 Ablabesmyia mallochi	+
77500 Conchapelopia sp	+
77800 Helopelopia sp	+
78401 Natarsia species A (sensu Roback, 1978)	+
82820 Cryptochironomus sp	+
83820 Microtendipes "caelum" (sensu Simpson & Bode, 1980)	+
83840 Microtendipes pedellus group	+
84450 Polypedilum (Uresipedilum) flavum	+
84460 Polypedilum (P.) fallax group	+
84470 Polypedilum (P.) illinoense	+
84750 Stictochironomus sp	+
93900 Elimia sp	+
94400 Fossaria sp	+
95100 Physella sp	+
96264 Planorbella (Pierosoma) pilsbryi	+
96900 Ferrissia sp	+
98600 Sphaerium sp	+

Station: X03S03

E. FK. EAGLE CREEK W OF WEST UNION @ TWP. RD. 231

0:00 7/26/16

Rivercode: 10-110-000

River Mile: 7.90

Sensitive

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
44	11	8	0	44		8		Good	ABOVE NO

Taxa	Quant/Qual
03360 Plumatella sp	+
03600 Oligochaeta	+
04666 Helobdella papillata	+
04685 Placobdella ornata	+
05800 Caecidotea sp	+
05900 Lirceus sp	+
06201 Hyalella sp	+
08250 Orconectes (Procericambarus) rusticus	+
11020 Acerpenna pygmaea	+
11120 Baetis flavistriga	+
11130 Baetis intercalaris	+
11650 Proclonon sp (w/ hindwing pads)	+
11651 Proclonon sp (w/o hindwing pads)	+
13000 Leucrocota sp	+
13400 Stenacron sp	+
13521 Stenonema femoratum	+
17200 Caenis sp	+
22001 Coenagrionidae	+
51600 Polycentropus sp	+
52200 Cheumatopsyche sp	+
63300 Hydropsyche	+
66500 Ecnemurus sp	+
67700 Paracymbia sp	+
67800 Tropisternus sp	+
68025 Ectopria sp	+
68075 Psephenus herricki	+
68201 Scirtidae	+
68708 Dubiraphia vittata group	+
69400 Stenelmis sp	+
74501 Ceratopogonidae	+
77120 Ablabesmyia mallochii	+
77500 Conchapelopia sp	+
82820 Cryptochironomus sp	+
84201 Paratendipes sp 1	+
84450 Polypedilum (Uresipedilum) flavum	+
84470 Polypedilum (P.) illinoense	+
84750 Stictochironomus sp	+
85615 Rheotanytarsus pellucidus	+
85625 Rheotanytarsus sp	+
85821 Tanytarsus glabrescens group sp 7	+
85840 Tanytarsus sepp	+
93900 Elimia sp	+
96900 Ferrissia sp	+
98600 Sphaerium sp	+

Station: 200691

E. FK. EAGLE CREEK S OF FAIRVIEW @ BRIER RIDGE RD.

0:00 8/24/16

Rivercode: 10-110-000

River Mile: 4.30

Sensitive

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
49	18	15	0	57	2,839	17	52	N/A	0.60 NORMAL

Taxa	Quant/Qual
03600 Oligochaeta	8+ 98600 Sphaerium sp +
05800 Caecidotea sp	+
05900 Lirceus sp	+
06904 Synurella dentata	+
08250 Orconectes (Procericambarus) rusticus	+
11020 Acerpenna pygmaea	863+
11120 Baetis flavistriga	1
11130 Baetis intercalaris	545+
11650 Procloeon sp (w/ hindwing pads)	6+
11651 Procloeon sp (w/o hindwing pads)	+
12200 Isonychia sp	11+
13000 Leucrocota sp	26+
13400 Stenacron sp	4+
13510 Maccaffertium exiguum	1
13521 Stenonema femoratum	55+
14600 Choroterpes basalis	+
17200 Caenis sp	+
18700 Hexagenia sp	+
21200 Calopteryx sp	+
22001 Coenagrionidae	+
22300 Argia sp	+
24900 Gomphus Complex	+
45100 Palmacorixa sp	+
48410 Corydalus cornutus	2+
50315 Chimarra obscura	41+
51600 Polycentropus sp	1+
52200 Cheumatopsyche sp	248+
52530 Hydropsyche depravata group	+
52540 Hydropsyche dicantha	+
53501 Hydroptilidae	+
59730 Triaenodes melaca	+
68025 Ectopria sp	+
68075 Psephenus herricki	+
68201 Scirtidae	+
68708 Dubiraphia vittata group	+
69400 Stenelmis sp	10+
74100 Simulium sp	+
77120 Ablabesmyia mallochi	+
77500 Conchapelopia sp	45
77800 Helopelopia sp	+
78450 Nilotanytus fimbriatus	75
80370 Corynoneura lobata	19
82101 Thienemanniella taurocapita	5
82141 Thienemanniella xena	8
83840 Microtendipes pedellus group	+
84450 Polypedilum (Uresipedilum) flavum	45+
84470 Polypedilum (P.) illinoense	+
84490 Polypedilum (Cerobregma) ontario	+
84750 Stictochironomus sp	+
85625 Rheotanytarsus sp	718+
85720 Stempellinella fimbriata	5+
85821 Tanytarsus glabrescens group sp 7	55
86200 Tabanus sp	+
87540 Hemerodromia sp	42+
93900 Elimia sp	+
97601 Corbicula fluminea	+

Rivercode: 10-110-000

River Mile: 0.82

Sensitive

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Taxa	ICI	Narrative	Flow
57	22	18	0	70	2,264	21	56	N/A	0.40 ABOVE NO

Taxa	Quant/Qual	
01801 Turbellaria	4+	83840 Microtendipes pedellus group 35+
03040 Fredericella sp	1+	84210 Paratendipes albimanus or P. duplicatus 7
03600 Oligochaeta	8+	84450 Polypedilum (Uresipedilum) flavum 104+
04687 Placobdella parasitica	+	84460 Polypedilum (P.) fallax group 21
05800 Caecidotea sp	4+	84540 Polypedilum (Tripodura) scalaenum group 35+
05900 Lirceus sp	+	84750 Stictochironomus sp +
06904 Synurella dentata	+	85625 Rheotanytarsus sp 305
08250 Orconectes (Procericambarus) rusticus	+	85800 Tanytarsus sp +
11020 Acerpenna pygmaea	173+	85821 Tanytarsus glabrescens group sp 7 35
11120 Baetis flavistriga	57+	85840 Tanytarsus sepp 14+
11130 Baetis intercalaris	724+	87540 Hemerodromia sp 25
11250 Neocloeon sp	+	95100 Physella sp +
11650 Procloeon sp (w/ hindwing pads)	+	97601 Corbicula fluminea +
11651 Procloeon sp (w/o hindwing pads)	+	98600 Sphaerium sp +
12200 Isonychia sp	8+	
13000 Leucrocota sp	3+	
13400 Stenacron sp	168+	
13521 Stenonema femoratum	34+	
13561 Maccaffertium pulchellum	1	
14600 Choroterpes basalis	+	
17200 Caenis sp	33+	
18700 Hexagenia sp	+	
21200 Calopteryx sp	+	
22001 Coenagrionidae	+	
22300 Argia sp	1+	
23804 Basiaeschna janata	+	
34130 Acroneuria frisoni	1	
48410 Corydalus cornutus	4+	
48620 Nigronia serricornis	+	
50315 Chimarra obscura	30+	
51400 Nyctiophylax sp	+	
51600 Polycentropus sp	+	
52200 Cheumatopsyche sp	139+	
52530 Hydropsyche depravata group	+	
52540 Hydropsyche dicantha	18+	
53800 Hydroptila sp	25+	
57400 Neophylax sp	+	
59740 Triaenodes perna	+	
59970 Petrophila sp	+	
60900 Peltodytes sp	+	
68075 Psephenus herricki	+	
68708 Dubiraphia vittata group	+	
69400 Stenelmis sp	55+	
74100 Simulium sp	42+	
74673 Atrichopogon websteri	8	
77120 Ablabesmyia mallochii	7+	
77500 Conchapelopia sp	55+	
77800 Helopelopia sp	7+	
78401 Natarsia species A (sensu Roback, 1978)	+	
78450 Nilotanytus fimbriatus	4	
80351 Corynoneura caudicula	8	
80370 Corynoneura lobata	24	
80410 Cricotopus (C.) sp	14	
81280 Nanocladius (Plecopteracoluthus) downesi	+	
82101 Thienemanniella taurocapita	16	
83820 Microtendipes "caelum" (sensu Simpson & Bode, 1980)	7+	

Station: 303611

TRIB TO E. FK. EAGLE CR. (RM 6.92) ADJ. EAGLE CR. RD.

0:00 7/26/16

Rivercode: 10-110-002

River Mile: 0.10

Sensitive

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
37	15	13	0	37		13		Good	ABOVE NOI

Taxa	Quant/Qual
03600 Oligochaeta	+
05800 Caecidotea sp	+
05900 Lirceus sp	+
08250 Orconectes (Procericambarus) rusticus	+
11020 Acerpenna pygmaea	+
11120 Baetis flavistriga	+
11130 Baetis intercalaris	+
11250 Neocloeon sp	+
11650 Procloeon sp (w/ hindwing pads)	+
11651 Procloeon sp (w/o hindwing pads)	+
13000 Leucrocuta sp	+
13400 Stenacron sp	+
13521 Stenonema femoratum	+
14600 Choroterpes basalis	+
17200 Caenis sp	+
34300 Neoperla sp	+
47600 Sialis sp	+
48620 Nigronia serricornis	+
50315 Chimarra obscura	+
51600 Polycentropus sp	+
52200 Cheumatopsyche sp	+
61100 Acilius sp	+
66500 Enochrus sp	+
68075 Psephenus herricki	+
68708 Dubiraphia vittata group	+
69400 Stenelmis sp	+
71100 Hexatoma sp	+
72501 Culicidae	+
77500 Conchapelopia sp	+
77800 Helopelopia sp	+
78401 Natarsia species A (sensu Roback, 1978)	+
83840 Microtendipes pedellus group	+
84460 Polypedilum (P.) fallax group	+
84750 Stictochironomus sp	+
85720 Stempellinella fimbriata	+
95100 Physella sp	+
99860 Lampsilis siliquoidea	+

Station: 302947

TOWN BRANCH ADJ. EAST FORK RD. (RD. 221)

0:00 8/25/15

Rivercode: 10-111-000

River Mile: 0.15

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
41	14	7	2	41		7		Good	LOW

Taxa	Quant/Qual
03600 Oligochaeta	+
05900 Lirceus sp	+
08245 Orconectes (Procericambarus) raymondi	+
08250 Orconectes (Procericambarus) rusticus	+
11120 Baetis flavistriga	+
11130 Baetis intercalaris	+
11430 Diphetor hageni	+
11650 Proclaeon sp (w/ hindwing pads)	+
11651 Proclaeon sp (w/o hindwing pads)	+
12200 Isonychia sp	+
13400 Stenacron sp	+
13521 Stenonema femoratum	+
15000 Paraleptophlebia sp	+
17200 Caenis sp	+
48410 Corydalus cornutus	+
50315 Chimarra obscura	+
52200 Cheumatopsyche sp	+
52315 Dipletrona modesta	+
52530 Hydropsyche depravata group	+
63300 Hydroporini	+
68025 Ectopria sp	+
68075 Psephenus herricki	+
69400 Stenelmis sp	+
74501 Ceratopogonidae	+
77120 Ablabesmyia mallochii	+
77800 Helopelopia sp	+
78200 Larsia sp	+
78601 Pentaneura inyoensis	+
78655 Procladius (Holotanypus) sp	+
79400 Zavrelimyia (Z.) sp	+
80370 Corynoneura lobata	+
82730 Chironomus (C.) decorus group	+
82820 Cryptochironomus sp	+
83840 Microtendipes pedellus group	+
84450 Polypedilum (Uresipedilum) flavum	+
84540 Polypedilum (Tripodura) scalaenum group	+
85201 Cladotanytarsus species group A	+
85625 Rheotanytarsus sp	+
85821 Tanytarsus glabrescens group sp 7	+
86100 Chrysops sp	+
95100 Physella sp	+

Station: 302948

WASHBURN RUN DST. ST. RT. 125

0:00 8/4/15

Rivercode: 10-112-000

River Mile: 1.40

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
38	15	9	5	38		9		Good	NORMAL

Taxa	Quant/Qual
01801 Turbellaria	+
03600 Oligochaeta	+
05800 Caecidotea sp	+
05900 Lirceus sp	+
06700 Crangonyx sp	+
06904 Synurella dentata	+
08245 Orconectes (Procericambarus) raymondi	+
11120 Baetis flavistriga	+
11130 Baetis intercalaris	+
11250 Neocloeon sp	+
11430 Diphetor hageni	+
11650 Procloeon sp (w/ hindwing pads)	+
11651 Procloeon sp (w/o hindwing pads)	+
13100 Nixe sp	+
13400 Stenacron sp	+
13521 Stenonema femoratum	+
15000 Paraleptophlebia sp	+
17200 Caenis sp	+
47600 Sialis sp	+
51600 Polycentropus sp	+
52200 Cheumatopsyche sp	+
52315 Diplectrona modesta	+
57400 Neophylax sp	+
68025 Ectopria sp	+
68075 Psephenus herricki	+
69400 Stenelmis sp	+
74100 Simulium sp	+
77500 Conchapelopia sp	+
78402 Natarsia baltimoreus	+
79400 Zavrelimyia (Z.) sp	+
81650 Parametriocnemus sp	+
83840 Microtendipes pedellus group	+
84210 Paratendipes albimanus or P. duplicatus	+
84430 Polypedilum (P.) albicorne	+
84440 Polypedilum (Uresipedilum) aviceps	+
84450 Polypedilum (Uresipedilum) flavum	+
84470 Polypedilum (P.) illinoense	+
95100 Physella sp	+

Station: 302949

ADAS RUN DST. ST. RT. 125

0:00 8/4/15

Rivercode: 10-113-000

River Mile: 0.70

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
48	16	12	1	48		12		Good	NORMAL

Taxa	Quant/Qual
03600 Oligochaeta	+
05800 Caecidotea sp	+
05900 Lirceus sp	+
06904 Synurella dentata	+
08245 Orconectes (Procericambarus) raymondi	+
08250 Orconectes (Procericambarus) rusticus	+
08601 Hydrachnidia	+
11120 Baetis flavistriga	+
11130 Baetis intercalaris	+
11430 Dipheter hageni	+
11650 Procloeon sp (w/ hindwing pads)	+
13000 Leucrocuta sp	+
13400 Stenacron sp	+
13521 Stenonema femoratum	+
14600 Choroterpes basalis	+
17200 Caenis sp	+
21001 Calopterygidae	+
22001 Coenagrionidae	+
34130 Acroneuria frisoni	+
48410 Corydalus cornutus	+
48620 Nigronia serricornis	+
50301 Chimarra aterrima	+
51600 Polycentropus sp	+
52200 Cheumatopsyche sp	+
52315 Diplectrona modesta	+
52530 Hydropsyche depravata group	+
57400 Neophylax sp	+
60900 Peltodytes sp	+
63300 Hydroporini	+
66200 Cymbiodyta sp	+
68025 Ectopria sp	+
68075 Psephenus herricki	+
68201 Scirtidae	+
69400 Stenelmis sp	+
71100 Hexatoma sp	+
71800 Pseudolimnophila sp	+
74100 Simulium sp	+
74501 Ceratopogonidae	+
77120 Ablabesmyia mallochi	+
77500 Conchapelopia sp	+
83040 Dicrotendipes neomodestus	+
83840 Microtendipes pedellus group	+
84450 Polypedilum (Uresipedilum) flavum	+
84470 Polypedilum (P.) illinoense	+
84750 Stictochironomus sp	+
85821 Tanytarsus glabrescens group sp 7	+
85840 Tanytarsus sepp	+
95100 Physella sp	+

Station: 302951

HILLS FORK @ ECKMANSVILLE RD. (RD. 2)

0:00 8/4/15

Rivercode: 10-114-000

River Mile: 3.05

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
44	14	10	1	44		10		Good	NORMAL

Taxa	Quant/Qual
01801 Turbellaria	+
03600 Oligochaeta	+
05900 Lirceus sp	+
06904 Synurella dentata	+
08250 Orconectes (Procericambarus) rusticus	+
08601 Hydrachnidia	+
11020 Acerpenna pygmaea	+
11120 Baetis flavistriga	+
11130 Baetis intercalaris	+
11430 Dipheter hageni	+
11651 Procloeon sp (w/o hindwing pads)	+
13000 Leucrocuta sp	+
13400 Stenacron sp	+
13521 Stenonema femoratum	+
14600 Choroterpes basalis	+
17200 Caenis sp	+
22001 Coenagrionidae	+
24900 Gomphus Complex	+
27500 Somatochlora sp	+
34130 Acroneuria frisoni	+
44501 Corixidae	+
47600 Sialis sp	+
48600 Nigronia sp	+
50315 Chimarra obscura	+
51600 Polycentropus sp	+
52200 Cheumatopsyche sp	+
60900 Peltodytes sp	+
63300 Hydroporini	+
68075 Psephenus herricki	+
68707 Dubiraphia quadrinotata	+
69400 Stenelmis sp	+
71800 Pseudolimnophila sp	+
72700 Anopheles sp	+
77120 Ablabesmyia mallochi	+
77500 Conchapelopia sp	+
78401 Natarsia species A (sensu Roback, 1978)	+
81650 Parametriocnemus sp	+
82820 Cryptochironomus sp	+
83840 Microtendipes pedellus group	+
84450 Polypedilum (Uresipedilum) flavum	+
84750 Stictochironomus sp	+
86100 Chrysops sp	+
95100 Physella sp	+
98600 Sphaerium sp	+

Station: 302950		HILLS FORK @ ST. RT. 125				0:00 8/4/15			
Rivercode: 10-114-000		River Mile: 1.30							
Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
51	17	13	0	51		13		Good	NORMAL
Taxa		Quant/Qual							
01801	Turbellaria	+							
03040	Fredericella sp	+							
03600	Oligochaeta	+							
05900	Lirceus sp	+							
06904	Synurella dentata	+							
08250	Orconectes (Procericambarus) rusticus	+							
11020	Acerpenna pygmaea	+							
11120	Baetis flavistriga	+							
11130	Baetis intercalaris	+							
11250	Neocloeon sp	+							
11650	Procloeon sp (w/ hindwing pads)	+							
11651	Procloeon sp (w/o hindwing pads)	+							
13000	Leucrocuta sp	+							
13400	Stenacron sp	+							
13521	Stenonema femoratum	+							
14600	Choroterpes basalis	+							
17200	Caenis sp	+							
34130	Acroneuria frisoni	+							
47600	Sialis sp	+							
50315	Chimarra obscura	+							
51600	Polycentropus sp	+							
52200	Cheumatopsyche sp	+							
52530	Hydropsyche depravata group	+							
53800	Hydroptila sp	+							
60900	Peltodytes sp	+							
63300	Hydroporini	+							
67800	Tropisternus sp	+							
68025	Ectopria sp	+							
68075	Psephenus herricki	+							
69400	Stenelmis sp	+							
71100	Hexatoma sp	+							
71800	Pseudolimnophila sp	+							
72700	Anopheles sp	+							
74100	Simulium sp	+							
74501	Ceratopogonidae	+							
77120	Ablabesmyia mallochi	+							
77500	Conchapelopia sp	+							
77800	Helopelopia sp	+							
78401	Natarsia species A (sensu Roback, 1978)	+							
82820	Cryptochironomus sp	+							
83040	Dicrotendipes neomodestus	+							
83840	Microtendipes pedellus group	+							
84450	Polypedilum (Uresipedilum) flavum	+							
84540	Polypedilum (Tripodura) scalaenum group	+							
84750	Stictochironomus sp	+							
85500	Paratanytarsus sp	+							
86200	Tabanus sp	+							
95100	Physella sp	+							
96900	Ferrissia sp	+							
98600	Sphaerium sp	+							
99860	Lampsilis siliquoidea	+							

Station: 302952

LICK RUN @ OLD CINCINNATI PIKE (RD. 21)

0:00 8/3/15

Rivercode: 10-115-000

River Mile: 0.95

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
55	13	6	0	55		6		Good	NORMAL

Taxa	Quant/Qual
01801 Turbellaria	+
03360 Plumatella sp	+
03600 Oligochaeta	+
04666 Helobdella papillata	+
04930 Erpobdella sp	+
05900 Lirceus sp	+
06904 Synurella dentata	+
08245 Orconectes (Procericambarus) raymondi	+
11120 Baetis flavistriga	+
11130 Baetis intercalaris	+
11200 Callibaetis sp	+
11250 Neocloeon sp	+
11430 Diphetor hageni	+
11651 Procloeon sp (w/o hindwing pads)	+
13400 Stenacron sp	+
13521 Stenonema femoratum	+
17200 Caenis sp	+
22001 Coenagrionidae	+
23804 Basiaeschna janata	+
44501 Corixidae	+
52200 Cheumatopsyche sp	+
52530 Hydropsyche depravata group	+
53800 Hydroptila sp	+
59730 Triaenodes melaca	+
60900 Peltodytes sp	+
63300 Hydroporini	+
67500 Laccobius sp	+
67700 Paracymus sp	+
68025 Ectopria sp	+
68075 Psephenus herricki	+
68708 Dubiraphia vittata group	+
69400 Stenelmis sp	+
71000 Helius sp	+
71900 Tipula sp	+
72700 Anopheles sp	+
74100 Simulium sp	+
74501 Ceratopogonidae	+
77500 Conchapelopia sp	+
77800 Helopelopia sp	+
80370 Corynoneura lobata	+
80410 Cricotopus (C.) sp	+
80420 Cricotopus (C.) bicinctus	+
81690 Paratrachocladius sp	+
82730 Chironomus (C.) decorus group	+
84210 Paratendipes albimanus or P. duplicatus	+
84450 Polypedilum (Uresipedilum) flavum	+
84470 Polypedilum (P.) illinoense	+
84750 Stictochironomus sp	+
85500 Paratanytarsus sp	+
86100 Chrysops sp	+
89001 Sciomyzidae	+
95100 Physella sp	+
96002 Helisoma anceps anceps	+
98200 Pisidium sp	+
98600 Sphaerium sp	+

Station: 302953

GORDON RUN @ DEATLEY RD.

0:00 8/3/15

Rivercode: 10-116-000

River Mile: 0.05

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
31	10	6	1	31		6		Marginally Good	NORMAL

Taxa	Quant/Qual
01801 Turbellaria	+
03000 Ectoprocta	+
03600 Oligochaeta	+
05800 Caecidotea sp	+
05900 Lirceus sp	+
06904 Synurella dentata	+
08250 Orconectes (Procericambarus) rusticus	+
11120 Baetis flavistriga	+
11130 Baetis intercalaris	+
13000 Leucrocuta sp	+
13400 Stenacron sp	+
13521 Stenonema femoratum	+
15000 Paraleptophlebia sp	+
17200 Caenis sp	+
48620 Nigronia serricornis	+
50315 Chimarra obscura	+
52200 Cheumatopsyche sp	+
59730 Triaenodes melaca	+
63300 Hydroporini	+
68025 Ectopria sp	+
68075 Psephenus herricki	+
68708 Dubiraphia vittata group	+
69400 Stenelmis sp	+
71800 Pseudolimnophila sp	+
74100 Simulium sp	+
77500 Conchapelopia sp	+
83840 Microtendipes pedellus group	+
84440 Polypedilum (Uresipedilum) aviceps	+
84450 Polypedilum (Uresipedilum) flavum	+
84750 Stictochironomus sp	+
85821 Tanytarsus glabrescens group sp 7	+

Station: 302954

HANNAH RUN @ McCLANAHAN RD. (RD. T-110)

0:00 8/3/15

Rivercode: 10-117-000

River Mile: 0.30

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
41	11	4	0	41		4		Marginally Good	NORMAL

Taxa	Quant/Qual
03360 Plumatella sp	+
03600 Oligochaeta	+
04666 Helobdella papillata	+
04964 Erpobdella microstoma	+
05900 Lirceus sp	+
06904 Synurella dentata	+
11120 Baetis flavistriga	+
11130 Baetis intercalaris	+
11200 Callibaetis sp	+
11250 Neocloeon sp	+
11650 Procloeon sp (w/ hindwing pads)	+
13400 Stenacron sp	+
13521 Stenonema femoratum	+
17200 Caenis sp	+
21001 Calopterygidae	+
28955 Plathemis lydia	+
45300 Sigara sp	+
50315 Chimarra obscura	+
52200 Cheumatopsyche sp	+
52530 Hydropsyche depravata group	+
60900 Peltodytes sp	+
62200 Copelatus sp	+
64050 Liodessus sp	+
66500 Enochrus sp	+
67700 Paracymus sp	+
72700 Anopheles sp	+
74100 Simulium sp	+
77120 Ablabesmyia mallochii	+
78402 Natarsia baltimoreus	+
78655 Procladius (Holotanypus) sp	+
80415 Cricotopus (Isocladius) absurdus	+
80420 Cricotopus (C.) bicinctus	+
82711 Chironomus (C.) sp 1	+
82730 Chironomus (C.) decorus group	+
84210 Paratendipes albimanus or P. duplicatus	+
84450 Polypedilum (Uresipedilum) flavum	+
84470 Polypedilum (P.) illinoense	+
84750 Stictochironomus sp	+
85800 Tanytarsus sp	+
86100 Chrysops sp	+
95100 Physella sp	+

Rivercode: 10-120-000

River Mile: 7.38

Sensitive

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Taxa	ICI	Narrative	Flow
43	13	10	0	65	1,246	15	46	N/A	0.17 ABOVE NO

Taxa	Quant/Qual	
01801 Turbellaria	13+	85840 Tanytarsus sepp 7
03360 Plumatella sp	3+	86100 Chrysops sp +
03600 Oligochaeta	63+	93900 Elimia sp 142+
04964 Erpobdella microstoma	+	96120 Menetus (Micromenetus) dilatatus 4
05800 Caecidotea sp	+	96900 Ferrissia sp 4
08601 Hydrachnidia	+	98200 Pisidium sp 5
11020 Acerpenna pygmaea	56+	98600 Sphaerium sp 8+
11130 Baetis intercalaris	7+	99100 Pyganodon grandis +
11200 Callibaetis sp	+	99860 Lampsilis siliquoidea +
11670 Proclonon viridoculare	+	
13000 Leucrocota sp	+	
13400 Stenacron sp	8+	
13521 Stenonema femoratum	11+	
14600 Choroterpes basalis	+	
17200 Caenis sp	7+	
22001 Coenagrionidae	+	
22300 Argia sp	+	
24900 Gomphus Complex	+	
48410 Corydalus cornutus	2+	
50315 Chimarra obscura	15+	
52200 Cheumatopsyche sp	123+	
52530 Hydropsyche depravata group	+	
53800 Hydroptila sp	2	
58505 Helicopsyche borealis	2+	
60900 Peltodytes sp	+	
65800 Berosus sp	4+	
68075 Psephenus herricki	2+	
69400 Stenelmis sp	118+	
72700 Anopheles sp	+	
74501 Ceratopogonidae	2	
77120 Ablabesmyia mallochii	21+	
77500 Conchapelopia sp	28	
77800 Helopelopia sp	+	
78450 Nilotanytus fimbriatus	28	
80363 Corynoneura sp. 12	4	
82101 Thienemanniella taurocapita	2	
82141 Thienemanniella xena	2	
82820 Cryptochironomus sp	21	
82824 Cryptochironomus ponderosus	+	
83040 Dicrotendipes neomodestus	21+	
84201 Paratendipes sp 1	7	
84210 Paratendipes albimanus or P. duplicatus	41+	
84450 Polypedilum (Uresipedilum) flavum	158+	
84460 Polypedilum (P.) fallax group	14	
84490 Polypedilum (Cerobregma) ontario	7	
84520 Polypedilum (Tripodura) halterale group	7	
84540 Polypedilum (Tripodura) scalaenum group	151+	
84700 Stenochironomus sp	14	
84750 Stictochironomus sp	7+	
85201 Cladotanytarsus species group A	28+	
85265 Cladotanytarsus vanderwulpi group sp 5	7	
85625 Rheotanytarsus sp	14	
85720 Stempellinella fimbriata	14	
85800 Tanytarsus sp	7+	
85802 Tanytarsus n. sp. near curticornis	7	
85821 Tanytarsus glabrescens group sp 7	28	

Station: 200693

W. FK. EAGLE CREEK W OF DECATUR, UPST. ST. RT. 353

0:00 8/23/16

Rivercode: 10-120-000

River Mile: 3.30

Sensitive

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
45	18	15	0	63	2,094	19	50	N/A	0.00 NORMAL

Taxa	Quant/Qual
01801 Turbellaria	8+ 84540 Polypedilum (Tripodura) scalaenum group 21
03360 Plumatella sp	+ 85625 Rheotanytarsus sp +
04687 Placobdella parasitica	+ 85821 Tanytarsus glabrescens group sp 7 14+
05800 Caecidotea sp	2+ 87540 Hemerodromia sp 2+
08601 Hydrachnidia	+ 93900 Elimia sp 1+
11020 Acerpenna pygmaea	148+ 95100 Physella sp +
11120 Baetis flavistriga	11+ 98600 Sphaerium sp 8
11130 Baetis intercalaris	437+
11200 Callibaetis sp	+
11650 Procloeon sp (w/ hindwing pads)	+
11651 Procloeon sp (w/o hindwing pads)	+
13000 Leucrocota sp	10+
13400 Stenacron sp	+
13521 Stenonema femoratum	104+
13561 Maccaffertium pulchellum	+
17200 Caenis sp	10+
22001 Coenagrionidae	+
22300 Argia sp	+
23804 Basiaeschna janata	+
48410 Corydalus cornutus	1+
50315 Chimarra obscura	39+
52200 Cheumatopsyche sp	397+
52430 Ceratopsyche morosa group	+
52530 Hydropsyche depravata group	2+
52540 Hydropsyche dicantha	5+
53501 Hydroptilidae	4
58505 Helicopsyche borealis	+
59140 Ceraclea maculata	+
59970 Petrophila sp	1
60201 Gyrinidae	+
60900 Peltodytes sp	+
68025 Ectopria sp	8
68075 Psephenus herricki	8+
68708 Dubiraphia vittata group	+
68901 Macronychus glabratus	1
69400 Stenelmis sp	83+
69713 Lutrochus laticeps	2+
74100 Simulium sp	+
77120 Ablabesmyia mallochi	7
77500 Conchapelopia sp	35+
77750 Thienemannimyia sp	7
77800 Helopelopia sp	14+
78140 Labrundinia pilosella	8
78450 Nilotanypus fimbriatus	24
80370 Corynoneura lobata	8
80415 Cricotopus (Isocladius) absurdus	7
81270 Nanocladius (N.) spinipennis	+
82130 Thienemanniella similis	8
82824 Cryptochironomus ponderosus	+
83040 Dicrotendipes neomodestus	42
83050 Dicrotendipes lucifer	7
83820 Dicrotendipes "caelum" (sensu Simpson & Bode, 1980)	21+
83840 Dicrotendipes pedellus group	7
84210 Paratendipes albimanus or P. duplicatus	14
84450 Polypedilum (Uresipedilum) flavum	551+
84490 Polypedilum (Cerobregma) ontario	7

Station: X03W07

TRIB TO W FK EAGLE CREEK (7.05) @ RUSSELLVILLE-WINCHESTER RD

0:00 7/26/16

Rivercode: 10-120-001

River Mile: 1.80

Sensitive

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Taxa	ICI	Narrative	Flow
49	13	6	0	49		6		Good	ABOVE NO

Taxa	Quant/Qual
01801 Turbellaria	+
01900 Nemertea	+
03600 Oligochaeta	+
04935 Erpobdella punctata punctata	+
05800 Caecidotea sp	+
05900 Lirceus sp	+
08245 Orconectes (Procericambarus) raymondi	+
11020 Acerpenna pygmaea	+
11120 Baetis flavistriga	+
11130 Baetis intercalaris	+
11200 Callibaetis sp	+
11650 Proclotron sp (w/ hindwing pads)	+
11651 Proclotron sp (w/o hindwing pads)	+
13400 Stenacron sp	+
13521 Stenonema femoratum	+
17200 Caenis sp	+
21200 Calopteryx sp	+
22001 Coenagrionidae	+
22300 Argia sp	+
45300 Sigara sp	+
50315 Chimarra obscura	+
52200 Cheumatopsyche sp	+
52530 Hydropsyche depravata group	+
58505 Helicopsyche borealis	+
65800 Berosus sp	+
66500 Enochrus sp	+
67800 Tropisternus sp	+
68075 Psephenus herricki	+
68130 Helichus sp	+
68708 Dubiraphia vittata group	+
69400 Stenelmis sp	+
71900 Tipula sp	+
74501 Ceratopogonidae	+
77120 Ablabesmyia mallochi	+
77500 Conchapelopia sp	+
77750 Thienemannimyia sp	+
77800 Helopelopia sp	+
78401 Natarsia species A (sensu Roback, 1978)	+
80420 Cricotopus (C.) bicinctus	+
82820 Cryptochironomus sp	+
83040 Dicrotendipes neomodestus	+
84300 Phaenopsectra obediens group	+
84450 Polypedilum (Uresipedilum) flavum	+
84460 Polypedilum (P.) fallax group	+
84540 Polypedilum (Tripodura) scalaenum group	+
84750 Stictochironomus sp	+
85230 Cladotanytarsus mancus group	+
85800 Tanytarsus sp	+
85821 Tanytarsus glabrescens group sp 7	+

Station: X99Q04

HONEY CREEK E OF RUSSELLVILLE @ MOUTH

0:00 7/25/16

Rivercode: 10-120-002

River Mile: 0.10

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
23	3	0	0	23		0		Low Fair	NORMAL

Taxa	Quant/Qual
01801 Turbellaria	+
03600 Oligochaeta	+
05900 Lirceus sp	+
06904 Synurella dentata	+
07820 Cambarus (Cambarus) sp A	+
11120 Baetis flavistriga	+
21200 Calopteryx sp	+
52200 Cheumatopsyche sp	+
52530 Hydropsyche depravata group	+
67500 Laccobius sp	+
69400 Stenelmis sp	+
71900 Tipula sp	+
74100 Simulium sp	+
77500 Conchapelopia sp	+
82730 Chironomus (C.) decorus group	+
82820 Cryptochironomus sp	+
83040 Dicrotendipes neomodestus	+
84210 Paratendipes albimanus or P. duplicatus	+
84540 Polypedilum (Tripodura) scalaenum group	+
84750 Stictochironomus sp	+
85625 Rheotanytarsus sp	+
85821 Tanytarsus glabrescens group sp 7	+
95100 Physella sp	+

Station: 302194

WAGGONER RUN SW OF TULIP, UPST. ABNER HOLLOW RD.

0:00 4/4/13

Rivercode: 10-202-000

River Mile: 1.04

Sensitive

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Taxa	ICI	Narrative	Flow
20	15	16	8	20		16			NORMAL

Taxa	Quant/Qual
06800 Gammarus sp	+
07800 Cambarus sp	+
10550 Ameletus sp	+
11430 Diphetor hageni	+
12800 Epeorus sp	+
13400 Stenacron sp	+
13590 Maccaffertium vicarium	+
15000 Paraleptophlebia sp	+
16200 Eurylophella sp	+
18610 Ephemera guttulata	+
23905 Boyeria grafiana	+
25510 Stylogomphus albistylus	+
32200 Amphinemura sp	+
33100 Leuctra sp	+
34120 Acroneuria carolinensis	+
35150 Clioperla clio	+
36500 Sweltsa sp	+
56650 Goera sp.	+
57900 Pycnopsyche sp	+
71100 Hexatoma sp	+

Station: 302767

MACKENZIE RUN UPST. WAGGONER RIFFLE RD.

0:00 8/20/14

Rivercode: 10-203-000

River Mile: 0.20

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
39	14	15	5	39		15		Very Good	ABOVE NOI

Taxa	Quant/Qual
03600 Oligochaeta	+
05900 Lirceus sp	+
06830 Gammarus minus	+
07820 Cambarus (Cambarus) sp A	+
11100 Baetis sp	+
11250 Neocloeon sp	+
11430 Diphetor hageni	+
13400 Stenacron sp	+
13590 Maccaffertium vicarium	+
15000 Paraleptophlebia sp	+
18610 Ephemera guttulata	+
21200 Calopteryx sp	+
23905 Boyeria grafiana	+
25510 Stylogomphus albistylus	+
33100 Leuctra sp	+
34120 Acroneuria carolinensis	+
34130 Acroneuria frisoni	+
47600 Sialis sp	+
48610 Nigronia fasciata	+
48620 Nigronia serricornis	+
51600 Polycentropus sp	+
52200 Cheumatopsyche sp	+
52315 Diplectrona modesta	+
57400 Neophylax sp	+
68025 Ectopria sp	+
68075 Psephenus herricki	+
68130 Helichus sp	+
69200 Optioservus sp	+
69400 Stenelmis sp	+
71800 Pseudolimnophila sp	+
71910 Tipula abdominalis	+
72340 Dixella sp	+
77500 Conchapelopia sp	+
82820 Cryptochironomus sp	+
83840 Microtendipes pedellus group	+
84210 Paratendipes albimanus or P. duplicatus	+
84750 Stictochironomus sp	+
85802 Tanytarsus n. sp. near curticornis	+
94400 Fossaria sp	+

Station: X03W09

STRAIGHT CREEK AT ARNHEIM @ BROWNSTOWN-ARNHEIM RD.

0:00 7/25/16

Rivercode: 10-300-000

River Mile: 16.75

Sensitive

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Taxa	ICI	Narrative	Flow
45	14	9	1	45		9		Good	NORMAL

Taxa	Quant/Qual
00401 Spongillidae	+
01801 Turbellaria	+
03600 Oligochaeta	+
04964 Erpobdella microstoma	+
05900 Lirceus sp	+
06201 Hyalella sp	+
06700 Crangonyx sp	+
08245 Orconectes (Procericambarus) raymondi	+
08601 Hydrachnidia	+
11020 Acerpenna pygmaea	+
11120 Baetis flavistriga	+
11130 Baetis intercalaris	+
11250 Neocloeon sp	+
11651 Procloeon sp (w/o hindwing pads)	+
11670 Procloeon viridoculare	+
13400 Stenacron sp	+
13521 Stenonema femoratum	+
14600 Choroterpes basalis	+
17200 Caenis sp	+
21200 Calopteryx sp	+
22001 Coenagrionidae	+
23804 Basiaeschna janata	+
50315 Chimarra obscura	+
52200 Cheumatopsyche sp	+
52530 Hydropsyche depravata group	+
58505 Helicopsyche borealis	+
60900 Peltodytes sp	+
68075 Psephenus herricki	+
68130 Helichus sp	+
69400 Stenelmis sp	+
70502 Limoniinae	+
72700 Anopheles sp	+
78401 Natarsia species A (sensu Roback, 1978)	+
78655 Procladius (Holotanypus) sp	+
83820 Microtendipes "caelum" (sensu Simpson & Bode, 1980)	+
83840 Microtendipes pedellus group	+
84210 Paratendipes albimanus or P. duplicatus	+
84430 Polypedilum (P.) albicorne	+
84450 Polypedilum (Uresipedilum) flavum	+
84470 Polypedilum (P.) illinoense	+
84540 Polypedilum (Tripodura) scalaenum group	+
84750 Stictochironomus sp	+
85800 Tanytarsus sp	+
86200 Tabanus sp	+
96900 Ferrissia sp	+

Station: X03W11

STRAIGHT CREEK WSW OF RUSSELLVILLE @ ST. RT. 125

0:00 8/22/16

Rivercode: 10-300-000

River Mile: 9.45

Sensitive

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
50	20	18	0	50		18		Exceptional	ABOVE NO
Taxa		Quant/Qual							
01801	Turbellaria	+							
03600	Oligochaeta	+							
04935	Erpobdella punctata punctata	+							
05900	Lirceus sp	+							
06904	Synurella dentata	+							
08601	Hydrachnidia	+							
11014	Acentrella turbida	+							
11020	Acerpenna pygmaea	+							
11120	Baetis flavistriga	+							
11130	Baetis intercalaris	+							
11200	Callibaetis sp	+							
11650	Proclotron sp (w/ hindwing pads)	+							
11651	Proclotron sp (w/o hindwing pads)	+							
11670	Proclotron viridoculare	+							
13000	Leucrocota sp	+							
13400	Stenacron sp	+							
13521	Stenonema femoratum	+							
17200	Caenis sp	+							
22001	Coenagrionidae	+							
22300	Argia sp	+							
23804	Basiaeschna janata	+							
24900	Gomphus Complex	+							
48410	Corydalus cornutus	+							
50315	Chimarra obscura	+							
52200	Cheumatopsyche sp	+							
52430	Ceratopsyche morosa group	+							
52530	Hydropsyche depravata group	+							
52540	Hydropsyche dicantha	+							
57400	Neophylax sp	+							
58505	Helicopsyche borealis	+							
59310	Mystacides sepulchralis	+							
59970	Petrophila sp	+							
60900	Peltodytes sp	+							
65501	Hydrophilidae	+							
68075	Psephenus herricki	+							
69400	Stenelmis sp	+							
74100	Simulium sp	+							
77500	Conchapelopia sp	+							
77800	Helopelopia sp	+							
80370	Corynoneura lobata	+							
82820	Cryptochironomus sp	+							
83040	Dicrotendipes neomodestus	+							
83820	Microtendipes "caelum" (sensu Simpson & Bode, 1980)	+							
84210	Paratendipes albimanus or P. duplicatus	+							
84450	Polypedilum (Uresipedilum) flavum	+							
85230	Cladotanytarsus mancus group	+							
85720	Stempellinella fimbriata	+							
85821	Tanytarsus glabrescens group sp 7	+							
93900	Elimia sp	+							
95100	Physella sp	+							

Rivercode: 10-300-000

River Mile: 2.78

Sensitive

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Taxa	ICI	Narrative	Flow
48	21	18	0	65	2,837	22	50	N/A	0.60 NORMAL

Taxa	Quant/Qual	
01801 Turbellaria	16+	85230 Cladotanytarsus mancus group 14
01900 Nemertea	8	85625 Rheotanytarsus sp 27
03600 Oligochaeta	24	85720 Stempellinella fimbriata 8
04935 Erpobdella punctata punctata	+	85800 Tanytarsus sp 14+
05900 Lirceus sp	8+	85821 Tanytarsus glabrescens group sp 7 216+
08245 Orconectes (Procericambarus) raymondi	1+	85840 Tanytarsus sepp 54
08601 Hydrachnidia	16	93900 Elimia sp 2+
11014 Acentrella turbida	+	95100 Physella sp 1+
11020 Acerpenna pygmaea	168+	97601 Corbicula fluminea +
11120 Baetis flavistriga	23+	
11130 Baetis intercalaris	710+	
11200 Callibaetis sp	+	
11651 Proclonus sp (w/o hindwing pads)	+	
11670 Proclonus viridoculare	+	
13400 Stenacron sp	4+	
13521 Stenonema femoratum	88+	
13561 Maccaffertium pulchellum	9	
14600 Choroterpes basalis	+	
17200 Caenis sp	19+	
22300 Argia sp	+	
27400 Neurocordulia sp	+	
44501 Corixidae	+	
48410 Corydalus cornutus	4+	
50315 Chimarra obscura	46+	
51400 Nyctiophylax sp	+	
51600 Polycentropus sp	+	
52200 Cheumatopsyche sp	317+	
52430 Ceratopsyche morosa group	24+	
52530 Hydropsyche depravata group	+	
52540 Hydropsyche dicantha	12+	
53800 Hydroptila sp	+	
58505 Helicopsyche borealis	+	
59310 Mystacides sepulchralis	+	
59970 Petrophila sp	2+	
60900 Peltodytes sp	+	
68075 Psephenus herricki	+	
69400 Stenelmis sp	77+	
74100 Simulium sp	+	
77120 Ablabesmyia mallochi	+	
77500 Conchapelopia sp	14	
77750 Thienemannimyia sp	27	
77800 Helopelopia sp	27+	
78450 Nilotanytus fimbriatus	48	
80350 Corynoneura sp	8	
80415 Cricotopus (Isocladus) absurdus	+	
80420 Cricotopus (C.) bicinctus	14	
80430 Cricotopus (C.) tremulus group	+	
82101 Thienemanniella taurocapita	40+	
82130 Thienemanniella similis	16	
83820 Microtendipes "caelum" (sensu Simpson & Bode, 1980)	27	
84210 Paratendipes albimanus or P. duplicatus	+	
84450 Polypedilum (Uresipedilum) flavum	609+	
84520 Polypedilum (Tripodura) halterale group	+	
84540 Polypedilum (Tripodura) scalaenum group	81	
84750 Stictochironomus sp	+	
84790 Tribelos fuscicorne	14	

Station: 302955		SINK CREEK ADJ. OLD A AND P RD. (RD. 67A)					0:00 8/17/15		
Rivercode: 10-301-000		River Mile: 0.15							
Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
48	15	7	2	48		7		Good	NORMAL
Taxa		Quant/Qual							
05900	Lirceus sp	+							
06904	Synurella dentata	+							
07820	Cambarus (Cambarus) sp A	+							
11120	Baetis flavistriga	+							
11130	Baetis intercalaris	+							
11250	Neocloeon sp	+							
11651	Procloeon sp (w/o hindwing pads)	+							
13400	Stenacron sp	+							
13521	Stenonema femoratum	+							
15000	Paraleptophlebia sp	+							
17200	Caenis sp	+							
47600	Sialis sp	+							
51600	Polycentropus sp	+							
52200	Cheumatopsyche sp	+							
52315	Diplectrona modesta	+							
52530	Hydropsyche depravata group	+							
53800	Hydroptila sp	+							
59300	Mystacides sp	+							
59570	Oecetis nocturna	+							
60900	Peltodytes sp	+							
66500	Enochrus sp	+							
68025	Ectopria sp	+							
68075	Psephenus herricki	+							
69400	Stenelmis sp	+							
71100	Hexatoma sp	+							
72700	Anopheles sp	+							
74100	Simulium sp	+							
77120	Ablabesmyia mallochi	+							
77500	Conchapelopia sp	+							
77750	Thienemannimyia sp	+							
78601	Pentaneura inyoensis	+							
78655	Procladius (Holotanypus) sp	+							
79400	Zavrelimyia (Z.) sp	+							
81690	Paratrachocladius sp	+							
82730	Chironomus (C.) decorus group	+							
82820	Cryptochironomus sp	+							
83040	Dicrotendipes neomodestus	+							
83840	Microtendipes pedellus group	+							
84210	Paratendipes albimanus or P. duplicatus	+							
84315	Phaenopsectra flavipes	+							
84470	Polypedilum (P.) illinoense	+							
84540	Polypedilum (Tripodura) scalaenum group	+							
84750	Stictochironomus sp	+							
85500	Paratanytarsus sp	+							
85625	Rheotanytarsus sp	+							
85800	Tanytarsus sp	+							
85818	Tanytarsus glabrescens group sp 4	+							
85840	Tanytarsus sepp	+							

Station: 302956

RANGLE RUN ADJ. RANGLE RUN RD. (RD. 541)

0:00 8/17/15

Rivercode: 10-302-000

River Mile: 0.30

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
29	11	6	5	29		6		Good	NORMAL

Taxa	Quant/Qual
06700 Crangonyx sp	+
06904 Synurella dentata	+
07820 Cambarus (Cambarus) sp A	+
11120 Baetis flavistriga	+
11250 Neocloeon sp	+
11430 Dipheter hageni	+
11650 Procloeon sp (w/ hindwing pads)	+
13400 Stenacron sp	+
13521 Stenonema femoratum	+
15000 Paraleptophlebia sp	+
17200 Caenis sp	+
48610 Nigronia fasciata	+
52200 Cheumatopsyche sp	+
52315 Diplectrona modesta	+
52530 Hydropsyche depravata group	+
68025 Ectopria sp	+
68075 Psephenus herricki	+
69400 Stenelmis sp	+
74100 Simulium sp	+
77500 Conchapelopia sp	+
79400 Zavrelimyia (Z.) sp	+
81650 Parametriocnemus sp	+
82730 Chironomus (C.) decorus group	+
83040 Dicrotendipes neomodestus	+
83840 Microtendipes pedellus group	+
84210 Paratendipes albimanus or P. duplicatus	+
84440 Polypedilum (Uresipedilum) aviceps	+
84750 Stictochironomus sp	+
95100 Physella sp	+

Station: 302957

SHEEP RUN UPST. CENTERPOINT RD. (RD. 67B)

0:00 8/17/15

Rivercode: 10-303-000

River Mile: 0.10

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
54	19	10	1	54		10		Very Good	NORMAL

Taxa	Quant/Qual
01801 Turbellaria	+
03600 Oligochaeta	+
05900 Lirceus sp	+
07820 Cambarus (Cambarus) sp A	+
08245 Orconectes (Procericambarus) raymondi	+
08601 Hydrachnidia	+
11020 Acerpenna pygmaea	+
11120 Baetis flavistriga	+
11130 Baetis intercalaris	+
11200 Callibaetis sp	+
11250 Neocloeon sp	+
11430 Dipheter hageni	+
11650 Procloeon sp (w/ hindwing pads)	+
11651 Procloeon sp (w/o hindwing pads)	+
13400 Stenacron sp	+
13521 Stenonema femoratum	+
15000 Paraleptophlebia sp	+
17200 Caenis sp	+
48620 Nigronia serricornis	+
51400 Nyctiophylax sp	+
51600 Polycentropus sp	+
52200 Cheumatopsyche sp	+
52430 Ceratopsyche morosa group	+
52530 Hydropsyche depravata group	+
53800 Hydroptila sp	+
57400 Neophylax sp	+
66500 Enochrus sp	+
67500 Laccobius sp	+
67700 Paracymus sp	+
68075 Psephenus herricki	+
68708 Dubiraphia vittata group	+
69400 Stenelmis sp	+
72700 Anopheles sp	+
74100 Simulium sp	+
77120 Ablabesmyia mallochi	+
77500 Conchapelopia sp	+
77750 Thienemannimyia sp	+
78402 Natarsia baltimoreus	+
79400 Zavrelimyia (Z.) sp	+
80410 Cricotopus (C.) sp	+
80420 Cricotopus (C.) bicinctus	+
82141 Thienemanniella xena	+
82730 Chironomus (C.) decorus group	+
83003 Dicrotendipes fumidus	+
83040 Dicrotendipes neomodestus	+
84210 Paratendipes albimanus or P. duplicatus	+
84470 Polypedilum (P.) illinoense	+
84540 Polypedilum (Tripodura) scalaenum group	+
84612 Saetheria tylus	+
85500 Paratanytarsus sp	+
85800 Tanytarsus sp	+
85818 Tanytarsus glabrescens group sp 4	+
85821 Tanytarsus glabrescens group sp 7	+
95100 Physella sp	+

Station: 302958

CAMPBELL RUN @ OLD U.S. RT. 68 (RD. 30)

0:00 8/11/15

Rivercode: 10-304-000

River Mile: 0.20

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
37	15	8	1	37		8		Good	NORMAL

Taxa	Quant/Qual
03600 Oligochaeta	+
05900 Lirceus sp	+
06904 Synurella dentata	+
11120 Baetis flavistriga	+
11130 Baetis intercalaris	+
11200 Callibaetis sp	+
11250 Neocloeon sp	+
11430 Diphetor hageni	+
11650 Procloeon sp (w/ hindwing pads)	+
13400 Stenacron sp	+
13521 Stenonema femoratum	+
17200 Caenis sp	+
44501 Corixidae	+
48410 Corydalus cornutus	+
51600 Polycentropus sp	+
52200 Cheumatopsyche sp	+
52315 Diplectronea modesta	+
52430 Ceratopsyche morosa group	+
52530 Hydropsyche depravata group	+
53501 Hydroptilidae	+
63300 Hydroporini	+
67500 Laccobius sp	+
68025 Ectopria sp	+
68075 Psephenus herricki	+
68708 Dubiraphia vittata group	+
69400 Stenelmis sp	+
74100 Simulium sp	+
77120 Ablabesmyia mallochii	+
77500 Conchapelopia sp	+
77750 Thienemannimyia sp	+
78601 Pentaneura inyoensis	+
80420 Cricotopus (C.) bicinctus	+
82820 Cryptochironomus sp	+
83820 Microtendipes "caelum" (sensu Simpson & Bode, 1980)	+
83840 Microtendipes pedellus group	+
85821 Tanytarsus glabrescens group sp 7	+
95100 Physella sp	+

Station: 302959

EVANS RUN ADJ. STRAIGHT CREEK RD. (RD. 255) AT CONFLUENCE

0:00 8/11/15

Rivercode: 10-305-000

River Mile: 0.05

Sensitive

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Taxa	ICI	Narrative	Flow
35	14	7	2	35		7		Good	ABOVE NO

Taxa	Quant/Qual
01801 Turbellaria	+
03600 Oligochaeta	+
06904 Synurella dentata	+
11120 Baetis flavistriga	+
11130 Baetis intercalaris	+
11250 Neocloeon sp	+
11650 Procloeon sp (w/ hindwing pads)	+
13400 Stenacron sp	+
13521 Stenonema femoratum	+
15000 Paraleptophlebia sp	+
17200 Caenis sp	+
44501 Corixidae	+
50315 Chimarra obscura	+
51600 Polycentropus sp	+
52200 Cheumatopsyche sp	+
52530 Hydropsyche depravata group	+
52540 Hydropsyche dicantha	+
53800 Hydroptila sp	+
68025 Ectopria sp	+
68075 Psephenus herricki	+
69400 Stenelmis sp	+
74100 Simulium sp	+
77800 Helopelopia sp	+
78601 Pentaneura inyoensis	+
80420 Cricotopus (C.) bicinctus	+
81650 Parametriocnemus sp	+
82730 Chironomus (C.) decorus group	+
83040 Dicrotendipes neomodestus	+
83050 Dicrotendipes lucifer	+
84440 Polypedilum (Uresipedilum) aviceps	+
84470 Polypedilum (P.) illinoense	+
85625 Rheotanytarsus sp	+
85821 Tanytarsus glabrescens group sp 7	+
94400 Fossaria sp	+
95100 Physella sp	+

Station: 302960

WASHBURN RUN ABOUT 100 YDS. DST. HOCKMAN RD. (RD. 68)

0:00 8/10/15

Rivercode: 10-307-000

River Mile: 1.25

Sensitive

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
41	10	6	0	41		6		Marginally Good	NORMAL

Taxa	Quant/Qual
01801 Turbellaria	+
02600 Nematomorpha	+
03600 Oligochaeta	+
04964 Erpobdella microstoma	+
05900 Lirceus sp	+
06904 Synurella dentata	+
08245 Orconectes (Procericambarus) raymondi	+
08601 Hydrachnidia	+
11120 Baetis flavistriga	+
11650 Procloeon sp (w/ hindwing pads)	+
11651 Procloeon sp (w/o hindwing pads)	+
13400 Stenacron sp	+
13521 Stenonema femoratum	+
15000 Paraleptophlebia sp	+
17200 Caenis sp	+
21200 Calopteryx sp	+
44501 Corixidae	+
50301 Chimarra aterrima	+
50315 Chimarra obscura	+
52200 Cheumatopsyche sp	+
68025 Ectopria sp	+
68075 Psephenus herricki	+
69400 Stenelmis sp	+
72700 Anopheles sp	+
74100 Simulium sp	+
74501 Ceratopogonidae	+
77120 Ablabesmyia mallochii	+
77500 Conchapelopia sp	+
78601 Pentaneura inyoensis	+
80420 Cricotopus (C.) bicinctus	+
81825 Rheocricotopus (Psilocricotopus) robacki	+
82820 Cryptochironomus sp	+
83840 Microtendipes pedellus group	+
84210 Paratendipes albimanus or P. duplicatus	+
84450 Polypedilum (Uresipedilum) flavum	+
84540 Polypedilum (Tripodura) scalaenum group	+
84750 Stictochironomus sp	+
85500 Paratanytarsus sp	+
85720 Stempellinella fimbriata	+
85821 Tanytarsus glabrescens group sp 7	+
95100 Physella sp	+

Station: 302961

BULL RUN NEAR MOUTH

0:00 8/10/15

Rivercode: 10-308-000

River Mile: 0.05

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
34	11	6	2	34		6		Good	LOW

Taxa	Quant/Qual
03600 Oligochaeta	+
05800 Caecidotea sp	+
05900 Lirceus sp	+
06904 Synurella dentata	+
07870 Cambarus (Tubericambarus) sp	+
08601 Hydrachnidia	+
11120 Baetis flavistriga	+
11250 Neocloeon sp	+
11650 Procloeon sp (w/ hindwing pads)	+
13521 Stenonema femoratum	+
15000 Paraleptophlebia sp	+
17200 Caenis sp	+
21200 Calopteryx sp	+
50301 Chimarra aterrima	+
51600 Polycentropus sp	+
52200 Cheumatopsyche sp	+
52530 Hydropsyche depravata group	+
57400 Neophylax sp	+
68075 Psephenus herricki	+
69400 Stenelmis sp	+
74100 Simulium sp	+
74501 Ceratopogonidae	+
77500 Conchapelopia sp	+
79400 Zavrelimyia (Z.) sp	+
81650 Parametriocnemus sp	+
82730 Chironomus (C.) decorus group	+
82820 Cryptochironomus sp	+
84210 Paratendipes albimanus or P. duplicatus	+
84450 Polypedilum (Uresipedilum) flavum	+
84470 Polypedilum (P.) illinoense	+
84540 Polypedilum (Tripodura) scalaenum group	+
84750 Stictochironomus sp	+
87400 Stratiomys sp	+
95100 Physella sp	+

Station: 302962

SCOTT RUN @ U.S. RT. 68

0:00 8/11/15

Rivercode: 10-309-000

River Mile: 0.20

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
42	14	9	4	42		9		Good	ABOVE NOI

Taxa	Quant/Qual
01801 Turbellaria	+
03600 Oligochaeta	+
05900 Lirceus sp	+
06904 Synurella dentata	+
07800 Cambarus sp	+
08601 Hydrachnidia	+
11120 Baetis flavistriga	+
11200 Callibaetis sp	+
11250 Neocloeon sp	+
11430 Diphetor hageni	+
11650 Procloeon sp (w/ hindwing pads)	+
13400 Stenacron sp	+
15000 Paraleptophlebia sp	+
44501 Corixidae	+
50301 Chimarra aterrima	+
51600 Polycentropus sp	+
52200 Cheumatopsyche sp	+
52315 Diplectrona modesta	+
52330 Homoplectra doringa or monticola	+
52530 Hydropsyche depravata group	+
57400 Neophylax sp	+
63300 Hydroporini	+
68025 Ectopria sp	+
68075 Psephenus herricki	+
69400 Stenelmis sp	+
70502 Limoniinae	+
72900 Culex sp	+
74100 Simulium sp	+
74501 Ceratopogonidae	+
77500 Conchapelopia sp	+
79400 Zavrelimyia (Z.) sp	+
81650 Parametriocnemus sp	+
82730 Chironomus (C.) decorus group	+
82820 Cryptochironomus sp	+
83820 Microtendipes "caelum" (sensu Simpson & Bode, 1980)	+
83840 Microtendipes pedellus group	+
84470 Polypedilum (P.) illinoense	+
84540 Polypedilum (Tripodura) scalaenum group	+
84960 Pseudochironomus sp	+
85800 Tanytarsus sp	+
94603 Pseudosuccinea columella	+
95100 Physella sp	+

Station: 302963

CAMP RUN @ DAY HILL-ARNHEIM RD.

0:00 8/10/15

Rivercode: 10-310-000

River Mile: 0.10

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
46	17	11	0	46		11		Good	NORMAL

Taxa	Quant/Qual
01801 Turbellaria	+
03600 Oligochaeta	+
05900 Lirceus sp	+
06904 Synurella dentata	+
08245 Orconectes (Procericambarus) raymondi	+
08601 Hydrachnidia	+
11014 Acentrella turbida	+
11020 Acerpenna pygmaea	+
11120 Baetis flavistriga	+
11130 Baetis intercalaris	+
11200 Callibaetis sp	+
11650 Proclotron sp (w/ hindwing pads)	+
11651 Proclotron sp (w/o hindwing pads)	+
13400 Stenacron sp	+
13521 Stenonema femoratum	+
14600 Choroterpes basalis	+
15000 Paraleptophlebia sp	+
17200 Caenis sp	+
22001 Coenagrionidae	+
23804 Basiaeschna janata	+
42700 Belostoma sp	+
48410 Corydalus cornutus	+
50315 Chimarra obscura	+
52200 Cheumatopsyche sp	+
52530 Hydropsyche depravata group	+
53800 Hydroptila sp	+
58505 Helicopsyche borealis	+
65501 Hydrophilidae	+
68075 Psephenus herricki	+
68707 Dubiraphia quadrinotata	+
69400 Stenelmis sp	+
72700 Anopheles sp	+
74100 Simulium sp	+
77120 Ablabesmyia mallochii	+
77500 Conchapelopia sp	+
78401 Natarsia species A (sensu Roback, 1978)	+
78601 Pentaneura inyoensis	+
80420 Cricotopus (C.) bicinctus	+
82730 Chironomus (C.) decorus group	+
82820 Cryptochironomus sp	+
84210 Paratendipes albimanus or P. duplicatus	+
84450 Polypedilum (Uresipedilum) flavum	+
84470 Polypedilum (P.) illinoense	+
85720 Stempellinella fimbriata	+
93900 Elimia sp	+
95100 Physella sp	+

Station: 302964

MYERS RUN @ MARTIN-HOLLOW RD. (RD. 68)

0:00 7/8/15

Rivercode: 10-311-000

River Mile: 0.05

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
31	8	4	1	31		4		Marginally Good	ABOVE NO

Taxa	Quant/Qual
01801 Turbellaria	+
05900 Lirceus sp	+
08250 Orconectes (Procericambarus) rusticus	+
08601 Hydrachnidia	+
11120 Baetis flavistriga	+
11250 Neocloeon sp	+
11651 Procloeon sp (w/o hindwing pads)	+
12501 Heptageniidae	+
17200 Caenis sp	+
42700 Belostoma sp	+
45300 Sigara sp	+
52200 Cheumatopsyche sp	+
52530 Hydropsyche depravata group	+
57400 Neophylax sp	+
60900 Peltodytes sp	+
65800 Berosus sp	+
66500 Enochrus sp	+
67500 Laccobius sp	+
67800 Tropisternus sp	+
69400 Stenelmis sp	+
77500 Conchapelopia sp	+
78200 Larsia sp	+
78655 Procladius (Holotanypus) sp	+
83003 Dicrotendipes fumidus	+
83040 Dicrotendipes neomodestus	+
84440 Polypedilum (Uresipedilum) aviceps	+
84470 Polypedilum (P.) illinoense	+
84960 Pseudochironomus sp	+
87540 Hemerodromia sp	+
94400 Fossaria sp	+
95100 Physella sp	+

Station: 302965

HONEY RUN ADJ. DAY HILL-ARNHEIM RD.

0:00 8/5/15

Rivercode: 10-313-000

River Mile: 0.10

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
34	8	5	1	34		5		Marginally Good	NORMAL

Taxa	Quant/Qual
01801 Turbellaria	+
03600 Oligochaeta	+
04930 Erpobdella sp	+
05900 Lirceus sp	+
06904 Synurella dentata	+
08245 Orconectes (Procericambarus) raymondi	+
11120 Baetis flavistriga	+
11130 Baetis intercalaris	+
13521 Stenonema femoratum	+
15000 Paraleptophlebia sp	+
17200 Caenis sp	+
23804 Basiaeschna janata	+
27500 Somatochlora sp	+
50315 Chimarra obscura	+
52200 Cheumatopsyche sp	+
52430 Ceratopsyche morosa group	+
60900 Peltodytes sp	+
65800 Berosus sp	+
69400 Stenelmis sp	+
72700 Anopheles sp	+
77120 Ablabesmyia mallochii	+
77500 Conchapelopia sp	+
82730 Chironomus (C.) decorus group	+
83820 Microtendipes "caelum" (sensu Simpson & Bode, 1980)	+
83840 Microtendipes pedellus group	+
84210 Paratendipes albimanus or P. duplicatus	+
84440 Polypedilum (Uresipedilum) aviceps	+
84450 Polypedilum (Uresipedilum) flavum	+
84470 Polypedilum (P.) illinoense	+
84520 Polypedilum (Tripodura) halterale group	+
84540 Polypedilum (Tripodura) scalaenum group	+
84750 Stictochironomus sp	+
85615 Rheotanytarsus pellucidus	+
95100 Physella sp	+

Station: 302966

WEST FORK STRAIGHT CREEK @ WESTFORK RD. (RD. 66A)

0:00 8/5/15

Rivercode: 10-314-000

River Mile: 1.25

Sensitive

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
57	13	7	1	57		7		Good	NORMAL

Taxa	Quant/Qual
03360 Plumatella sp	+ 98600 Sphaerium sp +
03600 Oligochaeta	+
04660 Helobdella sp	+
04935 Erpobdella punctata punctata	+
05900 Lirceus sp	+
06904 Synurella dentata	+
07870 Cambarus (Tubericambarus) sp	+
08601 Hydrachnidia	+
11120 Baetis flavistriga	+
11130 Baetis intercalaris	+
11650 Procloeon sp (w/ hindwing pads)	+
11651 Procloeon sp (w/o hindwing pads)	+
13521 Stenonema femoratum	+
14600 Choroterpes basalis	+
17200 Caenis sp	+
21200 Calopteryx sp	+
22001 Coenagrionidae	+
23804 Basiaeschna janata	+
27307 Epithea (Epicordulia) princeps	+
27500 Somatochlora sp	+
43570 Neoplea sp	+
44501 Corixidae	+
50301 Chimarra aterrima	+
52200 Cheumatopsyche sp	+
52530 Hydropsyche depravata group	+
53501 Hydroptilidae	+
58505 Helicopsyche borealis	+
59570 Oecetis nocturna	+
60900 Peltodytes sp	+
67800 Tropisternus sp	+
68025 Ectopria sp	+
68075 Psephenus herricki	+
68708 Dubiraphia vittata group	+
69400 Stenelmis sp	+
72700 Anopheles sp	+
74100 Simulium sp	+
77120 Ablabesmyia mallochii	+
77500 Conchapelopia sp	+
77800 Helopelopia sp	+
78401 Natarsia species A (sensu Roback, 1978)	+
80351 Corynoneura caudicula	+
82730 Chironomus (C.) decorus group	+
83002 Dicrotendipes modestus	+
83040 Dicrotendipes neomodestus	+
84210 Paratendipes albimanus or P. duplicatus	+
84440 Polypedilum (Uresipedilum) aviceps	+
84450 Polypedilum (Uresipedilum) flavum	+
84520 Polypedilum (Tripodura) halterale group	+
84540 Polypedilum (Tripodura) scalaenum group	+
84800 Tribelos jucundum	+
85500 Paratanytarsus sp	+
85821 Tanytarsus glabrescens group sp 7	+
86100 Chrysops sp	+
95100 Physella sp	+
96264 Planorbella (Pierosoma) pilsbryi	+
96900 Ferrissia sp	+

Station: 302967

BUCK RUN @ ASH RIDGE ARNHEIM RD. (RD. 17B)

0:00 7/8/15

Rivercode: 10-315-000

River Mile: 0.05

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
46	8	5	1	46		5		Marginally Good	ABOVE NOI

Taxa	Quant/Qual
01801 Turbellaria	+
03360 Plumatella sp	+
03600 Oligochaeta	+
05900 Lirceus sp	+
06904 Synurella dentata	+
08245 Orconectes (Procericambarus) raymondi	+
08601 Hydrachnidia	+
11120 Baetis flavistriga	+
11130 Baetis intercalaris	+
13521 Stenonema femoratum	+
23909 Boyeria vinosa	+
44501 Corixidae	+
47600 Sialis sp	+
52200 Cheumatopsyche sp	+
52530 Hydropsyche depravata group	+
58505 Helicopsyche borealis	+
59310 Mystacides sepulchralis	+
59570 Oecetis nocturna	+
60900 Peltodytes sp	+
68025 Ectopria sp	+
68075 Psephenus herricki	+
69400 Stenelmis sp	+
70502 Limoniinae	+
71900 Tipula sp	+
74100 Simulium sp	+
78140 Labrundinia pilosella	+
78401 Natarsia species A (sensu Roback, 1978)	+
83040 Dicrotendipes neomodestus	+
84315 Phaenopsectra flavipes	+
84440 Polypedilum (Uresipedilum) aviceps	+
84450 Polypedilum (Uresipedilum) flavum	+
84469 Polypedilum (P.) illinoense group	+
84520 Polypedilum (Tripodura) halterale group	+
84540 Polypedilum (Tripodura) scalaenum group	+
84601 Saetheria species 1 (sensu Jackson, 1977)	+
84700 Stenochironomus sp	+
84800 Tribelos jucundum	+
85720 Stempellinella fimbriata	+
85800 Tanytarsus sp	+
85821 Tanytarsus glabrescens group sp 7	+
85840 Tanytarsus sepp	+
94400 Fossaria sp	+
95100 Physella sp	+
96002 Helisoma anceps anceps	+
96200 Planorbella sp	+
96900 Ferrissia sp	+

Station: 302968

SYCAMORE RUN NR. FITE-HAUCK RD. AND ASH RIDGE ARNHEIM RD.

0:00 7/8/15

Rivercode: 10-316-000

River Mile: 0.05

Sensitive

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
46	6	3	4	46		3		Fair	ABOVE NO

Taxa	Quant/Qual
01801 Turbellaria	+
03600 Oligochaeta	+
04964 Erpobdella microstoma	+
06904 Synurella dentata	+
07820 Cambarus (Cambarus) sp A	+
08200 Orconectes sp	+
08601 Hydrachnidia	+
11120 Baetis flavistriga	+
11250 Neocloeon sp	+
13521 Stenonema femoratum	+
17200 Caenis sp	+
23600 Aeshna sp	+
47600 Sialis sp	+
52200 Cheumatopsyche sp	+
52315 Diplectrona modesta	+
68025 Ectopria sp	+
69400 Stenelmis sp	+
70502 Limoniinae	+
71700 Palaria sp	+
71800 Pseudolimnophila sp	+
71900 Tipula sp	+
74501 Ceratopogonidae	+
77500 Conchapelopia sp	+
79400 Zavrelimyia (Z.) sp	+
81650 Parametriocnemus sp	+
82730 Chironomus (C.) decorus group	+
82820 Cryptochironomus sp	+
83051 Dicrotendipes simpsoni	+
83300 Glyptotendipes (G.) sp	+
83840 Microtendipes pedellus group	+
84210 Paratendipes albimanus or P. duplicatus	+
84315 Phaenopsectra flavipes	+
84440 Polypedilum (Uresipedilum) aviceps	+
84450 Polypedilum (Uresipedilum) flavum	+
84460 Polypedilum (P.) fallax group	+
84470 Polypedilum (P.) illinoense	+
84520 Polypedilum (Tripodura) halterale group	+
84540 Polypedilum (Tripodura) scalaenum group	+
84700 Stenochironomus sp	+
85230 Cladotanytarsus mancus group	+
85800 Tanytarsus sp	+
85802 Tanytarsus n. sp. near curticornis	+
86100 Chrysops sp	+
95100 Physella sp	+
96264 Planorbella (Pierosoma) pilsbryi	+
96900 Ferrissia sp	+

Station: X02S05

TOWN RUN JUST UPST. GEORGETOWN WWTP

0:00 7/13/16

Rivercode: 10-407-000

River Mile: 0.81

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
35	9	4	1	35		4		Good	LOW

Taxa	Quant/Qual
01801 Turbellaria	+
03600 Oligochaeta	+
05900 Lirceus sp	+
06700 Crangonyx sp	+
07820 Cambarus (Cambarus) sp A	+
11120 Baetis flavistriga	+
13521 Stenonema femoratum	+
17200 Caenis sp	+
21001 Calopterygidae	+
23600 Aeshna sp	+
50315 Chimarra obscura	+
51600 Polycentropus sp	+
52200 Cheumatopsyche sp	+
52530 Hydropsyche depravata group	+
53800 Hydroptila sp	+
57400 Neophylax sp	+
63300 Hydroporini	+
68025 Ectopria sp	+
68075 Psephenus herricki	+
69400 Stenelmis sp	+
71900 Tipula sp	+
77500 Conchapelopia sp	+
78350 Meropelopia sp	+
82820 Cryptochironomus sp	+
83003 Dicrotendipes fumidus	+
83840 Microtendipes pedellus group	+
84315 Phaenopsectra flavipes	+
84450 Polypedilum (Uresipedilum) flavum	+
84750 Stictochironomus sp	+
85500 Paratanytarsus sp	+
85625 Rheotanytarsus sp	+
85800 Tanytarsus sp	+
85818 Tanytarsus glabrescens group sp 4	+
85821 Tanytarsus glabrescens group sp 7	+
95100 Physella sp	+

Station: X02W04

TOWN RUN DST. GEORGETOWN WWTP

0:00 7/13/16

Rivercode: 10-407-000

River Mile: 0.63

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
24	3	0	1	24		0		Low Fair	NORMAL

Taxa	Quant/Qual
01801 Turbellaria	+
03360 Plumatella sp	+
03600 Oligochaeta	+
04666 Helobdella papillata	+
04985 Barbronia weberi	+
05900 Lirceus sp	+
13521 Stenonema femoratum	+
52200 Cheumatopsyche sp	+
52530 Hydropsyche depravata group	+
68025 Ectopria sp	+
69400 Stenelmis sp	+
71900 Tipula sp	+
74100 Simulium sp	+
77500 Conchapelopia sp	+
78350 Meropelopia sp	+
80410 Cricotopus (C.) sp	+
83840 Microtendipes pedellus group	+
84210 Paratendipes albimanus or P. duplicatus	+
84450 Polypedilum (Uresipedilum) flavum	+
85500 Paratanytarsus sp	+
85625 Rheotanytarsus sp	+
85800 Tanytarsus sp	+
95100 Physella sp	+
98600 Sphaerium sp	+

Station: 303601

NACE RUN @ SHAWNEE SP MARINA UPST. DAM

0:00 7/19/16

Rivercode: 10-507-000

River Mile: 0.43

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
45	15	16	6	45		16		Very Good	NORMAL

Taxa	Quant/Qual
01801 Turbellaria	+
01900 Nemertea	+
03600 Oligochaeta	+
05800 Caecidotea sp	+
07840 Cambarus (Cambarus) sciotensis	+
11120 Baetis flavistriga	+
11130 Baetis intercalaris	+
11650 Proclonia sp (w/ hindwing pads)	+
13000 Leucrocota sp	+
13400 Stenacron sp	+
13521 Stenonema femoratum	+
13590 Maccaffertium vicarium	+
14600 Choroterpes basalis	+
16200 Eurylophella sp	+
21001 Calopterygidae	+
25510 Stylogomphus albistylus	+
33100 Leuctra sp	+
36500 Sweltsa sp	+
47600 Sialis sp	+
48610 Nigronia fasciata	+
48620 Nigronia serricornis	+
51600 Polycentropus sp	+
52200 Cheumatopsyche sp	+
57400 Neophylax sp	+
57900 Pycnopsyche sp	+
68075 Psephenus herricki	+
69400 Stenelmis sp	+
71900 Tipula sp	+
71910 Tipula abdominalis	+
77120 Ablabesmyia mallochii	+
77500 Conchapelopia sp	+
77800 Helopelopia sp	+
79400 Zavrelimyia (Z.) sp	+
79720 Diamesa sp	+
82730 Chironomus (C.) decorus group	+
82820 Cryptochironomus sp	+
83040 Dicrotendipes neomodestus	+
83840 Microtendipes pedellus group	+
84210 Paratendipes albimanus or P. duplicatus	+
84440 Polypedilum (Uresipedilum) aviceps	+
84750 Stictochironomus sp	+
85500 Paratanytarsus sp	+
85625 Rheotanytarsus sp	+
85720 Stempellinella fimbriata	+
85800 Tanytarsus sp	+

Station: 303610

TURKEY CREEK DST. WOLFDEN RUN ADJ. SR 125

0:00 7/18/16

Rivercode: 10-508-000

River Mile: 12.90

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
43	18	21	8	43		21		Exceptional	NORMAL
Taxa					Quant/Qual				
01801	Turbellaria				+				
03600	Oligochaeta				+				
05900	Lirceus sp				+				
08201	Orconectes (Procericambarus) cristavarius				+				
11120	Baetis flavistriga				+				
11250	Neocloeon sp				+				
11430	Dipheter hageni				+				
11651	Procloeon sp (w/o hindwing pads)				+				
13000	Leucrocuta sp				+				
13400	Stenacron sp				+				
13521	Stenonema femoratum				+				
13590	Maccaffertium vicarium				+				
14600	Choroterpes basalis				+				
23905	Boyeria grafiana				+				
25510	Stylogomphus albistylus				+				
33100	Leuctra sp				+				
34120	Acroneuria carolinensis				+				
47600	Sialis sp				+				
48610	Nigronia fasciata				+				
48620	Nigronia serricornis				+				
50301	Chimarra aterrima				+				
50410	Dolophilodes distinctus				+				
52200	Cheumatopsyche sp				+				
52315	Diplectrona modesta				+				
53122	Rhyacophila invaria complex				+				
57400	Neophylax sp				+				
57900	Pycnopsyche sp				+				
66200	Cymbiodyta sp				+				
68075	Psephenus herricki				+				
77120	Ablabesmyia mallochi				+				
77500	Conchapelopia sp				+				
77800	Helopelopia sp				+				
79300	Trissopelopia ogemawi				+				
82200	Tvetenia bavarica group				+				
82820	Cryptochironomus sp				+				
83040	Dicrotendipes neomodestus				+				
83840	Microtendipes pedellus group				+				
84210	Paratendipes albimanus or P. duplicatus				+				
84440	Polypedilum (Uresipedilum) aviceps				+				
84460	Polypedilum (P.) fallax group				+				
84750	Stictochironomus sp				+				
85720	Stempellinella fimbriata				+				
85800	Tanytarsus sp				+				

Station: 303609

TURKEY CREEK DST. TURKEY CREEK LAKE

0:00 7/18/16

Rivercode: 10-508-000

River Mile: 10.70

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
50	15	14	2	50		14		Good	NORMAL

Taxa	Quant/Qual
00700 Radiospongilla crateriformis	+
01801 Turbellaria	+
03040 Fredericella sp	+
03600 Oligochaeta	+
05900 Lirceus sp	+
08201 Orconectes (Procericambarus) cristavarius	+
11012 Acentrella nadineae	+
11120 Baetis flavistriga	+
11250 Neocloeon sp	+
13400 Stenacron sp	+
13521 Stenonema femoratum	+
13590 Maccaffertium vicarium	+
17200 Caenis sp	+
21200 Calopteryx sp	+
22300 Argia sp	+
23909 Boyeria vinosa	+
25510 Stylogomphus albistylus	+
27001 Corduliidae	+
33100 Leuctra sp	+
34130 Acroneuria frisoni	+
47600 Sialis sp	+
48610 Nigronia fasciata	+
48620 Nigronia serricornis	+
50301 Chimarra aterrima	+
50315 Chimarra obscura	+
51400 Nyctiophylax sp	+
52200 Cheumatopsyche sp	+
52530 Hydropsyche depravata group	+
59150 Ceraclea resurgens or C. transversa	+
63300 Hydroporini	+
68025 Ectopria sp	+
68075 Psephenus herricki	+
77120 Ablabesmyia mallochi	+
77800 Helopelopia sp	+
78401 Natarsia species A (sensu Roback, 1978)	+
78680 Procladius (Psilotanypus) bellus	+
82300 Xylotopus par	+
83840 Microtendipes pedellus group	+
84060 Parachironomus pectinatellae	+
84210 Paratendipes albimanus or P. duplicatus	+
84450 Polypedilum (Uresipedilum) flavum	+
84750 Stictochironomus sp	+
84800 Tribelos jucundum	+
84888 Xenochironomus xenolabis	+
85625 Rheotanytarsus sp	+
85720 Stempellinella fimbriata	+
85800 Tanytarsus sp	+
96002 Helisoma anceps anceps	+
97601 Corbicula fluminea	+
98600 Sphaerium sp	+

Rivercode: 10-508-000

River Mile: 9.58

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
56	15	13	3	56		13		Good	NORMAL

Taxa	Quant/Qual
00653 Eunapius fragilis	+
01801 Turbellaria	+
01900 Nemertea	+
03121 Paludicella articulata	+
03360 Plumatella sp	+
03600 Oligochaeta	+
08201 Orconectes (Procericambarus) cristavarius	+
11130 Baetis intercalaris	+
13400 Stenacron sp	+
13521 Stenonema femoratum	+
13590 Maccaffertium vicarium	+
17200 Caenis sp	+
18700 Hexagenia sp	+
21001 Calopterygidae	+
22300 Argia sp	+
23804 Basiaeschna janata	+
23905 Boyeria grafiana	+
24900 Gomphus Complex	+
25510 Stylogomphus albistylus	+
27340 Helocordulia uhleri	+
33100 Leuctra sp	+
34120 Acroneuria carolinensis	+
34130 Acroneuria frisoni	+
48410 Corydalus cornutus	+
48610 Nigronia fasciata	+
48620 Nigronia serricornis	+
50315 Chimarra obscura	+
51600 Polycentropus sp	+
52200 Cheumatopsyche sp	+
52530 Hydropsyche depravata group	+
59150 Ceraclea resurgens or C. transversa	+
59724 Triaenodes injustus	+
63300 Hydroporini	+
68075 Psephenus herricki	+
68130 Helichus sp	+
69400 Stenelmis sp	+
71900 Tipula sp	+
74100 Simulium sp	+
74501 Ceratopogonidae	+
77115 Ablabesmyia janta	+
77120 Ablabesmyia mallochii	+
77500 Conchapelopia sp	+
78401 Natarsia species A (sensu Roback, 1978)	+
78655 Procladius (Hilotanypus) sp	+
78680 Procladius (Psilotanypus) bellus	+
82730 Chironomus (C.) decorus group	+
82820 Cryptochironomus sp	+
83300 Glyptotendipes (G.) sp	+
83840 Microtendipes pedellus group	+
84210 Paratendipes albimanus or P. duplicatus	+
84750 Stictochironomus sp	+
84888 Xenochironomus xenolabis	+
85625 Rheotanytarsus sp	+
87540 Hemerodromia sp	+
97601 Corbicula fluminea	+
98100 Musculium sp	+

Station: 200744

TURKEY CREEK UPST. POND LICK RUN @ ST. RT. 125

0:00 8/24/16

Rivercode: 10-508-000

River Mile: 6.70

Sensitive

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Taxa	ICI	Narrative	Flow
46	20	17	0	61	1,009	21	32	Exceptional	0.20 NORMAL

Taxa	Quant/Qual
00401 Spongillidae	+ 85802 Tanytarsus n. sp. near curticornis 20
01320 Hydra sp	4 85821 Tanytarsus glabrescens group sp 7 155
03600 Oligochaeta	152+ 87540 Hemerodromia sp 4
08201 Orconectes (Procericambarus) cristavarius	1+ 95100 Physella sp +
11012 Acentrella nadineae	+ 98600 Sphaerium sp +
11018 Akerpenna macdunnoughi	5+
11120 Baetis flavistriga	+
11130 Baetis intercalaris	+
11650 Proclonia sp (w/ hindwing pads)	3+
11651 Proclonia sp (w/o hindwing pads)	23+
12200 Isonychia sp	+
13400 Stenacron sp	+
13521 Stenonema femoratum	+
13590 Maccaffertium vicarium	12+
14600 Choroterpes basalis	+
16200 Eurylophella sp	7
17200 Caenis sp	+
18600 Ephemera sp	+
22300 Argia sp	7+
26600 Didymops transversa	+
27500 Somatochlora sp	+
34120 Acroneuria carolinensis	+
34130 Acroneuria frisoni	10+
47600 Sialis sp	+
48410 Corydalus cornutus	+
48620 Nigronia serricornis	1+
49200 Climacia areolaris	+
50301 Chimarra aterrima	+
50315 Chimarra obscura	+
51400 Nyctiophylax sp	+
51600 Polycentropus sp	+
52200 Cheumatopsyche sp	+
63300 Hydroporini	+
68075 Psephenus herricki	+
68130 Helichus sp	+
74501 Ceratopogonidae	+
77120 Ablabesmyia mallochi	+
77500 Conchapelopia sp	20+
77800 Helopelopia sp	13
78140 Labrundinia pilosella	20
78450 Nilotanypus fimbriatus	2
78510 Zavrelimyia (Paramerina) sp 1	13
80370 Corynoneura lobata	50
80410 Cricotopus (C.) sp	20+
81280 Nanocladius (Plecopteracoluthus) downesi	+
82141 Thienemanniella xena	2
84210 Paratendipes albimanus or P. duplicatus	7+
84460 Polypedilum (P.) fallax group	7
84469 Polypedilum (P.) illinoense group	+
84700 Stenochironomus sp	+
84750 Stictochironomus sp	+
85500 Paratanytarsus sp	7
85615 Rheotanytarsus pellucidus	13
85625 Rheotanytarsus sp	417+
85720 Stempellinella fimbriata	14
85801 Tanytarsus sp 1	+

Station: X04P02

TURKEY CREEK AT FRIENDSHIP @ U.S. RT. 52

0:00 8/24/16

Rivercode: 10-508-000

River Mile: 4.13

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
47	17	18	1	47		18		Very Good	NORMAL

Taxa	Quant/Qual
00653 Eunapius fragilis	+
01900 Nemertea	+
03600 Oligochaeta	+
08201 Orconectes (Procericambarus) cristavarius	+
11012 Acentrella nadineae	+
11130 Baetis intercalaris	+
11250 Neocloeon sp	+
11650 Procloeon sp (w/ hindwing pads)	+
11651 Procloeon sp (w/o hindwing pads)	+
12200 Isonychia sp	+
13400 Stenacron sp	+
13521 Stenonema femoratum	+
13590 Maccaffertium vicarium	+
14950 Leptophlebia sp or Paraleptophlebia sp	+
16200 Eurylophella sp	+
17200 Caenis sp	+
18600 Ephemera sp	+
21200 Calopteryx sp	+
22001 Coenagrionidae	+
22300 Argia sp	+
25510 Stylogomphus albistylus	+
26700 Macromia sp	+
33100 Leuctra sp	+
34130 Acroneuria frisoni	+
47600 Sialis sp	+
48410 Corydalus cornutus	+
48620 Nigronia serricornis	+
49200 Climacia areolaris	+
50315 Chimarra obscura	+
51600 Polycentropus sp	+
60300 Dineutus sp	+
63300 Hydroporini	+
68075 Psephenus herricki	+
69400 Stenelmis sp	+
70600 Antocha sp	+
77800 Helopelopia sp	+
78655 Procladius (Holotanypus) sp	+
81280 Nanocladius (Plecopteracoluthus) downesi	+
81825 Rheocricotopus (Psilocricotopus) robacki	+
82600 Axarus sp	+
83840 Microtendipes pedellus group	+
84700 Stenochironomus sp	+
84750 Stictochironomus sp	+
85821 Tanytarsus glabrescens group sp 7	+
95100 Physella sp	+
96002 Helisoma anceps anceps	+
97601 Corbicula fluminea	+

Station: 302183

ODELL CREEK W OF FRIENDSHIP @ DRIVEWAY OFF ODELL CREEK RD.

0:00 6/25/13

Rivercode: 10-516-000

River Mile: 0.30

Sensitive

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Taxa	ICI	Narrative	Flow
41	15	15	2	41		15		Very Good	LOW

Taxa	Quant/Qual
03600 Oligochaeta	+
05800 Caecidotea sp	+
05900 Lirceus sp	+
08200 Orconectes sp	+
11018 Acerpenna macdunnoughi	+
11120 Baetis flavistriga	+
11650 Proclotron sp (w/ hindwing pads)	+
11651 Proclotron sp (w/o hindwing pads)	+
13000 Leucrocota sp	+
13521 Stenonema femoratum	+
13590 Maccaffertium vicarium	+
14600 Choroterpes basalis	+
17200 Caenis sp	+
21200 Calopteryx sp	+
25510 Stylogomphus albistylus	+
27500 Somatochlora sp	+
33100 Leuctra sp	+
34130 Acroneuria frisoni	+
34500 Perlesta sp	+
47600 Sialis sp	+
51600 Polycentropus sp	+
52200 Cheumatopsyche sp	+
59300 Mystacides sp	+
68075 Psephenus herricki	+
69400 Stenelmis sp	+
70600 Antocha sp	+
71900 Tipula sp	+
77120 Ablabesmyia mallochii	+
77750 Thienemannimyia sp	+
77800 Helopelopia sp	+
80363 Corynoneura sp. 12	+
82730 Chironomus (C.) decorus group	+
83840 Microtendipes pedellus group	+
84210 Paratendipes albimanus or P. duplicatus	+
84440 Polypedilum (Uresipedilum) aviceps	+
84750 Stictochironomus sp	+
85625 Rheotanytarsus sp	+
85800 Tanytarsus sp	+
85821 Tanytarsus glabrescens group sp 7	+
87540 Hemerodromia sp	+
95100 Physella sp	+

Station: 302184

POND LICK RUN NW OF FRIENDSHIP, NEAR MOUTH ADJ. SHAWNEE RD.

0:00 6/25/13

Rivercode: 10-517-000

River Mile: 0.20

Sensitive

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Taxa	ICI	Narrative	Flow
36	18	17	2	36		17		Exceptional	LOW

Taxa	Quant/Qual
01801 Turbellaria	+
05900 Lirceus sp	+
07840 Cambarus (Cambarus) sciotensis	+
08201 Orconectes (Procericambarus) cristavarius	+
11120 Baetis flavistriga	+
11130 Baetis intercalaris	+
11250 Neocloeon sp	+
11430 Diphetor hageni	+
11651 Procloeon sp (w/o hindwing pads)	+
13000 Leucrocuta sp	+
13521 Stenonema femoratum	+
13590 Maccaffertium vicarium	+
14600 Choroterpes basalis	+
15000 Paraleptophlebia sp	+
16200 Eurylophella sp	+
23900 Boyeria sp	+
33100 Leuctra sp	+
34100 Acroneuria sp	+
34500 Perlesta sp	+
48620 Nigronia serricornis	+
50301 Chimarra aterrima	+
52200 Cheumatopsyche sp	+
53106 Rhyacophila glaberrima	+
57900 Pycnopsyche sp	+
63300 Hydroporini	+
68075 Psephenus herricki	+
68708 Dubiraphia vittata group	+
71100 Hexatoma sp	+
77120 Ablabesmyia mallochii	+
77500 Conchapelopia sp	+
77800 Helopelopia sp	+
83840 Microtendipes pedellus group	+
83860 Microtendipes rydalensis	+
84210 Paratendipes albimanus or P. duplicatus	+
84800 Tribelos jucundum	+
85720 Stempellinella fimbriata	+

Station: 302770

ROCK LICK UPST. NF 1

0:00 8/19/14

Rivercode: 10-518-000

River Mile: 0.50

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
31	11	18	10	31		18		Very Good	INTERSTITI

Taxa	Quant/Qual
05900 Lirceus sp	+
07840 Cambarus (Cambarus) sciotensis	+
11430 Diphetor hageni	+
11650 Procloeon sp (w/ hindwing pads)	+
13400 Stenacron sp	+
16200 Eurylophella sp	+
23905 Boyeria grafiana	+
25510 Stylogomphus albistylus	+
33100 Leuctra sp	+
45300 Sigara sp	+
47600 Sialis sp	+
48610 Nigronia fasciata	+
50410 Dolophilodes distinctus	+
50552 Wormaldia moesta	+
51600 Polycentropus sp	+
52315 Diplectrona modesta	+
57900 Pycnopsyche sp	+
58020 Lepidostoma sp	+
63300 Hydroporini	+
68075 Psephenus herricki	+
71100 Hexatoma sp	+
71800 Pseudolimnophila sp	+
72340 Dixella sp	+
77500 Conchapelopia sp	+
79300 Trissopelopia ogemawi	+
79400 Zavrelimyia (Z.) sp	+
82820 Cryptochironomus sp	+
83840 Microtendipes pedellus group	+
83860 Microtendipes rydalensis	+
84210 Paratendipes albimanus or P. duplicatus	+
85400 Micropsectra sp	+

Station: 302185

BRUSH FORK JUST W OF POND LICK LAKE @ MOUTH

0:00 10/9/13

Rivercode: 10-519-000

River Mile: 0.01

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
22	10	11	6	22		11		Good	LOW

Taxa	Quant/Qual
03600 Oligochaeta	+
05900 Lirceus sp	+
06700 Crangonyx sp	+
07860 Cambarus (Puncticambarus) robustus	+
13000 Leucrocuta sp	+
13400 Stenacron sp	+
13590 Maccaffertium vicarium	+
14950 Leptophlebia sp or Paraleptophlebia sp	+
16200 Eurylophella sp	+
23909 Boyeria vinosa	+
33100 Leuctra sp	+
34120 Acroneuria carolinensis	+
36500 Sweltsa sp	+
47600 Sialis sp	+
48610 Nigronia fasciata	+
50410 Dolophilodes distinctus	+
52315 Diplectrona modesta	+
68075 Psephenus herricki	+
71100 Hexatoma sp	+
81600 Parachaetocladius sp	+
83840 Microtendipes pedellus group	+
84800 Tribelos jucundum	+

Station: 302186

WES RUN NW OF FRIENDSHIP, NEAR MOUTH ADJ. ODELL CEMETERY RD.

0:00 10/9/13

Rivercode: 10-520-000

River Mile: 0.01

Sensitive

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Taxa	ICI	Narrative	Flow
12	2	5	2	12		5		Fair	LOW
Taxa					Quant/Qual				
01801	Turbellaria				+				
03600	Oligochaeta				+				
05900	Lirceus sp				+				
06700	Crangonyx sp				+				
07820	Cambarus (Cambarus) sp A				+				
07840	Cambarus (Cambarus) sciotensis				+				
16200	Eurylophella sp				+				
48610	Nigronia fasciata				+				
52315	Diplectrona modesta				+				
63300	Hydroporini				+				
68075	Psephenus herricki				+				
71100	Hexatoma sp				+				

Station: 302187

HARBER FORK NEAR CAMP OYO, NEAR MOUTH @ SHAWNEE RD.

0:00 6/25/13

Rivercode: 10-523-000

River Mile: 0.07

Sensitive

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
39	21	20	3	39		20		Exceptional	INTERSTITI

Taxa	Quant/Qual
03600 Oligochaeta	+
05900 Lirceus sp	+
07840 Cambarus (Cambarus) sciotensis	+
11012 Acentrella nadineae	+
11120 Baetis flavistriga	+
11130 Baetis intercalaris	+
11250 Neocloeon sp	+
11430 Diphetor hageni	+
11651 Procloeon sp (w/o hindwing pads)	+
13000 Leucrocuta sp	+
13400 Stenacron sp	+
13521 Stenonema femoratum	+
13590 Maccaffertium vicarium	+
14600 Choroterpes basalis	+
14900 Leptophlebia sp	+
16200 Eurylophella sp	+
21200 Calopteryx sp	+
23900 Boyeria sp	+
33100 Leuctra sp	+
34120 Acroneuria carolinensis	+
34300 Neoperla sp	+
34500 Perlesta sp	+
48610 Nigronia fasciata	+
50301 Chimarra aterrima	+
51600 Polycentropus sp	+
52200 Cheumatopsyche sp	+
57900 Pycnopsyche sp	+
63300 Hydroporini	+
68075 Psephenus herricki	+
68708 Dubiraphia vittata group	+
71100 Hexatoma sp	+
74501 Ceratopogonidae	+
77120 Ablabesmyia mallochi	+
77800 Helopelopia sp	+
79400 Zavrelimyia (Z.) sp	+
83820 Microtendipes "caelum" (sensu Simpson & Bode, 1980)	+
83860 Microtendipes rydalensis	+
84470 Polypedilum (P.) illinoense	+
85500 Paratanytarsus sp	+

Station: 302188

MACKLETREE RUN JUST UPST. ROOSEVELT LAKE @ MACKLETREE RD.

0:00 6/25/13

Rivercode: 10-524-000

River Mile: 0.43

Sensitive

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
37	16	18	1	37		18		Very Good	LOW

Taxa	Quant/Qual
03360 Plumatella sp	+
03600 Oligochaeta	+
05900 Lirceus sp	+
07840 Cambarus (Cambarus) sciotensis	+
11012 Acentrella nadineae	+
11018 Acerpenna macdunnoughi	+
11130 Baetis intercalaris	+
11250 Neocloeon sp	+
11430 Diphetor hageni	+
13000 Leucrocuta sp	+
13400 Stenacron sp	+
13590 Maccaffertium vicarium	+
14600 Choroterpes basalis	+
17200 Caenis sp	+
24900 Gomphus Complex	+
33100 Leuctra sp	+
34300 Neoperla sp	+
34500 Perlesta sp	+
47600 Sialis sp	+
48410 Corydalus cornutus	+
48620 Nigronia serricornis	+
51400 Nyctiophylax sp	+
52200 Cheumatopsyche sp	+
57900 Pycnopsyche sp	+
68075 Psephenus herricki	+
69400 Stenelmis sp	+
70600 Antocha sp	+
71900 Tipula sp	+
77750 Thienemannimyia sp	+
77800 Helopelopia sp	+
79085 Telopelopia okoboji	+
81530 Orthocladius (Symposiocladius) lignicola	+
82200 Tvetenia bavarica group	+
83040 Dicrotendipes neomodestus	+
83840 Microtendipes pedellus group	+
84210 Paratendipes albimanus or P. duplicatus	+
85802 Tanytarsus n. sp. near curticornis	+

Station: 302189

LAMPBLACK RUN JUST UPST. TURKEY CREEK LAKE @ PARKING LOT

0:00 6/25/13

Rivercode: 10-526-000

River Mile: 0.10

Sensitive

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Taxa	ICI	Narrative	Flow
33	14	12	4	33		12		Good	LOW

Taxa	Quant/Qual
03600 Oligochaeta	+
05900 Lirceus sp	+
07840 Cambarus (Cambarus) sciotensis	+
11250 Neocloeon sp	+
11651 Procloeon sp (w/o hindwing pads)	+
13000 Leucrocuta sp	+
13400 Stenacron sp	+
13521 Stenonema femoratum	+
14600 Choroterpes basalis	+
14900 Leptophlebia sp	+
16200 Eurylophella sp	+
17200 Caenis sp	+
23905 Boyeria grafiana	+
33100 Leuctra sp	+
34500 Perlesta sp	+
47600 Sialis sp	+
50301 Chimarra aterrima	+
52200 Cheumatopsyche sp	+
57900 Pycnopsyche sp	+
68075 Psephenus herricki	+
68130 Helichus sp	+
77120 Ablabesmyia mallochi	+
77500 Conchapelopia sp	+
79400 Zavrelimyia (Z.) sp	+
81650 Parametriocnemus sp	+
82141 Thienemanniella xena	+
82820 Cryptochironomus sp	+
83840 Microtendipes pedellus group	+
84210 Paratendipes albimanus or P. duplicatus	+
84450 Polypedilum (Uresipedilum) flavum	+
84800 Tribelos jucundum	+
85615 Rheotanytarsus pellucidus	+
85814 Tanytarsus glabrescens group	+

Station: 302190

OLD LADE RUN NEAR MOUTH, ADJ. BIG RUN RD.

0:00 6/25/13

Rivercode: 10-527-000

River Mile: 0.20

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
45	22	20	1	45		20		Exceptional	INTERSTITI

Taxa	Quant/Qual
03600 Oligochaeta	+
05900 Lirceus sp	+
07840 Cambarus (Cambarus) sciotensis	+
08601 Hydrachnidia	+
11012 Acentrella nadineae	+
11018 Acerpenna macdunnoughi	+
11250 Neocloeon sp	+
11430 Diphetor hageni	+
11650 Procloeon sp (w/ hindwing pads)	+
11651 Procloeon sp (w/o hindwing pads)	+
13000 Leucrocuta sp	+
13400 Stenacron sp	+
13521 Stenonema femoratum	+
13590 Maccaffertium vicarium	+
14600 Choroterpes basalis	+
14900 Leptophlebia sp	+
17200 Caenis sp	+
33100 Leuctra sp	+
34100 Acroneuria sp	+
34120 Acroneuria carolinensis	+
34300 Neoperla sp	+
34500 Perlesta sp	+
50301 Chimarra aterrima	+
52200 Cheumatopsyche sp	+
53800 Hydroptila sp	+
57900 Pycnopsyche sp	+
63300 Hydroporini	+
68075 Psephenus herricki	+
68130 Helichus sp	+
69400 Stenelmis sp	+
71100 Hexatoma sp	+
71900 Tipula sp	+
72340 Dixella sp	+
72700 Anopheles sp	+
77120 Ablabesmyia mallochi	+
77800 Helopelopia sp	+
78500 Zavrelimyia (Paramerina) fragilis	+
78601 Pentaneura inyoensis	+
79085 Telopelopia okoboji	+
82730 Chironomus (C.) decorus group	+
83820 Microtendipes "caelum" (sensu Simpson & Bode, 1980)	+
83840 Microtendipes pedellus group	+
85800 Tanytarsus sp	+
85818 Tanytarsus glabrescens group sp 4	+
86100 Chrysops sp	+

Station: 302768

WOLFDEN RUN UPST. WOLFDEN LAKE

0:00 8/19/14

Rivercode: 10-530-000

River Mile: 0.50

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
30	10	10	6	30		10		Good	INTERSTITI

Taxa	Quant/Qual
03600 Oligochaeta	+
05900 Lirceus sp	+
06700 Crangonyx sp	+
07820 Cambarus (Cambarus) sp A	+
11250 Neocloeon sp	+
11650 Procloeon sp (w/ hindwing pads)	+
13400 Stenacron sp	+
15000 Paraleptophlebia sp	+
16200 Eurylophella sp	+
33100 Leuctra sp	+
45300 Sigara sp	+
47600 Sialis sp	+
48610 Nigronia fasciata	+
52315 Diplectrona modesta	+
57400 Neophylax sp	+
57900 Pycnopsyche sp	+
58020 Lepidostoma sp	+
62200 Copelatus sp	+
63300 Hydroporini	+
63700 Ilybius sp	+
67100 Hydrobius sp	+
68075 Psephenus herricki	+
72340 Dixella sp	+
72900 Culex sp	+
79400 Zavrelimyia (Z.) sp	+
82070 Synorthocladius semivirens	+
83840 Microtendipes pedellus group	+
84210 Paratendipes albimanus or P. duplicatus	+
84469 Polypedilum (P.) illinoense group	+
85501 Paratanytarsus longistilus	+

Appendix C

Macroinvertebrate ICI Scores and Metrics

ICI metric scores from macroinvertebrate sampling sites (quantitative) in the SWORT basin study area, 2016

Stream	Stream Code	RM	DA	Number of:				Percent:					Qual EPT	ECO	ICI Score
				Taxa Count	Mayfly Taxa	Caddisfly Taxa	Dipteran Taxa	Mayflies	Caddisflies	Tanytarsini	Other Dipterans/ Noninsects	Tolerant Organisms			
Eagle Creek	10-100	14	107	50(6)	8(4)	5(6)	28(6)	30.0(4)	3.5(2)	9.6(2)	42.9(4)	10.3(4)	20(6)	IP	42
East Fork Eagle Creek	10-110	4.3	36	25(4)	9(6)	3(4)	10(2)	53.3(6)	10.2(6)	27.4(6)	8.7(6)	0.3(6)	18(6)	IP	52
East Fork Eagle Creek	10-110	0.8	48	41(6)	9(6)	4(6)	20(6)	53.1(6)	9.4(4)	15.6(4)	19.3(6)	1.3(6)	22(6)	IP	56
Turkey Creek	10-508	6.7	26	28(4)	5(4)	0(0)	17(4)	5.0(2)	0.0(0)	62.0(6)	31.2(4)	15.8(4)	20(6)	WAP	32
West Fork Eagle Creek	10-120	7.4	28	47(6)	5(4)	4(6)	26(6)	7.1(2)	11.4(6)	9.0(2)	62.4(2)	6.5(6)	13(6)	IP	46
West Fork Eagle Creek	10-120	3.3	54	41(6)	6(4)	5(6)	19(4)	34.4(6)	21.4(6)	0.7(2)	38.6(4)	0.0(6)	18(6)	IP	50
Straight Creek	10-300	2.8	57	40(6)	7(4)	4(6)	18(4)	36.0(6)	14.1(6)	11.7(2)	35.3(4)	1.4(6)	21(6)	IP	50

Appendix D

Fish Species and Abundance for Each Sampling Location

River Code: 10-038-000	Stream: CORNICK RUN	Sample Date: 2017-06-21
River Mile: 0.7	Location: CORNICK RUN ADJ. OLD U.S. RT. 68 (RD. 30)	
Time Fished: 1800 sec	Drainage: 2.1 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: F

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Golden Redhorse		I	S	M	2	4.00	0.39	0.00	#Error	0.00
Northern Hog Sucker		I	S	M	1	2.00	0.20	0.00	#Error	0.00
White Sucker		O	S	T	14	28.00	2.76	0.00	#Error	0.00
Western Blacknose Dace		G	S	T	16	32.00	3.15	0.00	#Error	0.00
Creek Chub		G	N	T	139	278.00	27.36	0.00	#Error	0.00
Emerald Shiner		I	M	N	1	2.00	0.20	0.00	#Error	0.00
Striped Shiner		I	S	N	10	20.00	1.97	0.00	#Error	0.00
Silverjaw Minnow		I	M	N	1	2.00	0.20	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	85	170.00	16.73	0.00	#Error	0.00
Central Stoneroller		H	N	N	176	352.00	34.65	0.00	#Error	0.00
Channel Catfish			C	N	1	2.00	0.20	0.00	#Error	0.00
Western Mosquitofish		I	N	N	1	2.00	0.20	0.00	#Error	0.00
Rock Bass		C	C	N	1	2.00	0.20	0.00	#Error	0.00
Smallmouth Bass		C	C	M	2	4.00	0.39	0.00	#Error	0.00
Spotted Bass		C	C	N	2	4.00	0.39	0.00	#Error	0.00
Green Sunfish		I	C	T	9	18.00	1.77	0.00	#Error	0.00
Bluegill Sunfish		I	C	P	4	8.00	0.79	0.00	#Error	0.00
Longear Sunfish		I	C	M	13	26.00	2.56	0.00	#Error	0.00
Logperch		I	S	M	1	2.00	0.20	0.00	#Error	0.00
Rainbow Darter		I	S	M	29	58.00	5.71	0.00	#Error	0.00
Data Totals:					508	1016.00		0.00		
Number of Species:					20					
Number of Hybrids:					0					

River Code: 10-040-000	Stream: REDOAK CREEK	Sample Date: 2015-06-18
River Mile: 7.2	Location: REDOAK CREEK @ RD. 231A	
Time Fished: 2100 sec	Drainage: 4.0 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
White Sucker		O	S	T	5	10.00	1.46	0.00	#Error	0.00
Creek Chub		G	N	T	16	32.00	4.68	0.00	#Error	0.00
Fathead Minnow		O	C	T	65	130.00	19.01	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	45	90.00	13.16	0.00	#Error	0.00
Central Stoneroller		H	N	N	12	24.00	3.51	0.00	#Error	0.00
Green Sunfish		I	C	T	40	80.00	11.70	0.00	#Error	0.00
Bluegill Sunfish		I	C	P	1	2.00	0.29	0.00	#Error	0.00
Johnny Darter		I	C	N	148	296.00	43.27	0.00	#Error	0.00
Fantail Darter		I	C	N	10	20.00	2.92	0.00	#Error	0.00
Data Totals:					342	684.00		0.00		
Number of Species:					9					
Number of Hybrids:					0					

River Code: 10-040-000	Stream: REDOAK CREEK	Sample Date: 2015-06-18
River Mile: 6.3	Location: REDOAK CREEK DST. W. FK. REDOAK CREEK	
Time Fished: 1800 sec	Drainage: 8.7 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
White Sucker		O	S	T	16	32.00	1.74	0.00	#Error	0.00
Creek Chub		G	N	T	128	256.00	13.94	0.00	#Error	0.00
Striped Shiner		I	S	N	6	12.00	0.65	0.00	#Error	0.00
Fathead Minnow		O	C	T	30	60.00	3.27	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	37	74.00	4.03	0.00	#Error	0.00
Central Stoneroller		H	N	N	139	278.00	15.14	0.00	#Error	0.00
Black Bullhead		I	C	P	11	22.00	1.20	0.00	#Error	0.00
Green Sunfish		I	C	T	346	692.00	37.69	0.00	#Error	0.00
Bluegill Sunfish		I	C	P	13	26.00	1.42	0.00	#Error	0.00
Johnny Darter		I	C	N	87	174.00	9.48	0.00	#Error	0.00
Greenside Darter		I	S	M	5	10.00	0.54	0.00	#Error	0.00
Rainbow Darter		I	S	M	20	40.00	2.18	0.00	#Error	0.00
Fantail Darter		I	C	N	80	160.00	8.71	0.00	#Error	0.00
Data Totals:					918	1836.00		0.00		
Number of Species:					13					
Number of Hybrids:					0					

River Code: 10-040-000	Stream: REDOAK CREEK	Sample Date: 2015-07-07
River Mile: 2.3	Location: RED OAK CREEK AT STRINGTOWN @ RIPLEY RD.	
Time Fished: 2585 sec	Drainage: 16.2 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribes	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Northern Hog Sucker		I	S	M	13	26.00	2.07	0.00	#Error	0.00
White Sucker		O	S	T	3	6.00	0.48	0.00	#Error	0.00
Creek Chub		G	N	T	25	50.00	3.97	0.00	#Error	0.00
Emerald Shiner		I	M	N	30	60.00	4.77	0.00	#Error	0.00
Scarlet Shiner		I	S	M	11	22.00	1.75	0.00	#Error	0.00
Striped Shiner		I	S	N	5	10.00	0.79	0.00	#Error	0.00
Spotfin Shiner		I	M	N	4	8.00	0.64	0.00	#Error	0.00
Mimic Shiner		I	M	I	61	122.00	9.70	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	121	242.00	19.24	0.00	#Error	0.00
Central Stoneroller		H	N	N	87	174.00	13.83	0.00	#Error	0.00
Yellow Bullhead		I	C	T	4	8.00	0.64	0.00	#Error	0.00
Brown Bullhead		I	C	T	9	18.00	1.43	0.00	#Error	0.00
Rock Bass		C	C	N	4	8.00	0.64	0.00	#Error	0.00
Smallmouth Bass		C	C	M	10	20.00	1.59	0.00	#Error	0.00
Warmouth Sunfish		C	C	N	1	2.00	0.16	0.00	#Error	0.00
Green Sunfish		I	C	T	111	222.00	17.65	0.00	#Error	0.00
Bluegill Sunfish		I	C	P	5	10.00	0.79	0.00	#Error	0.00
Orangespotted Sunfish		I	C	N	4	8.00	0.64	0.00	#Error	0.00
Longear Sunfish		I	C	M	37	74.00	5.88	0.00	#Error	0.00
Logperch		I	S	M	1	2.00	0.16	0.00	#Error	0.00
Johnny Darter		I	C	N	6	12.00	0.95	0.00	#Error	0.00
Greenside Darter		I	S	M	38	76.00	6.04	0.00	#Error	0.00
Rainbow Darter		I	S	M	24	48.00	3.82	0.00	#Error	0.00
Fantail Darter		I	C	N	15	30.00	2.38	0.00	#Error	0.00
Data Totals:					629	1258.00		0.00		
Number of Species:					24					
Number of Hybrids:					0					

River Code: 10-041-000	Stream: WEST FORK REDOAK CREEK	Sample Date: 2015-07-07
River Mile: 0.1	Location: W. FK. REDOAK CREEK @ END OF BEALER RD. (RD. 231)	
Time Fished: 2331 sec	Drainage: 3.9 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
White Sucker		O	S	T	1	2.00	0.33	0.00	#Error	0.00
Creek Chub		G	N	T	202	404.00	66.67	0.00	#Error	0.00
Fathead Minnow		O	C	T	7	14.00	2.31	0.00	#Error	0.00
Central Stoneroller		H	N	N	62	124.00	20.46	0.00	#Error	0.00
Green Sunfish		I	C	T	25	50.00	8.25	0.00	#Error	0.00
Johnny Darter		I	C	N	6	12.00	1.98	0.00	#Error	0.00
Data Totals:					303	606.00		0.00		
Number of Species:					6					
Number of Hybrids:					0					

River Code: 10-043-000	Stream: THREEMILE CREEK	Sample Date: 2015-08-17
River Mile: 11.1	Location: BIG THREEMILE CREEK @ ROUSH HILL RD. (RD. 20)	
Time Fished: 2200 sec	Drainage: 5.8 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
White Sucker		O	S	T	133	266.00	17.90	0.00	#Error	0.00
Creek Chub		G	N	T	162	324.00	21.80	0.00	#Error	0.00
Scarlet Shiner		I	S	M	21	42.00	2.83	0.00	#Error	0.00
Silverjaw Minnow		I	M	N	3	6.00	0.40	0.00	#Error	0.00
Fathead Minnow		O	C	T	4	8.00	0.54	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	73	146.00	9.83	0.00	#Error	0.00
Central Stoneroller		H	N	N	139	278.00	18.71	0.00	#Error	0.00
Yellow Bullhead		I	C	T	3	6.00	0.40	0.00	#Error	0.00
Largemouth Bass		C	C	N	1	2.00	0.13	0.00	#Error	0.00
Green Sunfish		I	C	T	1	2.00	0.13	0.00	#Error	0.00
Green Sunfish		I	C	T	81	162.00	10.90	0.00	#Error	0.00
Bluegill Sunfish		I	C	P	3	6.00	0.40	0.00	#Error	0.00
Johnny Darter		I	C	N	43	86.00	5.79	0.00	#Error	0.00
Fantail Darter		I	C	N	76	152.00	10.23	0.00	#Error	0.00
Data Totals:					743	1486.00		0.00		
Number of Species:					14					
Number of Hybrids:					0					

River Code: 10-043-000	Stream: THREEMILE CREEK	Sample Date: 2015-08-10
River Mile: 8.1	Location: BIG THREEMILE CREEK @ ST. RT. 41	
Time Fished: 1800 sec	Drainage: 11.3 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
White Sucker		O	S	T	39	78.00	1.44	0.00	0.00	0.00
Creek Chub		G	N	T	247	494.00	9.10	3.82	14.01	7.73
Scarlet Shiner		I	S	M	15	30.00	0.55	0.00	0.00	0.00
Silverjaw Minnow		I	M	N	330	660.00	12.16	0.80	2.94	1.21
Fathead Minnow		O	C	T	182	364.00	6.71	0.91	3.34	2.50
Bluntnose Minnow		O	C	T	400	800.00	14.74	2.32	8.51	2.90
Central Stoneroller		H	N	N	1243	2486.00	45.80	19.40	71.20	7.80
Yellow Bullhead		I	C	T	3	6.00	0.11	0.00	0.00	0.00
Green Sunfish		I	C	T	19	38.00	0.70	0.00	0.00	0.00
Green SF x Bluegill SF				N	4	8.00	0.15	0.00	0.00	0.00
Johnny Darter		I	C	N	93	186.00	3.43	0.00	0.00	0.00
Rainbow Darter		I	S	M	1	2.00	0.04	0.00	0.00	0.00
Fantail Darter		I	C	N	138	276.00	5.08	0.00	0.00	0.00
Data Totals:					2714	5428.00		27.25		
Number of Species:					13					
Number of Hybrids:					1					

River Code: 10-043-000	Stream: THREEMILE CREEK	Sample Date: 2015-08-10
River Mile: 4.2	Location: BIG THREEMILE CREEK NE OF ABERDEEN @ ST. RT. 763	
Time Fished: 2620 sec	Drainage: 19.7 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Northern Hog Sucker		I	S	M	15	30.00	1.39	0.00	#Error	0.00
White Sucker		O	S	T	9	18.00	0.83	0.00	#Error	0.00
Creek Chub		G	N	T	51	102.00	4.71	0.00	#Error	0.00
Emerald Shiner		I	M	N	17	34.00	1.57	0.00	#Error	0.00
Scarlet Shiner		I	S	M	18	36.00	1.66	0.00	#Error	0.00
Striped Shiner		I	S	N	218	436.00	20.15	0.00	#Error	0.00
Mimic Shiner		I	M	I	4	8.00	0.37	0.00	#Error	0.00
Silverjaw Minnow		I	M	N	2	4.00	0.18	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	144	288.00	13.31	0.00	#Error	0.00
Central Stoneroller		H	N	N	300	600.00	27.73	0.00	#Error	0.00
Yellow Bullhead		I	C	T	3	6.00	0.28	0.00	#Error	0.00
Rock Bass		C	C	N	6	12.00	0.55	0.00	#Error	0.00
Smallmouth Bass		C	C	M	5	10.00	0.46	0.00	#Error	0.00
Largemouth Bass		C	C	N	1	2.00	0.09	0.00	#Error	0.00
Green Sunfish		I	C	T	23	46.00	2.13	0.00	#Error	0.00
Bluegill Sunfish		I	C	P	8	16.00	0.74	0.00	#Error	0.00
Longear Sunfish		I	C	M	36	72.00	3.33	0.00	#Error	0.00
Logperch		I	S	M	4	8.00	0.37	0.00	#Error	0.00
Johnny Darter		I	C	N	3	6.00	0.28	0.00	#Error	0.00
Greenside Darter		I	S	M	55	110.00	5.08	0.00	#Error	0.00
Rainbow Darter		I	S	M	107	214.00	9.89	0.00	#Error	0.00
Fantail Darter		I	C	N	53	106.00	4.90	0.00	#Error	0.00
Data Totals:					1082	2164.00		0.00		
Number of Species:					22					
Number of Hybrids:					0					

River Code: 10-044-000	Stream: SLICKAWAY RUN	Sample Date: 2015-07-21
River Mile: 0.1	Location: SLICKAWAY RUN @ STRINGTOWN RD. (RD. 251)	
Time Fished: 2581 sec	Drainage: 1.3 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
White Sucker		O	S	T	7	14.00	3.76	0.00	#Error	0.00
Creek Chub		G	N	T	95	190.00	51.08	0.00	#Error	0.00
Striped Shiner		I	S	N	4	8.00	2.15	0.00	#Error	0.00
Fathead Minnow		O	C	T	2	4.00	1.08	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	15	30.00	8.06	0.00	#Error	0.00
Central Stoneroller		H	N	N	30	60.00	16.13	0.00	#Error	0.00
Green Sunfish		I	C	T	2	4.00	1.08	0.00	#Error	0.00
Longear Sunfish		I	C	M	1	2.00	0.54	0.00	#Error	0.00
Rainbow Darter		I	S	M	2	4.00	1.08	0.00	#Error	0.00
Fantail Darter		I	C	N	28	56.00	15.05	0.00	#Error	0.00
Data Totals:					186	372.00		0.00		
Number of Species:					10					
Number of Hybrids:					0					

River Code: 10-047-000	Stream: ELLIS RUN	Sample Date: 2015-07-16
River Mile: 0.1	Location: ELLIS RUN @ ELLIS RUN RD. (RD. 44) NR. ELLSBERRY	
Time Fished: 2828 sec	Drainage: 2.1 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Northern Hog Sucker		I	S	M	1	2.00	0.27	0.00	#Error	0.00
White Sucker		O	S	T	14	28.00	3.71	0.00	#Error	0.00
Creek Chub		G	N	T	102	204.00	27.06	0.00	#Error	0.00
Striped Shiner		I	S	N	17	34.00	4.51	0.00	#Error	0.00
Silverjaw Minnow		I	M	N	6	12.00	1.59	0.00	#Error	0.00
Fathead Minnow		O	C	T	1	2.00	0.27	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	37	74.00	9.81	0.00	#Error	0.00
Central Stoneroller		H	N	N	110	220.00	29.18	0.00	#Error	0.00
Green Sunfish		I	C	T	8	16.00	2.12	0.00	#Error	0.00
Bluegill Sunfish		I	C	P	5	10.00	1.33	0.00	#Error	0.00
Longear Sunfish		I	C	M	1	2.00	0.27	0.00	#Error	0.00
Rainbow Darter		I	S	M	51	102.00	13.53	0.00	#Error	0.00
Fantail Darter		I	C	N	24	48.00	6.37	0.00	#Error	0.00
Data Totals:					377	754.00		0.00		
Number of Species:					13					
Number of Hybrids:					0					

River Code: 10-048-000	Stream: MORLEY RUN	Sample Date: 2015-07-16
River Mile: 0.1	Location: MEFFORDS RUN ADJ. MEFFORDS RUN RD. (RD. 248)	
Time Fished: 2384 sec	Drainage: 1.1 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Creek Chub		G	N	T	70	140.00	57.85	0.00	#Error	0.00
Fathead Minnow		O	C	T	7	14.00	5.79	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	4	8.00	3.31	0.00	#Error	0.00
Central Stoneroller		H	N	N	23	46.00	19.01	0.00	#Error	0.00
Green Sunfish		I	C	T	4	8.00	3.31	0.00	#Error	0.00
Bluegill Sunfish		I	C	P	1	2.00	0.83	0.00	#Error	0.00
Fantail Darter		I	C	N	12	24.00	9.92	0.00	#Error	0.00
		Data Totals:			121	242.00		0.00		
		Number of Species:			7					
		Number of Hybrids:			0					

River Code: 10-049-000	Stream: FISHING GUT CREEK	Sample Date: 2017-06-21
River Mile: 1.0	Location: FISHING GUT CREEK E OF ABERDEEN, NEAR OLD ST. RT. 249	
Time Fished: 1800 sec	Drainage: 2.6 sq mi	Depth: Data Source:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
White Sucker		O	S	T	6	12.00	0.91	0.00	#Error	0.00
Western Blacknose Dace		G	S	T	17	34.00	2.58	0.00	#Error	0.00
Creek Chub		G	N	T	162	324.00	24.55	0.00	#Error	0.00
South. Redbelly Dace		H	S	N	106	212.00	16.06	0.00	#Error	0.00
Rosyside Dace		I	S	S	1	2.00	0.15	0.00	#Error	0.00
Striped Shiner		I	S	N	26	52.00	3.94	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	28	56.00	4.24	0.00	#Error	0.00
Central Stoneroller		H	N	N	293	586.00	44.39	0.00	#Error	0.00
Green Sunfish		I	C	T	6	12.00	0.91	0.00	#Error	0.00
Johnny Darter		I	C	N	12	24.00	1.82	0.00	#Error	0.00
Orangethroat Darter		I	S	N	3	6.00	0.45	0.00	#Error	0.00
Data Totals:					660	1320.00		0.00		
Number of Species:					11					
Number of Hybrids:					0					

River Code: 10-049-000	Stream: FISHING GUT CREEK	Sample Date: 2016-09-01
River Mile: 1.7	Location: FISHING GUT CREEK E OF ABERDEEN, NEAR OLD ST. RT. 249	
Time Fished: 1874 sec	Drainage: 1.9 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Creek Chub		G	N	T	466	932.00	99.15	0.00	#Error	0.00
Central Stoneroller		H	N	N	4	8.00	0.85	0.00	#Error	0.00
		Data Totals:			470	940.00		0.00		
		Number of Species:			2					
		Number of Hybrids:			0					

River Code: 10-050-000	Stream: LITTLE THREEMILE CREEK	Sample Date: 2016-07-26
River Mile: 1.3	Location: L. THREEMILE CREEK E OF MAYSVILLE @ U.S. RT. 52	
Time Fished: 1800 sec	Drainage: 4.7 sq mi	Depth: Data Source:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
White Sucker		O	S	T	1	2.00	0.24	0.00	#Error	0.00
Creek Chub		G	N	T	182	364.00	43.86	0.00	#Error	0.00
Emerald Shiner		I	M	N	5	10.00	1.20	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	5	10.00	1.20	0.00	#Error	0.00
Central Stoneroller		H	N	N	87	174.00	20.96	0.00	#Error	0.00
Channel Shiner		I	M	I	31	62.00	7.47	0.00	#Error	0.00
Western Mosquitofish		I	N	N	1	2.00	0.24	0.00	#Error	0.00
Green Sunfish		I	C	T	3	6.00	0.72	0.00	#Error	0.00
Johnny Darter		I	C	N	10	20.00	2.41	0.00	#Error	0.00
Rainbow Darter		I	S	M	90	180.00	21.69	0.00	#Error	0.00
Data Totals:					415	830.00		0.00		
Number of Species:					10					
Number of Hybrids:					0					

River Code: 10-056-000	Stream: ISAACS CREEK	Sample Date: 2017-06-20
River Mile: 1.4	Location: ISAACS CREEK IN MANCHESTER @ BROADWAY ST.	
Time Fished: 1800 sec	Drainage: 4.9 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Creek Chub		G	N	T	82	164.00	31.54	0.00	#Error	0.00
Emerald Shiner		I	M	N	1	2.00	0.38	0.00	#Error	0.00
Spotfin Shiner		I	M	N	3	6.00	1.15	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	19	38.00	7.31	0.00	#Error	0.00
Central Stoneroller		H	N	N	73	146.00	28.08	0.00	#Error	0.00
Channel Shiner		I	M	I	45	90.00	17.31	0.00	#Error	0.00
Yellow Bullhead		I	C	T	2	4.00	0.77	0.00	#Error	0.00
Western Mosquitofish		I	N	N	1	2.00	0.38	0.00	#Error	0.00
Green Sunfish		I	C	T	4	8.00	1.54	0.00	#Error	0.00
Bluegill Sunfish		I	C	P	1	2.00	0.38	0.00	#Error	0.00
Johnny Darter		I	C	N	4	8.00	1.54	0.00	#Error	0.00
Rainbow Darter		I	S	M	23	46.00	8.85	0.00	#Error	0.00
Fantail Darter		I	C	N	2	4.00	0.77	0.00	#Error	0.00
Data Totals:					260	520.00		0.00		
Number of Species:					13					
Number of Hybrids:					0					

River Code: 10-057-000	Stream: ISLAND CREEK	Sample Date: 2016-07-26
River Mile: 1.1	Location: ISLAND CREEK @ ISLAND CREEK RD.	
Time Fished: 2342 sec	Drainage: 6.8 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
White Sucker		O	S	T	6	12.00	0.85	0.00	#Error	0.00
Western Blacknose Dace		G	S	T	4	8.00	0.57	0.00	#Error	0.00
Creek Chub		G	N	T	1	2.00	0.14	0.00	#Error	0.00
Striped Shiner		I	S	N	2	4.00	0.28	0.00	#Error	0.00
Spotfin Shiner		I	M	N	2	4.00	0.28	0.00	#Error	0.00
Mimic Shiner		I	M	I	5	10.00	0.71	0.00	#Error	0.00
Silverjaw Minnow		I	M	N	6	12.00	0.85	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	277	554.00	39.40	0.00	#Error	0.00
Central Stoneroller		H	N	N	216	432.00	30.73	0.00	#Error	0.00
Johnny Darter		I	C	N	3	6.00	0.43	0.00	#Error	0.00
Rainbow Darter		I	S	M	68	136.00	9.67	0.00	#Error	0.00
Fantail Darter		I	C	N	113	226.00	16.07	0.00	#Error	0.00
Data Totals:					703	1406.00		0.00		
Number of Species:					12					
Number of Hybrids:					0					

River Code: 10-060-000	Stream: DONALDSON RUN	Sample Date: 2016-07-26
River Mile: 0.5	Location: DONALDSON CREEK @ US 52	
Time Fished: 1651 sec	Drainage: 2.8 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
White Sucker		O	S	T	1	2.00	0.34	0.00	#Error	0.00
Creek Chub		G	N	T	62	124.00	20.88	0.00	#Error	0.00
Striped Shiner		I	S	N	17	34.00	5.72	0.00	#Error	0.00
Spotfin Shiner		I	M	N	1	2.00	0.34	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	2	4.00	0.67	0.00	#Error	0.00
Central Stoneroller		H	N	N	159	318.00	53.54	0.00	#Error	0.00
Channel Shiner		I	M	I	16	32.00	5.39	0.00	#Error	0.00
Yellow Bullhead		I	C	T	1	2.00	0.34	0.00	#Error	0.00
Green Sunfish		I	C	T	3	6.00	1.01	0.00	#Error	0.00
Bluegill Sunfish		I	C	P	1	2.00	0.34	0.00	#Error	0.00
Longear Sunfish		I	C	M	4	8.00	1.35	0.00	#Error	0.00
Rainbow Darter		I	S	M	20	40.00	6.73	0.00	#Error	0.00
Fantail Darter		I	C	N	10	20.00	3.37	0.00	#Error	0.00
Data Totals:					297	594.00		0.00		
Number of Species:					13					
Number of Hybrids:					0					

River Code: 10-067-000	Stream: STOUT RUN	Sample Date: 2016-08-31
River Mile: 3.0	Location: STOUT RUN N OF ROME ADJ. BLUE CREEK RD, DST. PUNTENNEY RUN	
Time Fished: 1800 sec	Drainage: 5.4 sq mi	Depth: Data Source:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Northern Hog Sucker		I	S	M	36	72.00	2.70	0.00	#Error	0.00
White Sucker		O	S	T	37	74.00	2.78	0.00	#Error	0.00
Western Blacknose Dace		G	S	T	78	156.00	5.86	0.00	#Error	0.00
Creek Chub		G	N	T	143	286.00	10.74	0.00	#Error	0.00
South. Redbelly Dace		H	S	N	140	280.00	10.51	0.00	#Error	0.00
Rosyside Dace		I	S	S	78	156.00	5.86	0.00	#Error	0.00
Striped Shiner		I	S	N	174	348.00	13.06	0.00	#Error	0.00
Spotfin Shiner		I	M	N	1	2.00	0.08	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	38	76.00	2.85	0.00	#Error	0.00
Central Stoneroller		H	N	N	416	832.00	31.23	0.00	#Error	0.00
Channel Shiner		I	M	I	72	144.00	5.41	0.00	#Error	0.00
Hybrid x Minnow				N	1	2.00	0.08	0.00	#Error	0.00
Rock Bass		C	C	N	5	10.00	0.38	0.00	#Error	0.00
Smallmouth Bass		C	C	M	3	6.00	0.23	0.00	#Error	0.00
Rainbow Darter		I	S	M	50	100.00	3.75	0.00	#Error	0.00
Fantail Darter		I	C	N	60	120.00	4.50	0.00	#Error	0.00
Data Totals:					1332	2664.00		0.00		
Number of Species:					16					
Number of Hybrids:					1					

River Code: 10-069-000	Stream: RUSSELL FORK	Sample Date: 2016-08-31
River Mile: 0.1	Location: RUSSELL FORK @ POINT CEMETERY ROAD	
Time Fished: 1800 sec	Drainage: 5.1 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Golden Redhorse		I	S	M	4	8.00	1.03	0.00	#Error	0.00
Northern Hog Sucker		I	S	M	16	32.00	4.10	0.00	#Error	0.00
White Sucker		O	S	T	18	36.00	4.62	0.00	#Error	0.00
Western Blacknose Dace		G	S	T	2	4.00	0.51	0.00	#Error	0.00
Creek Chub		G	N	T	81	162.00	20.77	0.00	#Error	0.00
Striped Shiner		I	S	N	91	182.00	23.33	0.00	#Error	0.00
Silverjaw Minnow		I	M	N	1	2.00	0.26	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	24	48.00	6.15	0.00	#Error	0.00
Central Stoneroller		H	N	N	63	126.00	16.15	0.00	#Error	0.00
Channel Shiner		I	M	I	32	64.00	8.21	0.00	#Error	0.00
Johnny Darter		I	C	N	44	88.00	11.28	0.00	#Error	0.00
Rainbow Darter		I	S	M	6	12.00	1.54	0.00	#Error	0.00
Fantail Darter		I	C	N	8	16.00	2.05	0.00	#Error	0.00
Data Totals:					390	780.00		0.00		
Number of Species:					13					
Number of Hybrids:					0					

River Code: 10-071-000	Stream: PUNTENNEY RUN	Sample Date: 2016-09-20
River Mile: 1.4	Location: PUNTENNEY RUN N OF SQUIRREL TOWN, ADJ PUNTENNEY RUN RD	
Time Fished: 1800 sec	Drainage: 0.5 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Western Blacknose Dace		G	S	T	35	70.00	18.32	0.00	#Error	0.00
Creek Chub		G	N	T	156	312.00	81.68	0.00	#Error	0.00
		Data Totals:			191	382.00		0.00		
		Number of Species:			2					
		Number of Hybrids:			0					

River Code: 10-075-000	Stream: LONG LICK RUN	Sample Date: 2016-08-31
River Mile: 1.2	Location: LONG LICK RUN @ FORD DST. OWL HOLLOW	
Time Fished: 1800 sec	Drainage: 2.7 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Northern Hog Sucker		I	S	M	1	2.00	0.10	0.00	#Error	0.00
White Sucker		O	S	T	8	16.00	0.76	0.00	#Error	0.00
Spotted Sucker		I	S	N	1	2.00	0.10	0.00	#Error	0.00
Western Blacknose Dace		G	S	T	55	110.00	5.24	0.00	#Error	0.00
Creek Chub		G	N	T	179	358.00	17.06	0.00	#Error	0.00
South. Redbelly Dace		H	S	N	63	126.00	6.01	0.00	#Error	0.00
Rosyside Dace		I	S	S	102	204.00	9.72	0.00	#Error	0.00
Striped Shiner		I	S	N	33	66.00	3.15	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	2	4.00	0.19	0.00	#Error	0.00
Central Stoneroller		H	N	N	501	1002.00	47.76	0.00	#Error	0.00
Creek Chub x Southern Redbelly Dace				N	1	2.00	0.10	0.00	#Error	0.00
Yellow Bullhead		I	C	T	1	2.00	0.10	0.00	#Error	0.00
Largemouth Bass		C	C	N	3	6.00	0.29	0.00	#Error	0.00
Green Sunfish		I	C	T	22	44.00	2.10	0.00	#Error	0.00
Bluegill Sunfish		I	C	P	20	40.00	1.91	0.00	#Error	0.00
Longear Sunfish		I	C	M	2	4.00	0.19	0.00	#Error	0.00
Hybrid x Sunfish				N	2	4.00	0.19	0.00	#Error	0.00
Logperch		I	S	M	2	4.00	0.19	0.00	#Error	0.00
Rainbow Darter		I	S	M	11	22.00	1.05	0.00	#Error	0.00
Fantail Darter		I	C	N	40	80.00	3.81	0.00	#Error	0.00
Data Totals:					1049	2098.00		0.00		
Number of Species:					20					
Number of Hybrids:					2					

River Code: 10-077-000	Stream: SULPHUR CREEK	Sample Date: 2016-08-16
River Mile: 0.4	Location: SULPHUR CREEK @ SULPHUR CREEK RD.	
Time Fished: 1800 sec	Drainage: 2.4 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribes	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Western Blacknose Dace		G	S	T	36	72.00	11.11	0.00	#Error	0.00
Creek Chub		G	N	T	152	304.00	46.91	0.00	#Error	0.00
South. Redbelly Dace		H	S	N	20	40.00	6.17	0.00	#Error	0.00
Rosyside Dace		I	S	S	8	16.00	2.47	0.00	#Error	0.00
Striped Shiner		I	S	N	1	2.00	0.31	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	3	6.00	0.93	0.00	#Error	0.00
Central Stoneroller		H	N	N	53	106.00	16.36	0.00	#Error	0.00
Channel Shiner		I	M	I	50	100.00	15.43	0.00	#Error	0.00
Western Mosquitofish		I	N	N	1	2.00	0.31	0.00	#Error	0.00
Data Totals:					324	648.00		0.00		
Number of Species:					9					
Number of Hybrids:					0					

River Code: 10-081-000	Stream: ROCK RUN	Sample Date: 2017-06-20
River Mile: 0.3	Location: ROCK RUN Upst. US 52	
Time Fished: 1800 sec	Drainage: 2.0 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: F

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Western Blacknose Dace		G	S	T	34	68.00	18.99	0.00	#Error	0.00
Creek Chub		G	N	T	82	164.00	45.81	0.00	#Error	0.00
South. Redbelly Dace		H	S	N	2	4.00	1.12	0.00	#Error	0.00
Rosyside Dace		I	S	S	23	46.00	12.85	0.00	#Error	0.00
Striped Shiner		I	S	N	1	2.00	0.56	0.00	#Error	0.00
Central Stoneroller		H	N	N	30	60.00	16.76	0.00	#Error	0.00
Green Sunfish		I	C	T	3	6.00	1.68	0.00	#Error	0.00
Rainbow Darter		I	S	M	1	2.00	0.56	0.00	#Error	0.00
Mottled Sculpin		I	C	N	3	6.00	1.68	0.00	#Error	0.00
Data Totals:					179	358.00		0.00		
Number of Species:					9					
Number of Hybrids:					0					

River Code: 10-082-000	Stream: LOWER TWIN CREEK	Sample Date: 2016-08-10
River Mile: 5.2	Location: LOWER TWIN CREEK (RM 5.2) ADJ. LOWER TWIN CREEK RD.	
Time Fished: 1568 sec	Drainage: 6.1 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribes	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Western Blacknose Dace		G	S	T	25	50.00	12.25	0.00	#Error	0.00
Creek Chub		G	N	T	52	104.00	25.49	0.00	#Error	0.00
South. Redbelly Dace		H	S	N	32	64.00	15.69	0.00	#Error	0.00
Rosyside Dace		I	S	S	23	46.00	11.27	0.00	#Error	0.00
Central Stoneroller		H	N	N	32	64.00	15.69	0.00	#Error	0.00
Rainbow Darter		I	S	M	4	8.00	1.96	0.00	#Error	0.00
Orangethroat Darter		I	S	N	12	24.00	5.88	0.00	#Error	0.00
Mottled Sculpin		I	C	N	24	48.00	11.76	0.00	#Error	0.00
Data Totals:					204	408.00		0.00		
Number of Species:					8					
Number of Hybrids:					0					

River Code: 10-082-000	Stream: LOWER TWIN CREEK	Sample Date: 2016-08-16
River Mile: 1.65	Location: LOWER TWIN CREEK NW OF BUENA VISTA, ADJ. LOWER TWIN CREEK RD	
Time Fished: 1800 sec	Drainage: 15.1 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Northern Hog Sucker		I	S	M	25	50.00	7.37	0.00	#Error	0.00
Western Blacknose Dace		G	S	T	7	14.00	2.06	0.00	#Error	0.00
Creek Chub		G	N	T	91	182.00	26.84	0.00	#Error	0.00
Rosyside Dace		I	S	S	30	60.00	8.85	0.00	#Error	0.00
Scarlet Shiner		I	S	M	7	14.00	2.06	0.00	#Error	0.00
Striped Shiner		I	S	N	6	12.00	1.77	0.00	#Error	0.00
Central Stoneroller		H	N	N	123	246.00	36.28	0.00	#Error	0.00
Rock Bass		C	C	N	3	6.00	0.88	0.00	#Error	0.00
Smallmouth Bass		C	C	M	12	24.00	3.54	0.00	#Error	0.00
Rainbow Darter		I	S	M	16	32.00	4.72	0.00	#Error	0.00
Fantail Darter		I	C	N	3	6.00	0.88	0.00	#Error	0.00
Mottled Sculpin		I	C	N	16	32.00	4.72	0.00	#Error	0.00
Data Totals:					339	678.00		0.00		
Number of Species:					12					
Number of Hybrids:					0					

River Code: 10-085-000	Stream: UPPER TWIN CREEK	Sample Date: 2016-07-14
River Mile: 2.6	Location: UPPER TWIN CREEK AT MCGAW @ U.S. RT. 52	
Time Fished: 1573 sec	Drainage: 12.8 sq mi	Depth: Data Source:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
White Sucker		O	S	T	5	10.00	1.13	0.00	#Error	0.00
Western Blacknose Dace		G	S	T	36	72.00	8.11	0.00	#Error	0.00
Creek Chub		G	N	T	41	82.00	9.23	0.00	#Error	0.00
South. Redbelly Dace		H	S	N	14	28.00	3.15	0.00	#Error	0.00
Rosyside Dace		I	S	S	30	60.00	6.76	0.00	#Error	0.00
Central Stoneroller		H	N	N	238	476.00	53.60	0.00	#Error	0.00
Rainbow Darter		I	S	M	24	48.00	5.41	0.00	#Error	0.00
Orangethroat Darter		I	S	N	5	10.00	1.13	0.00	#Error	0.00
Fantail Darter		I	C	N	9	18.00	2.03	0.00	#Error	0.00
Mottled Sculpin		I	C	N	42	84.00	9.46	0.00	#Error	0.00
Data Totals:					444	888.00		0.00		
Number of Species:					10					
Number of Hybrids:					0					

River Code: 10-089-000	Stream: EAST FORK UPPER TWIN CREEK	Sample Date: 2016-08-16
River Mile: 0.1	Location: E. FORK UPPER TWIN CR. @ UPPER TWIN CREEK RD.	
Time Fished: 1800 sec	Drainage: 3.9 sq mi	Depth: Data Source:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Western Blacknose Dace		G	S	T	46	92.00	12.96	0.00	#Error	0.00
Creek Chub		G	N	T	107	214.00	30.14	0.00	#Error	0.00
South. Redbelly Dace		H	S	N	19	38.00	5.35	0.00	#Error	0.00
Rosyside Dace		I	S	S	109	218.00	30.70	0.00	#Error	0.00
Central Stoneroller		H	N	N	11	22.00	3.10	0.00	#Error	0.00
Rainbow Darter		I	S	M	1	2.00	0.28	0.00	#Error	0.00
Orangethroat Darter		I	S	N	6	12.00	1.69	0.00	#Error	0.00
Fantail Darter		I	C	N	6	12.00	1.69	0.00	#Error	0.00
Mottled Sculpin		I	C	N	50	100.00	14.08	0.00	#Error	0.00
Data Totals:					355	710.00		0.00		
Number of Species:					9					
Number of Hybrids:					0					

River Code: 10-096-000	Stream: MCATEE RUN	Sample Date: 2016-07-14
River Mile: 0.7	Location: MCATEE RUN @ US 52	
Time Fished: 1717 sec	Drainage: 1.6 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Western Blacknose Dace		G	S	T	62	124.00	20.33	0.00	#Error	0.00
Creek Chub		G	N	T	145	290.00	47.54	0.00	#Error	0.00
South. Redbelly Dace		H	S	N	1	2.00	0.33	0.00	#Error	0.00
Central Stoneroller		H	N	N	79	158.00	25.90	0.00	#Error	0.00
Fantail Darter		I	C	N	18	36.00	5.90	0.00	#Error	0.00
Data Totals:					305	610.00		0.00		
Number of Species:					5					
Number of Hybrids:					0					

River Code: 10-099-000	Stream: POND RUN	Sample Date: 2016-07-11
River Mile: 4.6	Location: POND RUN OFF SF RD 1 (POND RUN RD.) AT BACKPACK TRAIL	
Time Fished: 2162 sec	Drainage: 3.2 sq mi	Depth: Data Source:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Western Blacknose Dace		G	S	T	6	12.00	1.50	0.00	#Error	0.00
Creek Chub		G	N	T	82	164.00	20.45	0.00	#Error	0.00
South. Redbelly Dace		H	S	N	75	150.00	18.70	0.00	#Error	0.00
Rosyside Dace		I	S	S	184	368.00	45.89	0.00	#Error	0.00
Central Stoneroller		H	N	N	49	98.00	12.22	0.00	#Error	0.00
Orangethroat Darter		I	S	N	5	10.00	1.25	0.00	#Error	0.00
		Data Totals:			401	802.00		0.00		
		Number of Species:			6					
		Number of Hybrids:			0					

River Code: 10-099-000	Stream: POND RUN	Sample Date: 2016-07-11
River Mile: 0.4	Location: POND RUN @ US 52 SW OF FRIENDSHIP	
Time Fished: 2024 sec	Drainage: 11.3 sq mi	Depth: Data Source:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Northern Hog Sucker		I	S	M	1	2.00	0.16	0.00	#Error	0.00
Creek Chub		G	N	T	29	58.00	4.55	0.00	#Error	0.00
Striped Shiner		I	S	N	8	16.00	1.26	0.00	#Error	0.00
Spotfin Shiner		I	M	N	19	38.00	2.98	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	7	14.00	1.10	0.00	#Error	0.00
Central Stoneroller		H	N	N	113	226.00	17.74	0.00	#Error	0.00
Channel Shiner		I	M	I	378	756.00	59.34	0.00	#Error	0.00
Western Mosquitofish		I	N	N	2	4.00	0.31	0.00	#Error	0.00
Largemouth Bass		C	C	N	3	6.00	0.47	0.00	#Error	0.00
Green Sunfish		I	C	T	6	12.00	0.94	0.00	#Error	0.00
Bluegill Sunfish		I	C	P	1	2.00	0.16	0.00	#Error	0.00
Longear Sunfish		I	C	M	2	4.00	0.31	0.00	#Error	0.00
Rainbow Darter		I	S	M	32	64.00	5.02	0.00	#Error	0.00
Fantail Darter		I	C	N	36	72.00	5.65	0.00	#Error	0.00
Data Totals:					637	1274.00		0.00		
Number of Species:					14					
Number of Hybrids:					0					

River Code: 10-100-000	Stream: EAGLE CREEK	Sample Date: 2016-07-20
River Mile: 14.4	Location: EAGLE CREEK DST CONFL. WITH W FORK AND E FORK EAGLE CR	
Time Fished: 2948 sec	Drainage: 107.0 sq mi	Depth:
Dist Fished: 0.2 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Gizzard Shad		O	M	N	1	1.50	0.26	0.11	0.25	70.00
Black Redhorse		I	S	I	25	37.50	6.43	7.79	18.85	207.60
Golden Redhorse		I	S	M	26	39.00	6.68	13.80	33.42	353.85
Northern Hog Sucker		I	S	M	6	9.00	1.54	1.80	4.36	200.00
Striped Shiner		I	S	N	12	18.00	3.08	0.15	0.36	8.33
Spotfin Shiner		I	M	N	2	3.00	0.51	0.01	0.02	2.50
Bluntnose Minnow		O	C	T	6	9.00	1.54	0.02	0.04	2.00
Central Stoneroller		H	N	N	57	85.50	14.65	0.18	0.44	2.11
Channel Catfish			C	N	1	1.50	0.26	3.00	7.27	2000.00
Yellow Bullhead		I	C	T	7	10.50	1.80	1.43	3.45	135.71
Rock Bass		C	C	N	17	25.50	4.37	2.47	5.98	96.88
Smallmouth Bass		C	C	M	34	51.00	8.74	1.80	4.36	35.29
Spotted Bass		C	C	N	2	3.00	0.51	0.35	0.84	115.00
Largemouth Bass		C	C	N	2	3.00	0.51	0.15	0.36	50.00
Green Sunfish		I	C	T	29	43.50	7.46	2.80	6.77	64.29
Longear Sunfish		I	C	M	82	123.00	21.08	2.21	5.35	17.95
Logperch		I	S	M	3	4.50	0.77	0.04	0.09	8.33
Johnny Darter		I	C	N	3	4.50	0.77	0.00	0.01	1.00
Greenside Darter		I	S	M	35	52.50	9.00	0.15	0.37	2.94
Rainbow Darter		I	S	M	10	15.00	2.57	0.02	0.04	1.00
Fantail Darter		I	C	N	28	42.00	7.20	0.04	0.09	0.89
Freshwater Drum			M	P	1	1.50	0.26	3.00	7.27	2000.00
Data Totals:					389	583.50		41.29		
Number of Species:					22					
Number of Hybrids:					0					

River Code: 10-100-000	Stream: EAGLE CREEK	Sample Date: 2016-07-21
River Mile: 6.2	Location: EAGLE CREEK E OF RIPLEY @ NORTH POLE RD.	
Time Fished: 1800 sec	Drainage: 129.0 sq mi	Depth:
Dist Fished: 0.2 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: D

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Gizzard Shad		O	M	N	9	13.50	1.31	1.05	3.41	77.78
Black Redhorse		I	S	I	9	13.50	1.31	4.50	14.61	333.33
Golden Redhorse		I	S	M	15	22.50	2.18	4.66	15.13	207.14
Northern Hog Sucker		I	S	M	19	28.50	2.76	3.15	10.23	110.53
Smallmouth Redhorse		I	S	M	7	10.50	1.02	1.20	3.90	114.29
Emerald Shiner		I	M	N	19	28.50	2.76	0.04	0.13	1.39
Striped Shiner		I	S	N	78	117.00	11.32	0.76	2.47	6.49
Spotfin Shiner		I	M	N	3	4.50	0.44	0.01	0.03	2.00
Mimic Shiner		I	M	I	54	81.00	7.84	0.08	0.25	0.94
Bluntnose Minnow		O	C	T	26	39.00	3.77	0.06	0.19	1.54
Central Stoneroller		H	N	N	220	330.00	31.93	3.80	12.34	11.52
Channel Catfish			C	N	5	7.50	0.73	3.00	9.74	400.00
Yellow Bullhead		I	C	T	1	1.50	0.15	0.05	0.15	30.00
Stonecat Madtom		I	C	I	1	1.50	0.15	0.00	0.01	2.00
Rock Bass		C	C	N	12	18.00	1.74	0.88	2.86	49.00
Smallmouth Bass		C	C	M	15	22.50	2.18	2.09	6.78	92.86
Spotted Bass		C	C	N	7	10.50	1.02	3.00	9.74	285.71
Green Sunfish		I	C	T	8	12.00	1.16	0.45	1.46	37.50
Longear Sunfish		I	C	M	64	96.00	9.29	1.62	5.26	16.89
Logperch		I	S	M	7	10.50	1.02	0.09	0.28	8.33
Johnny Darter		I	C	N	1	1.50	0.15	0.00	0.00	1.00
Greenside Darter		I	S	M	47	70.50	6.82	0.21	0.67	2.93
Rainbow Darter		I	S	M	46	69.00	6.68	0.08	0.27	1.22
Fantail Darter		I	C	N	16	24.00	2.32	0.02	0.08	1.00
Data Totals:					689	1033.50		30.80		
Number of Species:					24					
Number of Hybrids:					0					

River Code: 10-101-000	Stream: BAYLOR RUN	Sample Date: 2015-07-23
River Mile: 0.2	Location: BAYLOR RUN @ SCOFFIELD RD.	
Time Fished: 1168 sec	Drainage: 0.9 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Creek Chub		G	N	T	12	24.00	85.71	0.00	#Error	0.00
Central Stoneroller		H	N	N	2	4.00	14.29	0.00	#Error	0.00
		Data Totals:			14	28.00		0.00		
		Number of Species:			2					
		Number of Hybrids:			0					

River Code: 10-102-000	Stream: BEETLE CREEK	Sample Date: 2015-08-11
River Mile: 4.9	Location: BEETLE CREEK ADJ. EAST FORK RD.	
Time Fished: 2433 sec	Drainage: 5.1 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Creek Chub		G	N	T	34	68.00	13.28	0.00	#Error	0.00
Fathead Minnow		O	C	T	24	48.00	9.38	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	28	56.00	10.94	0.00	#Error	0.00
Central Stoneroller		H	N	N	24	48.00	9.38	0.00	#Error	0.00
Green Sunfish		I	C	T	28	56.00	10.94	0.00	#Error	0.00
Bluegill Sunfish		I	C	P	1	2.00	0.39	0.00	#Error	0.00
Fantail Darter		I	C	N	117	234.00	45.70	0.00	#Error	0.00
		Data Totals:			256	512.00		0.00		
		Number of Species:			7					
		Number of Hybrids:			0					

River Code: 10-102-000	Stream: BEETLE CREEK	Sample Date: 2015-07-23
River Mile: 0.5	Location: BEETLE CREEK @ GRIFFITH RD.	
Time Fished: 2464 sec	Drainage: 10.9 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
White Sucker		O	S	T	20	40.00	3.60	0.00	#Error	0.00
Creek Chub		G	N	T	105	210.00	18.92	0.00	#Error	0.00
Striped Shiner		I	S	N	56	112.00	10.09	0.00	#Error	0.00
Spotfin Shiner		I	M	N	2	4.00	0.36	0.00	#Error	0.00
Mimic Shiner		I	M	I	2	4.00	0.36	0.00	#Error	0.00
Silverjaw Minnow		I	M	N	1	2.00	0.18	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	69	138.00	12.43	0.00	#Error	0.00
Central Stoneroller		H	N	N	161	322.00	29.01	0.00	#Error	0.00
Hybrid x Minnow				N	1	2.00	0.18	0.00	#Error	0.00
Yellow Bullhead		I	C	T	1	2.00	0.18	0.00	#Error	0.00
Rock Bass		C	C	N	3	6.00	0.54	0.00	#Error	0.00
Spotted Bass		C	C	N	2	4.00	0.36	0.00	#Error	0.00
Green Sunfish		I	C	T	41	82.00	7.39	0.00	#Error	0.00
Longear Sunfish		I	C	M	8	16.00	1.44	0.00	#Error	0.00
Green SF x Bluegill SF				N	1	2.00	0.18	0.00	#Error	0.00
Logperch		I	S	M	1	2.00	0.18	0.00	#Error	0.00
Johnny Darter		I	C	N	7	14.00	1.26	0.00	#Error	0.00
Rainbow Darter		I	S	M	33	66.00	5.95	0.00	#Error	0.00
Fantail Darter		I	C	N	41	82.00	7.39	0.00	#Error	0.00
Data Totals:					555	1110.00		0.00		
Number of Species:					19					
Number of Hybrids:					2					

River Code: 10-103-000	Stream: LAFFERTY RUN	Sample Date: 2015-08-11
River Mile: 0.1	Location: LAFFERTY RUN @ NORTH POLE RD. (RD. 13B)	
Time Fished: 2356 sec	Drainage: 2.7 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Northern Hog Sucker		I	S	M	2	4.00	0.40	0.00	#Error	0.00
White Sucker		O	S	T	7	14.00	1.39	0.00	#Error	0.00
Creek Chub		G	N	T	111	222.00	21.98	0.00	#Error	0.00
Scarlet Shiner		I	S	M	12	24.00	2.38	0.00	#Error	0.00
Striped Shiner		I	S	N	95	190.00	18.81	0.00	#Error	0.00
Fathead Minnow		O	C	T	3	6.00	0.59	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	30	60.00	5.94	0.00	#Error	0.00
Central Stoneroller		H	N	N	112	224.00	22.18	0.00	#Error	0.00
Rock Bass		C	C	N	1	2.00	0.20	0.00	#Error	0.00
Smallmouth Bass		C	C	M	4	8.00	0.79	0.00	#Error	0.00
Spotted Bass		C	C	N	6	12.00	1.19	0.00	#Error	0.00
Largemouth Bass		C	C	N	1	2.00	0.20	0.00	#Error	0.00
Green Sunfish		I	C	T	29	58.00	5.74	0.00	#Error	0.00
Longear Sunfish		I	C	M	21	42.00	4.16	0.00	#Error	0.00
Logperch		I	S	M	1	2.00	0.20	0.00	#Error	0.00
Johnny Darter		I	C	N	9	18.00	1.78	0.00	#Error	0.00
Greenside Darter		I	S	M	6	12.00	1.19	0.00	#Error	0.00
Rainbow Darter		I	S	M	41	82.00	8.12	0.00	#Error	0.00
Fantail Darter		I	C	N	14	28.00	2.77	0.00	#Error	0.00
Data Totals:					505	1010.00		0.00		
Number of Species:					19					
Number of Hybrids:					0					

River Code: 10-105-000	Stream: BRUSHY FORK	Sample Date: 2015-08-17
River Mile: 1.0	Location: BRUSHY FORK @ BRUSHY FORK RD. (RD. 241)	
Time Fished: 1745 sec	Drainage: 4.0 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Creek Chub		G	N	T	206	412.00	19.86	0.00	#Error	0.00
Fathead Minnow		O	C	T	104	208.00	10.03	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	127	254.00	12.25	0.00	#Error	0.00
Central Stoneroller		H	N	N	473	946.00	45.61	0.00	#Error	0.00
Green Sunfish		I	C	T	127	254.00	12.25	0.00	#Error	0.00
Data Totals:					1037	2074.00		0.00		
Number of Species:					5					
Number of Hybrids:					0					

River Code: 10-106-000	Stream: SUCK RUN	Sample Date: 2015-08-13
River Mile: 1.7	Location: SUCK RUN @ EBENEZER RD. (RD. 33)	
Time Fished: 2173 sec	Drainage: 5.2 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
White Sucker		O	S	T	2	4.00	0.32	0.00	#Error	0.00
Creek Chub		G	N	T	52	104.00	8.21	0.00	#Error	0.00
Scarlet Shiner		I	S	M	6	12.00	0.95	0.00	#Error	0.00
Fathead Minnow		O	C	T	31	62.00	4.90	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	60	120.00	9.48	0.00	#Error	0.00
Central Stoneroller		H	N	N	309	618.00	48.82	0.00	#Error	0.00
Green Sunfish		I	C	T	173	346.00	27.33	0.00	#Error	0.00
		Data Totals:			633	1266.00		0.00		
		Number of Species:			7					
		Number of Hybrids:			0					

River Code: 10-110-000	Stream: EAST FORK EAGLE CREEK	Sample Date: 2016-08-03
River Mile: 11.0	Location: E. FK. EAGLE CR. SW OF WEST UNION OFF SR 41 @ FARM FORD	
Time Fished: 1800 sec	Drainage: 9.9 sq mi	Depth: Data Source:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
White Sucker		O	S	T	13	26.00	3.22	0.00	#Error	0.00
Creek Chub		G	N	T	51	102.00	12.62	0.00	#Error	0.00
Scarlet Shiner		I	S	M	2	4.00	0.50	0.00	#Error	0.00
Striped Shiner		I	S	N	146	292.00	36.14	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	13	26.00	3.22	0.00	#Error	0.00
Central Stoneroller		H	N	N	35	70.00	8.66	0.00	#Error	0.00
Largemouth Bass		C	C	N	3	6.00	0.74	0.00	#Error	0.00
Green Sunfish		I	C	T	69	138.00	17.08	0.00	#Error	0.00
Bluegill Sunfish		I	C	P	1	2.00	0.25	0.00	#Error	0.00
Logperch		I	S	M	2	4.00	0.50	0.00	#Error	0.00
Johnny Darter		I	C	N	5	10.00	1.24	0.00	#Error	0.00
Greenside Darter		I	S	M	7	14.00	1.73	0.00	#Error	0.00
Rainbow Darter		I	S	M	12	24.00	2.97	0.00	#Error	0.00
Fantail Darter		I	C	N	45	90.00	11.14	0.00	#Error	0.00
Data Totals:					404	808.00		0.00		
Number of Species:					14					
Number of Hybrids:					0					

River Code: 10-110-000	Stream: EAST FORK EAGLE CREEK	Sample Date: 2016-08-01
River Mile: 7.9	Location: E. FK. EAGLE CREEK W OF WEST UNION @ TWP. RD. 231	
Time Fished: 1800 sec	Drainage: 15.1 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
White Sucker		O	S	T	31	62.00	7.52	0.00	#Error	0.00
Creek Chub		G	N	T	46	92.00	11.17	0.00	#Error	0.00
Scarlet Shiner		I	S	M	9	18.00	2.18	0.00	#Error	0.00
Striped Shiner		I	S	N	107	214.00	25.97	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	24	48.00	5.83	0.00	#Error	0.00
Central Stoneroller		H	N	N	49	98.00	11.89	0.00	#Error	0.00
Yellow Bullhead		I	C	T	1	2.00	0.24	0.00	#Error	0.00
Largemouth Bass		C	C	N	5	10.00	1.21	0.00	#Error	0.00
Green Sunfish		I	C	T	34	68.00	8.25	0.00	#Error	0.00
Bluegill Sunfish		I	C	P	1	2.00	0.24	0.00	#Error	0.00
Longear Sunfish		I	C	M	5	10.00	1.21	0.00	#Error	0.00
Loggerhead		I	S	M	1	2.00	0.24	0.00	#Error	0.00
Johnny Darter		I	C	N	4	8.00	0.97	0.00	#Error	0.00
Greenside Darter		I	S	M	11	22.00	2.67	0.00	#Error	0.00
Rainbow Darter		I	S	M	26	52.00	6.31	0.00	#Error	0.00
Fantail Darter		I	C	N	58	116.00	14.08	0.00	#Error	0.00
Data Totals:					412	824.00		0.00		
Number of Species:					16					
Number of Hybrids:					0					

River Code: 10-110-000	Stream: EAST FORK EAGLE CREEK	Sample Date: 2016-07-21
River Mile: 4.3	Location: E. FK. EAGLE CREEK S OF FAIRVIEW @ BRIER RIDGE RD.	
Time Fished: 3190 sec	Drainage: 36.0 sq mi	Depth: Data Source:
Dist Fished: 0.2 km	Basin: Southwest Ohio River Tribs	Flow: N
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Golden Redhorse		I	S	M	20	30.00	3.75	7.19	27.91	239.50
Northern Hog Sucker		I	S	M	12	18.00	2.25	3.12	12.12	173.33
White Sucker		O	S	T	14	21.00	2.63	1.30	5.03	61.67
Creek Chub		G	N	T	14	21.00	2.63	0.15	0.59	7.27
Scarlet Shiner		I	S	M	8	12.00	1.50	0.03	0.12	2.57
Striped Shiner		I	S	N	44	66.00	8.26	0.68	2.63	10.24
Silverjaw Minnow		I	M	N	3	4.50	0.56	0.03	0.10	6.00
Bluntnose Minnow		O	C	T	46	69.00	8.63	0.16	0.61	2.27
Central Stoneroller		H	N	N	56	84.00	10.51	0.43	1.66	5.09
Yellow Bullhead		I	C	T	20	30.00	3.75	3.75	14.56	125.00
Stonecat Madtom		I	C	I	3	4.50	0.56	0.21	0.82	46.67
Rock Bass		C	C	N	15	22.50	2.81	2.10	8.16	93.33
Smallmouth Bass		C	C	M	19	28.50	3.56	2.38	9.22	83.33
Largemouth Bass		C	C	N	1	1.50	0.19	0.18	0.70	120.00
Green Sunfish		I	C	T	72	108.00	13.51	3.24	12.58	30.00
Longear Sunfish		I	C	M	15	22.50	2.81	0.35	1.37	15.71
Logperch		I	S	M	3	4.50	0.56	0.03	0.12	6.67
Johnny Darter		I	C	N	16	24.00	3.00	0.02	0.07	0.71
Greenside Darter		I	S	M	55	82.50	10.32	0.26	1.02	3.18
Rainbow Darter		I	S	M	33	49.50	6.19	0.05	0.19	0.97
Fantail Darter		I	C	N	64	96.00	12.01	0.11	0.43	1.15
Data Totals:					533	799.50		25.75		
Number of Species:					21					
Number of Hybrids:					0					

River Code: 10-110-000	Stream: EAST FORK EAGLE CREEK	Sample Date: 2016-07-19
River Mile: 0.8	Location: E. FK. EAGLE CREEK @ END OF EAST FORK RD.	
Time Fished: 3154 sec	Drainage: 48.0 sq mi	Depth:
Dist Fished: 0.2 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Northern Hog Sucker		I	S	M	31	46.50	2.71	2.93	14.84	62.90
White Sucker		O	S	T	3	4.50	0.26	0.06	0.30	13.33
Creek Chub		G	N	T	20	30.00	1.75	0.38	1.90	12.50
Scarlet Shiner		I	S	M	18	27.00	1.58	0.07	0.37	2.67
Striped Shiner		I	S	N	128	192.00	11.21	1.50	7.61	7.81
Sand Shiner		I	M	M	3	4.50	0.26	0.01	0.04	1.67
Silverjaw Minnow		I	M	N	9	13.50	0.79	0.04	0.19	2.78
Bluntnose Minnow		O	C	T	46	69.00	4.03	0.18	0.92	2.62
Central Stoneroller		H	N	N	606	909.00	53.06	7.83	39.71	8.61
Yellow Bullhead		I	C	T	8	12.00	0.70	1.35	6.85	112.50
Stonecat Madtom		I	C	I	4	6.00	0.35	0.04	0.19	6.25
Smallmouth Bass		C	C	M	25	37.50	2.19	3.84	19.46	102.27
Green Sunfish		I	C	T	7	10.50	0.61	0.20	0.99	18.57
Longear Sunfish		I	C	M	16	24.00	1.40	0.50	2.51	20.63
Logperch		I	S	M	8	12.00	0.70	0.09	0.46	7.50
Johnny Darter		I	C	N	6	9.00	0.53	0.01	0.04	0.83
Greenside Darter		I	S	M	91	136.50	7.97	0.48	2.43	3.52
Rainbow Darter		I	S	M	58	87.00	5.08	0.13	0.64	1.45
Fantail Darter		I	C	N	55	82.50	4.82	0.11	0.56	1.35
Data Totals:					1142	1713.00		19.71		
Number of Species:					19					
Number of Hybrids:					0					

River Code: 10-110-002	Stream: Trib. to East Fork Eagle Creek (6.92)	Sample Date: 2016-08-01
River Mile: 0.1	Location: TRIB TO E. FK. EAGLE CR. (RM 6.92) ADJ. EAGLE CR. RD.	
Time Fished: 1800 sec	Drainage: 5.1 sq mi	Depth: Data Source:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
White Sucker		O	S	T	7	14.00	1.56	0.00	#Error	0.00
Creek Chub		G	N	T	144	288.00	32.07	0.00	#Error	0.00
Scarlet Shiner		I	S	M	27	54.00	6.01	0.00	#Error	0.00
Striped Shiner		I	S	N	85	170.00	18.93	0.00	#Error	0.00
Silverjaw Minnow		I	M	N	1	2.00	0.22	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	21	42.00	4.68	0.00	#Error	0.00
Central Stoneroller		H	N	N	78	156.00	17.37	0.00	#Error	0.00
Largemouth Bass		C	C	N	4	8.00	0.89	0.00	#Error	0.00
Green Sunfish		I	C	T	33	66.00	7.35	0.00	#Error	0.00
Longear Sunfish		I	C	M	4	8.00	0.89	0.00	#Error	0.00
Loggerhead		I	S	M	6	12.00	1.34	0.00	#Error	0.00
Johnny Darter		I	C	N	12	24.00	2.67	0.00	#Error	0.00
Rainbow Darter		I	S	M	7	14.00	1.56	0.00	#Error	0.00
Fantail Darter		I	C	N	20	40.00	4.45	0.00	#Error	0.00
Data Totals:					449	898.00		0.00		
Number of Species:					14					
Number of Hybrids:					0					

River Code: 10-111-000	Stream: TOWN BRANCH	Sample Date: 2015-07-08
River Mile: 0.2	Location: TOWN BRANCH ADJ. EAST FORK RD. (RD. 221)	
Time Fished: 1800 sec	Drainage: 1.8 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
White Sucker		O	S	T	32	64.00	2.08	0.00	#Error	0.00
Creek Chub		G	N	T	1082	2164.00	70.40	0.00	#Error	0.00
South. Redbelly Dace		H	S	N	3	6.00	0.20	0.00	#Error	0.00
Striped Shiner		I	S	N	9	18.00	0.59	0.00	#Error	0.00
Central Stoneroller		H	N	N	352	704.00	22.90	0.00	#Error	0.00
Green Sunfish		I	C	T	2	4.00	0.13	0.00	#Error	0.00
Bluegill Sunfish		I	C	P	6	12.00	0.39	0.00	#Error	0.00
Green SF x Bluegill SF				N	1	2.00	0.07	0.00	#Error	0.00
Johnny Darter		I	C	N	5	10.00	0.33	0.00	#Error	0.00
Rainbow Darter		I	S	M	3	6.00	0.20	0.00	#Error	0.00
Fantail Darter		I	C	N	42	84.00	2.73	0.00	#Error	0.00
Data Totals:					1537	3074.00		0.00		
Number of Species:					11					
Number of Hybrids:					1					

River Code: 10-112-000	Stream: WASHBURN RUN	Sample Date: 2015-06-24
River Mile: 1.4	Location: WASHBURN RUN DST. ST. RT. 125	
Time Fished: 2531 sec	Drainage: 1.4 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Creek Chub		G	N	T	298	596.00	79.47	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	35	70.00	9.33	0.00	#Error	0.00
Central Stoneroller		H	N	N	30	60.00	8.00	0.00	#Error	0.00
Green Sunfish		I	C	T	10	20.00	2.67	0.00	#Error	0.00
Green SF x Bluegill SF				N	2	4.00	0.53	0.00	#Error	0.00
		Data Totals:			375	750.00		0.00		
		Number of Species:			5					
		Number of Hybrids:			1					

River Code: 10-113-000	Stream: ADA RUN	Sample Date: 2015-06-24
River Mile: 0.7	Location: ADAS RUN DST. ST. RT. 125	
Time Fished: 1800 sec	Drainage: 3.3 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
White Sucker		O	S	T	35	70.00	3.42	0.00	#Error	0.00
Creek Chub		G	N	T	423	846.00	41.35	0.00	#Error	0.00
Fathead Minnow		O	C	T	44	88.00	4.30	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	218	436.00	21.31	0.00	#Error	0.00
Central Stoneroller		H	N	N	139	278.00	13.59	0.00	#Error	0.00
Green Sunfish		I	C	T	5	10.00	0.49	0.00	#Error	0.00
Johnny Darter		I	C	N	26	52.00	2.54	0.00	#Error	0.00
Fantail Darter		I	C	N	133	266.00	13.00	0.00	#Error	0.00
Data Totals:					1023	2046.00		0.00		
Number of Species:					8					
Number of Hybrids:					0					

River Code: 10-114-000	Stream: HILLS FORK	Sample Date: 2015-06-22
River Mile: 3.1	Location: HILLS FORK @ ECKMANSVILLE RD. (RD. 2)	
Time Fished: 3301 sec	Drainage: 5.3 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
White Sucker		O	S	T	52	104.00	7.16	0.00	#Error	0.00
Creek Chub		G	N	T	259	518.00	35.67	0.00	#Error	0.00
Scarlet Shiner		I	S	M	7	14.00	0.96	0.00	#Error	0.00
Striped Shiner		I	S	N	75	150.00	10.33	0.00	#Error	0.00
Fathead Minnow		O	C	T	2	4.00	0.28	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	66	132.00	9.09	0.00	#Error	0.00
Central Stoneroller		H	N	N	103	206.00	14.19	0.00	#Error	0.00
Green Sunfish		I	C	T	17	34.00	2.34	0.00	#Error	0.00
Longear Sunfish		I	C	M	2	4.00	0.28	0.00	#Error	0.00
Green SF x Bluegill SF				N	2	4.00	0.28	0.00	#Error	0.00
Johnny Darter		I	C	N	18	36.00	2.48	0.00	#Error	0.00
Rainbow Darter		I	S	M	10	20.00	1.38	0.00	#Error	0.00
Fantail Darter		I	C	N	113	226.00	15.56	0.00	#Error	0.00
Data Totals:					726	1452.00		0.00		
Number of Species:					13					
Number of Hybrids:					1					

River Code: 10-114-000	Stream: HILLS FORK	Sample Date: 2015-06-23
River Mile: 1.3	Location: HILLS FORK @ ST. RT. 125	
Time Fished: 1513 sec	Drainage: 10.1 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Golden Redhorse		I	S	M	4	8.00	1.37	0.00	#Error	0.00
Northern Hog Sucker		I	S	M	5	10.00	1.72	0.00	#Error	0.00
Creek Chub		G	N	T	13	26.00	4.47	0.00	#Error	0.00
Scarlet Shiner		I	S	M	18	36.00	6.19	0.00	#Error	0.00
Striped Shiner		I	S	N	74	148.00	25.43	0.00	#Error	0.00
Silverjaw Minnow		I	M	N	2	4.00	0.69	0.00	#Error	0.00
Fathead Minnow		O	C	T	10	20.00	3.44	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	73	146.00	25.09	0.00	#Error	0.00
Central Stoneroller		H	N	N	31	62.00	10.65	0.00	#Error	0.00
Yellow Bullhead		I	C	T	1	2.00	0.34	0.00	#Error	0.00
Green Sunfish		I	C	T	8	16.00	2.75	0.00	#Error	0.00
Longear Sunfish		I	C	M	11	22.00	3.78	0.00	#Error	0.00
Green SF x Bluegill SF				N	2	4.00	0.69	0.00	#Error	0.00
Johnny Darter		I	C	N	13	26.00	4.47	0.00	#Error	0.00
Greenside Darter		I	S	M	4	8.00	1.37	0.00	#Error	0.00
Rainbow Darter		I	S	M	7	14.00	2.41	0.00	#Error	0.00
Fantail Darter		I	C	N	15	30.00	5.15	0.00	#Error	0.00
Data Totals:					291	582.00		0.00		
Number of Species:					17					
Number of Hybrids:					1					

River Code: 10-115-000	Stream: LICK RUN	Sample Date: 2015-06-23
River Mile: 1.0	Location: LICK RUN @ OLD CINCINNATI PIKE (RD. 21)	
Time Fished: 3072 sec	Drainage: 0.7 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Creek Chub		G	N	T	239	478.00	61.13	0.00	#Error	0.00
Fathead Minnow		O	C	T	26	52.00	6.65	0.00	#Error	0.00
Green Sunfish		I	C	T	68	136.00	17.39	0.00	#Error	0.00
Bluegill Sunfish		I	C	P	3	6.00	0.77	0.00	#Error	0.00
Green SF x Bluegill SF				N	3	6.00	0.77	0.00	#Error	0.00
Fantail Darter		I	C	N	52	104.00	13.30	0.00	#Error	0.00
		Data Totals:			391	782.00		0.00		
		Number of Species:			6					
		Number of Hybrids:			1					

River Code: 10-116-000	Stream: GORDON RUN	Sample Date: 2015-06-22
River Mile: 0.1	Location: GORDON RUN @ DEATLEY RD.	
Time Fished: 2778 sec	Drainage: 3.1 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Northern Hog Sucker		I	S	M	1	2.00	0.16	0.00	#Error	0.00
White Sucker		O	S	T	5	10.00	0.78	0.00	#Error	0.00
Creek Chub		G	N	T	245	490.00	38.34	0.00	#Error	0.00
Scarlet Shiner		I	S	M	11	22.00	1.72	0.00	#Error	0.00
Striped Shiner		I	S	N	67	134.00	10.49	0.00	#Error	0.00
Fathead Minnow		O	C	T	47	94.00	7.36	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	34	68.00	5.32	0.00	#Error	0.00
Central Stoneroller		H	N	N	33	66.00	5.16	0.00	#Error	0.00
Green Sunfish		I	C	T	178	356.00	27.86	0.00	#Error	0.00
Longear Sunfish		I	C	M	5	10.00	0.78	0.00	#Error	0.00
Johnny Darter		I	C	N	8	16.00	1.25	0.00	#Error	0.00
Rainbow Darter		I	S	M	3	6.00	0.47	0.00	#Error	0.00
Fantail Darter		I	C	N	2	4.00	0.31	0.00	#Error	0.00
Data Totals:					639	1278.00		0.00		
Number of Species:					13					
Number of Hybrids:					0					

River Code: 10-120-000	Stream: WEST FORK EAGLE CREEK	Sample Date: 2016-07-25
River Mile: 7.4	Location: W. FK. EAGLE CREEK SE OF RUSSELLVILLE @ ST. RT. 125	
Time Fished: 1800 sec	Drainage: 28.0 sq mi	Depth:
Dist Fished: 0.2 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Silver Redhorse		I	S	M	1	1.50	0.12	0.03	0.24	20.00
Golden Redhorse		I	S	M	3	4.50	0.35	0.63	4.94	140.00
Northern Hog Sucker		I	S	M	3	4.50	0.35	0.75	5.88	166.67
White Sucker		O	S	T	6	9.00	0.70	0.26	2.00	28.33
White Sucker		O	S	T	2	3.00	0.23	0.23	1.76	75.00
Creek Chub		G	N	T	46	69.00	5.39	0.34	2.68	4.96
Scarlet Shiner		I	S	M	18	27.00	2.11	0.06	0.44	2.06
Striped Shiner		I	S	N	111	166.50	13.01	1.05	8.23	6.31
Sand Shiner		I	M	M	55	82.50	6.45	0.08	0.59	0.91
Silverjaw Minnow		I	M	N	5	7.50	0.59	0.02	0.12	2.00
Bluntnose Minnow		O	C	T	129	193.50	15.12	0.57	4.47	2.95
Central Stoneroller		H	N	N	168	252.00	19.70	1.50	11.76	5.95
Yellow Bullhead		I	C	T	8	12.00	0.94	0.65	5.11	54.29
Stonecat Madtom		I	C	I	4	6.00	0.47	0.02	0.12	2.50
Smallmouth Bass		C	C	M	3	4.50	0.35	1.73	13.53	383.33
Largemouth Bass		C	C	N	8	12.00	0.94	1.13	8.82	93.75
Green Sunfish		I	C	T	58	87.00	6.80	2.18	17.06	25.00
Bluegill Sunfish		I	C	P	10	15.00	1.17	0.14	1.06	9.00
Longear Sunfish		I	C	M	21	31.50	2.46	0.85	6.63	26.84
Logperch		I	S	M	1	1.50	0.12	0.02	0.12	10.00
Johnny Darter		I	C	N	8	12.00	0.94	0.01	0.09	1.00
Greenside Darter		I	S	M	100	150.00	11.72	0.42	3.33	2.83
Rainbow Darter		I	S	M	39	58.50	4.57	0.07	0.54	1.18
Fantail Darter		I	C	N	46	69.00	5.39	0.06	0.48	0.89
Data Totals:					853	1279.50		12.75		
Number of Species:					24					
Number of Hybrids:					0					

River Code: 10-120-000	Stream: WEST FORK EAGLE CREEK	Sample Date: 2016-08-03
River Mile: 3.3	Location: W. FK. EAGLE CREEK W OF DECATUR, UPST. ST. RT. 353	
Time Fished: 3043 sec	Drainage: 54.0 sq mi	Depth:
Dist Fished: 0.2 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: D

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Black Redhorse		I	S	I	7	10.50	1.73	4.65	15.32	442.86
Golden Redhorse		I	S	M	11	16.50	2.72	8.21	27.06	497.73
Northern Hog Sucker		I	S	M	24	36.00	5.94	3.68	12.12	102.17
White Sucker		O	S	T	1	1.50	0.25	0.08	0.25	50.00
Smallmouth Redhorse		I	S	M	1	1.50	0.25	0.75	2.47	500.00
Common Carp		O	M	T	1	1.50	0.25	2.25	7.41	1500.00
Scarlet Shiner		I	S	M	22	33.00	5.45	0.04	0.13	1.19
Striped Shiner		I	S	N	16	24.00	3.96	0.22	0.73	9.29
Spotfin Shiner		I	M	N	2	3.00	0.50	0.01	0.02	2.50
Sand Shiner		I	M	M	27	40.50	6.68	0.05	0.15	1.11
Silverjaw Minnow		I	M	N	8	12.00	1.98	0.02	0.05	1.25
Bluntnose Minnow		O	C	T	27	40.50	6.68	0.08	0.25	1.85
Central Stoneroller		H	N	N	15	22.50	3.71	0.15	0.49	6.67
Yellow Bullhead		I	C	T	20	30.00	4.95	1.80	5.93	60.00
Rock Bass		C	C	N	4	6.00	0.99	0.38	1.24	62.50
Smallmouth Bass		C	C	M	6	9.00	1.49	1.73	5.69	192.00
Spotted Bass		C	C	N	3	4.50	0.74	0.44	1.43	96.67
Largemouth Bass		C	C	N	2	3.00	0.50	0.30	0.99	100.00
Green Sunfish		I	C	T	50	75.00	12.38	2.34	7.72	31.25
Bluegill Sunfish		I	C	P	3	4.50	0.74	0.03	0.10	6.67
Longear Sunfish		I	C	M	102	153.00	25.25	2.87	9.45	18.75
Logperch		I	S	M	1	1.50	0.25	0.02	0.06	12.00
Johnny Darter		I	C	N	9	13.50	2.23	0.02	0.05	1.11
Johnny Darter		I	C	N	2	3.00	0.50	0.00	0.01	1.00
Greenside Darter		I	S	M	27	40.50	6.68	0.09	0.30	2.22
Rainbow Darter		I	S	M	12	18.00	2.97	0.02	0.06	1.00
Freshwater Drum			M	P	1	1.50	0.25	0.15	0.49	100.00
Data Totals:					404	606.00		30.35		
Number of Species:					27					
Number of Hybrids:					0					

River Code: 10-120-001	Stream: TRIB TO W FK EAGLE CREEK (7.05) @ RUSSELLVILLE-WINCHESTER RD	Sample Date: 2016-08-30
River Mile: 1.8	Location: TRIB TO W FK EAGLE CREEK (7.05) @ RUSSELLVILLE-WINCHESTER RD	
Time Fished: 1800 sec	Drainage: 7.2 sq mi	Depth: Data Source:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribes	Flow: N Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
White Sucker		O	S	T	17	34.00	2.08	0.00	#Error	0.00
Creek Chub		G	N	T	369	738.00	45.05	0.00	#Error	0.00
South. Redbelly Dace		H	S	N	96	192.00	11.72	0.00	#Error	0.00
Silverjaw Minnow		I	M	N	126	252.00	15.38	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	68	136.00	8.30	0.00	#Error	0.00
Central Stoneroller		H	N	N	54	108.00	6.59	0.00	#Error	0.00
Bluegill Sunfish		I	C	P	1	2.00	0.12	0.00	#Error	0.00
Johnny Darter		I	C	N	31	62.00	3.79	0.00	#Error	0.00
Rainbow Darter		I	S	M	2	4.00	0.24	0.00	#Error	0.00
Fantail Darter		I	C	N	55	110.00	6.72	0.00	#Error	0.00
Data Totals:					819	1638.00		0.00		
Number of Species:					10					
Number of Hybrids:					0					

River Code: 10-120-002	Stream: HONEY CREEK E OF RUSSELLVILLE @ MOUTH	Sample Date: 2016-07-06
River Mile: 0.1	Location: HONEY CREEK E OF RUSSELLVILLE @ MOUTH	
Time Fished: 1091 sec	Drainage: 0.9 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
White Sucker		O	S	T	1	2.00	0.15	0.00	#Error	0.00
Creek Chub		G	N	T	221	442.00	33.54	0.00	#Error	0.00
South. Redbelly Dace		H	S	N	282	564.00	42.79	0.00	#Error	0.00
Silverjaw Minnow		I	M	N	20	40.00	3.03	0.00	#Error	0.00
Fathead Minnow		O	C	T	2	4.00	0.30	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	4	8.00	0.61	0.00	#Error	0.00
Central Stoneroller		H	N	N	13	26.00	1.97	0.00	#Error	0.00
Johnny Darter		I	C	N	57	114.00	8.65	0.00	#Error	0.00
Rainbow Darter		I	S	M	1	2.00	0.15	0.00	#Error	0.00
Fantail Darter		I	C	N	58	116.00	8.80	0.00	#Error	0.00
Data Totals:					659	1318.00		0.00		
Number of Species:					10					
Number of Hybrids:					0					

River Code: 10-203-000	Stream: MACKENZIE RUN	Sample Date: 2014-10-02
River Mile: 0.2	Location: MACKENZIE RUN UPST. WAGGONER RIFFLE RD.	
Time Fished: 995 sec	Drainage: 0.6 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Western Blacknose Dace		G	S	T	6	12.00	4.23	0.00	#Error	0.00
Creek Chub		G	N	T	96	192.00	67.61	0.00	#Error	0.00
South. Redbelly Dace		H	S	N	1	2.00	0.70	0.00	#Error	0.00
Central Stoneroller		H	N	N	23	46.00	16.20	0.00	#Error	0.00
Green Sunfish		I	C	T	8	16.00	5.63	0.00	#Error	0.00
Rainbow Darter		I	S	M	1	2.00	0.70	0.00	#Error	0.00
Fantail Darter		I	C	N	7	14.00	4.93	0.00	#Error	0.00
		Data Totals:			142	284.00		0.00		
		Number of Species:			7					
		Number of Hybrids:			0					

River Code: 10-300-000	Stream: STRAIGHT CREEK	Sample Date: 2015-06-15
River Mile: 17.7	Location: STRAIGHT CREEK NEAR FITE-HAUCK RD. AND ASH RIDGE-ARNHEIM RD.	
Time Fished: 3016 sec	Drainage: 8.9 sq mi	Depth: Data Source:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
White Sucker		O	S	T	19	38.00	3.38	0.00	#Error	0.00
Creek Chub		G	N	T	112	224.00	19.93	0.00	#Error	0.00
Scarlet Shiner		I	S	M	4	8.00	0.71	0.00	#Error	0.00
Silverjaw Minnow		I	M	N	3	6.00	0.53	0.00	#Error	0.00
Fathead Minnow		O	C	T	1	2.00	0.18	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	132	264.00	23.49	0.00	#Error	0.00
Central Stoneroller		H	N	N	122	244.00	21.71	0.00	#Error	0.00
Yellow Bullhead		I	C	T	6	12.00	1.07	0.00	#Error	0.00
Green Sunfish		I	C	T	26	52.00	4.63	0.00	#Error	0.00
Bluegill Sunfish		I	C	P	30	60.00	5.34	0.00	#Error	0.00
Longear Sunfish		I	C	M	5	10.00	0.89	0.00	#Error	0.00
Green SF x Bluegill SF				N	1	2.00	0.18	0.00	#Error	0.00
Johnny Darter		I	C	N	22	44.00	3.91	0.00	#Error	0.00
Greenside Darter		I	S	M	4	8.00	0.71	0.00	#Error	0.00
Rainbow Darter		I	S	M	10	20.00	1.78	0.00	#Error	0.00
Fantail Darter		I	C	N	65	130.00	11.57	0.00	#Error	0.00
Data Totals:					562	1124.00		0.00		
Number of Species:					16					
Number of Hybrids:					1					

River Code: 10-300-000	Stream: STRAIGHT CREEK	Sample Date: 2016-07-06
River Mile: 16.8	Location: STRAIGHT CREEK AT ARNHEIM @ BROWNSTOWN-ARNHEIM RD.	
Time Fished: 1861 sec	Drainage: 12.5 sq mi	Depth: Data Source:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Northern Hog Sucker		I	S	M	2	4.00	0.22	0.00	#Error	0.00
White Sucker		O	S	T	58	116.00	6.51	0.00	#Error	0.00
Creek Chub		G	N	T	65	130.00	7.30	0.00	#Error	0.00
Scarlet Shiner		I	S	M	1	2.00	0.11	0.00	#Error	0.00
Striped Shiner		I	S	N	39	78.00	4.38	0.00	#Error	0.00
Silverjaw Minnow		I	M	N	51	102.00	5.72	0.00	#Error	0.00
Fathead Minnow		O	C	T	1	2.00	0.11	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	113	226.00	12.68	0.00	#Error	0.00
Central Stoneroller		H	N	N	355	710.00	39.84	0.00	#Error	0.00
Largemouth Bass		C	C	N	9	18.00	1.01	0.00	#Error	0.00
Green Sunfish		I	C	T	11	22.00	1.23	0.00	#Error	0.00
Bluegill Sunfish		I	C	P	1	2.00	0.11	0.00	#Error	0.00
Longear Sunfish		I	C	M	17	34.00	1.91	0.00	#Error	0.00
Hybrid x Sunfish				N	3	6.00	0.34	0.00	#Error	0.00
Johnny Darter		I	C	N	21	42.00	2.36	0.00	#Error	0.00
Greenside Darter		I	S	M	8	16.00	0.90	0.00	#Error	0.00
Rainbow Darter		I	S	M	27	54.00	3.03	0.00	#Error	0.00
Fantail Darter		I	C	N	109	218.00	12.23	0.00	#Error	0.00
Data Totals:					891	1782.00		0.00		
Number of Species:					18					
Number of Hybrids:					1					

River Code: 10-300-000	Stream: STRAIGHT CREEK	Sample Date: 2016-07-18
River Mile: 9.5	Location: STRAIGHT CREEK WSW OF RUSSELLVILLE @ ST. RT. 125	
Time Fished: 1328 sec	Drainage: 34.0 sq mi	Depth:
Dist Fished: 0.12 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Northern Hog Sucker		I	S	M	1	2.61	0.22	0.08	0.79	31.00
White Sucker		O	S	T	23	60.00	5.16	0.37	3.56	6.09
Creek Chub		G	N	T	88	229.57	19.73	1.66	16.16	7.21
Striped Shiner		I	S	N	14	36.52	3.14	0.30	2.93	8.21
Silverjaw Minnow		I	M	N	15	39.13	3.36	0.07	0.68	1.79
Bluntnose Minnow		O	C	T	35	91.30	7.85	0.27	2.62	2.94
Central Stoneroller		H	N	N	163	425.22	36.55	6.64	64.86	15.63
Yellow Bullhead		I	C	T	6	15.65	1.35	0.38	3.69	24.17
Largemouth Bass		C	C	N	4	10.43	0.90	0.06	0.56	5.50
Johnny Darter		I	C	N	23	60.00	5.16	0.05	0.53	0.91
Greenside Darter		I	S	M	18	46.96	4.04	0.18	1.78	3.89
Fantail Darter		I	C	N	56	146.09	12.56	0.19	1.83	1.29
Data Totals:					446	1163.48		10.24		
Number of Species:					12					
Number of Hybrids:					0					

River Code: 10-300-000	Stream: STRAIGHT CREEK	Sample Date: 2016-07-18
River Mile: 2.8	Location: STRAIGHT CREEK AT CENTERPOINT @ OLD U.S. RT. 68	
Time Fished: 2513 sec	Drainage: 57.0 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: D

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Golden Redhorse		I	S	M	15	30.00	1.92	0.09	0.29	3.00
Northern Hog Sucker		I	S	M	28	56.00	3.59	6.22	20.21	111.11
White Sucker		O	S	T	16	32.00	2.05	0.15	0.49	4.75
Creek Chub		G	N	T	23	46.00	2.95	0.16	0.52	3.48
Scarlet Shiner		I	S	M	17	34.00	2.18	0.07	0.24	2.19
Striped Shiner		I	S	N	97	194.00	12.44	5.01	16.26	25.81
Silverjaw Minnow		I	M	N	9	18.00	1.15	0.01	0.03	0.56
Bluntnose Minnow		O	C	T	25	50.00	3.21	0.11	0.37	2.29
Central Stoneroller		H	N	N	416	832.00	53.33	17.77	57.73	21.36
Channel Catfish			C	N	6	12.00	0.77	0.03	0.10	2.50
Smallmouth Bass		C	C	M	1	2.00	0.13	0.01	0.03	5.00
Spotted Bass		C	C	N	1	2.00	0.13	0.06	0.20	31.00
Green Sunfish		I	C	T	7	14.00	0.90	0.46	1.48	32.50
Bluegill Sunfish		I	C	P	1	2.00	0.13	0.05	0.16	25.00
Orangespotted Sunfish		I	C	N	1	2.00	0.13	0.03	0.10	15.00
Longear Sunfish		I	C	M	3	6.00	0.38	0.17	0.55	28.00
Johnny Darter		I	C	N	3	6.00	0.38	0.01	0.02	1.00
Greenside Darter		I	S	M	44	88.00	5.64	0.21	0.68	2.38
Rainbow Darter		I	S	M	22	44.00	2.82	0.05	0.15	1.05
Fantail Darter		I	C	N	45	90.00	5.77	0.11	0.37	1.27
Data Totals:					780	1560.00		30.78		
Number of Species:					20					
Number of Hybrids:					0					

River Code: 10-301-000	Stream: SINK CREEK	Sample Date: 2015-08-13
River Mile: 0.2	Location: SINK CREEK ADJ. OLD A AND P RD. (RD. 67A)	
Time Fished: 1112 sec	Drainage: 1.7 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
White Sucker		O	S	T	3	6.00	4.23	0.00	#Error	0.00
Creek Chub		G	N	T	3	6.00	4.23	0.00	#Error	0.00
Striped Shiner		I	S	N	1	2.00	1.41	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	22	44.00	30.99	0.00	#Error	0.00
Channel Catfish			C	N	1	2.00	1.41	0.00	#Error	0.00
Yellow Bullhead		I	C	T	5	10.00	7.04	0.00	#Error	0.00
Brown Bullhead		I	C	T	11	22.00	15.49	0.00	#Error	0.00
Green Sunfish		I	C	T	22	44.00	30.99	0.00	#Error	0.00
Bluegill Sunfish		I	C	P	1	2.00	1.41	0.00	#Error	0.00
Longear Sunfish		I	C	M	2	4.00	2.82	0.00	#Error	0.00
Data Totals:					71	142.00		0.00		
Number of Species:					10					
Number of Hybrids:					0					

River Code: 10-302-000	Stream: RANGLE RUN	Sample Date: 2015-08-12
River Mile: 0.3	Location: RANGLE RUN ADJ. RANGLE RUN RD. (RD. 541)	
Time Fished: 1800 sec	Drainage: 1.0 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
White Sucker		O	S	T	33	66.00	4.62	0.00	#Error	0.00
Creek Chub		G	N	T	346	692.00	48.46	0.00	#Error	0.00
Emerald Shiner		I	M	N	18	36.00	2.52	0.00	#Error	0.00
Scarlet Shiner		I	S	M	8	16.00	1.12	0.00	#Error	0.00
Striped Shiner		I	S	N	43	86.00	6.02	0.00	#Error	0.00
Spotfin Shiner		I	M	N	1	2.00	0.14	0.00	#Error	0.00
Silverjaw Minnow		I	M	N	1	2.00	0.14	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	63	126.00	8.82	0.00	#Error	0.00
Central Stoneroller		H	N	N	7	14.00	0.98	0.00	#Error	0.00
Yellow Bullhead		I	C	T	4	8.00	0.56	0.00	#Error	0.00
Brown Bullhead		I	C	T	15	30.00	2.10	0.00	#Error	0.00
Western Mosquitofish		I	N	N	1	2.00	0.14	0.00	#Error	0.00
Largemouth Bass		C	C	N	3	6.00	0.42	0.00	#Error	0.00
Green Sunfish		I	C	T	116	232.00	16.25	0.00	#Error	0.00
Bluegill Sunfish		I	C	P	21	42.00	2.94	0.00	#Error	0.00
Longear Sunfish		I	C	M	20	40.00	2.80	0.00	#Error	0.00
Logperch		I	S	M	2	4.00	0.28	0.00	#Error	0.00
Rainbow Darter		I	S	M	1	2.00	0.14	0.00	#Error	0.00
Fantail Darter		I	C	N	11	22.00	1.54	0.00	#Error	0.00
Data Totals:					714	1428.00		0.00		
Number of Species:					19					
Number of Hybrids:					0					

River Code: 10-303-000	Stream: SHEEP RUN	Sample Date: 2015-08-12
River Mile: 0.1	Location: SHEEP RUN UPST. CENTERPOINT RD. (RD. 67B)	
Time Fished: 2278 sec	Drainage: 3.7 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Northern Hog Sucker		I	S	M	2	4.00	0.25	0.00	#Error	0.00
White Sucker		O	S	T	25	50.00	3.13	0.00	#Error	0.00
Creek Chub		G	N	T	182	364.00	22.78	0.00	#Error	0.00
Scarlet Shiner		I	S	M	53	106.00	6.63	0.00	#Error	0.00
Striped Shiner		I	S	N	64	128.00	8.01	0.00	#Error	0.00
Silverjaw Minnow		I	M	N	3	6.00	0.38	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	114	228.00	14.27	0.00	#Error	0.00
Central Stoneroller		H	N	N	294	588.00	36.80	0.00	#Error	0.00
Western Mosquitofish		I	N	N	1	2.00	0.13	0.00	#Error	0.00
Green Sunfish		I	C	T	12	24.00	1.50	0.00	#Error	0.00
Bluegill Sunfish		I	C	P	2	4.00	0.25	0.00	#Error	0.00
Orangespotted Sunfish		I	C	N	2	4.00	0.25	0.00	#Error	0.00
Longear Sunfish		I	C	M	3	6.00	0.38	0.00	#Error	0.00
Rainbow Darter		I	S	M	2	4.00	0.25	0.00	#Error	0.00
Fantail Darter		I	C	N	40	80.00	5.01	0.00	#Error	0.00
Data Totals:					799	1598.00		0.00		
Number of Species:					15					
Number of Hybrids:					0					

River Code: 10-304-000	Stream: CAMPBELL RUN	Sample Date: 2015-08-02
River Mile: 0.2	Location: CAMPBELL RUN @ OLD U.S. RT. 68 (RD. 30)	
Time Fished: 2472 sec	Drainage: 2.0 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
White Sucker		O	S	T	2	4.00	1.02	0.00	#Error	0.00
Creek Chub		G	N	T	134	268.00	68.02	0.00	#Error	0.00
Striped Shiner		I	S	N	4	8.00	2.03	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	7	14.00	3.55	0.00	#Error	0.00
Central Stoneroller		H	N	N	26	52.00	13.20	0.00	#Error	0.00
Green Sunfish		I	C	T	5	10.00	2.54	0.00	#Error	0.00
Green SF x Bluegill SF				N	1	2.00	0.51	0.00	#Error	0.00
Rainbow Darter		I	S	M	1	2.00	0.51	0.00	#Error	0.00
Fantail Darter		I	C	N	17	34.00	8.63	0.00	#Error	0.00
Data Totals:					197	394.00		0.00		
Number of Species:					9					
Number of Hybrids:					1					

River Code: 10-305-000	Stream: EVANS RUN	Sample Date: 2015-08-02
River Mile: 0.1	Location: EVANS RUN ADJ. STRAIGHT CREEK RD. (RD. 255) AT CONFLUENCE	
Time Fished: 1984 sec	Drainage: 5.3 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
White Sucker		O	S	T	25	50.00	11.11	0.00	#Error	0.00
Creek Chub		G	N	T	143	286.00	63.56	0.00	#Error	0.00
Silverjaw Minnow		I	M	N	2	4.00	0.89	0.00	#Error	0.00
Central Stoneroller		H	N	N	46	92.00	20.44	0.00	#Error	0.00
Fantail Darter		I	C	N	9	18.00	4.00	0.00	#Error	0.00
Data Totals:					225	450.00		0.00		
Number of Species:					5					
Number of Hybrids:					0					

River Code: 10-307-000	Stream: WASHBURN RUN	Sample Date: 2015-07-01
River Mile: 1.3	Location: WASHBURN RUN ABOUT 100 YDS. DST. HOCKMAN RD. (RD. 68)	
Time Fished: 2828 sec	Drainage: 5.1 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Creek Chub		G	N	T	210	420.00	54.40	0.00	#Error	0.00
Fathead Minnow		O	C	T	1	2.00	0.26	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	15	30.00	3.89	0.00	#Error	0.00
Central Stoneroller		H	N	N	156	312.00	40.41	0.00	#Error	0.00
Largemouth Bass		C	C	N	2	4.00	0.52	0.00	#Error	0.00
Green Sunfish		I	C	T	2	4.00	0.52	0.00	#Error	0.00
		Data Totals:			386	772.00		0.00		
		Number of Species:			6					
		Number of Hybrids:			0					

River Code: 10-308-000	Stream: BULL RUN	Sample Date: 2015-07-01
River Mile: 0.1	Location: BULL RUN NEAR MOUTH	
Time Fished: 1958 sec	Drainage: 1.3 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Creek Chub		G	N	T	20	40.00	54.05	0.00	#Error	0.00
Central Stoneroller		H	N	N	15	30.00	40.54	0.00	#Error	0.00
Green Sunfish		I	C	T	1	2.00	2.70	0.00	#Error	0.00
Bluegill Sunfish		I	C	P	1	2.00	2.70	0.00	#Error	0.00
Data Totals:					37	74.00		0.00		
Number of Species:					4					
Number of Hybrids:					0					

River Code: 10-310-000	Stream: CAMP RUN	Sample Date: 2015-06-17
River Mile: 0.1	Location: CAMP RUN @ DAY HILL-ARNHEIM RD.	
Time Fished: 2001 sec	Drainage: 2.9 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
White Sucker		O	S	T	110	220.00	15.54	0.00	#Error	0.00
Creek Chub		G	N	T	367	734.00	51.84	0.00	#Error	0.00
South. Redbelly Dace		H	S	N	1	2.00	0.14	0.00	#Error	0.00
Fathead Minnow		O	C	T	1	2.00	0.14	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	28	56.00	3.95	0.00	#Error	0.00
Central Stoneroller		H	N	N	149	298.00	21.05	0.00	#Error	0.00
Yellow Bullhead		I	C	T	3	6.00	0.42	0.00	#Error	0.00
Green Sunfish		I	C	T	5	10.00	0.71	0.00	#Error	0.00
Bluegill Sunfish		I	C	P	5	10.00	0.71	0.00	#Error	0.00
Green SF x Bluegill SF				N	2	4.00	0.28	0.00	#Error	0.00
Johnny Darter		I	C	N	2	4.00	0.28	0.00	#Error	0.00
Fantail Darter		I	C	N	35	70.00	4.94	0.00	#Error	0.00
Data Totals:					708	1416.00		0.00		
Number of Species:					12					
Number of Hybrids:					1					

River Code: 10-311-000	Stream: MYERS RUN	Sample Date: 2015-06-30
River Mile: 0.1	Location: MYERS RUN @ MARTIN-HOLLOW RD. (RD. 68)	
Time Fished: 2535 sec	Drainage: 1.3 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
White Sucker		O	S	T	17	34.00	5.17	0.00	#Error	0.00
Creek Chub		G	N	T	130	260.00	39.51	0.00	#Error	0.00
Spotfin Shiner		I	M	N	1	2.00	0.30	0.00	#Error	0.00
Silverjaw Minnow		I	M	N	12	24.00	3.65	0.00	#Error	0.00
Central Stoneroller		H	N	N	153	306.00	46.50	0.00	#Error	0.00
Largemouth Bass		C	C	N	4	8.00	1.22	0.00	#Error	0.00
Green Sunfish		I	C	T	1	2.00	0.30	0.00	#Error	0.00
Bluegill Sunfish		I	C	P	1	2.00	0.30	0.00	#Error	0.00
Green SF x Bluegill SF				N	2	4.00	0.61	0.00	#Error	0.00
Johnny Darter		I	C	N	1	2.00	0.30	0.00	#Error	0.00
Fantail Darter		I	C	N	7	14.00	2.13	0.00	#Error	0.00
		Data Totals:			329	658.00		0.00		
		Number of Species:			11					
		Number of Hybrids:			1					

River Code: 10-313-000	Stream: HONEY RUN	Sample Date: 2015-06-17
River Mile: 0.1	Location: HONEY RUN ADJ. DAY HILL-ARNHEIM RD.	
Time Fished: 842 sec	Drainage: 3.0 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
White Sucker		O	S	T	14	28.00	9.15	0.00	#Error	0.00
Creek Chub		G	N	T	61	122.00	39.87	0.00	#Error	0.00
Silverjaw Minnow		I	M	N	12	24.00	7.84	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	11	22.00	7.19	0.00	#Error	0.00
Central Stoneroller		H	N	N	7	14.00	4.58	0.00	#Error	0.00
Green Sunfish		I	C	T	7	14.00	4.58	0.00	#Error	0.00
Johnny Darter		I	C	N	16	32.00	10.46	0.00	#Error	0.00
Fantail Darter		I	C	N	25	50.00	16.34	0.00	#Error	0.00
Data Totals:					153	306.00		0.00		
Number of Species:					8					
Number of Hybrids:					0					

River Code: 10-314-000	Stream: WEST FORK STRAIGHT CREEK	Sample Date: 2015-06-17
River Mile: 1.3	Location: WEST FORK STRAIGHT CREEK @ WESTFORK RD. (RD. 66A)	
Time Fished: 2141 sec	Drainage: 4.3 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
White Sucker		O	S	T	61	122.00	10.30	0.00	#Error	0.00
Creek Chub		G	N	T	273	546.00	46.11	0.00	#Error	0.00
Silverjaw Minnow		I	M	N	6	12.00	1.01	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	92	184.00	15.54	0.00	#Error	0.00
Central Stoneroller		H	N	N	110	220.00	18.58	0.00	#Error	0.00
Johnny Darter		I	C	N	6	12.00	1.01	0.00	#Error	0.00
Fantail Darter		I	C	N	44	88.00	7.43	0.00	#Error	0.00
		Data Totals:			592	1184.00		0.00		
		Number of Species:			7					
		Number of Hybrids:			0					

River Code: 10-315-000	Stream: BUCK RUN	Sample Date: 2015-06-15
River Mile: 0.1	Location: BUCK RUN @ ASH RIDGE ARNHEIM RD. (RD. 17B)	
Time Fished: 2649 sec	Drainage: 2.2 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
White Sucker		O	S	T	8	16.00	2.31	0.00	#Error	0.00
Creek Chub		G	N	T	173	346.00	49.86	0.00	#Error	0.00
Silverjaw Minnow		I	M	N	2	4.00	0.58	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	28	56.00	8.07	0.00	#Error	0.00
Central Stoneroller		H	N	N	97	194.00	27.95	0.00	#Error	0.00
Green Sunfish		I	C	T	11	22.00	3.17	0.00	#Error	0.00
Bluegill Sunfish		I	C	P	1	2.00	0.29	0.00	#Error	0.00
Longear Sunfish		I	C	M	1	2.00	0.29	0.00	#Error	0.00
Johnny Darter		I	C	N	13	26.00	3.75	0.00	#Error	0.00
Rainbow Darter		I	S	M	2	4.00	0.58	0.00	#Error	0.00
Fantail Darter		I	C	N	11	22.00	3.17	0.00	#Error	0.00
Data Totals:					347	694.00		0.00		
Number of Species:					11					
Number of Hybrids:					0					

River Code: 10-316-000	Stream: SYCAMORE RUN	Sample Date: 2017-06-22
River Mile: 0.1	Location: SYCAMORE RUN NR. FITE-HAUCK RD. AND ASH RIDGE ARNHEIM RD.	
Time Fished: 1800 sec	Drainage: 1.6 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: F

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
White Sucker		O	S	T	14	28.00	7.11	0.00	#Error	0.00
Creek Chub		G	N	T	87	174.00	44.16	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	28	56.00	14.21	0.00	#Error	0.00
Central Stoneroller		H	N	N	14	28.00	7.11	0.00	#Error	0.00
Yellow Bullhead		I	C	T	1	2.00	0.51	0.00	#Error	0.00
Black Crappie		I	C	N	1	2.00	0.51	0.00	#Error	0.00
Largemouth Bass		C	C	N	6	12.00	3.05	0.00	#Error	0.00
Green Sunfish		I	C	T	8	16.00	4.06	0.00	#Error	0.00
Bluegill Sunfish		I	C	P	24	48.00	12.18	0.00	#Error	0.00
Johnny Darter		I	C	N	8	16.00	4.06	0.00	#Error	0.00
Fantail Darter		I	C	N	6	12.00	3.05	0.00	#Error	0.00
Data Totals:					197	394.00		0.00		
Number of Species:					11					
Number of Hybrids:					0					

River Code: 10-407-000	Stream: TOWN RUN	Sample Date: 2016-08-30
River Mile: 0.8	Location: TOWN RUN JUST UPST. GEORGETOWN WWTP	
Time Fished: 1800 sec	Drainage: 1.4 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Creek Chub		G	N	T	308	616.00	99.68	0.00	#Error	0.00
Green Sunfish		I	C	T	1	2.00	0.32	0.00	#Error	0.00
		Data Totals:			309	618.00		0.00		
		Number of Species:			2					
		Number of Hybrids:			0					

River Code: 10-407-000	Stream: TOWN RUN	Sample Date: 2016-08-30
River Mile: 0.6	Location: TOWN RUN DST. GEORGETOWN WWTP	
Time Fished: 1800 sec	Drainage: 1.4 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Creek Chub		G	N	T	152	304.00	96.20	0.00	#Error	0.00
Green Sunfish		I	C	T	5	10.00	3.16	0.00	#Error	0.00
Hybrid x Sunfish				N	1	2.00	0.63	0.00	#Error	0.00
		Data Totals:			158	316.00		0.00		
		Number of Species:			3					
		Number of Hybrids:			1					

River Code: 10-507-000	Stream: NACE RUN	Sample Date: 2016-07-11
River Mile: 0.4	Location: NACE RUN @ SHAWNEE SP MARINA UPST. DAM	
Time Fished: 1747 sec	Drainage: 1.4 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Western Blacknose Dace		G	S	T	115	230.00	23.71	0.00	#Error	0.00
Creek Chub		G	N	T	178	356.00	36.70	0.00	#Error	0.00
South. Redbelly Dace		H	S	N	187	374.00	38.56	0.00	#Error	0.00
Rainbow Darter		I	S	M	5	10.00	1.03	0.00	#Error	0.00
		Data Totals:			485	970.00		0.00		
		Number of Species:			4					
		Number of Hybrids:			0					

River Code: 10-508-000	Stream: TURKEY CREEK	Sample Date: 2016-07-08
River Mile: 12.9	Location: TURKEY CREEK DST. WOLF DEN RUN ADJ. SR 125	
Time Fished: 1920 sec	Drainage: 1.6 sq mi	Depth: Data Source:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
White Sucker		O	S	T	2	4.00	0.69	0.00	#Error	0.00
Western Blacknose Dace		G	S	T	14	28.00	4.86	0.00	#Error	0.00
Creek Chub		G	N	T	187	374.00	64.93	0.00	#Error	0.00
South. Redbelly Dace		H	S	N	24	48.00	8.33	0.00	#Error	0.00
Central Stoneroller		H	N	N	35	70.00	12.15	0.00	#Error	0.00
Green Sunfish		I	C	T	5	10.00	1.74	0.00	#Error	0.00
Rainbow Darter		I	S	M	17	34.00	5.90	0.00	#Error	0.00
Orangethroat Darter		I	S	N	4	8.00	1.39	0.00	#Error	0.00
Data Totals:					288	576.00		0.00		
Number of Species:					8					
Number of Hybrids:					0					

River Code: 10-508-000	Stream: TURKEY CREEK	Sample Date: 2016-07-13
River Mile: 10.7	Location: TURKEY CREEK DST. TURKEY CREEK LAKE	
Time Fished: 2362 sec	Drainage: 8.7 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Western Blacknose Dace		G	S	T	1	2.00	0.52	0.00	#Error	0.00
Creek Chub		G	N	T	30	60.00	15.46	0.00	#Error	0.00
Striped Shiner		I	S	N	38	76.00	19.59	0.00	#Error	0.00
Central Stoneroller		H	N	N	98	196.00	50.52	0.00	#Error	0.00
Yellow Bullhead		I	C	T	3	6.00	1.55	0.00	#Error	0.00
Green Sunfish		I	C	T	9	18.00	4.64	0.00	#Error	0.00
Bluegill Sunfish		I	C	P	3	6.00	1.55	0.00	#Error	0.00
Rainbow Darter		I	S	M	8	16.00	4.12	0.00	#Error	0.00
Fantail Darter		I	C	N	4	8.00	2.06	0.00	#Error	0.00
Data Totals:					194	388.00		0.00		
Number of Species:					9					
Number of Hybrids:					0					

River Code: 10-508-000	Stream: TURKEY CREEK	Sample Date: 2016-09-20
River Mile: 9.6	Location: TURKEY CREEK DST. ROOSEVELT LAKE @ ST. RT. 125	
Time Fished: 2700 sec	Drainage: 16.5 sq mi	Depth: Data Source:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Golden Redhorse		I	S	M	3	6.00	1.00	0.00	#Error	0.00
Northern Hog Sucker		I	S	M	34	68.00	11.37	0.00	#Error	0.00
White Sucker		O	S	T	1	2.00	0.33	0.00	#Error	0.00
Spotted Sucker		I	S	N	9	18.00	3.01	0.00	#Error	0.00
Western Blacknose Dace		G	S	T	1	2.00	0.33	0.00	#Error	0.00
Creek Chub		G	N	T	14	28.00	4.68	0.00	#Error	0.00
South. Redbelly Dace		H	S	N	6	12.00	2.01	0.00	#Error	0.00
Silver Shiner		I	S	I	2	4.00	0.67	0.00	#Error	0.00
Scarlet Shiner		I	S	M	8	16.00	2.68	0.00	#Error	0.00
Striped Shiner		I	S	N	99	198.00	33.11	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	25	50.00	8.36	0.00	#Error	0.00
Central Stoneroller		H	N	N	14	28.00	4.68	0.00	#Error	0.00
Yellow Bullhead		I	C	T	3	6.00	1.00	0.00	#Error	0.00
Rock Bass		C	C	N	1	2.00	0.33	0.00	#Error	0.00
Smallmouth Bass		C	C	M	2	4.00	0.67	0.00	#Error	0.00
Largemouth Bass		C	C	N	4	8.00	1.34	0.00	#Error	0.00
Green Sunfish		I	C	T	44	88.00	14.72	0.00	#Error	0.00
Bluegill Sunfish		I	C	P	10	20.00	3.34	0.00	#Error	0.00
Longear Sunfish		I	C	M	2	4.00	0.67	0.00	#Error	0.00
Johnny Darter		I	C	N	1	2.00	0.33	0.00	#Error	0.00
Greenside Darter		I	S	M	6	12.00	2.01	0.00	#Error	0.00
Rainbow Darter		I	S	M	4	8.00	1.34	0.00	#Error	0.00
Fantail Darter		I	C	N	6	12.00	2.01	0.00	#Error	0.00
Data Totals:					299	598.00		0.00		
Number of Species:					23					
Number of Hybrids:					0					

River Code: 10-508-000	Stream: TURKEY CREEK	Sample Date: 2016-07-08
River Mile: 6.7	Location: TURKEY CREEK UPST. POND LICK RUN @ ST. RT. 125	
Time Fished: 2344 sec	Drainage: 26.4 sq mi	Depth: Data Source:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Northern Hog Sucker		I	S	M	23	46.00	11.68	3.80	18.07	82.61
Creek Chub		G	N	T	13	26.00	6.60	0.84	3.99	32.31
Scarlet Shiner		I	S	M	3	6.00	1.52	0.01	0.05	1.67
Striped Shiner		I	S	N	32	64.00	16.24	1.80	8.56	28.13
Bluntnose Minnow		O	C	T	2	4.00	1.02	0.01	0.04	2.00
Central Stoneroller		H	N	N	22	44.00	11.17	0.59	2.79	13.33
Yellow Bullhead		I	C	T	1	2.00	0.51	0.30	1.43	150.00
Rock Bass		C	C	N	15	30.00	7.61	7.80	37.08	260.00
Smallmouth Bass		C	C	M	8	16.00	4.06	2.00	9.51	125.00
Spotted Bass		C	C	N	3	6.00	1.52	2.81	13.34	467.67
Green Sunfish		I	C	T	20	40.00	10.15	0.28	1.33	7.00
Bluegill Sunfish		I	C	P	8	16.00	4.06	0.04	0.19	2.50
Longear Sunfish		I	C	M	12	24.00	6.09	0.64	3.04	26.67
Greenside Darter		I	S	M	12	24.00	6.09	0.07	0.34	3.00
Rainbow Darter		I	S	M	14	28.00	7.11	0.03	0.15	1.15
Fantail Darter		I	C	N	9	18.00	4.57	0.02	0.10	1.11
Data Totals:					197	394.00		21.04		
Number of Species:					16					
Number of Hybrids:					0					

River Code: 10-508-000	Stream: TURKEY CREEK	Sample Date: 2016-07-13
River Mile: 4.1	Location: TURKEY CREEK AT FRIENDSHIP @ U.S. RT. 52	
Time Fished: 2587 sec	Drainage: 39.5 sq mi	Depth:
Dist Fished: 0.2 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Golden Redhorse		I	S	M	2	3.00	0.40	0.17	2.06	57.50
Northern Hog Sucker		I	S	M	25	37.50	4.98	0.71	8.43	18.80
Bigeye Chub		I	S	I	5	7.50	1.00	0.03	0.36	4.00
Western Blacknose Dace		G	S	T	1	1.50	0.20	0.00	0.05	3.00
Creek Chub		G	N	T	26	39.00	5.18	0.75	8.97	19.23
Rosyside Dace		I	S	S	3	4.50	0.60	0.01	0.09	1.67
Silver Shiner		I	S	I	3	4.50	0.60	0.02	0.18	3.33
Scarlet Shiner		I	S	M	3	4.50	0.60	0.02	0.19	3.50
Striped Shiner		I	S	N	77	115.50	15.34	0.45	5.34	3.87
Spotfin Shiner		I	M	N	3	4.50	0.60	0.02	0.18	3.33
Silverjaw Minnow		I	M	N	1	1.50	0.20	0.00	0.04	2.00
Bluntnose Minnow		O	C	T	3	4.50	0.60	0.02	0.18	3.33
Central Stoneroller		H	N	N	144	216.00	28.69	0.79	9.39	3.64
Channel Shiner		I	M	I	45	67.50	8.96	0.07	0.79	0.98
Yellow Bullhead		I	C	T	1	1.50	0.20	0.15	1.79	100.00
Rock Bass		C	C	N	14	21.00	2.79	3.75	44.83	178.57
Smallmouth Bass		C	C	M	1	1.50	0.20	0.00	0.04	2.00
Spotted Bass		C	C	N	9	13.50	1.79	0.51	6.10	37.78
Green Sunfish		I	C	T	8	12.00	1.59	0.10	1.17	8.13
Bluegill Sunfish		I	C	P	3	4.50	0.60	0.03	0.36	6.67
Longear Sunfish		I	C	M	18	27.00	3.59	0.51	6.10	18.89
Logperch		I	S	M	7	10.50	1.39	0.12	1.43	11.43
Greenside Darter		I	S	M	9	13.50	1.79	0.03	0.36	2.22
Rainbow Darter		I	S	M	47	70.50	9.36	0.09	1.10	1.31
Orangethroat Darter		I	S	N	1	1.50	0.20	0.00	0.02	1.00
Fantail Darter		I	C	N	43	64.50	8.57	0.04	0.47	0.61
Data Totals:					502	753.00		8.36		
Number of Species:					26					
Number of Hybrids:					0					

River Code: 10-516-000	Stream: ODELL CREEK	Sample Date: 2013-09-04
River Mile: 0.3	Location: ODELL CREEK W OF FRIENDSHIP @ DRIVEWAY OFF ODELL CREEK RD.	
Time Fished: 1653 sec	Drainage: 5.3 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Western Blacknose Dace		G	S	T	69	138.00	10.28	0.00	#Error	0.00
Creek Chub		G	N	T	168	336.00	25.04	0.00	#Error	0.00
South. Redbelly Dace		H	S	N	91	182.00	13.56	0.00	#Error	0.00
Rosyside Dace		I	S	S	74	148.00	11.03	0.00	#Error	0.00
Central Stoneroller		H	N	N	218	436.00	32.49	0.00	#Error	0.00
Orangethroat Darter		I	S	N	9	18.00	1.34	0.00	#Error	0.00
Fantail Darter		I	C	N	42	84.00	6.26	0.00	#Error	0.00
		Data Totals:			671	1342.00		0.00		
		Number of Species:			7					
		Number of Hybrids:			0					

River Code: 10-517-000	Stream: POND LICK RUN	Sample Date: 2013-09-04
River Mile: 0.2	Location: POND LICK RUN NW OF FRIENDSHIP, NEAR MOUTH ADJ. SHAWNEE RD.	
Time Fished: 1784 sec	Drainage: 5.3 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Northern Hog Sucker		I	S	M	8	16.00	4.82	0.00	#Error	0.00
White Sucker		O	S	T	1	2.00	0.60	0.00	#Error	0.00
Creek Chub		G	N	T	35	70.00	21.08	0.00	#Error	0.00
Scarlet Shiner		I	S	M	8	16.00	4.82	0.00	#Error	0.00
Striped Shiner		I	S	N	7	14.00	4.22	0.00	#Error	0.00
Central Stoneroller		H	N	N	85	170.00	51.20	0.00	#Error	0.00
Largemouth Bass		C	C	N	1	2.00	0.60	0.00	#Error	0.00
Green Sunfish		I	C	T	1	2.00	0.60	0.00	#Error	0.00
Johnny Darter		I	C	N	1	2.00	0.60	0.00	#Error	0.00
Rainbow Darter		I	S	M	4	8.00	2.41	0.00	#Error	0.00
Orangethroat Darter		I	S	N	1	2.00	0.60	0.00	#Error	0.00
Fantail Darter		I	C	N	14	28.00	8.43	0.00	#Error	0.00
		Data Totals:			166	332.00		0.00		
		Number of Species:			12					
		Number of Hybrids:			0					

River Code: 10-519-000	Stream: BRUSH FORK	Sample Date: 2013-10-09
River Mile: 0.0	Location: BRUSH FORK JUST W OF POND LICK LAKE @ MOUTH	
Time Fished: 1451 sec	Drainage: 1.1 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Western Blacknose Dace		G	S	T	4	8.00	4.30	0.00	#Error	0.00
Creek Chub		G	N	T	85	170.00	91.40	0.00	#Error	0.00
South. Redbelly Dace		H	S	N	4	8.00	4.30	0.00	#Error	0.00
		Data Totals:			93	186.00		0.00		
		Number of Species:			3					
		Number of Hybrids:			0					

River Code: 10-520-000	Stream: WES RUN	Sample Date: 2013-09-04
River Mile: 0.0	Location: WES RUN NW OF FRIENDSHIP, NEAR MOUTH ADJ. ODELL CEMETERY RD.	
Time Fished: 1800 sec	Drainage: 1.0 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Creek Chub		G	N	T	65	130.00	85.53	0.00	#Error	0.00
South. Redbelly Dace		H	S	N	11	22.00	14.47	0.00	#Error	0.00
		Data Totals:			76	152.00		0.00		
		Number of Species:			2					
		Number of Hybrids:			0					

River Code: 10-523-000	Stream: HARBER FORK	Sample Date: 2013-09-04
River Mile: 0.1	Location: HARBER FORK NEAR CAMP OYO, NEAR MOUTH @ SHAWNEE RD.	
Time Fished: 1711 sec	Drainage: 4.7 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Western Blacknose Dace		G	S	T	31	62.00	18.79	0.00	#Error	0.00
Creek Chub		G	N	T	94	188.00	56.97	0.00	#Error	0.00
South. Redbelly Dace		H	S	N	38	76.00	23.03	0.00	#Error	0.00
Orangethroat Darter		I	S	N	2	4.00	1.21	0.00	#Error	0.00
Data Totals:					165	330.00		0.00		
Number of Species:					4					
Number of Hybrids:					0					

River Code: 10-524-000	Stream: MACKLETREE RUN	Sample Date: 2013-09-06
River Mile: 0.4	Location: MACKLETREE RUN JUST UPST. ROOSEVELT LAKE @ MACKLETREE RD.	
Time Fished: 1591 sec	Drainage: 5.8 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Northern Hog Sucker		I	S	M	4	8.00	0.55	0.00	#Error	0.00
White Sucker		O	S	T	31	62.00	4.27	0.00	#Error	0.00
Western Blacknose Dace		G	S	T	12	24.00	1.65	0.00	#Error	0.00
Creek Chub		G	N	T	181	362.00	24.93	0.00	#Error	0.00
South. Redbelly Dace		H	S	N	14	28.00	1.93	0.00	#Error	0.00
Striped Shiner		I	S	N	1	2.00	0.14	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	27	54.00	3.72	0.00	#Error	0.00
Central Stoneroller		H	N	N	271	542.00	37.33	0.00	#Error	0.00
Yellow Bullhead		I	C	T	20	40.00	2.75	0.00	#Error	0.00
Green Sunfish		I	C	T	7	14.00	0.96	0.00	#Error	0.00
Johnny Darter		I	C	N	21	42.00	2.89	0.00	#Error	0.00
Rainbow Darter		I	S	M	104	208.00	14.33	0.00	#Error	0.00
Orangethroat Darter		I	S	N	2	4.00	0.28	0.00	#Error	0.00
Fantail Darter		I	C	N	31	62.00	4.27	0.00	#Error	0.00
Data Totals:					726	1452.00		0.00		
Number of Species:					14					
Number of Hybrids:					0					

River Code: 10-526-000	Stream: LAMPBLACK RUN	Sample Date: 2013-09-06
River Mile: 0.1	Location: LAMPBLACK RUN JUST UPST. TURKEY CREEK LAKE @ PARKING LOT	
Time Fished: 1304 sec	Drainage: 2.7 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Western Blacknose Dace		G	S	T	26	52.00	5.68	0.00	#Error	0.00
Creek Chub		G	N	T	43	86.00	9.39	0.00	#Error	0.00
South. Redbelly Dace		H	S	N	7	14.00	1.53	0.00	#Error	0.00
Striped Shiner		I	S	N	1	2.00	0.22	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	142	284.00	31.00	0.00	#Error	0.00
Central Stoneroller		H	N	N	73	146.00	15.94	0.00	#Error	0.00
Yellow Bullhead		I	C	T	12	24.00	2.62	0.00	#Error	0.00
Green Sunfish		I	C	T	63	126.00	13.76	0.00	#Error	0.00
Rainbow Darter		I	S	M	90	180.00	19.65	0.00	#Error	0.00
Orangethroat Darter		I	S	N	1	2.00	0.22	0.00	#Error	0.00
Data Totals:					458	916.00		0.00		
Number of Species:					10					
Number of Hybrids:					0					

River Code: 10-527-000	Stream: OLD LADE RUN	Sample Date: 2013-09-06
River Mile: 0.2	Location: OLD LADE RUN NEAR MOUTH, ADJ. BIG RUN RD.	
Time Fished: 1275 sec	Drainage: 2.2 sq mi	Depth:
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs	Flow: L
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Western Blacknose Dace		G	S	T	40	80.00	19.05	0.00	#Error	0.00
Creek Chub		G	N	T	60	120.00	28.57	0.00	#Error	0.00
South. Redbelly Dace		H	S	N	35	70.00	16.67	0.00	#Error	0.00
Silverjaw Minnow		I	M	N	5	10.00	2.38	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	2	4.00	0.95	0.00	#Error	0.00
Central Stoneroller		H	N	N	54	108.00	25.71	0.00	#Error	0.00
Green Sunfish		I	C	T	2	4.00	0.95	0.00	#Error	0.00
Rainbow Darter		I	S	M	12	24.00	5.71	0.00	#Error	0.00
		Data Totals:			210	420.00		0.00		
		Number of Species:			8					
		Number of Hybrids:			0					

River Code: 10-530-000	Stream: WOLFDEN RUN	Sample Date: 2014-10-02
River Mile: 0.5	Location: WOLFDEN RUN UPST. WOLFDEN LAKE	
Time Fished: 489 sec	Drainage: 0.4 sq mi	Depth:
Dist Fished: 0.12 km	Basin: Southwest Ohio River Tribs	Flow: N
		Data Source:
		Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Western Blacknose Dace		G	S	T	1	2.40	1.20	0.00	#Error	0.00
Creek Chub		G	N	T	75	180.00	90.36	0.00	#Error	0.00
South. Redbelly Dace		H	S	N	3	7.20	3.61	0.00	#Error	0.00
Green Sunfish		I	C	T	4	9.60	4.82	0.00	#Error	0.00
Data Totals:					83	199.20		0.00		
Number of Species:					4					
Number of Hybrids:					0					

Appendix E

Fish IBI and MIwb Scores and Metrics

Headwater Sites			Number of						Percent of Individuals						Rel Nol minus tolerants/(0. 3km)	IBI
River Mile	Type	Date	DA (sq mi)	Total Species	Minnow Species	Headwater Species	Sensitive Species	Darter Sculpin Species	Simple Lithophils	Tolerant Fishes	Omni- vores	Pioneering	Insect- ivores	DELT Anomalies		
CORNICK RUN (10-038)																
Year: 2017																
0.70	F	6/21/2017	2.0	20(5)	7(5)	1(1)	6(5)	2(3)	14.4(5)	51.8(3)	19.5(1)	46.1(3)	14.0(3)	0.0(5)	490(5)	44
REDOAK CREEK (10-040)																
Year: 2015																
7.20	E	6/18/2015	4.0	9(3)	4(3)	1(1)	0(1)	2(3)	1.5(1)	50.0(3)	33.6(1)	91.8(1)	58.0(5)	0.0(5)	342(3)	30
6.30	E	6/18/2015	9.0	13(3)	5(3)	1(1)	2(1)	4(5)	5.1(3)	60.7(1)	9.0(5)	68.4(1)	62.0(5)	0.0(5)	722(3)	36
2.32	E	7/7/2015	16.0	24(3)	8(5)	1(1)	8(5)	5(5)	15.1(5)	43.4(3)	19.7(3)	41.8(3)	60.0(5)	0.0(5)	712(3)	48
WEST FORK REDOAK CREEK (10-041)																
Year: 2015																
0.05	E	7/7/2015	4.0	6(3)	3(3)	0(1)	0(1)	1(1)	0.3(1)	77.6(1)	2.6(5)	79.2(1)	10.0(1)	0.0(5)	136(3)	26
BIG THREEMILE CREEK (10-043)																
Year: 2015																
11.12	E	8/17/2015	6.0	14(5)	6(5)	1(1)	1(1)	2(3)	20.7(1)	61.5(1)	28.3(1)	49.4(3)	31.0(3)	0.0(5)	572(5)	34
8.07	E	8/10/2015	11.0	13(5)	6(3)	1(1)	2(1)	3(3)	2.0(1)	32.8(5)	22.9(3)	46.8(3)	22.0(3)	0.0(5)	3648(5)	36
4.2	E	8/10/2015	19.7	22(5)	8(5)	1(1)	8(5)	5(5)	7.0(3)	21.3(5)	14.14(5)	20.61(5)	52.3(5)	0.0(5)	1704(5)	54
SLICKAWAY RUN (10-044)																
Year: 2015																
0.10	E	7/21/2015	1.0	10(3)	5(5)	1(1)	2(5)	2(5)	7.0(5)	65.1(1)	12.9(3)	61.3(1)	20.0(3)	0.0(5)	130(3)	42
ELLIS RUN (10-047)																
Year: 2015																
0.05	E	7/16/2015	2.0	13(5)	6(5)	1(1)	3(5)	2(3)	22.0(5)	43.0(3)	13.8(3)	40.9(3)	30.0(5)	0.0(5)	430(5)	48
MORLEY RUN (10-048)																
Year: 2015																
0.05	E	7/16/2015	1.0	7(3)	4(5)	1(1)	0(1)	1(3)	0.0(1)	70.3(1)	9.1(3)	70.3(1)	14.0(3)	0.0(5)	72(3)	32
FISHING GUT CREEK (10-049)																
Year: 2017																
1.00	E	6/21/2017	2.0	11(5)	7(5)	3(3)	1(1)	2(3)	24.1(5)	33.2(5)	5.2(5)	32.0(3)	7.0(1)	0.0(5)	882(5)	46
Year: 2016																
1.70	E	9/1/2016	2.0	2(1)	2(1)	0(1)	0(1)	0(1)	0.0(1)	99.2(1)	0.0(5)	99.2(1)	0.0(1)	0.0(5)	8(1)	20

LITTLE THREEMILE CREEK (10-050)

Year: 2016

1.30	E	7/26/2016	5.0	10(3)	5(3)	0(1)	2(3)	2(3)	21.9(1)	46.0(3)	1.5(5)	48.2(3)	34.0(3)	0.0(5)	448(3)	36

ISAACS CREEK (10-056)

Year: 2017

1.43	E	6/20/2017	5.0	13(3)	6(5)	1(1)	2(1)	3(3)	8.9(1)	41.2(3)	7.3(5)	41.9(3)	33.0(3)	0.0(5)	306(3)	38

ISLAND CREEK (10-057)

Year: 2016

1.10	E	7/26/2016	7.0	12(5)	8(5)	2(3)	2(1)	3(3)	11.4(3)	41.0(3)	40.3(1)	40.8(3)	28.0(3)	0.0(5)	830(5)	38

DONALDSON RUN (10-060)

Year: 2016

0.45	E	7/26/2016	3.0	13(5)	6(5)	1(1)	3(3)	2(3)	12.8(3)	23.2(5)	1.0(5)	22.6(5)	25.0(3)	0.0(5)	456(5)	48

STOUT RUN (10-067)

Year: 2016

3.00	E	8/31/2016	5.0	16(5)	9(5)	4(5)	5(5)	2(3)	44.5(5)	22.2(5)	5.6(5)	13.6(5)	35.0(3)	0.0(5)	2072(5)	56

RUSSELL FORK (10-069)

Year: 2016

0.10	E	8/31/2016	5.0	13(5)	7(5)	2(3)	4(3)	3(3)	35.1(5)	32.1(5)	10.8(5)	38.5(3)	52.0(5)	0.0(5)	530(5)	52

PUNTENNEY RUN (10-071)

Year: 2016

1.35	E	9/20/2016	1.0	2(1)	2(3)	1(1)	0(1)	0(1)	18.3(3)	100.0(1)	0.0(5)	81.7(1)	0.0(1)	0.0(5)	0(1)	24

LONG LICK RUN (10-075)

Year: 2016

1.23	E	8/31/2016	3.0	20(5)	7(5)	4(5)	5(5)	3(5)	26.3(5)	25.5(5)	1.0(5)	19.4(5)	22.0(3)	0.0(5)	1564(5)	58

SULPHUR CREEK (10-077)

Year: 2016

0.35	E	8/16/2016	2.0	9(5)	8(5)	3(3)	2(3)	0(1)	20.1(5)	59.0(1)	0.9(5)	47.8(3)	19.0(3)	0.0(5)	266(5)	42

ROCK RUN (10-081)

Year: 2017

1.80	F	6/20/2017	1.0	9(3)	6(5)	4(5)	2(3)	2(3)	34.1(5)	66.5(1)	0.0(5)	47.5(3)	17.0(3)	0.0(5)	120(3)	46

LOWER TWIN CREEK (10-082)

Year: 2016

5.20	E	8/10/2016	6.0	8(3)	5(3)	4(5)	2(1)	3(3)	47.1(3)	37.8(3)	0.0(5)	31.4(3)	31.0(3)	0.0(5)	254(3)	40
1.65	E	8/16/2016	14.0	12(3)	6(3)	4(5)	5(3)	3(3)	26.8(3)	28.9(5)	0.0(5)	26.8(5)	30.0(3)	0.0(5)	482(3)	46

UPPER TWIN CREEK (10-085)

Year: 2016

2.55	E	7/14/2016	13.0	10(3)	5(3)	5(5)	2(1)	4(3)	25.7(3)	18.5(5)	1.1(5)	10.4(5)	25.0(3)	0.0(5)	724(3)	44

EAST FORK UPPER TWIN CREEK (10-089)

Year: 2016

0.10	E	8/16/2016	4.0	9(5)	5(3)	5(5)	2(3)	4(5)	51.0(5)	43.1(3)	0.0(5)	31.8(3)	48.0(5)	0.0(5)	404(5)	50

MCATEE RUN (10-096)

Year: 2016

0.66	E	7/14/2016	2.0	5(5)	4(3)	3(3)	0(1)	1(3)	20.7(3)	67.9(1)	0.0(5)	47.5(3)	6.0(1)	0.0(5)	196(5)	36

POND RUN (10-099)

Year: 2016

4.64	E	7/11/2016	3.0	6(5)	5(5)	3(3)	1(1)	1(1)	67.3(5)	22.0(5)	0.0(5)	21.7(5)	47.0(5)	0.0(5)	626(5)	48
0.38	E	7/11/2016	11.0	14(5)	6(3)	1(1)	4(3)	2(3)	6.4(1)	6.6(5)	1.1(5)	6.6(5)	76.0(5)	0.0(5)	1190(5)	44

EAGLE CREEK (10-100)

Year: 2016

14.43	E	7/20/2016	107.0	22(3)	3(3)	3(3)	1(1)	5(3)	30.1(3)	10.8(5)	1.8(5)	14.1(5)	69.0(5)	0.0(5)	520(3)	44	9.6
6.20	D	7/21/2016	129.0	24(5)	3(3)	4(3)	3(3)	5(3)	33.1(3)	5.1(5)	5.1(5)	4.9(3)	57.0(5)	0.0(5)	981(5)	48	10.1

BAYLOR RUN (10-101)

Year: 2015

0.15	E	7/23/2015	1.0	2(1)	2(3)	0(1)	0(1)	0(1)	0.0(1)	85.7(1)	0.0(5)	85.7(1)	0.0(1)	0.0(5)	4(1)	22

BEETLE CREEK (10-102)

Year: 2015

4.85	E	8/11/2015	5.0	7(3)	4(3)	1(1)	0(1)	1(1)	0.0(1)	44.5(3)	20.3(3)	44.5(3)	57.0(5)	0.0(5)	284(3)	32
0.45	E	7/23/2015	11.0	19(3)	7(5)	1(1)	4(3)	4(3)	19.8(3)	42.5(3)	16.0(5)	40.2(3)	35.0(3)	0.0(5)	638(3)	42

LAFFERTY RUN (10-103)

Year: 2015

0.05	E	8/11/2015	3.0	19(5)	6(5)	1(1)	7(5)	5(5)	32.5(5)	35.6(3)	7.9(5)	36.0(3)	46.0(5)	0.0(5)	650(5)	52

BRUSHY FORK (10-105)

Year: 2015																	
1.00	E	8/17/2015	4.0	5(5)	4(3)	0(1)	0(1)	0(1)	0.0(1)	54.4(3)	22.3(3)	54.4(3)	12.0(1)	0.0(5)	946(5)	28	

SUCK RUN (10-106)

Year: 2015																	
1.70	E	8/13/2015	5.0	7(5)	5(3)	0(1)	1(1)	0(1)	1.3(1)	50.2(3)	14.7(3)	49.9(3)	28.0(3)	0.0(5)	630(5)	32	

EAST FORK EAGLE CREEK (10-110)

Year: 2016																	
10.95	E	8/3/2016	10.0	14(3)	5(3)	1(1)	4(3)	5(5)	45.1(5)	36.1(3)	6.4(5)	34.2(3)	72.0(5)	0.0(5)	516(3)	44	
7.90	E	8/1/2016	15.0	16(3)	5(3)	1(1)	5(3)	5(5)	44.9(3)	33.0(3)	13.4(5)	26.2(5)	62.0(5)	0.0(5)	552(3)	46	
4.30	E	7/21/2016	36.0	21(3)	3(3)	3(3)	1(1)	5(5)	35.5(3)	31.1(3)	11.3(5)	6.6(5)	69.0(5)	0.0(5)	550(3)	46	9.5
0.82	E	7/19/2016	48.0	19(5)	2(3)	2(3)	1(1)	5(5)	29.5(3)	7.4(5)	4.3(5)	2.2(3)	39.0(3)	0.0(5)	1587(5)	44	8.8

Trib. to East Fork Eagle Creek (6.92) (10-110)

Year: 2016																	
0.10	E	8/1/2016	5.0	14(5)	6(5)	1(1)	4(3)	4(5)	29.4(5)	45.7(3)	6.2(5)	47.0(3)	43.0(5)	0.0(5)	488(5)	50	

TOWN BRANCH (10-111)

Year: 2015																	
0.15	E	7/8/2015	2.0	11(5)	4(3)	2(3)	1(1)	3(5)	3.1(5)	72.6(1)	2.1(5)	70.9(1)	4.0(1)	0.0(5)	842(5)	40	

WASHBURN RUN (10-112)

Year: 2015																	
1.40	E	6/24/2015	1.0	5(3)	3(3)	0(1)	0(1)	0(1)	0.0(1)	91.5(1)	9.3(3)	91.5(1)	3.0(1)	0.0(5)	64(3)	24	

ADA RUN (10-113)

Year: 2015																	
0.70	E	6/24/2015	3.0	8(5)	4(3)	1(1)	0(1)	2(3)	3.4(1)	70.9(1)	29.0(1)	70.0(1)	16.0(3)	0.0(3)	596(5)	26	

HILLS FORK (10-114)

Year: 2015																	
3.05	E	6/22/2015	5.0	13(5)	6(5)	1(1)	3(3)	3(3)	19.8(3)	54.6(3)	16.5(3)	49.9(3)	33.0(3)	1.0(3)	660(5)	38	
1.30	E	6/23/2015	10.0	17(3)	7(5)	1(1)	6(5)	4(5)	38.5(5)	36.1(3)	28.5(3)	40.9(3)	56.0(5)	1.0(3)	372(3)	46	

LICK RUN (10-115)

Year: 2015																	
0.95	E	6/23/2015	1.0	6(5)	2(3)	1(1)	0(1)	1(3)	0.0(1)	85.2(1)	6.7(5)	85.2(1)	31.0(5)	1.0(3)	116(5)	32	

GORDON RUN (10-116)

Year: 2015

0.05	E	6/22/2015	3.0	13(3)	6(5)	1(1)	4(5)	3(5)	13.6(5)	79.7(1)	13.5(3)	80.1(1)	43.0(5)	2.0(1)	260(3)	40	
WEST FORK EAGLE CREEK (10-120)																	
Year: 2016																	
7.38	E	7/25/2016	28.0	24(5)	3(3)	5(5)	1(1)	5(5)	33.3(3)	29.2(3)	16.1(5)	1.3(3)	58.0(5)	0.0(5)	906(5)	48	9.5
3.30	D	8/3/2016	54.0	27(3)	4(5)	5(5)	1(1)	5(5)	30.2(3)	24.5(5)	7.2(5)	3.7(3)	85.0(5)	0.0(5)	458(3)	50	9.6
TRIB TO W FK EAGLE CREEK (7.05) @ RUSSELLVILLE-WINCHESTER RD (10-120)																	
Year: 2016																	
1.80	E	8/30/2016	7.0	10(5)	5(3)	2(3)	1(1)	3(3)	14.0(3)	55.4(3)	10.4(5)	72.5(1)	26.0(3)	0.0(5)	730(5)	38	
HONEY CREEK E OF RUSSELLVILLE @ MOUTH (10-120)																	
Year: 2016																	
0.10	E	7/6/2016	1.0	10(5)	6(5)	2(3)	1(3)	3(5)	43.1(5)	34.6(3)	1.1(5)	46.1(3)	21.0(5)	0.0(5)	862(5)	52	
MACKENZIE RUN (10-203)																	
Year: 2014																	
0.20	E	10/2/2014	1.0	7(3)	4(5)	3(3)	1(3)	2(5)	5.6(5)	77.5(1)	0.0(5)	73.2(1)	11.0(3)	0.0(5)	64(3)	44	
STRAIGHT CREEK (10-300)																	
Year: 2015																	
17.70	E	6/15/2015	9.0	16(3)	6(3)	1(1)	4(3)	4(5)	6.6(3)	52.7(3)	27.1(3)	52.7(3)	31.0(3)	0.0(5)	532(3)	40	
Year: 2016																	
16.75	E	7/6/2016	13.0	18(5)	7(5)	1(1)	5(3)	4(3)	15.2(3)	27.8(5)	19.3(3)	29.4(5)	32.0(3)	0.0(5)	1286(5)	46	
9.45	E	7/18/2016	34.0	12(5)	0(1)	2(3)	0(1)	3(3)	12.6(1)	34.1(3)	13.0(5)	0.9(1)	30.0(3)	0.0(5)	767(5)	34	7.5
2.78	D	7/18/2016	57.0	20(5)	4(5)	3(3)	0(1)	4(3)	30.6(3)	9.1(5)	5.3(5)	0.3(1)	37.0(3)	0.0(5)	1418(5)	42	8.4
SINK CREEK (10-301)																	
Year: 2015																	
0.15	E	8/13/2015	2.0	10(1)	3(3)	0(1)	1(1)	0(1)	5.6(3)	93.0(1)	35.2(1)	66.2(1)	59.0(5)	7.0(1)	10(1)	24	
RANGLE RUN (10-302)																	
Year: 2015																	
0.30	E	8/12/2015	1.0	19(5)	8(5)	1(1)	4(5)	3(5)	12.2(5)	80.8(1)	13.5(3)	73.7(1)	37.0(5)	0.0(5)	274(5)	46	
SHEEP RUN (10-303)																	
Year: 2015																	
0.10	E	8/12/2015	4.0	15(5)	6(5)	1(1)	4(5)	2(3)	18.3(5)	41.7(3)	17.4(3)	38.9(3)	23.0(3)	0.0(5)	932(5)	46	
CAMPBELL RUN (10-304)																	
Year: 2015																	

0.20	E	8/2/2015	2.0	9(3)	4(3)	1(1)	1(1)	2(3)	3.6(3)	75.1(1)	4.6(5)	74.1(1)	14.0(3)	0.0(5)	98(3)	32
EVANS RUN (10-305)																
Year: 2015																
0.05	E	8/2/2015	5.0	5(1)	3(3)	1(1)	0(1)	1(1)	11.1(1)	74.7(1)	11.1(5)	64.4(1)	5.0(1)	0.0(5)	114(1)	22
WASHBURN RUN (10-307)																
Year: 2015																
1.25	E	7/1/2015	5.0	6(3)	4(3)	0(1)	0(1)	0(1)	0.0(1)	59.1(1)	4.2(5)	59.1(1)	1.0(1)	0.0(5)	316(3)	26
BULL RUN (10-308)																
Year: 2015																
0.05	E	7/1/2015	1.0	4(1)	2(3)	0(1)	0(1)	0(1)	0.0(1)	56.8(3)	0.0(5)	56.8(1)	5.0(1)	0.0(5)	32(1)	26
CAMP RUN (10-310)																
Year: 2015																
0.10	E	6/17/2015	3.0	12(5)	5(5)	2(3)	0(1)	2(3)	15.7(3)	72.6(1)	19.6(3)	56.9(1)	7.0(1)	0.0(5)	388(5)	36
MYERS RUN (10-311)																
Year: 2015																
0.05	E	6/30/2015	1.0	11(5)	4(5)	1(1)	0(1)	2(5)	5.2(1)	45.0(3)	5.2(5)	43.8(3)	7.0(1)	2.0(1)	362(5)	36
HONEY RUN (10-313)																
Year: 2015																
0.10	E	6/17/2015	3.0	8(3)	4(3)	1(1)	0(1)	2(3)	9.2(1)	60.8(1)	16.3(3)	69.9(1)	39.0(5)	0.0(5)	120(3)	30
WEST FORK STRAIGHT CREEK (10-314)																
Year: 2015																
1.25	E	6/17/2015	4.0	7(3)	4(3)	1(1)	0(1)	2(3)	10.3(1)	72.0(1)	25.8(1)	63.7(1)	9.0(1)	0.0(5)	332(3)	24
BUCK RUN (10-315)																
Year: 2015																
0.05	E	6/15/2015	2.0	11(5)	4(3)	1(1)	2(3)	3(5)	2.9(3)	63.4(1)	10.4(5)	65.4(1)	12.0(1)	0.0(5)	254(5)	38
SYCAMORE RUN (10-316)																
Year: 2017																
0.05	F	6/22/2017	2.0	11(3)	3(3)	1(1)	0(1)	2(5)	7.1(1)	70.1(1)	21.3(1)	66.5(1)	24.0(3)	0.0(5)	118(3)	30
TOWN RUN (10-407)																
Year: 2016																
0.81	E	8/30/2016	1.4	2(1)	1(1)	0(1)	0(1)	0(1)	0(1)	100.0(1)	0(5)	100.0(1)	0.32(1)	0.0(5)	0(1)	20

TOWN RUN (10-407)																
Year: 2016																
0.63	E	8/30/2016	1.4	2(1)	1(1)	0(1)	0(1)	0(1)	0(1)	99.37(1)	0(5)	99.37(1)	3.16(1)	0.0(5)	2(1)	20

NACE RUN (10-507)																
Year: 2016																
0.43	E	7/11/2016	1.0	4(5)	3(3)	2(3)	1(3)	1(3)	63.3(5)	60.4(1)	0.0(5)	36.7(3)	1.0(1)	0.0(5)	384(5)	40

TURKEY CREEK (10-508)																
Year: 2016																
12.90	E	7/8/2016	2.0	8(5)	4(3)	2(3)	1(1)	2(5)	21.2(5)	72.2(1)	0.7(5)	68.1(1)	9.0(1)	0.0(5)	160(5)	40
10.70	E	7/13/2016	9.0	9(3)	4(3)	2(3)	1(1)	2(3)	24.2(3)	22.2(5)	0.0(5)	20.1(5)	34.0(3)	0.0(5)	302(3)	42
9.58	E	9/20/2016	17.0	23(3)	8(5)	3(3)	8(5)	4(3)	57.9(5)	29.4(5)	8.7(5)	28.1(5)	77.0(5)	0.0(5)	422(3)	54
6.70	E	7/8/2016	26.0	16(3)	4(5)	1(1)	0(1)	3(3)	42.6(5)	18.3(5)	1.0(5)	13.2(5)	68.0(5)	0.0(5)	322(3)	46 8.8
4.13	E	7/13/2016	40.0	26(3)	4(5)	2(3)	4(5)	5(5)	36.5(5)	7.8(5)	0.6(5)	4.8(3)	61.0(5)	0.0(5)	694(3)	54 8.7

ODELL CREEK (10-516)																
Year: 2013																
0.30	E	9/4/2013	5.0	7(5)	5(3)	4(5)	1(1)	2(3)	36.2(3)	35.3(3)	0.0(5)	26.4(5)	19.0(3)	0.0(5)	868(5)	44

POND LICK RUN (10-517)																
Year: 2013																
0.20	E	9/4/2013	5.0	12(3)	4(3)	1(1)	3(3)	4(5)	17.5(5)	22.3(5)	0.6(5)	22.9(5)	27.0(3)	0.0(5)	258(3)	46

BRUSH FORK (10-519)																
Year: 2013																
0.01	E	10/9/2013	1.0	3(1)	3(3)	2(3)	0(1)	0(1)	8.6(3)	95.7(1)	0.0(5)	91.4(1)	0.0(1)	0.0(5)	8(1)	26

WES RUN (10-520)																
Year: 2013																
0.01	E	9/4/2013	1.0	2(1)	2(3)	1(1)	0(1)	0(1)	14.5(3)	85.5(1)	0.0(5)	85.5(1)	0.0(1)	0.0(5)	22(1)	24

HARBER FORK (10-523)																
Year: 2013																
0.07	E	9/4/2013	5.0	4(1)	3(3)	2(3)	0(1)	1(1)	43.0(3)	75.8(1)	0.0(5)	58.2(1)	1.0(1)	0.0(5)	80(1)	26

MACKLETREE RUN (10-524)																
Year: 2013																
0.43	E	9/6/2013	6.0	14(5)	6(5)	3(3)	2(1)	4(5)	23.1(5)	38.3(3)	8.0(5)	32.8(3)	26.0(3)	0.0(5)	896(5)	48

LAMPBLACK RUN (10-526)

Year: 2013

0.10	E	9/6/2013	3.0	10(5)	6(5)	2(3)	1(1)	2(3)	27.3(5)	62.5(1)	31.0(1)	54.4(3)	36.0(5)	0.0(5)	344(5)	42

OLD LADE RUN (10-527)

Year: 2013

0.20	E	9/6/2013	2.0	8(3)	6(5)	2(3)	1(1)	1(1)	41.4(3)	49.5(3)	1.0(5)	32.9(3)	9.0(1)	0.0(5)	212(3)	36

WOLFDEN RUN (10-530)

Year: 2014

0.50	E	10/2/2014	0.0	4(1)	3(3)	2(3)	0(1)	0(1)	4.8(5)	96.4(1)	0.0(5)	95.2(1)	5.0(1)	0.0(5)	7(1)	30

Appendix F

Qualitative Habitat Evaluation Index Scores and Attributes

QHEI Attributes:			Southwest Ohio River Tributaries																								
			WWH Attributes					MWH Attributes																			
Key QHEI Components			Influence																								
			High Influence					Moderate Influence																			
River Mile	QHEI	Gradient (ft/mi)	Silt/Muck Substrates	Max Depth > 40cm	Sparse/No Cover	No Sinuosity	High-Influence Modified Attributes	Recovering Channel	Heavy/Moderate Silt Cover	Sand Substrates (Boat)	Hardpan Substrate	Development Origin	Low Sinuosity	Fair/Poor	Only 1 or 2 Cover Types	Intermittent/Poor	No Fast Current	Embeddedness	High/Moderate	High/Mod. Riffle	No Riffle	M.I. Modified Attributes	H.I.+1/MWH+1 Ratio	MWH	MWH M.I./MWH Ratio		
Cornick Run																											
Year: 2017																											
0.70	70.8	154.00	X	X			X		X						0	X		X	X			X	X	X	6	0.20	1.40
Redoak Creek																											
Year: 2015																											
7.20	47.5	66.00	X							1			X	X	2	X		X	X			X	X	X	7	1.50	4.00
6.30	66.5	68.00	X	X		X	X	X		X	X				0	X		X	X			X	X	X	6	0.13	0.88
2.30	84.0	27.27	X	X		X	X	X	X	X	X				0										0	0.10	0.10
Isaacs Creek																											
Year: 2017																											
1.43	74.4	95.50	X	X			X		X	X	X				0			X	X			X			3	0.14	0.57
W Fk Redoak Creek																											
Year: 2015																											
0.05	65.8	66.67	X				X	X	X	X	X		X		1			X							1	0.29	0.29
Big Threemile Creek																											
Year: 2015																											
11.10	74.8	22.86	X	X		X	X	X		X	X				0	X		X	X			X	X	X	8	0.13	1.13
8.10	56.0	46.00	X							X	X		X		1			X	X			X	X		4	0.40	1.00
4.20	75.5	133.33	X	X		X	X	X		X	X				0							X			1	0.11	0.22
Slickaway Run																											
Year: 2015																											
0.10	82.8	140.00	X	X	X	X	X	X	X	X	X				0										0	0.09	0.09
Ellis Run																											
Year: 2015																											
0.10	76.5	92.00	X	X	X	X	X	X	X	X	X				0										0	0.09	0.09
Meffords Run																											
Year: 2015																											
0.10	80.0	144.44	X	X	X	X	X	X	X	X	X				0										0	0.09	0.09
Fishing Gut Creek																											
Year: 2016																											
1.70	74.3	44.44	X	X	X		X	X		X	X	X			0			X	X			X		X	4	0.11	0.56
Year: 2017																											
1.00	72.8	44.44	X	X			X	X		X	X	X			0			X				X			2	0.13	0.38
Little Threemile Creek																											
Year: 2016																											
1.30	90.5	22.39	X	X		X																					

QHEI Attributes:			Southwest Ohio River Tributaries																												
			WWH Attributes					MWH Attributes																							
Key QHEI Components			High Influence																	Moderate Influence											
			Silt/Muck Substrates	No Sinuosity	Sparse/No Cover	Max Depth <40cm	Modified Attributes	High-Influence Modified Attributes	Recovering Channel	Heavy/Moderate Silt Cover	Sand Substrates (Boat)	Hardpan Substrate Origin	Development Fair/Poor	Low Sinuosity	Only 1 or 2 Cover Types	Intermittent/Poor Pools	No Fast Current Embeddedness	High/Moderate Embeddedness	High/Mod. Riffle Attributes	No Riffle Attributes	M.I. Modified Attributes	H.I.+1/MWH+1 Ratio	MWH	M.I./MWH Ratio							
River Mile	QHEI	Gradient (ft/mi)																													
5.20	74.3	105.00	X	X	X	X	X	X	X	X	X	9				0					X	X			2	0.10	0.30				
1.70	73.0	28.57	X	X		X	X	X	X	X	X	8				0					X	X	X		3	0.11	0.44				
Upper Twin Creek																															
Year: 2016																															
2.60	80.0	64.70	X	X	X	X	X	X	X	X	X	10				0									0	0.09	0.09				
E Fk Upper Twin Creek																															
Year: 2016																															
0.10	79.3	86.90	X		X	X	X	X		X	X	8				0					X		X		2	0.11	0.33				
Mcatee Run																															
Year: 2016																															
0.70	66.5	192.00	X	X	X	X	X	X	X	X	X	9			X	2				X					1	0.30	0.20				
Pond Run																															
Year: 2016																															
4.60	77.5	93.90	X	X	X	X	X	X	X	X	X	10				0						X			1	0.09	0.18				
0.40	77.5	63.70	X	X		X	X	X	X	X	X	9				0									0	0.10	0.10				
Eagle Creek																															
Year: 2016																															
14.40	88.3	20.30	X	X		X	X	X	X	X	X	9				0									0	0.10	0.10				
6.20	88.0	18.00	X	X	X	X	X	X	X	X	X	10				0									0	0.09	0.09				
E Fk Eagle Creek																															
Year: 2016																															
11.00	78.8	19.40	X	X		X	X	X		X	X	7				0				X				X	X	4	0.13	0.63			
7.90	83.5	14.70	X	X		X	X	X	X		X	8				0				X				X		2	0.11	0.33			
4.30	89.8	12.90	X	X		X	X	X	X	X	X	9				0									0	0.10	0.10				
0.80	81.0	34.48	X	X		X	X	X	X	X	X	9				0									0	0.10	0.10				
Trib to E Fk Eagle Creek																															
Year: 2016																															
0.10	80.3	40.20	X	X		X	X	X	X	X	X	9				0				X				X		2	0.10	0.30			
Hannah Run																															
Year: 2016																															
7.40	88.8	20.20	X	X		X	X	X	X	X	X	9				0									0	0.10	0.10				
3.30	87.5	20.90	X	X	X	X	X	X	X	X	X	10				0									0	0.09	0.09				
Northwest Fork																															
Year: 2016																															
1.80	64.3	14.93	X		X		X		X		X	5				X	1				X	X		X		3	0.33	0.67			
Honey Creek																															
Year: 2016																															
0.10	70.3	61.80	X		X	X	X	X		X		7				X	1					X			1	0.25	0.25				
Straight Creek																															
Year: 2015																															
17.70	70.5	31.25	X	X		X	X	X	X	X	X	8				0					X	X		X	3	0.11	0.44				
Year: 2016																															
16.80	70.8	16.95	X	X	</																										

QHEI Attributes:			Southwest Ohio River Tributaries																													
			WWH Attributes							MWH Attributes																						
Key QHEI Components			High Influence															Moderate Influence														
			Silt/Muck Substrates	No Sinuosity	Sparse/No Cover	Max Depth <40cm	Modified Attributes	High-Influence	Recovering Channel	Heavy/Moderate Silt Cover	(Boat)	Sand Substrates	Hardpan Substrate	Development	Low Sinuosity	Fair/Poor	Types	Only 1 or 2 Cover	Intermittent/Poor	No Fast Current	Embeddedness	High/Moderate	Embeddedness	High/Mod. Riffle	No Riffle	M.I. Modified Attributes	H.I.+1/MWH+1 Ratio	MWH	M.I./MWH Ratio			
River Mile	QHEI	Gradient (ft/mi)																														
0.20	68.0	122.73	X	X	X	X	X	X	X	X	8			X	X	2				X						1	0.33	0.22				
Beetle Creek																																
Year:	2015																															
4.90	75.0	26.32	X	X	X	X	X	X	X	X	9				X	1				X						2	0.20	0.30				
0.50	69.3	36.48	X	X	X	X	X	X	X	X	8				X	1				X						2	0.22	0.33				
Lafferty Run																																
Year:	2015																															
0.10	74.0	94.12	X	X	X	X	X	X	X	X	10				X	1				X	X					2	0.18	0.27				
Indian Lick																																
Year:	2015																															
1.00	57.3	40.32	X				X			X	3				X	X	2				X	X		X	X	X	5	0.75	1.50			
Suck Run																																
Year:	2015																															
1.70	65.5	54.09	X		X	X	X	X		X	X	8					0				X	X		X		X	4	0.11	0.56			
Town Branch																																
Year:	2015																															
0.20	73.0	108.00	X		X		X	X	X	X	X	8					0						X			1	0.11	0.22				
Washburn Run																																
Year:	2015																															
1.40	66.3	45.00	X	X		X	X	X		X	X	8					0						X	X		X	3	0.11	0.44			
Adas Run																																
Year:	2015																															
0.70	83.3	57.14	X	X		X	X	X		X	X	8					0							X		X	2	0.11	0.33			
Hills Fork																																
Year:	2015																															
3.10	81.5	22.72	X	X		X	X	X		X	X	8					0							X			1	0.11	0.22			
1.30	78.5	13.04	X		X	X	X																									

[illegible]

Appendix G

Surface Water Organic Chemical Results

Site Location: TURKEY CREEK AT FRIENDSHIP @ U.S. RT. 52				
River Mile: 4.13			STORET ID: X04P02	
Date Sampled	5/16/2016	6/28/2016	7/13/2016	
Organochlorine Pesticides (USEPA Method 608)				
Aldrin	< 0.0022	< 0.0021	< 0.002	
BHC-alpha	< 0.0022	< 0.0021	0.0036	
BHC-beta	< 0.0022	< 0.0021	< 0.002	
BHC-delta	< 0.0022	< 0.0021	< 0.002	
BHC-gamma (Lindane)	< 0.0022	< 0.0021	< 0.002	
DDD	< 0.0065	< 0.0062	< 0.0061	
DDE	< 0.0022	< 0.0021	< 0.002	
DDT	< 0.0065	< 0.0062	< 0.0061	
Dieldrin	< 0.0022	< 0.0021	< 0.002	
Endosulfan sulfate	< 0.022	< 0.021	< 0.02	
Endosulfan, alpha-	< 0.0022	< 0.0021	< 0.002	
Endosulfan, beta-	< 0.0022	< 0.0021	< 0.002	
Endrin	< 0.0022	< 0.0021	< 0.002	
Endrin aldehyde	< 0.0065	< 0.0062	< 0.0061	
Heptachlor	< 0.0022	< 0.0021	< 0.002	
Heptachlor epoxide	< 0.0022	< 0.0021	< 0.002	
Methoxychlor	< 0.011	< 0.01	< 0.01	
Mirex	< 0.011	< 0.01	< 0.01	
Glyphosate (USEPA Method 547)				
Glyphosate (Roundup)	< 5.0	< 5.0	< 5.0	
Chlorinated Acid Herbicides (USEPA Method 515.1)				
Acifluorfen	< 0.21	< 0.21	< 0.22	
Dicamba	< 0.22	< 0.21	< 0.22	
Dichlorophenoxyacetic acid (2,4-D)	< 0.22	< 0.21	< 0.22	
Dichloropropionic acid, 2,2-	< 0.22	< 0.21	< 0.22	
DNBP, 4,6-Dinitro-2-sec-butylphenol	< 0.22	< 0.21	< 0.22	
Picloram, isopropanolamine salt	< 0.22	< 0.21	< 0.22	
Silvex	< 0.22	< 0.21	< 0.22	
Acid Herbicides (USEPA Method 525.2)				
Acetochlor	< 0.2	< 0.23	< 0.21	
Alachlor	< 0.21	< 0.21	< 0.23	
Atrazine	< 0.21	< 0.21	< 0.23	
Butachlor	< 0.21	< 0.21	< 0.23	
Di(2-ethylhexyl) adipate	< 0.53	< 0.54	< 0.57	
Metolachlor	< 0.21	< 0.21	< 0.23	
Metribuzin	< 0.21	< 0.21	< 0.23	
Propachlor	< 0.21	< 0.21	< 0.23	
Simazine	< 0.21	< 0.21	< 0.23	
Benzo[a]pyrene	< 0.53	< 0.54	< 0.57	
bis(2-ethylhexyl) phthalate (DEHP)	< 0.53	< 0.54	< 0.57	
Hexachlorobenzene	< 0.0022	< 0.0021	< 0.002	
Pentachlorophenol (PCP)	< 0.11	< 0.1	< 0.11	

Site Location: UPPER TWIN CREEK AT MCGAW @ U.S. RT. 52				
River Mile: 2.55			STORET ID: X04P01	
Date Sampled	5/16/2016	6/29/2016	7/13/2016	
Organochlorine Pesticides (USEPA Method 608)				
Aldrin	< 0.0021	< 0.0021	< 0.0021	
BHC-alpha	< 0.0021	< 0.0021	< 0.0021	
BHC-beta	< 0.0021	< 0.0021	< 0.0021	
BHC-delta	< 0.0021	< 0.0021	0.0031	
BHC-gamma (Lindane)	< 0.0021	< 0.0021	< 0.0021	
DDD	< 0.0062	< 0.0062	< 0.0062	
DDE	< 0.0021	< 0.0021	< 0.0021	
DDT	< 0.0062	< 0.0062	< 0.0062	
Dieldrin	< 0.0021	< 0.0021	< 0.0021	
Endosulfan sulfate	< 0.021	< 0.021	< 0.021	
Endosulfan, alpha-	< 0.0021	< 0.0021	< 0.0021	
Endosulfan, beta-	< 0.0021	< 0.0021	< 0.0021	
Endrin	< 0.0021	< 0.0021	< 0.0021	
Endrin aldehyde	< 0.0062	< 0.0062	< 0.0062	
Heptachlor	< 0.0021	< 0.0021	< 0.0021	
Heptachlor epoxide	< 0.0021	< 0.0021	< 0.0021	
Methoxychlor	< 0.01	< 0.01	< 0.01	
Mirex	< 0.01	< 0.01	< 0.01	
Glyphosate (USEPA Method 547)				
Glyphosate (Roundup)	< 5.0	< 5.0	< 5.0	
Chlorinated Acid Herbicides (USEPA Method 515.1)				
Acifluorfen	< 0.21	< 0.21	< 0.22	
Dicamba	< 0.21	< 0.21	< 0.22	
Dichlorophenoxyacetic acid (2,4-D)	< 0.21	< 0.21	< 0.22	
Dichloropropionic acid, 2,2-	< 0.21	< 0.21	< 0.22	
DNBP, 4,6-Dinitro-2-sec-butylphenol	< 0.21	< 0.21	< 0.22	
Picloram, isopropanolamine salt	< 0.21	< 0.21	< 0.22	
Silvex	< 0.21	< 0.21	< 0.22	
Acid Herbicides (USEPA Method 525.2)				
Acetochlor	< 0.2	< 0.23	< 0.21	
Alachlor	< 0.2	< 0.23	< 0.21	
Atrazine	< 0.2	< 0.23	< 0.21	
Butachlor	< 0.2	< 0.23	< 0.21	
Di(2-ethylhexyl) adipate	< 0.51	< 0.58	< 0.52	
Metolachlor	< 0.2	< 0.23	< 0.21	
Metribuzin	< 0.2	< 0.23	< 0.21	
Propachlor	< 0.2	< 0.23	< 0.21	
Simazine	< 0.2	< 0.23	< 0.21	
Benzo[a]pyrene	< 0.51	< 0.58	< 0.52	
bis(2-ethylhexyl) phthalate (DEHP)	< 0.51	< 0.58	< 0.52	
Hexachlorobenzene	< 0.0021	< 0.0021	< 0.0021	
Pentachlorophenol (PCP)	< 0.11	< 5.75	< 0.11	

Site Location: LOWER TWIN CREEK NW OF BUENA VISTA, ADJ. LOWER TWIN CREEK RD				
River Mile: 2.10		STORET ID: X99Q02		
Date Sampled	5/16/2016	6/29/2016	7/13/2016	
Organochlorine Pesticides (USEPA Method 608)				
Aldrin	< 0.002	< 0.0021	< 0.002	
BHC-alpha	< 0.002	< 0.0021	0.0026	
BHC-beta	< 0.002	< 0.0021	< 0.002	
BHC-delta	< 0.002	< 0.0021	0.0027	
BHC-gamma (Lindane)	< 0.002	< 0.0021	< 0.002	
DDD	< 0.006	< 0.0062	< 0.0061	
DDE	< 0.002	< 0.0021	< 0.002	
DDT	< 0.006	< 0.0062	< 0.0061	
Dieldrin	< 0.002	< 0.0021	< 0.002	
Endosulfan sulfate	< 0.02	< 0.021	< 0.02	
Endosulfan, alpha-	< 0.002	< 0.0021	< 0.002	
Endosulfan, beta-	< 0.002	< 0.0021	< 0.002	
Endrin	< 0.002	< 0.0021	< 0.002	
Endrin aldehyde	< 0.006	< 0.0062	< 0.0061	
Heptachlor	< 0.002	< 0.0021	< 0.002	
Heptachlor epoxide	< 0.002	< 0.0021	< 0.002	
Methoxychlor	< 0.01	< 0.01	< 0.01	
Mirex	< 0.01	< 0.01	< 0.01	
Glyphosate (USEPA Method 547)				
Glyphosate (Roundup)	< 5.0	< 5.0	< 5.0	
Chlorinated Acid Herbicides (USEPA Method 515.1)				
Acifluorfen	< 0.21	< 0.2	< 0.21	
Dicamba	< 0.21	< 0.2	< 0.21	
Dichlorophenoxyacetic acid (2,4-D)	< 0.21	< 0.2	< 0.21	
Dichloropropionic acid, 2,2-	< 0.21	< 0.2	< 0.21	
DNBP, 4,6-Dinitro-2-sec-butylphenol	< 0.21	< 0.2	< 0.21	
Picloram, isopropanolamine salt	< 0.21	< 0.2	< 0.21	
Silvex	< 0.21	< 0.2	< 0.21	
Acid Herbicides (USEPA Method 525.2)				
Acetochlor	< 0.23	< 0.21	0.24	
Alachlor	< 0.23	< 0.21	0.23	
Atrazine	< 0.23	< 0.21	0.22	
Butachlor	< 0.23	< 0.21	0.36	
Di(2-ethylhexyl) adipate	< 0.57	< 0.53	0.57	
Metolachlor	< 0.23	< 0.21	0.28	
Metribuzin	< 0.23	< 0.21	< 0.21	
Propachlor	< 0.23	< 0.21	< 0.21	
Simazine	< 0.23	< 0.21	0.34 J	
Benzo[a]pyrene	< 0.57	< 0.53	< 0.52	
bis(2-ethylhexyl) phthalate (DEHP)	< 0.57	< 0.53	< 0.52	
Hexachlorobenzene	< 0.002	< 0.0021	< 0.002	
Pentachlorophenol (PCP)	< 0.1	< 0.1	< 0.1	

Site Location: EAGLE CREEK DST CONFL. WITH W FORK AND E FORK EAGLE CR				
River Mile: 14.43			STORET ID: 303537	
Date Sampled	5/16/2016	6/30/2016	7/14/2016	
Organochlorine Pesticides (USEPA Method 608)				
Aldrin	< 0.002	< 0.0021	< 0.0021	
BHC-alpha	< 0.002	< 0.0021	< 0.0021	
BHC-beta	< 0.002	< 0.0021	< 0.0021	
BHC-delta	< 0.002	< 0.0021	< 0.0021	
BHC-gamma (Lindane)	< 0.002	< 0.0021	< 0.0021	
DDD	< 0.0061	< 0.0062	< 0.0062	
DDE	< 0.002	< 0.0021	< 0.0021	
DDT	< 0.0061	< 0.0062	< 0.0062	
Dieldrin	< 0.002	< 0.0021	< 0.0021	
Endosulfan sulfate	< 0.02	< 0.021	< 0.021	
Endosulfan, alpha-	< 0.002	< 0.0021	< 0.0021	
Endosulfan, beta-	< 0.002	< 0.0021	< 0.0021	
Endrin	< 0.002	< 0.0021	< 0.0021	
Endrin aldehyde	< 0.0061	< 0.0062	< 0.0062	
Heptachlor	< 0.002	< 0.0021	< 0.0021	
Heptachlor epoxide	< 0.002	< 0.0021	< 0.0021	
Methoxychlor	< 0.01	< 0.01	< 0.01	
Mirex	< 0.01	< 0.01	< 0.01	
Glyphosate (USEPA Method 547)				
Glyphosate (Roundup)	< 5.0	< 5.0	< 5.0	
Chlorinated Acid Herbicides (USEPA Method 515.1)				
Acifluorfen	< 0.21	< 0.21	< 0.21	
Dicamba	< 0.21	< 0.21	< 0.21	
Dichlorophenoxyacetic acid (2,4-D)	0.3	0.21	< 0.21	
Dichloropropionic acid, 2,2-	< 0.21	< 0.21	< 0.21	
DNBP, 4,6-Dinitro-2-sec-butylphenol	< 0.21	< 0.21	< 0.21	
Picloram, isopropanolamine salt	< 0.21	< 0.21	< 0.21	
Silvex	< 0.21	< 0.21	< 0.21	
Acid Herbicides (USEPA Method 525.2)				
Acetochlor	< 0.2	< 0.2	0.27	
Alachlor	< 0.2	< 0.2	< 0.21	
Atrazine	0.77	0.93	0.77	
Butachlor	< 0.2	< 0.2	< 0.21	
Di(2-ethylhexyl) adipate	< 0.51	< 0.51	< 0.52	
Metolachlor	0.31	1.35	1.11	
Metribuzin	< 0.2	< 0.2	0.28	
Propachlor	< 0.2	< 0.2	< 0.21	
Simazine	< 0.2	0.26	< 0.21	
Benzo[a]pyrene	< 0.51	< 0.51	< 0.52	
bis(2-ethylhexyl) phthalate (DEHP)	< 0.51	0.55	< 0.52	
Hexachlorobenzene	< 0.002	< 0.0021	< 0.0021	
Pentachlorophenol (PCP)	< 0.1	< 0.1	< 0.11	

Site Location: STRAIGHT CREEK AT CENTERPOINT @ OLD U.S. RT. 68				
River Mile: 2.78			STORET ID: X03W12	
Date Sampled	5/16/2016	7/5/2016	7/12/2016	
Organochlorine Pesticides (USEPA Method 608)				
Aldrin	< 0.0021	< 0.0022	< 0.0021	
BHC-alpha	< 0.0021	< 0.0022	< 0.0021	
BHC-beta	< 0.0021	< 0.0022	< 0.0021	
BHC-delta	< 0.0021	< 0.0022	< 0.0021	
BHC-gamma (Lindane)	< 0.0021	< 0.0022	< 0.0021	
DDD	< 0.0062	< 0.0066	< 0.0062	
DDE	< 0.0021	< 0.0022	< 0.0021	
DDT	< 0.0062	< 0.0066	< 0.0062	
Dieldrin	< 0.0021	< 0.0022	< 0.0021	
Endosulfan sulfate	< 0.021	< 0.022	< 0.021	
Endosulfan, alpha-	< 0.0021	< 0.0022	< 0.0021	
Endosulfan, beta-	< 0.0021	< 0.0022	< 0.0021	
Endrin	< 0.0021	< 0.0022	< 0.0021	
Endrin aldehyde	< 0.0062	< 0.0066	< 0.0062	
Heptachlor	< 0.0021	< 0.0022	< 0.0021	
Heptachlor epoxide	< 0.0021	< 0.0022	< 0.0021	
Methoxychlor	< 0.01	< 0.011	< 0.01	
Mirex	< 0.01	< 0.011	< 0.01	
Glyphosate (USEPA Method 547)				
Glyphosate (Roundup)	< 5.0	6.9	< 5.0	
Chlorinated Acid Herbicides (USEPA Method 515.1)				
Acifluorfen	< 0.21	< 0.2	< 0.21	
Dicamba	< 0.21	< 0.2	< 0.21	
Dichlorophenoxyacetic acid (2,4-D)	0.3	1.56	< 0.21	
Dichloropropionic acid, 2,2-	< 0.21	< 0.2	< 0.21	
DNBP, 4,6-Dinitro-2-sec-butylphenol	< 0.21	< 0.2	< 0.21	
Picloram, isopropanolamine salt	< 0.21	< 0.2	< 0.21	
Silvex	< 0.21	< 0.2	< 0.21	
Acid Herbicides (USEPA Method 525.2)				
Acetochlor	0.23	0.45	< 0.21	
Alachlor	< 0.21	< 0.21	< 0.21	
Atrazine	1.22	0.97	0.54 J	
Butachlor	< 0.21	0.35	< 0.21	
Di(2-ethylhexyl) adipate	< 0.52	0.56	< 0.52	
Metolachlor	1.23	5.04	3.05 J	
Metribuzin	0.64	0.93	0.42 J	
Propachlor	< 0.21	< 0.21	< 0.21	
Simazine	< 0.21	0.39	< 0.21	
Benzo[a]pyrene	< 0.52	< 0.52	< 0.52	
bis(2-ethylhexyl) phthalate (DEHP)	0.57	0.82	< 0.52	
Hexachlorobenzene	< 0.0021	< 0.0022	< 0.0021	
Pentachlorophenol (PCP)	< 0.1	< 0.1	< 0.11	

Appendix H

Surface Water Inorganic Chemical Results

Appendix Table A Southwest Ohio River Tributary Watersheds Inorganic Water Chemistry Sampling Results (2016)

Site Location:	TURKEY CREEK DST. TURKEY CREEK LAKE					SWDO Map #	1
River Mile: 10.7	Storet ID: 303609	WAU: 050902010201	River Code: 10-508-000				
Latitude/Longitude: 38.7319 / -83.1892	Drainage Area (mi2): 8.7		County Scioto	Ecoregion: WAP	USGS Quad:		
Date Collected	6/28/2016	7/13/2016	7/27/2016	8/9/2016	8/16/2016	8/25/2016	
Time	11:35	11:40	11:15	10:55	2:10	12:35	
Temp (C)	29.62	29.08	29.93	25.95	26.89	26.42	
D.O. (mg/l) / (% sat)	7.33 / 96.3	7.65 / 99.6	7.59 / 100.3	7.3 / 89.9	7.27 / 91.1	7.08 / 88	
pH (fld) SU	8.1	7.71	7.7	7.28	7.91	7.68	
SpCond fld/lab (umhos/cm)	101 / 101	106 / 101	108 / 107	134 / 137	166 / 154	150 / 144	

COD (mg/l)	< 20	< 20	< 20		< 20	< 20
TDS (mg/l)	62	72	68	90	94	100
TSS (mg/l)	< 5	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/l)	21.8	22.6	22.9	38.8	51.4	49.1
Chloride (mg/l)	< 5	< 5	5.2	7.5	9	8.2
Sulfate (mg/l)	15.9	16.6	15.8	14.6	11.6	12.4
Ammonia-N (mg/l)	0.067	0.055	< 0.05		0.072	0.087
TKN (mg/l)	0.27	0.54			0.31	0.35
Nitrate-nitrite-N (mg/l)	0.1	< 0.1	< 0.1		0.32	0.33
Nitrite-N (mg/l)	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Phosphorus-T (mg/l)	0.013	0.011	0.011		0.01	0.011
Orthophosphate, D (mg/l)	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Arsenic-T (ug/l)	< 2		< 2			< 2
Cadmium-T (ug/l)	< 0.2		< 0.2			< 0.2
Chromium-T (ug/l)	< 2		< 2			< 2
Copper-T (ug/l)	< 2		< 2			< 2
Lead-T (ug/l)	< 2		< 2			< 2
Nickel-T (ug/l)	< 2		< 2			< 2
Selenium-T (ug/l)	< 2		< 2			< 2
Aluminum-T (ug/l)	< 200		< 200			< 200
Barium-T (ug/l)	17		18			22
Calcium-T (mg/l)	5.2		5.2			9.7
Iron-T (ug/l)	367		291			1460
Magnesium-T (mg/l)	4.4		4.5			6
Manganese-T (ug/l)	79		54			166
Potassium-T (mg/l)	< 2		< 2			< 2
Sodium-T (mg/l)	5.5		6.1			8.1
Strontium-T (ug/l)	36		36			57
Zinc-T (ug/l)	< 10		< 10			< 10
Hardness (mg/l)	31		32			49

Appendix Table A Southwest Ohio River Tributary Watersheds Inorganic Water Chemistry Sampling Results (2016)

Site Location:	TURKEY CREEK DST. TURKEY CREEK LAKE				SWDO Map # 1	
River Mile: 10.7	Storet ID: 303609	WAU: 050902010201	River Code: 10-508-000			
Latitude/Longitude: 38.7319 / -83.1892	Drainage Area (mi2): 8.7		County Scioto	Ecoregion: WAP	USGS Quad:	

Date Collected	9/1/2016
Time	3:00
Temp (C)	23.5
D.O. (mg/l) / (% sat)	5.87 / 69.2
pH (fld) SU	7.02
SpCond fld/lab (umhos/cm)	

COD (mg/l)	
TDS (mg/l)	98
TSS (mg/l)	< 5
Alkalinity (mg/l)	
Chloride (mg/l)	6.5
Sulfate (mg/l)	14.6
Ammonia-N (mg/l)	0.071
TKN (mg/l)	< 0.2
Nitrate-nitrite-N (mg/l)	0.16
Nitrite-N (mg/l)	< 0.02
Phosphorus-T (mg/l)	0.014
Orthophosphate, D (mg/l)	< 0.01
Arsenic-T (ug/l)	< 2
Cadmium-T (ug/l)	< 0.2
Chromium-T (ug/l)	< 2
Copper-T (ug/l)	< 2
Lead-T (ug/l)	< 2
Nickel-T (ug/l)	< 2
Selenium-T (ug/l)	< 2
Aluminum-T (ug/l)	< 200
Barium-T (ug/l)	25
Calcium-T (mg/l)	11.8
Iron-T (ug/l)	109
Magnesium-T (mg/l)	8.6
Manganese-T (ug/l)	209
Potassium-T (mg/l)	2.3
Sodium-T (mg/l)	7.1
Strontium-T (ug/l)	71
Zinc-T (ug/l)	< 10
Hardness (mg/l)	65

Appendix Table A Southwest Ohio River Tributary Watersheds Inorganic Water Chemistry Sampling Results (2016)

Site Location:	TURKEY CREEK DST. WOLFDEN RUN ADJ. SR 125				SWDO Map # 2	
River Mile: 12.9	Storet ID: 303610	WAU: 050902010201	River Code: 10-508-000			
Latitude/Longitude: 38.7494 / -83.2201	Drainage Area (mi2): 1.6		County Scioto	Ecoregion: WAP	USGS Quad:	

Date Collected	6/28/2016	7/13/2016	7/27/2016	8/9/2016	8/25/2016
Time	11:10	11:20	11:00	10:35	12:15
Temp (C)	20.72	21.01	23	21.48	21.85
D.O. (mg/l) / (% sat)	7.11 / 79.3	6.82 / 76.6	7.77 / 90.6	3.74 / 42.4	3.69 / 42.1
pH (fld) SU	8.11	7.69	7.67	7.47	7.44
SpCond fld/lab (umhos/cm)	181 / 185	175 / 170	169 / 170	208 / 205	219 / 210

COD (mg/l)	< 20	< 20	< 20	< 20	< 20
TDS (mg/l)	106	104	104	120	126
TSS (mg/l)	8	< 5	< 5	< 5	< 5
Alkalinity (mg/l)	46.9	46.7	43.7	60.6	66.7
Chloride (mg/l)	14.1	12.2	13.1	13.8	18.1
Sulfate (mg/l)	18.9	18.8	15.2	19	16.9
Ammonia-N (mg/l)	< 0.05	< 0.05	< 0.05	0.054	< 0.05
TKN (mg/l)	< 0.2	< 0.2	0.46	0.35	< 0.2
Nitrate-nitrite-N (mg/l)	0.38	0.37	0.35	0.45	0.22
Nitrite-N (mg/l)	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Phosphorus-T (mg/l)	0.016	0.011	0.018	< 0.01	< 0.01
Orthophosphate, D (mg/l)					
Arsenic-T (ug/l)	< 2		< 2		< 2
Cadmium-T (ug/l)	< 0.2		< 0.2		< 0.2
Chromium-T (ug/l)	< 2		4		< 2
Copper-T (ug/l)	< 2		< 2		< 2
Lead-T (ug/l)	< 2		< 2		< 2
Nickel-T (ug/l)	< 2		< 2		< 2
Selenium-T (ug/l)	< 2		< 2		< 2
Aluminum-T (ug/l)	< 200		< 200		< 200
Barium-T (ug/l)	32		27		37
Calcium-T (mg/l)	9.4		7.9		11.5
Iron-T (ug/l)	218		260		< 50
Magnesium-T (mg/l)	7.7		6.4		9.3
Manganese-T (ug/l)	19		< 10		85
Potassium-T (mg/l)	2.1		2		2.5
Sodium-T (mg/l)	13.2		12.7		15.2
Strontium-T (ug/l)	55		46		67
Zinc-T (ug/l)	< 10		< 10		< 10
Hardness (mg/l)	55		46		67

Appendix Table A Southwest Ohio River Tributary Watersheds Inorganic Water Chemistry Sampling Results (2016)

Site Location:	TURKEY CREEK DST. ROOSEVELT LAKE @ ST. RT. 125					SWDO Map #	3
River Mile: 9.58	Storet ID: X04P03	WAU: 050902010202	River Code: 10-508-000				
Latitude/Longitude: 38.7264 / -83.1708	Drainage Area (mi2): 16.5		County Scioto	Ecoregion: WAP		USGS Quad:	

Date Collected	6/28/2016	7/13/2016	7/27/2016	8/9/2016	8/25/2016	9/1/2016
Time	12:05	12:05	12:05	11:05	12:55	2:10
Temp (C)	23.52	23.95	25.58	23.53	23.93	22.2
D.O. (mg/l) / (% sat)	7.59 / 89.4	7.64 / 90.7	7.08 / 86.6	6.38 / 75.2	6.51 / 77.3	3.63 / 41.7
pH (fld) SU	7.37	7.26	6.95	7.3	7.5	6.93
SpCond fld/lab (umhos/cm)	110 / 109	115 / 110	126 / 124	129 / 127	130 / 127	

COD (mg/l)	< 20	< 20	< 20	< 20	< 20	
TDS (mg/l)	66	70	76	82	74	110
TSS (mg/l)	8	< 5	11	7	5	< 5
Alkalinity (mg/l)	29.6	29.7	37.4	36	38.9	
Chloride (mg/l)	< 5	< 5	5	5	5.6	9.9
Sulfate (mg/l)	14.9	15.9	13.1	15.2	14.5	9.9
Ammonia-N (mg/l)	0.231	0.121	0.234	0.141	0.051	0.118
TKN (mg/l)	0.34	0.24	0.53	0.27	0.21	0.3
Nitrate-nitrite-N (mg/l)	0.1	< 0.1	< 0.1	0.37	0.22	0.44
Nitrite-N (mg/l)	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Phosphorus-T (mg/l)	0.024	0.013	0.027	0.012	0.012	
Orthophosphate, D (mg/l)	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Arsenic-T (ug/l)	3		4.2		< 2	< 2
Cadmium-T (ug/l)	< 0.2		< 0.2		< 0.2	< 0.2
Chromium-T (ug/l)	< 2		< 2		< 2	< 2
Copper-T (ug/l)	< 2		< 2		< 2	< 2
Lead-T (ug/l)	< 2		< 2		< 2	< 2
Nickel-T (ug/l)	2		< 2		< 2	< 2
Selenium-T (ug/l)	< 2		< 2		< 2	< 2
Aluminum-T (ug/l)	< 200		< 200		< 200	< 200
Barium-T (ug/l)	34		42		25	26
Calcium-T (mg/l)	6.3		6.9		7.7	12
Iron-T (ug/l)	2520		3050		648	1210
Magnesium-T (mg/l)	5.2		5.4		6.2	7
Manganese-T (ug/l)	893		949		139	268
Potassium-T (mg/l)	2		2		< 2	2
Sodium-T (mg/l)	5.3		5.7		7	8.6
Strontium-T (ug/l)	48		52		58	69
Zinc-T (ug/l)	24		< 10		< 10	< 10
Hardness (mg/l)	37		40		45	59

Appendix Table A Southwest Ohio River Tributary Watersheds Inorganic Water Chemistry Sampling Results (2016)

Site Location:	TURKEY CREEK AT FRIENDSHIP @.S. RT. 52					SWDO Map # 4
River Mile: 4.13	Storet ID: X04P02	WAU: 050902010202	River Code: 10-508-000			
Latitude/Longitude: 38.6961 / -83.1000	Drainage Area (mi2): 39.5		County Scioto	Ecoregion: WAP	USGS Quad:	

Date Collected	5/16/2016	6/8/2016	6/28/2016	7/13/2016	7/27/2016	8/9/2016
Time	11:45	2:55	1:50	1:00	12:55	11:50
Temp (C)	11.85	20.6	27.48	26.18	26	26.04
D.O. (mg/l) / (% sat)	11.05 / 102.2	9.6 / 106.7	8.89 / 112.6	9.48 / 117.3	8.77 / 108.1	8.24 / 101.7
pH (fld) SU	7.73	7.62	7.59	7.33	7.37	7.39
SpCond fld/lab (umhos/cm)	100 / 103		146 / 145	157 / 152	143 / 144	174 / 175

COD (mg/l)	< 20		< 20	< 20	< 20	< 20
TDS (mg/l)	70	82	84	86	98	98
TSS (mg/l)	< 5	< 5	< 5	< 5	5	< 5
Alkalinity (mg/l)	15.2		29.7	32.1	27.4	37.7
Chloride (mg/l)	< 5	< 5	6.8	7.6	6.2	10.2
Sulfate (mg/l)	26.3	23.6	24.2	27	25.3	26.4
Ammonia-N (mg/l)	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.055
TKN (mg/l)	< 0.2	< 0.2	0.51	< 0.2	< 0.2	< 0.2
Nitrate-nitrite-N (mg/l)	0.27	0.3	0.2	0.17	0.31	0.18
Nitrite-N (mg/l)	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Phosphorus-T (mg/l)	< 0.01	< 0.01	< 0.01	< 0.01	0.014	0.011
Orthophosphate, D (mg/l)	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Arsenic-T (ug/l)	< 2	< 2	< 2	< 2	< 2	< 2
Cadmium-T (ug/l)	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium-T (ug/l)	< 2	< 2	< 2	< 2	< 2	< 2
Copper-T (ug/l)	< 2	< 2	< 2	< 2	< 2	< 2
Lead-T (ug/l)	< 2	< 2	< 2	< 2	< 2	< 2
Nickel-T (ug/l)	< 2	< 2	< 2	< 2	< 2	< 2
Selenium-T (ug/l)	< 2	< 2	< 2	< 2	< 2	< 2
Aluminum-T (ug/l)	< 200	< 200	< 200	< 200	< 200	< 200
Barium-T (ug/l)	18	19	23	27	24	32
Calcium-T (mg/l)	4.7	5.7	7.8	8.3	7.5	10.4
Iron-T (ug/l)	143	200	188	148	350	199
Magnesium-T (mg/l)	5.1	5.5	6.9	7.2	6.7	8.6
Manganese-T (ug/l)	< 10	< 10	18	22	23	38
Potassium-T (mg/l)	< 2	< 2	2.3	2.3	2.4	2.8
Sodium-T (mg/l)	5	5.6	7.2	7.9	7.1	9.8
Strontium-T (ug/l)	46	51	67	73	65	88
Zinc-T (ug/l)	< 10	< 10	< 10	< 10	< 10	16
Hardness (mg/l)	33	36	48	50	46	61

Appendix Table A Southwest Ohio River Tributary Watersheds Inorganic Water Chemistry Sampling Results (2016)

Site Location:	TURKEY CREEK AT FRIENDSHIP @.S. RT. 52					SWDO Map # 4
River Mile: 4.13	Storet ID: X04P02	WAU: 050902010202	River Code: 10-508-000			
Latitude/Longitude: 38.6961 / -83.1000	Drainage Area (mi2): 39.5		County Scioto	Ecoregion: WAP	USGS Quad:	

Date Collected	8/25/2016	9/1/2016	9/27/2016	10/25/2016	11/29/2016	12/20/2016
Time	1:50	1:40	10:45	10:50	11:15	11:45
Temp (C)	24.31	24.5	16.5	11.24	7.8	2.5
D.O. (mg/l) / (% sat)	7.56 / 90.4	5.79 / 69.5	5.5 / 56.3	9.51 / 86.7	10.41 / 87.4	15.05 / 110.3
pH (fld) SU	7.49	7.05	7.46	8.53	7.8	8.27
SpCond fld/lab (umhos/cm)	190 / 186		277.9 / 278	220 / 213	251.9 / 241	144 / 135

COD (mg/l)	< 20		< 20	< 20	< 20	< 20
TDS (mg/l)	106	98	170	130	132	88
TSS (mg/l)	< 5	< 5	6	< 5	< 5	< 5
Alkalinity (mg/l)	41.9		75.6	36.5	39.9	21.7
Chloride (mg/l)	14.6	16.2	25.3	16.9	24.4	9.1
Sulfate (mg/l)	26.5	27.7	31.6	42.7	38.9	21.7
Ammonia-N (mg/l)	< 0.05	0.052	0.058	< 0.05	< 0.05	< 0.05
TKN (mg/l)	< 0.2	< 0.2	< 0.2	0.22	< 0.2	0.27
Nitrate-nitrite-N (mg/l)	0.14	< 0.1	< 0.1	0.32	0.11	1.46
Nitrite-N (mg/l)	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Phosphorus-T (mg/l)	< 0.01		0.011	0.02	< 0.01	0.02
Orthophosphate, D (mg/l)		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Arsenic-T (ug/l)	< 2	< 2	2.1	< 2	< 2	< 2
Cadmium-T (ug/l)	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium-T (ug/l)	< 2	< 2	< 2	< 2	< 2	< 2
Copper-T (ug/l)	< 2	< 2	6.8	< 2	< 2	< 2
Lead-T (ug/l)	< 2	< 2	3.6	< 2	< 2	< 2
Nickel-T (ug/l)	< 2	< 2	3.6	< 2	< 2	2
Selenium-T (ug/l)	< 2	< 2	< 2	< 2	< 2	< 2
Aluminum-T (ug/l)	< 200	< 200	< 200	< 200	< 200	352
Barium-T (ug/l)	26	29	39	28	30	24
Calcium-T (mg/l)	9.8	11	18.6	11	12.4	7.5
Iron-T (ug/l)	106	202	341	78	110	542
Magnesium-T (mg/l)	7.9	8.3	11.8	9.5	9.9	6
Manganese-T (ug/l)	32	107	234	11	35	12
Potassium-T (mg/l)	2.6	2.7	2.9	2.9	2.4	2
Sodium-T (mg/l)	11.7	11.4	14.7	12.7	13.3	7.3
Strontium-T (ug/l)	85	90	130	96	98	58
Zinc-T (ug/l)	< 10	< 10	< 10	< 10	< 10	< 10
Hardness (mg/l)	57	62	95	67	72	43

Appendix Table A Southwest Ohio River Tributary Watersheds Inorganic Water Chemistry Sampling Results (2016)

Site Location:	TURKEY CREEKPST. POND LICK RUN @ ST. RT. 125				SWDO Map # 5	
River Mile: 6.7	Storet ID: 200744	WAU: 050902010202	River Code: 10-508-000			
Latitude/Longitude: 38.7086 / -83.1350	Drainage Area (mi2): 26.4		County Scioto	Ecoregion: WAP	USGS Quad:	

Date Collected	6/28/2016	7/13/2016	7/27/2016	8/9/2016	8/25/2016
Time	1:15	12:25	12:30	11:30	1:20
Temp (C)	24.82	24.37	24.81	24.15	26.84
D.O. (mg/l) / (% sat)	8.85 / 106.7	9.53 / 114.1	9 / 108.5	9.07 / 108.1	9.32 / 116.6
pH (fld) SU	7.78	7.45	7.35	7.41	7.57
SpCond fld/lab (umhos/cm)	133 / 132	140 / 135	119 / 118	156 / 155	164 / 159

COD (mg/l)	< 20	< 20	< 20	< 20	< 20
TDS (mg/l)	76	86	78	98	96
TSS (mg/l)	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/l)	28.8	30.6	25.2	34.1	38.1
Chloride (mg/l)	5.8	6.4	< 5	9.1	10.7
Sulfate (mg/l)	21.1	22.2	18.8	23.3	22.5
Ammonia-N (mg/l)	< 0.05	< 0.05	< 0.05	0.05	< 0.05
TKN (mg/l)	< 0.2	< 0.2	0.27	< 0.2	< 0.2
Nitrate-nitrite-N (mg/l)	0.19	0.24	0.53	0.23	0.15
Nitrite-N (mg/l)	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Phosphorus-T (mg/l)	0.01	< 0.01	0.015	< 0.01	< 0.01
Orthophosphate, D (mg/l)					
Arsenic-T (ug/l)	< 2		< 2		< 2
Cadmium-T (ug/l)	< 0.2		< 0.2		< 0.2
Chromium-T (ug/l)	< 2		< 2		< 2
Copper-T (ug/l)	< 2		< 2		< 2
Lead-T (ug/l)	< 2		< 2		< 2
Nickel-T (ug/l)	< 2		< 2		< 2
Selenium-T (ug/l)	< 2		< 2		< 2
Aluminum-T (ug/l)	< 200		< 200		< 200
Barium-T (ug/l)	22		20		23
Calcium-T (mg/l)	7.3		5.8		8.3
Iron-T (ug/l)	235		284		51
Magnesium-T (mg/l)	6.4		5.6		6.9
Manganese-T (ug/l)	12		17		< 10
Potassium-T (mg/l)	2.2		2.2		2.4
Sodium-T (mg/l)	6.7		5.4		10.2
Strontium-T (ug/l)	57		49		68
Zinc-T (ug/l)	< 10		< 10		< 10
Hardness (mg/l)	45		38		49

Appendix Table A Southwest Ohio River Tributary Watersheds Inorganic Water Chemistry Sampling Results (2016)

Site Location:	POND RUN OFF SF RD 1 (POND RUN RD.) AT BACKPACK TRAIL					SWDO Map # 6
River Mile: 4.64	Storet ID: 303613	WAU: 050902010203	River Code: 10-099-000			
Latitude/Longitude: 38.6659 / -83.1972	Drainage Area (mi2): 3.2	County Scioto	Ecoregion: WAP	USGS Quad:		

Date Collected	6/28/2016	7/13/2016	7/27/2016	8/9/2016	8/25/2016
Time	3:20	2:55	3:10	1:10	3:00
Temp (C)	22.32	22.65	23.75	23.87	23.3
D.O. (mg/l) / (% sat)	9.27 / 106.7	9.16 / 106	7.55 / 89.3	5.9 / 69.9	6.44 / 75.5
pH (fld) SU	6.85	7.26	7.26	7.31	7.19
SpCond fld/lab (umhos/cm)	70 / 85	83 / 78	82 / 84	94 / 92	98.1 / 90

COD (mg/l)	< 20		< 20	< 20	< 20
TDS (mg/l)	50	60	60	62	64
TSS (mg/l)	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/l)	17.2	16.1	18.8	22.4	26
Chloride (mg/l)	< 5	< 5	< 5	< 5	< 5
Sulfate (mg/l)	14.6	15.1	12.6	14.4	13.2
Ammonia-N (mg/l)	< 0.05		< 0.05	< 0.05	< 0.05
TKN (mg/l)	0.32		< 0.2	< 0.2	< 0.2
Nitrate-nitrite-N (mg/l)	0.38		0.36	0.3	0.27
Nitrite-N (mg/l)	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Phosphorus-T (mg/l)	0.014			< 0.01	< 0.01
Orthophosphate, D (mg/l)					
Arsenic-T (ug/l)	< 2		< 2		< 2
Cadmium-T (ug/l)	< 0.2		< 0.2		< 0.2
Chromium-T (ug/l)	< 2		< 2		< 2
Copper-T (ug/l)	< 2		< 2		< 2
Lead-T (ug/l)	< 2		< 2		< 2
Nickel-T (ug/l)	< 2		< 2		< 2
Selenium-T (ug/l)	< 2		< 2		< 2
Aluminum-T (ug/l)	< 200		< 200		< 200
Barium-T (ug/l)	16		17		19
Calcium-T (mg/l)	4		4.2		5
Iron-T (ug/l)	99		105		< 50
Magnesium-T (mg/l)	4.1		4.2		4.9
Manganese-T (ug/l)	< 10		< 10		11
Potassium-T (mg/l)	< 2		2.1		2.1
Sodium-T (mg/l)	< 5		< 5		< 5
Strontium-T (ug/l)	35		37		45
Zinc-T (ug/l)	< 10		< 10		< 10
Hardness (mg/l)	27		28		33

Appendix Table A Southwest Ohio River Tributary Watersheds Inorganic Water Chemistry Sampling Results (2016)

Site Location:	POND RUN @S 52 SW OF FRIENDSHIP					SWDO Map # 7
River Mile: 0.38	Storet ID: 303602	WAU: 050902010203	River Code: 10-099-000			
Latitude/Longitude: 38.6601 / -83.1292	Drainage Area (mi2): 11.3		County Scioto	Ecoregion: WAP	USGS Quad:	

Date Collected	6/28/2016	7/13/2016	7/27/2016	8/9/2016	8/25/2016	9/1/2016
Time	2:40	2:20	3:35	12:50	2:35	12:55
Temp (C)	27.32	26.26	26.68	27.72	30.2	25.1
D.O. (mg/l) / (% sat)	8.12 / 102.5	9.62 / 119.1	8.15 / 101.7	8.05 / 102.4	7.54 / 100.1	8.22 / 99.7
pH (fld) SU	7.32	7.47	7.4	7.57	7.55	7.18
SpCond fld/lab (umhos/cm)	149 / 150	141 / 133	149 / 155	171 / 171	183.3 / 174	

COD (mg/l)	< 20	< 20	< 20	< 20	< 20	
TDS (mg/l)	92	92	92	112	104	104
TSS (mg/l)	< 5	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/l)	25.3	25	28.4	36	39.2	
Chloride (mg/l)	< 5	< 5	5.2	6.6	8.6	9.4
Sulfate (mg/l)	31.5	29.2	31.5	31.4	31.7	26.3
Ammonia-N (mg/l)	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
TKN (mg/l)	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Nitrate-nitrite-N (mg/l)	0.2	0.14	0.17	0.24	0.16	0.37
Nitrite-N (mg/l)	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Phosphorus-T (mg/l)	0.017	< 0.01	< 0.01	< 0.01	< 0.01	0.01
Orthophosphate, D (mg/l)	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Arsenic-T (ug/l)	< 2		< 2		< 2	< 2
Cadmium-T (ug/l)	< 0.2		< 0.2		< 0.2	< 0.2
Chromium-T (ug/l)	< 2		< 2		< 2	< 2
Copper-T (ug/l)	< 2		< 2		< 2	< 2
Lead-T (ug/l)	< 2		< 2		< 2	< 2
Nickel-T (ug/l)	< 2		< 2		< 2	< 2
Selenium-T (ug/l)	< 2		< 2		< 2	< 2
Aluminum-T (ug/l)	< 200		< 200		< 200	< 200
Barium-T (ug/l)	22		23		27	23
Calcium-T (mg/l)	7.8		7.9		10.6	8.7
Iron-T (ug/l)	< 50		< 50		< 50	< 50
Magnesium-T (mg/l)	7.4		7.5		9.1	7.3
Manganese-T (ug/l)	< 10		< 10		< 10	< 10
Potassium-T (mg/l)	2.3		2.3		2.8	2.3
Sodium-T (mg/l)	6.3		6.6		8.9	6.7
Strontium-T (ug/l)	69		70		91	71
Zinc-T (ug/l)	< 10		< 10		< 10	< 10
Hardness (mg/l)	50		51		64	52

Appendix Table A Southwest Ohio River Tributary Watersheds Inorganic Water Chemistry Sampling Results (2016)

Site Location: NACE RUN @ SHAWNEE SP MARINAPST. DAM

SWDO Map # 8

River Mile: 0.43 Storet ID: 303601 WAU: 050902010204 River Code: 10-507-000

Latitude/Longitude: 38.6768 / -83.1133 Drainage Area (mi2): 1.4 County Scioto Ecoregion: WAP USGS Quad:

Date Collected	6/28/2016	7/13/2016	7/27/2016	8/9/2016	8/25/2016
Time	2:30	1:25	1:20	12:00	2:05
Temp (C)	22.39	23.47	24.06	22.77	22.25
D.O. (mg/l) / (% sat)	5.62 / 64.8	7.43 / 87.4	7.85 / 93.4	3.96 / 46	2.52 / 29
pH (fld) SU	7.12	7.32	7.34	7.14	7.25
SpCond fld/lab (umhos/cm)	383 / 390	349 / 335	323 / 315	471 / 476	513 / 493

COD (mg/l)	< 20	< 20	< 20	< 20	< 20
TDS (mg/l)	240	216	198	300	314
TSS (mg/l)	12	< 5	< 5	9	< 5
Alkalinity (mg/l)	75.5	63.7	61.2	89.8	104
Chloride (mg/l)	17.7	14	11.5	30.6	36.4
Sulfate (mg/l)	92.4	82.1	65.2	97.8	95.5
Ammonia-N (mg/l)	< 0.05	< 0.05	< 0.05	0.055	0.053
TKN (mg/l)	0.41	< 0.2	< 0.2	0.25	< 0.2
Nitrate-nitrite-N (mg/l)	0.65	0.72	0.63	0.93	1.47
Nitrite-N (mg/l)	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Phosphorus-T (mg/l)	0.038	0.022	0.03	0.023	0.021
Orthophosphate, D (mg/l)					
Arsenic-T (ug/l)	< 2		< 2		< 2
Cadmium-T (ug/l)	< 0.2		< 0.2		< 0.2
Chromium-T (ug/l)	< 2		< 2		< 2
Copper-T (ug/l)	< 2		< 2		< 2
Lead-T (ug/l)	< 2		< 2		< 2
Nickel-T (ug/l)	3.1		2.7		3.2
Selenium-T (ug/l)	< 2		< 2		< 2
Aluminum-T (ug/l)	213		< 200		< 200
Barium-T (ug/l)	43		33		52
Calcium-T (mg/l)	23.6		18.8		32.1
Iron-T (ug/l)	323		131		70
Magnesium-T (mg/l)	20.2		16.2		24.6
Manganese-T (ug/l)			12		23
Potassium-T (mg/l)	3.6		3.5		4.3
Sodium-T (mg/l)	21.1		17		31.3
Strontium-T (ug/l)	180		148		236
Zinc-T (ug/l)	< 10		< 10		< 10
Hardness (mg/l)	142		114		181

Appendix Table A Southwest Ohio River Tributary Watersheds Inorganic Water Chemistry Sampling Results (2016)

Site Location: E. FORKPPER TWIN CR. @PPER TWIN CREEK RD.

SWDO Map # 9

River Mile: 0.1 Storet ID: 303597 WAU: 050902010205 River Code: 10-089-000

Latitude/Longitude: 38.6601 / -83.2253 Drainage Area (mi2): 3.9 County Scioto Ecoregion: WAP USGS Quad:

Date Collected	6/28/2016	7/13/2016	7/27/2016	8/9/2016	8/25/2016
Time	4:10	3:30	2:25	12:25	2:10
Temp (C)	22.18	22.67	24	23.82	22.2
D.O. (mg/l) / (% sat)	8.33 / 95.7	9.29 / 107.7	8 / 95.1	8.28 / 98	8.56 / 98.4
pH (fld) SU	7.52	7.62	7.55	7.56	7.37
SpCond fld/lab (umhos/cm)	86 / 87	66 / 80	91 / 91	62 / 90	91.6 / 87

COD (mg/l)	< 20	< 20	< 20	< 20	< 20
TDS (mg/l)	60	62	66	74	64
TSS (mg/l)	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/l)	13.8	14.4	15.1	18.5	18.9
Chloride (mg/l)	< 5	< 5	< 5	< 5	< 5
Sulfate (mg/l)	19.6	18.9	18.9	18.5	17.5
Ammonia-N (mg/l)	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
TKN (mg/l)	< 0.2	< 0.2	< 0.2	0.24	< 0.2
Nitrate-nitrite-N (mg/l)	0.24	0.22	0.21	0.25	0.25
Nitrite-N (mg/l)	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Phosphorus-T (mg/l)	< 0.01	< 0.01	< 0.01	< 0.01	0.012
Orthophosphate, D (mg/l)					
Arsenic-T (ug/l)	< 2		< 2		< 2
Cadmium-T (ug/l)	< 0.2		< 0.2		< 0.2
Chromium-T (ug/l)	< 2		< 2		< 2
Copper-T (ug/l)	< 2		< 2		< 2
Lead-T (ug/l)	< 2		< 2		< 2
Nickel-T (ug/l)	< 2		< 2		< 2
Selenium-T (ug/l)	< 2		< 2		< 2
Aluminum-T (ug/l)	< 200		< 200		< 200
Barium-T (ug/l)	17		19		19
Calcium-T (mg/l)	3.6		3.9		4.1
Iron-T (ug/l)	< 50		82		92
Magnesium-T (mg/l)	4.5		4.9		5
Manganese-T (ug/l)	< 10		< 10		< 10
Potassium-T (mg/l)	2.1		2.3		2.3
Sodium-T (mg/l)	< 5		< 5		< 5
Strontium-T (ug/l)	37		40		43
Zinc-T (ug/l)	< 10		< 10		< 10
Hardness (mg/l)	28		30		31

Appendix Table A Southwest Ohio River Tributary Watersheds Inorganic Water Chemistry Sampling Results (2016)

Site Location:	UPPER TWIN CREEK AT MCGAW @.S. RT. 52					SWDO Map # 10
River Mile: 2.55	Storet ID: X04P01	WAU: 050902010205	River Code: 10-085-000			
Latitude/Longitude: 38.6376 / -83.2245	Drainage Area (mi2): 12.8		County Scioto	Ecoregion: WAP	USGS Quad:	

Date Collected	5/16/2016	6/8/2016	6/29/2016	7/13/2016	7/27/2016	8/9/2016
Time	1:10	2:30	3:45	1:45	3:10	2:00
Temp (C)	12.79	20.2	25.4	25	27.2	24
D.O. (mg/l) / (% sat)	10.62 / 100.3	8.92 / 98.5	8.56 / 104.4	8.99 / 108.7	8.26 / 103.9	7.93 / 94.2
pH (fld) SU	7.13	7.17	7.02	7.09	6.8	7.04
SpCond fld/lab (umhos/cm)	77 / 78		114 / 108	117.8 / 111	136.4 / 136	131.3 / 131

COD (mg/l)	< 20		< 20	< 20	< 20	< 20
TDS (mg/l)	60	70	74	80	92	86
TSS (mg/l)	< 5	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/l)	13		22.3	24	27.6	29.6
Chloride (mg/l)	< 5	< 5	< 5	< 5	< 5	< 5
Sulfate (mg/l)	20.2	21	24.3	23	25.1	23.5
Ammonia-N (mg/l)	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.051
TKN (mg/l)	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Nitrate-nitrite-N (mg/l)	0.22	0.22	0.2	0.36	0.44	0.38
Nitrite-N (mg/l)	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Phosphorus-T (mg/l)	< 0.01	0.018	0.011	< 0.01	< 0.01	< 0.01
Orthophosphate, D (mg/l)	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Arsenic-T (ug/l)	< 2	< 2	< 2	< 2	< 2	< 2
Cadmium-T (ug/l)	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium-T (ug/l)	< 2	< 2	< 2	< 2	< 2	< 2
Copper-T (ug/l)	< 2	< 2	< 2	< 2	< 2	< 2
Lead-T (ug/l)	< 2	< 2	< 2	< 2	< 2	< 2
Nickel-T (ug/l)	< 2	< 2	< 2	< 2	< 2	< 2
Selenium-T (ug/l)	< 2	< 2	< 2	< 2	< 2	< 2
Aluminum-T (ug/l)	< 200	< 200	< 200	< 200		< 200
Barium-T (ug/l)	< 15	16	20	21	24	25
Calcium-T (mg/l)	3.9	4.8	5.9	6.4	7.7	7.7
Iron-T (ug/l)	< 50	53	< 50	< 50		< 50
Magnesium-T (mg/l)	4	4.7	5.6	6	7	6.9
Manganese-T (ug/l)	< 10	< 10	< 10	< 10	< 10	< 10
Potassium-T (mg/l)	< 2	< 2	2.2	2.2	2.6	2.4
Sodium-T (mg/l)	< 5	< 5	< 5	< 5	5.1	5
Strontium-T (ug/l)	32	39	47	50	60	58
Zinc-T (ug/l)	< 10	17	< 10	< 10		< 10
Hardness (mg/l)	26	31	38	41	48	48

Appendix Table A Southwest Ohio River Tributary Watersheds Inorganic Water Chemistry Sampling Results (2016)

Site Location:	UPPER TWIN CREEK AT MCGAW @.S. RT. 52					SWDO Map # 10
River Mile: 2.55	Storet ID: X04P01	WAU: 050902010205	River Code: 10-085-000			
Latitude/Longitude: 38.6376 / -83.2245	Drainage Area (mi2): 12.8		County Scioto	Ecoregion: WAP	USGS Quad:	

Date Collected	8/25/2016	9/1/2016	9/27/2016	10/25/2016	11/29/2016	12/20/2016
Time	1:25	11:15	11:15	11:20	11:40	12:10
Temp (C)	22.93	23.3	16.7	11.76	7.2	5.7
D.O. (mg/l) / (% sat)	8.39 / 97.7	8.35 / 97.9	5.83 / 60	10.06 / 92.9	10.61 / 87.9	12.71 / 101.3
pH (fld) SU	7.24	7.42	7.68	8.29	8.18	8.18
SpCond fld/lab (umhos/cm)	132 / 123		159 / 158	144 / 141	162.6 / 152	116.4 / 105

COD (mg/l)	< 20		< 20	< 20	< 20	< 20
TDS (mg/l)	80	90	104	94	32	72
TSS (mg/l)	< 5	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/l)	32.2		38.3	27.6	30.4	18.2
Chloride (mg/l)	< 5	< 5	5.1	< 5	6.4	< 5
Sulfate (mg/l)	22.3	25.2	30.2	31.7	28.7	18.4
Ammonia-N (mg/l)	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
TKN (mg/l)	0.26	< 0.2	< 0.2	0.56	< 0.2	< 0.2
Nitrate-nitrite-N (mg/l)	0.26	0.51	0.25	0.63	0.31	1.81
Nitrite-N (mg/l)	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Phosphorus-T (mg/l)	< 0.01	< 0.05J	0.01	< 0.01	< 0.01	0.011
Orthophosphate, D (mg/l)	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Arsenic-T (ug/l)	< 2	< 2	< 2	< 2	< 2	< 2
Cadmium-T (ug/l)	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium-T (ug/l)	< 2	< 2	< 2	< 2	< 2	< 2
Copper-T (ug/l)	< 2	< 2	< 2	< 2	< 2	< 2
Lead-T (ug/l)	< 2	< 2	< 2	< 2	< 2	< 2
Nickel-T (ug/l)	< 2	< 2	2.1	< 2	< 2	< 2
Selenium-T (ug/l)	< 2	< 2	< 2	< 2	< 2	< 2
Aluminum-T (ug/l)	< 200	< 200	< 200	< 200	< 200	< 200
Barium-T (ug/l)	21	24	28	23	23	19
Calcium-T (mg/l)	7.3	8.2	9.9	8	8.5	5.8
Iron-T (ug/l)	< 50	< 50	97	< 50	< 50	185
Magnesium-T (mg/l)	6.5	7.1	8.2	7.4	7.6	5.2
Manganese-T (ug/l)	< 10	< 10	28	< 10	< 10	< 10
Potassium-T (mg/l)	2.3	2.3	2.3	2	< 2	< 2
Sodium-T (mg/l)	5.1	< 5	5.9	5.3	5.3	< 5
Strontium-T (ug/l)	57	60	70	61	58	43
Zinc-T (ug/l)	< 10	< 10	< 10	< 10	< 10	95
Hardness (mg/l)	45	50	59	50	53	36

Appendix Table A Southwest Ohio River Tributary Watersheds Inorganic Water Chemistry Sampling Results (2016)

Site Location:	LOWER TWIN CREEK (RM 5.2) ADJ. LOWER TWIN CREEK RD.				SWDO Map #	11
River Mile: 5.2	Storet ID: 303600	WAU: 050902010206	River Code: 10-082-000			
Latitude/Longitude: 38.6787 / -83.3102	Drainage Area (mi2): 6.1	County Adams	Ecoregion: WAP	USGS Quad:		

Date Collected	6/28/2016	7/13/2016	7/27/2016	8/9/2016	8/25/2016
Time	1:20	1:15	1:35	12:00	12:25
Temp (C)	20.88	20.89	22.76	22.31	22.6
D.O. (mg/l) / (% sat)	7.59 / 84.9	6.9 / 77.2	7.57 / 87.9	5.72 / 65.8	7.93 / 91.9
pH (fld) SU	7.74	7.84	7.75	7.26	7.4
SpCond fld/lab (umhos/cm)	127 / 129	135 / 127	143 / 145	146 / 147	152.2 / 144

COD (mg/l)	< 20	< 20	< 20	< 20	< 20
TDS (mg/l)	80	84	94	104	92
TSS (mg/l)	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/l)	13.6	15.8	14	21.5	21.7
Chloride (mg/l)	< 5	< 5	< 5	< 5	< 5
Sulfate (mg/l)	34.8	35.7	41.8	37.2	40.4
Ammonia-N (mg/l)	< 0.05	< 0.05	< 0.05	0.051	< 0.05
TKN (mg/l)	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Nitrate-nitrite-N (mg/l)	0.35	0.3	0.4	0.24	0.25
Nitrite-N (mg/l)	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Phosphorus-T (mg/l)	< 0.01	0.01	0.017	< 0.01	< 0.01
Orthophosphate, D (mg/l)					
Arsenic-T (ug/l)	< 2		< 2		< 2
Cadmium-T (ug/l)	0.33		0.31		0.37
Chromium-T (ug/l)	< 2		< 2		< 2
Copper-T (ug/l)	< 2		< 2		< 2
Lead-T (ug/l)	< 2		< 2		< 2
Nickel-T (ug/l)	6.3		6.5		7
Selenium-T (ug/l)	< 2		< 2		< 2
Aluminum-T (ug/l)	< 200		< 200		< 200
Barium-T (ug/l)	24		31		34
Calcium-T (mg/l)	7.3		8.8		9.7
Iron-T (ug/l)	< 50		63		74
Magnesium-T (mg/l)	6.2		7.4		7.9
Manganese-T (ug/l)	< 10		< 10		10
Potassium-T (mg/l)	2		2.4		2.4
Sodium-T (mg/l)	< 5		< 5		5.2
Strontium-T (ug/l)	50		61		67
Zinc-T (ug/l)	15		16		14
Hardness (mg/l)	44		52		57

Appendix Table A Southwest Ohio River Tributary Watersheds Inorganic Water Chemistry Sampling Results (2016)

Site Location:	LOWER TWIN CREEK NW OF BUENA VISTA, ADJ. LOWER TWIN CREEK RD					SWDO Map # 12
River Mile: 2.1	Storet ID: X99Q02	WAU: 050902010206	River Code: 10-082-000			
Latitude/Longitude: 38.6481 / -83.2739	Drainage Area (mi2): 14.1		County Adams	Ecoregion: WAP	USGS Quad:	

Date Collected	5/16/2016	6/8/2016	6/29/2016	7/13/2016	7/27/2016	8/9/2016
Time	2:15	2:10	2:45	12:40	1:50	12:50
Temp (C)	13.31	19.7	23.85	22.7	27.9	28.6
D.O. (mg/l) / (% sat)	10.45 / 99.9	8.37 / 91.4	8.28 / 98.1	9.31 / 107.9	7.92 / 100.9	7.7 / 99.4
pH (fld) SU	7.08	7.41	7.27	7.68	7.27	7.42
SpCond fld/lab (umhos/cm)	95 / 97		116 / 110	117.9 / 114	121.6 / 124	125.6 / 124

COD (mg/l)	< 20		< 20	< 20	< 20	119
TDS (mg/l)	60	76	78	82	80	86
TSS (mg/l)	18	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/l)	10.4		14.1	15.2	16.6	18.3
Chloride (mg/l)	< 5	< 5	< 5	< 5	< 5	< 5
Sulfate (mg/l)	28.6	27.5	30	29.5	29	31.3
Ammonia-N (mg/l)	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
TKN (mg/l)	< 0.2	< 0.2	< 0.2	1.93 J	< 0.2	< 0.2
Nitrate-nitrite-N (mg/l)	0.65	0.64	0.46	0.49	0.39	0.43
Nitrite-N (mg/l)	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Phosphorus-T (mg/l)	0.473	< 0.01	0.015	< 0.01	0.02	< 0.01
Orthophosphate, D (mg/l)	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Arsenic-T (ug/l)	< 2	< 2	< 2	< 2	< 2	< 2
Cadmium-T (ug/l)	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium-T (ug/l)	< 2	< 2	< 2	< 2	< 2	< 2
Copper-T (ug/l)	< 2	< 2	< 2	< 2	< 2	< 2
Lead-T (ug/l)	< 2	< 2	< 2	< 2	< 2	< 2
Nickel-T (ug/l)	4.8	4.9	3.7	4.1	3.7	3.4
Selenium-T (ug/l)	< 2	< 2	< 2	< 2	< 2	< 2
Aluminum-T (ug/l)	< 200	< 200	< 200	< 200	< 200	< 200
Barium-T (ug/l)	20	23	22	26	25	27
Calcium-T (mg/l)	5.2	5.9	6.2	6.6	7	7.4
Iron-T (ug/l)	61	62	83	60	85	< 50
Magnesium-T (mg/l)	4.7	5.1	5.3	5.6	5.8	5.9
Manganese-T (ug/l)	< 10	< 10	< 10	< 10	< 10	< 10
Potassium-T (mg/l)	< 2	2	2.1	2.1	2.4	2.3
Sodium-T (mg/l)	< 5	< 5	< 5	< 5	< 5	< 5
Strontium-T (ug/l)	41	45	45	48	51	52
Zinc-T (ug/l)	< 10	< 10	< 10	< 10	< 10	< 10
Hardness (mg/l)	32	35	37	40	41	43

Appendix Table A Southwest Ohio River Tributary Watersheds Inorganic Water Chemistry Sampling Results (2016)

Site Location:	LOWER TWIN CREEK NW OF BUENA VISTA, ADJ. LOWER TWIN CREEK RD					SWDO Map # 12
River Mile: 2.1	Storet ID: X99Q02	WAU: 050902010206	River Code: 10-082-000			
Latitude/Longitude: 38.6481 / -83.2739	Drainage Area (mi2): 14.1		County Adams	Ecoregion: WAP	USGS Quad:	

Date Collected	8/25/2016	9/1/2016	9/27/2016	10/25/2016	11/29/2016	12/20/2016
Time	12:40	12:15	11:35	11:40	11:55	12:30
Temp (C)	23.54	23.7	22.4	13.48	10.8	6
D.O. (mg/l) / (% sat)	5.35 / 63	8.17 / 96.4	4.86 / 56	9.83 / 94.3	9.88 / 89.2	12.61 / 101.3
pH (fld) SU	6.91	6.82	7.44	8.07	8.08	8.1
SpCond fld/lab (umhos/cm)	125 / 118		135.9 / 134	128 / 123	136.3 / 128	124.3 / 114

COD (mg/l)	< 20		< 20	< 20	< 20	< 20
TDS (mg/l)	76	78	84	94	72	82
TSS (mg/l)	< 5	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/l)	18.2		26.1	20.8	18.3	10.7
Chloride (mg/l)	< 5	< 5	< 5	< 5	< 5	< 5
Sulfate (mg/l)	31.1	27.9	34	32.5	32.7	25.6
Ammonia-N (mg/l)	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
TKN (mg/l)	< 0.2	< 0.2	< 0.2	1.66	< 0.2	< 0.2
Nitrate-nitrite-N (mg/l)	0.4	0.59	0.18	0.33	0.2	2.55
Nitrite-N (mg/l)	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Phosphorus-T (mg/l)	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.012
Orthophosphate, D (mg/l)	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Arsenic-T (ug/l)	< 2	< 2	< 2	< 2	< 2	< 2
Cadmium-T (ug/l)	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium-T (ug/l)	< 2	< 2	< 2	< 2	< 2	< 2
Copper-T (ug/l)	< 2	< 2	< 2	< 2	< 2	< 2
Lead-T (ug/l)	< 2	< 2	< 2	< 2	< 2	< 2
Nickel-T (ug/l)	3.2	4	< 2	2.7	2.3	5
Selenium-T (ug/l)	< 2	< 2	< 2	< 2	< 2	< 2
Aluminum-T (ug/l)	< 200	< 200	< 200	< 200	< 200	< 200
Barium-T (ug/l)	24	26	27	22	22	24
Calcium-T (mg/l)	7.4	6.8	8.9	7.5	7.5	6.7
Iron-T (ug/l)	< 50	246	100	< 50	< 50	122
Magnesium-T (mg/l)	5.8	5.6	6.7	6.1	6.1	5.5
Manganese-T (ug/l)	< 10	< 10	10	< 10	< 10	< 10
Potassium-T (mg/l)	2.1	2.2	2.1	< 2	< 2	< 2
Sodium-T (mg/l)	< 5	< 5	< 5	< 5	< 5	< 5
Strontium-T (ug/l)	53	50	57	51	48	47
Zinc-T (ug/l)	18	< 10	< 10	< 10	< 10	< 10
Hardness (mg/l)	42	40	49	44	44	39

Appendix Table A Southwest Ohio River Tributary Watersheds Inorganic Water Chemistry Sampling Results (2016)

Site Location:	MCATEE RUN @S 52					SWDO Map #	13
River Mile: 0.66	Storet ID: 303603	WAU: 050902010207	River Code: 10-096-000				
Latitude/Longitude:	38.6282 / -83.1594	Drainage Area (mi2): 1.6	County Scioto	Ecoregion: WAP			

Date Collected	6/29/2016	7/13/2016	7/27/2016	8/9/2016	8/25/2016
Time	4:15	2:10	3:35	2:35	1:10
Temp (C)	23.75	27.2	29.3	27	28.4
D.O. (mg/l) / (% sat)	8.33 / 98.5	7.26 / 91.5	7.6 / 99.4	6.45 / 81	7.26 / 93.4
pH (fld) SU	7.09	7.35	7.48	7.09	7.24
SpCond fld/lab (umhos/cm)	217 / 207	190.5 / 181	203 / 200	227.1 / 226	263 / 248

COD (mg/l)	< 20	< 20	< 20	121	< 20
TDS (mg/l)	142	122	128	154	162
TSS (mg/l)	< 5	< 5	< 5	41	< 5
Alkalinity (mg/l)	24.4	20.6	21.9	32.4	42.4
Chloride (mg/l)	< 5	< 5	< 5	< 5	< 5
Sulfate (mg/l)	67	56.8	59.1	63.9	71.9
Ammonia-N (mg/l)	< 0.05	< 0.05	< 0.05	0.072	< 0.05
TKN (mg/l)	< 0.2	< 0.2	< 0.2	0.69	< 0.2
Nitrate-nitrite-N (mg/l)	0.29	0.31	0.2	0.85	0.34
Nitrite-N (mg/l)	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Phosphorus-T (mg/l)	0.014	< 0.01	< 0.01	0.089	< 0.01
Orthophosphate, D (mg/l)					
Arsenic-T (ug/l)	< 2		< 2		< 2
Cadmium-T (ug/l)	< 0.2		< 0.2		< 0.2
Chromium-T (ug/l)	< 2		< 2		< 2
Copper-T (ug/l)	< 2		< 2		< 2
Lead-T (ug/l)	< 2		< 2		< 2
Nickel-T (ug/l)	4.2		3.5		3.7
Selenium-T (ug/l)	< 2		< 2		< 2
Aluminum-T (ug/l)	< 200		< 200		< 200
Barium-T (ug/l)	25		22		32
Calcium-T (mg/l)	10.4		9.6		14.5
Iron-T (ug/l)	59		93		< 50
Magnesium-T (mg/l)	11.5		10.4		14.9
Manganese-T (ug/l)	< 10		< 10		< 10
Potassium-T (mg/l)	2.5		2.7		3.1
Sodium-T (mg/l)	9.1		9.1		11.9
Strontium-T (ug/l)	95		89		126
Zinc-T (ug/l)	< 10		< 10		< 10
Hardness (mg/l)	73		67		98

Appendix Table A Southwest Ohio River Tributary Watersheds Inorganic Water Chemistry Sampling Results (2016)

Site Location: ROCK RUN IN SHAWNEE S.F. OFF TRAM ROAD

SWDO Map # 14

River Mile: 1.8 Storet ID: 303604 WAU: 050902010207 River Code: 10-081-000

Latitude/Longitude: 38.6291 / -83.2784 Drainage Area (mi2): 0.8 County Adams Ecoregion: WAP USGS Quad:

Date Collected	6/29/2016	7/13/2016	7/27/2016	8/9/2016	8/25/2016
Time	1:20	11:35	12:10	11:40	11:40
Temp (C)	19.57	20.4	23	22.4	21.51
D.O. (mg/l) / (% sat)	9.07 / 98.9	8.43 / 93.4	6.99 / 81.6	8.44 / 97.2	8.46 / 95.9
pH (fld) SU	8.4	8.16	8.26	7.74	7.79
SpCond fld/lab (umhos/cm)	141 / 131	129.4 / 123	151.7 / 149	169.1 / 170	172 / 162

COD (mg/l)	< 20	< 20	< 20	121	< 20
TDS (mg/l)	92	86	94	108	108
TSS (mg/l)	< 5	< 5	5	< 5	< 5
Alkalinity (mg/l)	23.8	19.4	31.3	36.5	39.5
Chloride (mg/l)	< 5	< 5	< 5	< 5	< 5
Sulfate (mg/l)	35.3	33.4	32.8	38.6	37.8
Ammonia-N (mg/l)	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
TKN (mg/l)	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Nitrate-nitrite-N (mg/l)	0.19	0.17	0.13	0.17	0.13
Nitrite-N (mg/l)	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Phosphorus-T (mg/l)	0.013	< 0.01	0.724	< 0.01	0.01
Orthophosphate, D (mg/l)					
Arsenic-T (ug/l)	< 2		< 2		< 2
Cadmium-T (ug/l)	< 0.2		< 0.2		< 0.2
Chromium-T (ug/l)	< 2		< 2		< 2
Copper-T (ug/l)	< 2		< 2		< 2
Lead-T (ug/l)	< 2		< 2		< 2
Nickel-T (ug/l)	< 2		2.7		< 2
Selenium-T (ug/l)	< 2		< 2		< 2
Aluminum-T (ug/l)	< 200		< 200		< 200
Barium-T (ug/l)	29		33		32
Calcium-T (mg/l)	7.1		8.3		10
Iron-T (ug/l)	202		328		102
Magnesium-T (mg/l)	7.5		8.4		9.6
Manganese-T (ug/l)	< 10		12		< 10
Potassium-T (mg/l)	< 2		2.1		2.2
Sodium-T (mg/l)	< 5		< 5		5.7
Strontium-T (ug/l)	59		65		78
Zinc-T (ug/l)	< 10		19		< 10
Hardness (mg/l)	49		55		65

Appendix Table A Southwest Ohio River Tributary Watersheds Inorganic Water Chemistry Sampling Results (2016)

Site Location:	RUSSELL FORK @ POINT CEMETERY ROAD				SWDO Map # 15	
River Mile: 0.1	Storet ID: 303605	WAU: 050902010209	River Code: 10-069-000			
Latitude/Longitude: 38.6742 / -83.3826	Drainage Area (mi2): 5.1		County Adams	Ecoregion: WAP	USGS Quad:	

Date Collected	6/28/2016	7/13/2016	7/27/2016	8/9/2016	8/25/2016
Time	11:45	12:25	12:40	11:05	11:05
Temp (C)	23.39	23.76	24.11	23.83	23.5
D.O. (mg/l) / (% sat)	7.97 / 93.7	8.99 / 106.4	7.65 / 91.2	8.03 / 95.2	8.25 / 97.3
pH (fld) SU	7.67	7.72	7.7	7.98	7.7
SpCond fld/lab (umhos/cm)	476 / 482	492 / 475	387 / 390	505 / 505	505 / 483

COD (mg/l)	< 20	< 20	< 20	< 20	< 20
TDS (mg/l)	288	296	242	304	294
TSS (mg/l)	7	< 5	22	< 5	< 5
Alkalinity (mg/l)	210	217	169	237	237
Chloride (mg/l)	< 5	< 5	< 5	< 5	< 5
Sulfate (mg/l)	52.8	52.9	41.5	47.3	45.6
Ammonia-N (mg/l)	0.053	< 0.05	< 0.05	< 0.05	< 0.05
TKN (mg/l)	0.23	< 0.2	0.32	< 0.2	< 0.2
Nitrate-nitrite-N (mg/l)	0.2	0.13	0.33	0.17	0.14
Nitrite-N (mg/l)	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Phosphorus-T (mg/l)	0.013	0.016	0.027	< 0.01	< 0.01
Orthophosphate, D (mg/l)					
Arsenic-T (ug/l)	< 2		< 2		< 2
Cadmium-T (ug/l)	< 0.2		< 0.2		< 0.2
Chromium-T (ug/l)	< 2		< 2		< 2
Copper-T (ug/l)	< 2		< 2		< 2
Lead-T (ug/l)	< 2		< 2		< 2
Nickel-T (ug/l)	3.4		5.8		2.8
Selenium-T (ug/l)	< 2		< 2		< 2
Aluminum-T (ug/l)	258		761		< 200
Barium-T (ug/l)	83		78		82
Calcium-T (mg/l)	52.4		45.4		55.2
Iron-T (ug/l)	498		1350		173
Magnesium-T (mg/l)	30.5		26.4		31.4
Manganese-T (ug/l)	41		44		81
Potassium-T (mg/l)	3.6		3.9		3.7
Sodium-T (mg/l)	< 5		< 5		5
Strontium-T (ug/l)	77		68		85
Zinc-T (ug/l)	< 10		< 10		< 10
Hardness (mg/l)	256		222		267

Appendix Table A Southwest Ohio River Tributary Watersheds Inorganic Water Chemistry Sampling Results (2016)

Site Location:	STOUT RUN N OF ROME ADJ. BLUE CREEK RD, DST. PUNTENNEY RUN					SWDO Map # 16
River Mile: 3	Storet ID: 200741	WAU: 050902010209	River Code: 10-067-000			
Latitude/Longitude: 38.6936 / -83.3792	Drainage Area (mi2): 5.4	County Adams	Ecoregion: WAP	USGS Quad:		

Date Collected	6/28/2016	7/13/2016	7/27/2016	8/9/2016	8/25/2016
Time	11:15	12:05	12:25	10:40	11:25
Temp (C)	21.08	22.72	23.63	23.53	24.2
D.O. (mg/l) / (% sat)	8.73 / 98.1	9.9 / 114.8	8.43 / 99.5	8.21 / 96.8	8.06 / 96.2
pH (fld) SU	7.55	8	7.64	8.22	7.77
SpCond fld/lab (umhos/cm)	349 / 350	371 / 353	300 / 297	381 / 375	388.4 / 364

COD (mg/l)	< 20	< 20	< 20	< 20	< 20
TDS (mg/l)	214	224	190	234	232
TSS (mg/l)	< 5	< 5	< 5	< 5	6
Alkalinity (mg/l)	129	136	104	143	153
Chloride (mg/l)	< 5	< 5	< 5	< 5	< 5
Sulfate (mg/l)	52.5	54.8	44	51.8	50.5
Ammonia-N (mg/l)	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
TKN (mg/l)	< 0.2	< 0.2	0.63	< 0.2	0.45
Nitrate-nitrite-N (mg/l)	0.42	0.3	0.4	0.26	0.19
Nitrite-N (mg/l)	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Phosphorus-T (mg/l)	< 0.01	< 0.01	0.012	0.011	< 0.01
Orthophosphate, D (mg/l)	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Arsenic-T (ug/l)	< 2		< 2		< 2
Cadmium-T (ug/l)	< 0.2		< 0.2		< 0.2
Chromium-T (ug/l)	< 2		< 2		< 2
Copper-T (ug/l)	< 2		< 2		< 2
Lead-T (ug/l)	< 2		< 2		< 2
Nickel-T (ug/l)	3.8		3.8		3.3
Selenium-T (ug/l)	< 2		< 2		< 2
Aluminum-T (ug/l)	< 200		< 200		< 200
Barium-T (ug/l)	69		58		78
Calcium-T (mg/l)	34.9		28.2		40
Iron-T (ug/l)	81		161		51
Magnesium-T (mg/l)	20.7		16.8		23.2
Manganese-T (ug/l)	< 10		< 10		11
Potassium-T (mg/l)	2.9		2.9		3.6
Sodium-T (mg/l)	< 5		< 5		5.9
Strontium-T (ug/l)	74		62		89
Zinc-T (ug/l)	< 10		< 10		< 10
Hardness (mg/l)	172		140		195

Appendix Table A Southwest Ohio River Tributary Watersheds Inorganic Water Chemistry Sampling Results (2016)

Site Location: LONG LICK RUN @ FORD DST. OWL HOLLOW

SWDO Map # 17

River Mile: 1.23

Storet ID: 303599

WAU: 050902010210

River Code: 10-075-000

Latitude/Longitude: 38.6670 / -83.3470

Drainage Area (mi2): 2.7

County Adams

Ecoregion: WAP

USGS Quad:

Date Collected	6/28/2016	7/13/2016	7/27/2016	8/9/2016	8/25/2016
Time	12:15	11:40	12:00	11:20	11:55
Temp (C)	19.45	19.93	21.77	22.17	21.9
D.O. (mg/l) / (% sat)	8.81 / 95.9	10.09 / 110.9	8.29 / 94.4	8.17 / 93.8	7.88 / 90.1
pH (fld) SU	7.56	8.34	7.52	7.67	7.81
SpCond fld/lab (umhos/cm)	203 / 247	259 / 249	290 / 293	299 / 301	313.9 / 298

COD (mg/l)	< 20	< 20	< 20	< 20	< 20
TDS (mg/l)	158	164	176	210	172
TSS (mg/l)	< 5	< 5	< 5	< 5	18
Alkalinity (mg/l)	55.5	61.8	73.8	79.4	86.3
Chloride (mg/l)	5.2	6.7	10.8	11.2	13.1
Sulfate (mg/l)	51.7	50.8	49.1	52.1	50.6
Ammonia-N (mg/l)	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
TKN (mg/l)	< 0.2	< 0.2	< 0.2	< 0.2	0.24
Nitrate-nitrite-N (mg/l)	0.33	0.34	0.31	0.34	0.37
Nitrite-N (mg/l)	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Phosphorus-T (mg/l)	< 0.01	0.013	0.012	< 0.01	0.018
Orthophosphate, D (mg/l)					
Arsenic-T (ug/l)	< 2		< 2		< 2
Cadmium-T (ug/l)	0.3		0.25		0.25
Chromium-T (ug/l)	< 2		< 2		< 2
Copper-T (ug/l)	< 2		< 2		< 2
Lead-T (ug/l)	< 2		< 2		< 2
Nickel-T (ug/l)	7.6		6.7		6.5
Selenium-T (ug/l)	< 2		< 2		< 2
Aluminum-T (ug/l)	< 200		< 200		< 200
Barium-T (ug/l)	52		59		61
Calcium-T (mg/l)	20		23.6		26.5
Iron-T (ug/l)	< 50		130		132
Magnesium-T (mg/l)	12.4		14.3		15.2
Manganese-T (ug/l)	< 10		< 10		18
Potassium-T (mg/l)	2.7		3.2		3.4
Sodium-T (mg/l)	7.6		10.3		12.7
Strontium-T (ug/l)	83		96		108
Zinc-T (ug/l)	11		13		< 10
Hardness (mg/l)	101		118		129

Appendix Table A Southwest Ohio River Tributary Watersheds Inorganic Water Chemistry Sampling Results (2016)

Site Location:	SULPHUR CREEK @ SULPHUR CREEK RD.				SWDO Map # 18	
River Mile: 0.35	Storet ID: 303608	WAU: 050902010210	River Code: 10-077-000			
Latitude/Longitude: 38.6394 / -83.3230	Drainage Area (mi2): 2.4	County Adams	Ecoregion: WAP	USGS Quad:		

Date Collected	6/29/2016	7/13/2016	7/27/2016	8/9/2016	8/25/2016
Time	11:10	1:15	2:35	1:30	1:50
Temp (C)	19.55	22.4	24.1	22.9	25.81
D.O. (mg/l) / (% sat)	8.4 / 91.6	8.78 / 101.1	6.4 / 76.2	4.33 / 50.5	8.26 / 101.5
pH (fld) SU	7.74	7.34	7.4	7.04	7.3
SpCond fld/lab (umhos/cm)	199 / 189	184 / 176	202.6 / 201	238.2 / 235	249 / 236

COD (mg/l)	< 20	< 20	< 20	154	< 20
TDS (mg/l)	132	118	128	172	152
TSS (mg/l)	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/l)	28.3	30.2	33.4	47	55.7
Chloride (mg/l)	< 5	< 5	< 5	6.3	7.1
Sulfate (mg/l)	54.5	50.2	50.4	53.3	49.2
Ammonia-N (mg/l)	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
TKN (mg/l)		< 0.2	< 0.2	< 0.2	< 0.2
Nitrate-nitrite-N (mg/l)	0.4	0.53	0.28	0.4	0.21
Nitrite-N (mg/l)	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Phosphorus-T (mg/l)	0.016	0.013	0.029	0.015	0.011
Orthophosphate, D (mg/l)					
Arsenic-T (ug/l)	< 2		< 2		< 2
Cadmium-T (ug/l)	0.24		0.22		0.23
Chromium-T (ug/l)	< 2		< 2		< 2
Copper-T (ug/l)	< 2		< 2		< 2
Lead-T (ug/l)	< 2		< 2		< 2
Nickel-T (ug/l)	7.5		6.7		7.6
Selenium-T (ug/l)	< 2		< 2		< 2
Aluminum-T (ug/l)	< 200		< 200		< 200
Barium-T (ug/l)	38		36		45
Calcium-T (mg/l)	12.8		12.6		17.8
Iron-T (ug/l)	< 50		76		< 50
Magnesium-T (mg/l)	9.5		9.1		11.5
Manganese-T (ug/l)	< 10		< 10		11
Potassium-T (mg/l)	3.6		4		5.1
Sodium-T (mg/l)	6.4		6.2		9.7
Strontium-T (ug/l)	74		72		100
Zinc-T (ug/l)	< 10		< 10		< 10
Hardness (mg/l)	71		69		92

Appendix Table A Southwest Ohio River Tributary Watersheds Inorganic Water Chemistry Sampling Results (2016)

Site Location:	DONALDSON CREEK @S 52					SWDO Map #	19
River Mile: 0.45	Storet ID: 303595	WAU: 050902010601	River Code: 10-060-000				
Latitude/Longitude:	38.7077 / -83.5201	Drainage Area (mi2): 2.8	County Adams	Ecoregion: IP			

Date Collected	6/29/2016	7/14/2016	7/28/2016	8/10/2016	8/23/2016
Time	11:20	10:15	11:10	11:10	10:25
Temp (C)	20.64	22.5	23.6	23.1	21.8
D.O. (mg/l) / (% sat)	7.12 / 79.4	3.69 / 42.6	7.7 / 90.8	5.12 / 59.9	2.8 / 32
pH (fld) SU	8.01	7.47	7.99	7.49	7.37
SpCond fld/lab (umhos/cm)	580 / 551	561 / 544	450.9 / 474	573 / 544	595 / 567

COD (mg/l)	< 20	< 20	< 20	< 20	< 20
TDS (mg/l)	336	326	280	314	332
TSS (mg/l)	17	< 5	46	< 5	10
Alkalinity (mg/l)	309	274	227	267	285
Chloride (mg/l)	8.8	9.6	8.9	10.5	11
Sulfate (mg/l)	24.1	27.8	27.5	33.6	29.5
Ammonia-N (mg/l)	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
TKN (mg/l)	< 0.2	< 0.2	0.34	0.22	< 0.2
Nitrate-nitrite-N (mg/l)	0.16	0.31	0.2	0.4	0.23
Nitrite-N (mg/l)	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Phosphorus-T (mg/l)	0.034	0.023	0.051	0.01	0.014
Orthophosphate, D (mg/l)					
Arsenic-T (ug/l)	< 2		< 2		< 2
Cadmium-T (ug/l)	< 0.2		< 0.2		< 0.2
Chromium-T (ug/l)	< 2		< 2		< 2
Copper-T (ug/l)	< 2		< 2		< 2
Lead-T (ug/l)	< 2		< 2		< 2
Nickel-T (ug/l)	< 2		2.8		< 2
Selenium-T (ug/l)	< 2		< 2		< 2
Aluminum-T (ug/l)	476		1110		< 200
Barium-T (ug/l)	35		30		37
Calcium-T (mg/l)	69.2		57.1		73.5
Iron-T (ug/l)	749		1880		64
Magnesium-T (mg/l)	36.7		28		33.6
Manganese-T (ug/l)	16		31		< 10
Potassium-T (mg/l)	2.3		3.6		2.9
Sodium-T (mg/l)	5		< 5		6.2
Strontium-T (ug/l)	107		107		121
Zinc-T (ug/l)	< 10		< 10		< 10
Hardness (mg/l)	324		258		322

Appendix Table A Southwest Ohio River Tributary Watersheds Inorganic Water Chemistry Sampling Results (2016)

Site Location: ISAACS CREEK IN MANCHESTER @ BROADWAY ST.

SWDO Map # 20

River Mile: 1.43 Storet ID: 303612 WAU: 050902010601 River Code: 10-056-000

Latitude/Longitude: 38.6919 / -83.6145 Drainage Area (mi2): 4.9 County Adams Ecoregion: IP USGS Quad:

Date Collected	6/29/2016	7/14/2016	7/28/2016	8/10/2016	8/23/2016
Time	12:15	11:10	11:45	11:50	11:20
Temp (C)	21.01	23.2	23.3	23.6	19.9
D.O. (mg/l) / (% sat)	6.96 / 78.2	5.71 / 66.8	6.91 / 81	7.37 / 87.1	7.68 / 84.4
pH (fld) SU	8.1	7.96	7.88	7.86	7.98
SpCond fld/lab (umhos/cm)	578 / 549	562 / 538	484 / 492	457.4 / 445	535 / 523

COD (mg/l)	< 20	< 20	< 20	< 20	< 20
TDS (mg/l)	344	324	282	266	296
TSS (mg/l)	6	31	69	9	6
Alkalinity (mg/l)	270	252	210	211	254
Chloride (mg/l)	23	19.6	19.5	14.8	17.2
Sulfate (mg/l)	31.9	25.2	25.5	20.6	23.2
Ammonia-N (mg/l)	< 0.05	< 0.05	< 0.05	0.053	< 0.05
TKN (mg/l)	< 0.2	0.74	0.53	0.35	< 0.2
Nitrate-nitrite-N (mg/l)	< 0.1	< 0.1	0.29	0.33	0.14
Nitrite-N (mg/l)	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Phosphorus-T (mg/l)	0.037	0.115	0.13	0.062	0.031
Orthophosphate, D (mg/l)					
Arsenic-T (ug/l)	< 2		< 2		< 2
Cadmium-T (ug/l)	< 0.2		< 0.2		< 0.2
Chromium-T (ug/l)	< 2		< 2		< 2
Copper-T (ug/l)	< 2		2.4		< 2
Lead-T (ug/l)	< 2		< 2		< 2
Nickel-T (ug/l)	< 2		3.2		2.4
Selenium-T (ug/l)	< 2		< 2		< 2
Aluminum-T (ug/l)	205		1390		686
Barium-T (ug/l)	45		46		47
Calcium-T (mg/l)	79.5		66.2		80.1
Iron-T (ug/l)	303		2460		1230
Magnesium-T (mg/l)	20.7		17.6		20.4
Manganese-T (ug/l)	91		163		119
Potassium-T (mg/l)	2.4		3.1		2.9
Sodium-T (mg/l)	11.9		12.8		13.2
Strontium-T (ug/l)	136		114		137
Zinc-T (ug/l)	< 10		< 10		< 10
Hardness (mg/l)	284		238		284

Appendix Table A Southwest Ohio River Tributary Watersheds Inorganic Water Chemistry Sampling Results (2016)

Site Location:	ISLAND CREEK @ ISLAND CREEK RD.				SWDO Map # 21	
River Mile: 1.1	Storet ID: 303598	WAU: 050902010601	River Code: 10-057-000			
Latitude/Longitude: 38.7023 / -83.5822	Drainage Area (mi2): 6.8		County Adams	Ecoregion: IP	USGS Quad:	

Date Collected	6/29/2016	7/14/2016	7/28/2016	8/10/2016	8/23/2016
Time	11:50	10:50	11:30	11:30	11:05
Temp (C)	23.03	23.7	23.6	24.9	21.5
D.O. (mg/l) / (% sat)	9.28 / 108.3	7.66 / 90.6	7.71 / 90.9	8.04 / 97.3	8.22 / 93.3
pH (fld) SU	8.19	7.87	8.07	7.89	7.85
SpCond fld/lab (umhos/cm)	480 / 458	471.3 / 469	415.8 / 420	398.1 / 380	427.3 / 413

COD (mg/l)	< 20	< 20	< 20	< 20	< 20
TDS (mg/l)	268	282	262	238	246
TSS (mg/l)	< 5	< 5	30	7	< 5
Alkalinity (mg/l)	227	227	199	184	202
Chloride (mg/l)	9.9	8.7	6.4	6.9	6.6
Sulfate (mg/l)	35.8	30.2	25.2	27.3	26.6
Ammonia-N (mg/l)	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
TKN (mg/l)	< 0.2	< 0.2	0.6	0.47	< 0.2
Nitrate-nitrite-N (mg/l)	< 0.1	0.1	0.23	0.2	< 0.1
Nitrite-N (mg/l)	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Phosphorus-T (mg/l)	0.054	0.01	0.362	0.035	0.012
Orthophosphate, D (mg/l)					
Arsenic-T (ug/l)	< 2		< 2		< 2
Cadmium-T (ug/l)	< 0.2		< 0.2		< 0.2
Chromium-T (ug/l)	< 2		< 2		< 2
Copper-T (ug/l)	< 2		< 2		< 2
Lead-T (ug/l)	< 2		< 2		< 2
Nickel-T (ug/l)	< 2		2.9		< 2
Selenium-T (ug/l)	< 2		< 2		< 2
Aluminum-T (ug/l)	< 200		1390		< 200
Barium-T (ug/l)	37		37		33
Calcium-T (mg/l)	61.2		58.5		56.7
Iron-T (ug/l)	83		2180		96
Magnesium-T (mg/l)	22.3		19.6		20.8
Manganese-T (ug/l)	13		47		20
Potassium-T (mg/l)	2.8		3.5		3.1
Sodium-T (mg/l)	5.7		< 5		5.5
Strontium-T (ug/l)	121		108		122
Zinc-T (ug/l)	< 10		< 10		< 10
Hardness (mg/l)	245		227		227

Appendix Table A Southwest Ohio River Tributary Watersheds Inorganic Water Chemistry Sampling Results (2016)

Site Location:	FISHING GUT CREEK E OF ABERDEEN, NEAR OLD ST. RT. 249					SWDO Map # 22
River Mile: 1.7	Storet ID: X03W13	WAU: 050902010605	River Code: 10-049-000			
Latitude/Longitude: 38.6578 / -83.7436	Drainage Area (mi2): 1.9		County Brown	Ecoregion: IP	USGS Quad:	

Date Collected	6/29/2016	7/14/2016	7/28/2016	8/10/2016	8/23/2016
Time	1:25	12:05	1:55	12:25	12:10
Temp (C)	26.38	23.4	21.7	24.1	20.1
D.O. (mg/l) / (% sat)	11.05 / 137.3	7.94 / 93.3	8.08 / 91.9	8.33 / 99.2	7.09 / 78.2
pH (fld) SU	8.38	8.11	7.94	8.07	7.95
SpCond fld/lab (umhos/cm)	473 / 456	494.2 / 482	207.7 / 211	503 / 491	492 / 478

COD (mg/l)	< 20	< 20	82	< 20	< 20
TDS (mg/l)	290	294	196	298	292
TSS (mg/l)	6	< 5	190	< 5	< 5
Alkalinity (mg/l)	239	251	105	254	253
Chloride (mg/l)	< 5	< 5	< 5	< 5	< 5
Sulfate (mg/l)	29.1	26.4	< 5	25.4	21.3
Ammonia-N (mg/l)	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
TKN (mg/l)	< 0.2	< 0.2	1.67	0.25	< 0.2
Nitrate-nitrite-N (mg/l)	0.13	0.21	0.15	1.04	0.17
Nitrite-N (mg/l)	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Phosphorus-T (mg/l)	0.527	0.095	0.718	0.168	0.137
Orthophosphate, D (mg/l)					
Arsenic-T (ug/l)	< 2		< 2		< 2
Cadmium-T (ug/l)	< 0.2		< 0.2		< 0.2
Chromium-T (ug/l)	< 2		4.2		< 2
Copper-T (ug/l)	< 2		4.9		< 2
Lead-T (ug/l)	< 2		4.9		< 2
Nickel-T (ug/l)	< 2		6.2		< 2
Selenium-T (ug/l)	< 2		< 2		< 2
Aluminum-T (ug/l)	402		5270		< 200
Barium-T (ug/l)	33		54		34
Calcium-T (mg/l)	85.5		42		93.7
Iron-T (ug/l)	570		7660		149
Magnesium-T (mg/l)	7.3		3.7		7.5
Manganese-T (ug/l)	19		334		< 10
Potassium-T (mg/l)	< 2		4.6		2.3
Sodium-T (mg/l)	< 5		< 5		< 5
Strontium-T (ug/l)	210		78		224
Zinc-T (ug/l)	10		22		< 10
Hardness (mg/l)	244		120		265

Appendix Table A Southwest Ohio River Tributary Watersheds Inorganic Water Chemistry Sampling Results (2016)

Site Location: L. THREEMILE CREEK E OF MAYSVILLE @.S. RT. 52

SWDO Map # 23

River Mile: 1.3 Storet ID: X99Q01 WAU: 050902010605 River Code: 10-050-000

Latitude/Longitude: 38.6416 / -83.6854 Drainage Area (mi2): 4.7 County Adams Ecoregion: IP USGS Quad:

Date Collected	6/29/2016	7/14/2016	7/28/2016	8/10/2016	8/23/2016
Time	12:45	11:40	1:23	12:05	11:50
Temp (C)	21.47	22.9	21	24.3	20.3
D.O. (mg/l) / (% sat)	8.86 / 100.4	7.69 / 89.7	9.16 / 102.9	6.91 / 82.7	6.98 / 77.3
pH (fld) SU	8	7.9	8	7.81	7.86
SpCond fld/lab (umhos/cm)	537 / 513	492.7 / 480	345.8 / 350	542 / 517	485.4 / 472

COD (mg/l)	< 20	< 20	33	< 20	< 20
TDS (mg/l)	316	290	234	320	294
TSS (mg/l)	12	< 5	118	< 5	< 5
Alkalinity (mg/l)	268	233	177	271	232
Chloride (mg/l)	6.8	5.5	< 5	6.8	7.1
Sulfate (mg/l)	30.4	24	12.7	25.3	26.9
Ammonia-N (mg/l)	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
TKN (mg/l)	< 0.2	0.59	1.06	< 0.2	< 0.2
Nitrate-nitrite-N (mg/l)	0.16	0.11	0.28	0.14	0.26
Nitrite-N (mg/l)	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Phosphorus-T (mg/l)	0.053	0.052	0.313	0.043	0.052
Orthophosphate, D (mg/l)					
Arsenic-T (ug/l)	< 2		< 2		< 2
Cadmium-T (ug/l)	< 0.2		< 0.2		< 0.2
Chromium-T (ug/l)	< 2		2.5		< 2
Copper-T (ug/l)	< 2		2.9		< 2
Lead-T (ug/l)	< 2		2		< 2
Nickel-T (ug/l)	< 2		4.5		< 2
Selenium-T (ug/l)	< 2		< 2		< 2
Aluminum-T (ug/l)	< 200		2720		< 200
Barium-T (ug/l)	50		54		44
Calcium-T (mg/l)	95		65.2		87.2
Iron-T (ug/l)	105		4190		121
Magnesium-T (mg/l)	11.7		8.1		10.8
Manganese-T (ug/l)	10		191		18
Potassium-T (mg/l)	< 2		3.1		2
Sodium-T (mg/l)	< 5		< 5		5.1
Strontium-T (ug/l)	173		104		164
Zinc-T (ug/l)	< 10		< 10		< 10
Hardness (mg/l)	285		196		262

Appendix Table A Southwest Ohio River Tributary Watersheds Inorganic Water Chemistry Sampling Results (2016)

Site Location: HONEY CREEK E OF RUSSELLVILLE @ MOUTH

SWDO Map # 24

River Mile: 0.1 Storet ID: X99Q04 WAU: 050902010701 River Code: 10-120-002

Latitude/Longitude: 38.8716 / -83.7683 Drainage Area (mi2): 0.9 County Brown Ecoregion: IP USGS Quad:

Date Collected	6/30/2016	7/14/2016	7/28/2016	8/10/2016	8/23/2016
Time	11:20	1:00	11:10	10:15	10:10
Temp (C)	19.91	26.44	22.53	23.31	18.39
D.O. (mg/l) / (% sat)	11.1 / 122	11.52 / 143.3	8.21 / 94.9	9.72 / 114.1	11.03 / 117.6
pH (fld) SU	8.35	8.46	7.85	8.31	8.19
SpCond fld/lab (umhos/cm)	548 / 527	535 / 498	487 / 489	595 / 584	582 / 575

COD (mg/l)	< 20	< 20	31	< 20	< 20
TDS (mg/l)	344	306	288	356	352
TSS (mg/l)	5	8	32	< 5	9
Alkalinity (mg/l)	248	226	188	266	262
Chloride (mg/l)	19.7	21	34.4	24	23.8
Sulfate (mg/l)	37.9	35.7	22.3	37.3	41.6
Ammonia-N (mg/l)	< 0.05	< 0.05	2.53	0.052	< 0.05
TKN (mg/l)	0.22	0.38	3.79	0.34	0.27
Nitrate-nitrite-N (mg/l)	< 0.1	< 0.1	0.59	0.13	0.15
Nitrite-N (mg/l)	< 0.02	< 0.02	0.022	< 0.02	< 0.02
Phosphorus-T (mg/l)	0.037	0.114	0.799	0.088	0.157
Orthophosphate, D (mg/l)					
Arsenic-T (ug/l)	< 2		< 2		< 2
Cadmium-T (ug/l)	< 0.2		< 0.2		< 0.2
Chromium-T (ug/l)	< 2		< 2		< 2
Copper-T (ug/l)	< 2		2.1		< 2
Lead-T (ug/l)	< 2		< 2		< 2
Nickel-T (ug/l)	< 2		2.3		< 2
Selenium-T (ug/l)	< 2		< 2		< 2
Aluminum-T (ug/l)	< 200		874		< 200
Barium-T (ug/l)	51		49		45
Calcium-T (mg/l)	76.2		55.5		84.5
Iron-T (ug/l)	53		1220		149
Magnesium-T (mg/l)	25.2		12.5		22.3
Manganese-T (ug/l)	10		110		21
Potassium-T (mg/l)	3		5.9		3.4
Sodium-T (mg/l)	10.6		21.1		15
Strontium-T (ug/l)	181		140		195
Zinc-T (ug/l)	< 10		< 10		< 10
Hardness (mg/l)	294		190		303

Appendix Table A Southwest Ohio River Tributary Watersheds Inorganic Water Chemistry Sampling Results (2016)

Site Location:	TRIB TO W FK EAGLE CREEK (7.05) @ RUSSELLVILLE-WINCHESTER RD					SWDO Map # 25
River Mile: 1.8	Storet ID: X03W07	WAU: 050902010701	River Code: 10-120-001			
Latitude/Longitude: 38.8658 / -83.7600	Drainage Area (mi2): 7.2		County Brown	Ecoregion: IP	USGS Quad:	

Date Collected	6/30/2016	7/14/2016	7/28/2016	8/10/2016	8/23/2016	9/1/2016
Time	11:40	12:45	11:30	10:35	10:15	12:43
Temp (C)	22.75	28.34	23	26.42	21.21	21.6
D.O. (mg/l) / (% sat)	12.79 / 148.5	11.93 / 153.5	8.06 / 94.1	11.96 / 148.7	11.92 / 134.4	10.53 / 119.6
pH (fld) SU	8.11	8.18	7.85	8.11	8.3	8.39
SpCond fld/lab (umhos/cm)	520 / 493	512 / 473	437 / 441	490 / 466	407 / 391	

COD (mg/l)	< 20	< 20	21	< 20	< 20	
TDS (mg/l)	328	292	266	286	232	290
TSS (mg/l)	< 5	6	38	< 5	< 5	< 5
Alkalinity (mg/l)	242	222	179	224	181	
Chloride (mg/l)	19.1	20.7	23.4	14.8	15.5	20.9
Sulfate (mg/l)	28	24.2	20.8	26.9	20.1	30.4
Ammonia-N (mg/l)	< 0.05	< 0.05	1.01	0.056	< 0.05	0.05
TKN (mg/l)	0.33	0.99	1.73	0.37	0.3	0.48
Nitrate-nitrite-N (mg/l)	0.23	0.22	0.6	< 0.1	< 0.1	< 0.1
Nitrite-N (mg/l)	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Phosphorus-T (mg/l)	0.037	0.038	0.389	0.018	0.047	0.067
Orthophosphate, D (mg/l)	0.015	0.018	0.284	0.01	0.036	0.041
Arsenic-T (ug/l)	< 2		< 2		< 2	< 2
Cadmium-T (ug/l)	< 0.2		< 0.2		< 0.2	< 0.2
Chromium-T (ug/l)	< 2		< 2		< 2	< 2
Copper-T (ug/l)	< 2		< 2		< 2	< 2
Lead-T (ug/l)	< 2		< 2		< 2	< 2
Nickel-T (ug/l)	< 2		2.3		< 2	< 2
Selenium-T (ug/l)	< 2		< 2		< 2	< 2
Aluminum-T (ug/l)	< 200		1170		232	< 200
Barium-T (ug/l)	49		48		38	38
Calcium-T (mg/l)	76.3		56.3		62.9	67.3
Iron-T (ug/l)	131		1630		326	59
Magnesium-T (mg/l)	18.8		11.7		12.8	15
Manganese-T (ug/l)	26		107		67	19
Potassium-T (mg/l)	4.4		5.6		4.8	4.4
Sodium-T (mg/l)	8.1		13.5		8.8	11.9
Strontium-T (ug/l)	179		133		150	166
Zinc-T (ug/l)	< 10		< 10		< 10	< 10
Hardness (mg/l)	268		189		210	230

Appendix Table A Southwest Ohio River Tributary Watersheds Inorganic Water Chemistry Sampling Results (2016)

Site Location:	RUSSELLVILLE WWTP 001 OUTFALL TO HONEY CREEK				SWDO Map # 26	
River Mile: 0.72	Storet ID: 303606	WAU: 050902010701	River Code: 10-120-002			
Latitude/Longitude: 38.8707 / -83.7799	Drainage Area (mi2): 0.9		County Brown	Ecoregion: IP	USGS Quad:	

Date Collected	7/28/2016
Time	10:30
Temp (C)	21.26
D.O. (mg/l) / (% sat)	0.95 / 10.8
pH (fld) SU	6.82
SpCond fld/lab (umhos/cm)	690 / 688

COD (mg/l)	88
TDS (mg/l)	316
TSS (mg/l)	28
Alkalinity (mg/l)	218
Chloride (mg/l)	77
Sulfate (mg/l)	< 5
Ammonia-N (mg/l)	22.2
TKN (mg/l)	23.2
Nitrate-nitrite-N (mg/l)	< 0.1
Nitrite-N (mg/l)	< 0.02
Phosphorus-T (mg/l)	4.81
Orthophosphate, D (mg/l)	
Arsenic-T (ug/l)	< 2
Cadmium-T (ug/l)	< 0.2
Chromium-T (ug/l)	< 2
Copper-T (ug/l)	2.4
Lead-T (ug/l)	3.6
Nickel-T (ug/l)	< 2
Selenium-T (ug/l)	< 2
Aluminum-T (ug/l)	< 200
Barium-T (ug/l)	25
Calcium-T (mg/l)	38.2
Iron-T (ug/l)	244
Magnesium-T (mg/l)	10.4
Manganese-T (ug/l)	150
Potassium-T (mg/l)	10.9
Sodium-T (mg/l)	50
Strontium-T (ug/l)	122
Zinc-T (ug/l)	< 10
Hardness (mg/l)	138

Appendix Table A Southwest Ohio River Tributary Watersheds Inorganic Water Chemistry Sampling Results (2016)

Site Location:	E. FK. EAGLE CR. SW OF WESTNION OFF SR 41 @ FARM FORD					SWDO Map # 27
River Mile: 10.95	Storet ID: 303607	WAU: 050902010702	River Code: 10-110-000			
Latitude/Longitude: 38.7773 / -83.5805	Drainage Area (mi2): 9.9	County Adams	Ecoregion: IP	USGS Quad:		

Date Collected	6/30/2016	7/14/2016	7/28/2016	8/10/2016	8/23/2016
Time	11:54	2:40	1:15	12:15	1:50
Temp (C)	21.1	27.23	24.14	24.84	22
D.O. (mg/l) / (% sat)	7.61 / 85.7	8.5 / 107.3	6.52 / 77.7	6.31 / 76.2	5.82 / 66.6
pH (fld) SU	7.78	7.96	7.53	7.53	8.06
SpCond fld/lab (umhos/cm)	476 / 456	541 / 511	305 / 308	304 / 292	513 / 494

COD (mg/l)	< 20	< 20	38	38	< 20
TDS (mg/l)	316	310	210	194	300
TSS (mg/l)	5	< 5	72	43	11
Alkalinity (mg/l)	192	216	113	112	195
Chloride (mg/l)	30.6	29.5	19.4	17.6	32.3
Sulfate (mg/l)	24.6	25.3	19.4	21.6	43.5
Ammonia-N (mg/l)	0.068	0.06	0.112	0.075	0.056
TKN (mg/l)	0.63	0.6	1.1	1.19	0.57
Nitrate-nitrite-N (mg/l)	0.59	0.6	0.68	0.53	0.54
Nitrite-N (mg/l)	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Phosphorus-T (mg/l)	0.036	0.033	0.154	0.17	0.054
Orthophosphate, D (mg/l)					
Arsenic-T (ug/l)	< 2		2.1		< 2
Cadmium-T (ug/l)	< 0.2		< 0.2		< 0.2
Chromium-T (ug/l)	< 2		< 2		< 2
Copper-T (ug/l)	< 2		3.1		< 2
Lead-T (ug/l)	< 2		< 2		< 2
Nickel-T (ug/l)	3		3.8		2
Selenium-T (ug/l)	< 2		< 2		< 2
Aluminum-T (ug/l)	211		2060		497
Barium-T (ug/l)	62		51		67
Calcium-T (mg/l)	51.6		30.2		54.3
Iron-T (ug/l)	356		3540		837
Magnesium-T (mg/l)	21.7		12.8		22.9
Manganese-T (ug/l)	77		187		119
Potassium-T (mg/l)	5.7		6.3		6.3
Sodium-T (mg/l)	14.3		10		22.5
Strontium-T (ug/l)	92		53		103
Zinc-T (ug/l)	< 10		10		< 10
Hardness (mg/l)	218		128		230

Appendix Table A Southwest Ohio River Tributary Watersheds Inorganic Water Chemistry Sampling Results (2016)

Site Location:	E. FK. EAGLE CREEK W OF WESTNION @ TWP. RD. 231					SWDO Map # 28
River Mile: 7.9	Storet ID: X03S03	WAU: 050902010702	River Code: 10-110-000			
Latitude/Longitude: 38.7803 / -83.6136	Drainage Area (mi2): 15.1	County Adams	Ecoregion: IP	USGS Quad:		

Date Collected	6/30/2016	7/14/2016	7/28/2016	8/10/2016	8/23/2016	9/1/2016
Time	11:45	1:05	11:50	11:50	12:30	10:05
Temp (C)	20.69	25.25	24.92	24.33	21.25	22.9
D.O. (mg/l) / (% sat)	6.25 / 69.8	6.14 / 74.7	5.28 / 63.9	6.27 / 75	6.75 / 76.1	6.21 / 72.4
pH (fld) SU	7.77	7.74	7.53	7.59	7.58	7.9
SpCond fld/lab (umhos/cm)	479 / 459	506 / 483	352 / 351	321 / 306	377 / 369	

COD (mg/l)	< 20	< 20	32	34	20	
TDS (mg/l)	310	302	232	206	228	288
TSS (mg/l)	11	15	60	67	19	27
Alkalinity (mg/l)	199	220	136	112	153	
Chloride (mg/l)	26.7	22	17.9	21.3	20.2	30.8
Sulfate (mg/l)	20.7	20.3	19.6	23.9	20.4	27.5
Ammonia-N (mg/l)	0.064	0.058	0.297	0.06	< 0.05	0.067
TKN (mg/l)	0.59	1.25	1.53	1.33	0.6	0.82
Nitrate-nitrite-N (mg/l)	0.84	1.02	1.05	0.72	0.62	0.17
Nitrite-N (mg/l)	< 0.02	< 0.02	0.074	< 0.02	< 0.02	< 0.02
Phosphorus-T (mg/l)	0.065	0.722	0.211	0.196	0.111	0.065
Orthophosphate, D (mg/l)	0.018	0.02	0.059	0.056	0.041	0.015
Arsenic-T (ug/l)	< 2		2.4		< 2	< 2
Cadmium-T (ug/l)	< 0.2		< 0.2		< 0.2	< 0.2
Chromium-T (ug/l)	< 2		2		< 2	< 2
Copper-T (ug/l)	< 2		2.8		< 2	< 2
Lead-T (ug/l)	< 2		2.2		< 2	< 2
Nickel-T (ug/l)	2.1		3.8		2	2.8
Selenium-T (ug/l)	< 2		< 2		< 2	< 2
Aluminum-T (ug/l)	394		2980		795	796
Barium-T (ug/l)	67		70		56	64
Calcium-T (mg/l)	59.3		38.9		42.8	49
Iron-T (ug/l)	625		4830		1230	1360
Magnesium-T (mg/l)	20.3		13.5		15.2	19
Manganese-T (ug/l)	95		242		122	167
Potassium-T (mg/l)	6.8		9.5		6.7	6.2
Sodium-T (mg/l)	11.3		7		12.4	17.2
Strontium-T (ug/l)	95		66		73	86
Zinc-T (ug/l)	< 10		12		< 10	< 10
Hardness (mg/l)	232		153		169	201

Appendix Table A Southwest Ohio River Tributary Watersheds Inorganic Water Chemistry Sampling Results (2016)

Site Location:	TRIB TO E. FK. EAGLE CR. (RM 6.92) ADJ. EAGLE CR. RD.					SWDO Map # 29
River Mile: 0.1	Storet ID: 303611	WAU: 050902010702	River Code: 10-110-002			
Latitude/Longitude: 38.7788 / -83.6264	Drainage Area (mi2): 5.1	County Adams	Ecoregion: IP	USGS Quad:		

Date Collected	6/30/2016	7/14/2016	7/28/2016	8/10/2016	8/23/2016
Time	12:25	12:00	1:40	11:05	12:10
Temp (C)	19.43	24.88	22.95	24.04	20.27
D.O. (mg/l) / (% sat)	6.89 / 75	8.09 / 97.8	7.22 / 84.2	6.23 / 74.1	7.64 / 84.6
pH (fld) SU	7.82	7.94	7.47	7.59	7.65
SpCond fld/lab (umhos/cm)	493 / 477	521 / 496	377 / 374	326 / 311	456 / 443

COD (mg/l)	< 20	< 20	50	55	26
TDS (mg/l)	304	302	272	226	290
TSS (mg/l)	12	7	128	54	8
Alkalinity (mg/l)	212	226	161	123	201
Chloride (mg/l)	27.2	22.7	16.1	19.6	20
Sulfate (mg/l)	21.9	20.8	17	19.6	18.3
Ammonia-N (mg/l)	< 0.05	< 0.05	0.107	0.083	< 0.05
TKN (mg/l)	0.65	0.45	1.86	1.81	0.69
Nitrate-nitrite-N (mg/l)	0.34	0.53	0.61	1.33	0.71
Nitrite-N (mg/l)	< 0.02	< 0.02	0.024	0.037	< 0.02
Phosphorus-T (mg/l)	0.041	0.032	0.232	0.346	0.076
Orthophosphate, D (mg/l)					
Arsenic-T (ug/l)	< 2		< 2		< 2
Cadmium-T (ug/l)	< 0.2		< 0.2		< 0.2
Chromium-T (ug/l)	< 2		3.3		< 2
Copper-T (ug/l)	< 2		4.7		< 2
Lead-T (ug/l)	< 2		2.7		< 2
Nickel-T (ug/l)	< 2		6.2		2.2
Selenium-T (ug/l)	< 2		< 2		< 2
Aluminum-T (ug/l)	257		3660		593
Barium-T (ug/l)	66		79		62
Calcium-T (mg/l)	65.3		52.1		58
Iron-T (ug/l)	350		6120		948
Magnesium-T (mg/l)	19		12.8		17.1
Manganese-T (ug/l)	162		264		88
Potassium-T (mg/l)	5.8		7.2		7.1
Sodium-T (mg/l)	12.6		7.6		13.1
Strontium-T (ug/l)	99		75		89
Zinc-T (ug/l)	< 10		19		< 10
Hardness (mg/l)	241		183		215

Appendix Table A Southwest Ohio River Tributary Watersheds Inorganic Water Chemistry Sampling Results (2016)

Site Location:	E. FK. EAGLE CREEK @ END OF EAST FORK RD.				SWDO Map # 30	
River Mile: 0.82	Storet ID: X03W04	WAU: 050902010703	River Code: 10-110-000			
Latitude/Longitude: 38.7842 / -83.6981	Drainage Area (mi2): 48		County Brown	Ecoregion: IP	USGS Quad:	

Date Collected	6/30/2016	7/14/2016	7/28/2016	8/10/2016	8/23/2016	9/1/2016
Time	2:15	10:35	1:15	11:20	11:10	12:05
Temp (C)	25.36	25.31	23.38	24.15	21.27	24.6
D.O. (mg/l) / (% sat)	10.81 / 131.9	8.61 / 104.9	8.05 / 94.6	8.15 / 97.1	8.97 / 101.3	8.9 / 106.9
pH (fld) SU	8.13	8.12	7.99	8.02	8.07	7.98
SpCond fld/lab (umhos/cm)	431 / 414	444 / 428	384 / 386	402 / 382	404 / 383	

COD (mg/l)	< 20	< 20	27	23	23	
TDS (mg/l)	282	248	240	230	240	212
TSS (mg/l)	< 5	< 5	74	45	14	9
Alkalinity (mg/l)	182	188	170	176	182	
Chloride (mg/l)	23.4	20.9	13.3	14.7	12.7	9.4
Sulfate (mg/l)	19.7	19.2	15.4	17.1	16	12.5
Ammonia-N (mg/l)	< 0.05	< 0.05	< 0.05	0.053	< 0.05	0.058
TKN (mg/l)	0.41	1.46	0.84	0.93	0.49	0.55
Nitrate-nitrite-N (mg/l)	0.26	0.2	0.65	0.54	0.42	0.39
Nitrite-N (mg/l)	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Phosphorus-T (mg/l)	0.035	0.034	0.221	0.131	0.066	0.063
Orthophosphate, D (mg/l)	0.01	0.011	0.083	0.032	0.028	0.029
Arsenic-T (ug/l)	< 2		< 2		< 2	< 2
Cadmium-T (ug/l)	< 0.2		< 0.2		< 0.2	< 0.2
Chromium-T (ug/l)	< 2		< 2		< 2	< 2
Copper-T (ug/l)	< 2		2.1		< 2	< 2
Lead-T (ug/l)	< 2		< 2		< 2	< 2
Nickel-T (ug/l)	< 2		3.3		< 2	< 2
Selenium-T (ug/l)	< 2		< 2		< 2	< 2
Aluminum-T (ug/l)	< 200		2420		578	335
Barium-T (ug/l)	53		62		54	45
Calcium-T (mg/l)	57.6		57.3		56.9	48.1
Iron-T (ug/l)	236		3550		873	517
Magnesium-T (mg/l)	16.2		11.4		13.2	10.3
Manganese-T (ug/l)	69		192		87	64
Potassium-T (mg/l)	4.9		5.2		5.4	4.8
Sodium-T (mg/l)	9.5		6.3		7	< 5
Strontium-T (ug/l)	113		101		103	89
Zinc-T (ug/l)	< 10		10		< 10	< 10
Hardness (mg/l)	211		190		196	163

Appendix Table A Southwest Ohio River Tributary Watersheds Inorganic Water Chemistry Sampling Results (2016)

Site Location:	E. FK. EAGLE CREEK S OF FAIRVIEW @ BRIER RIDGE RD.				SWDO Map #	31
River Mile: 4.3	Storet ID: 200691	WAU: 050902010703	River Code: 10-110-000			
Latitude/Longitude: 38.7955 / -83.6539	Drainage Area (mi2): 36	County Adams	Ecoregion: IP	USGS Quad:		

Date Collected	6/30/2016	7/14/2016	7/28/2016	8/10/2016	8/23/2016
Time	2:30	11:30	2:10	10:25	11:15
Temp (C)	24.05	24.96	22.71	24.12	20.16
D.O. (mg/l) / (% sat)	8.03 / 95.6	6.96 / 84.2	7.84 / 91	7.56 / 90.1	8.16 / 90.1
pH (fld) SU	7.96	7.85	7.66	7.61	7.7
SpCond fld/lab (umhos/cm)	468 / 442	489 / 473	366 / 368	387 / 372	381 / 368

COD (mg/l)	< 20	< 20	35	34	20
TDS (mg/l)	306	292	230	238	238
TSS (mg/l)	14	12	132	72	13
Alkalinity (mg/l)	194	209	151	165	165
Chloride (mg/l)	26.3	20.3	16	18.5	14.9
Sulfate (mg/l)	21.1	20.4	16	19.5	16.7
Ammonia-N (mg/l)	< 0.05	< 0.05	< 0.05	0.108	< 0.05
TKN (mg/l)	0.59	1.04	1.15	1.04	0.6
Nitrate-nitrite-N (mg/l)	0.6	0.4	0.79	0.63	0.58
Nitrite-N (mg/l)	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Phosphorus-T (mg/l)	0.031	0.038	0.211	0.108	0.089
Orthophosphate, D (mg/l)					
Arsenic-T (ug/l)	< 2		< 2		< 2
Cadmium-T (ug/l)	< 0.2		< 0.2		< 0.2
Chromium-T (ug/l)	< 2		2.3		< 2
Copper-T (ug/l)	< 2		3.1		< 2
Lead-T (ug/l)	< 2		2.4		< 2
Nickel-T (ug/l)	< 2		4.2		2
Selenium-T (ug/l)	< 2		< 2		< 2
Aluminum-T (ug/l)	310		3200		802
Barium-T (ug/l)	63		71		52
Calcium-T (mg/l)	59		49		48.2
Iron-T (ug/l)	443		4930		1180
Magnesium-T (mg/l)	18.6		12.6		14.4
Manganese-T (ug/l)	72		237		74
Potassium-T (mg/l)	5.2		5.2		6
Sodium-T (mg/l)	10.4		7.4		8.3
Strontium-T (ug/l)	109		82		88
Zinc-T (ug/l)	< 10		13		< 10
Hardness (mg/l)	224		174		180

Appendix Table A Southwest Ohio River Tributary Watersheds Inorganic Water Chemistry Sampling Results (2016)

Site Location:	W. FK. EAGLE CREEK SE OF RUSSELLVILLE @ ST. RT. 125					SWDO Map # 32
River Mile: 7.38	Storet ID: X03W05	WAU: 050902010701	River Code: 10-120-000			
Latitude/Longitude: 38.8528 / -83.7483	Drainage Area (mi2): 28		County Brown	Ecoregion: IP	USGS Quad:	

Date Collected	6/30/2016	7/14/2016	7/28/2016	8/10/2016	8/23/2016	9/1/2016
Time	12:20	12:00	11:50	10:50	10:35	3:15
Temp (C)	23.18	27.04	23.93	25.37	20.42	26.5
D.O. (mg/l) / (% sat)	10.51 / 123.1	9.68 / 121.7	7.45 / 88.4	8.7 / 106.1	9.04 / 100.3	11.2 / 139.6
pH (fld) SU	8.13	8.12	7.79	8.03	8.04	8.23
SpCond fld/lab (umhos/cm)	486 / 465	494 / 469	397 / 399	459 / 442	488 / 477	

COD (mg/l)	< 20	< 20	< 20	< 20	< 20	
TDS (mg/l)	332	296	254	268	294	254
TSS (mg/l)	< 5	< 5	39	7	< 5	5
Alkalinity (mg/l)	200	193	171	213	218	
Chloride (mg/l)	30.8	28.8	16.2	17.1	20	14
Sulfate (mg/l)	20.8	19.5	15.9	15.2	21.6	15.6
Ammonia-N (mg/l)	0.054	< 0.05	0.078	0.053	< 0.05	0.059
TKN (mg/l)	0.62	0.82	1.4	0.28	0.34	0.66
Nitrate-nitrite-N (mg/l)	0.87	0.34	1.3	0.17	0.32	0.55
Nitrite-N (mg/l)	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Phosphorus-T (mg/l)	0.066	0.062	0.169	0.045	0.048	0.12
Orthophosphate, D (mg/l)	0.035	0.034	0.088	0.017	0.03	0.077
Arsenic-T (ug/l)	< 2		< 2		< 2	< 2
Cadmium-T (ug/l)	< 0.2		< 0.2		< 0.2	< 0.2
Chromium-T (ug/l)	< 2		< 2		< 2	< 2
Copper-T (ug/l)	< 2		< 2		< 2	< 2
Lead-T (ug/l)	< 2		< 2		< 2	< 2
Nickel-T (ug/l)	< 2		2.4		< 2	< 2
Selenium-T (ug/l)	< 2		< 2		< 2	< 2
Aluminum-T (ug/l)	< 200		1290		< 200	< 200
Barium-T (ug/l)	52		56		59	47
Calcium-T (mg/l)	66		56.2		73.9	58.2
Iron-T (ug/l)	174		1800		217	274
Magnesium-T (mg/l)	15		11.3		15.1	11.3
Manganese-T (ug/l)	48		145		47	49
Potassium-T (mg/l)	7.4		6.6		5.7	6.4
Sodium-T (mg/l)	8.1		6.4		10.6	5.2
Strontium-T (ug/l)	161		128		179	130
Zinc-T (ug/l)	< 10		< 10		< 10	< 10
Hardness (mg/l)	227		187		247	192

Appendix Table A Southwest Ohio River Tributary Watersheds Inorganic Water Chemistry Sampling Results (2016)

Site Location:	W. FK. EAGLE CREEK W OF DECATUR,PST. ST. RT. 353					SWDO Map #	33
River Mile: 3.3	Storet ID: 200693	WAU: 050902010704	River Code: 10-120-000				
Latitude/Longitude: 38.8133 / -83.7406	Drainage Area (mi2): 54	County Brown	Ecoregion: IP		USGS Quad:		

Date Collected	6/30/2016	7/14/2016	7/28/2016	8/10/2016	8/23/2016	9/1/2016
Time	12:55	11:35	12:25	12:10	11:50	12:40
Temp (C)	24.66	27.25	23.72	26.07	21.23	24.6
D.O. (mg/l) / (% sat)	12.27 / 147.7	8.91 / 112.4	8.02 / 94.9	9.08 / 112.1	10.11 / 114.1	10.86 / 130.6
pH (fld) SU	8.3	8.14	8.03	8.09	8.17	8.32
SpCond fld/lab (umhos/cm)	468 / 451	464 / 435	417 / 417	394 / 379	479 / 475	

COD (mg/l)	< 20	< 20	< 20	26	< 20	
TDS (mg/l)	304	266	254	246	284	254
TSS (mg/l)	< 5	8	44	26	< 5	< 5
Alkalinity (mg/l)	198	186	181	181	223	
Chloride (mg/l)	27.5	27	18	13.6	17.9	14.2
Sulfate (mg/l)	20.4	19.8	16.8	15	19.2	16.8
Ammonia-N (mg/l)	< 0.05	< 0.05	< 0.05	0.055	< 0.05	0.052
TKN (mg/l)	0.44	0.78	2.57	0.87	0.34	0.48
Nitrate-nitrite-N (mg/l)	0.23	< 0.1	1.03	0.58	0.14	0.38
Nitrite-N (mg/l)	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Phosphorus-T (mg/l)	0.039	0.053	0.219	0.2	0.052	0.093
Orthophosphate, D (mg/l)	0.017	0.023	0.096	0.115	0.033	0.065
Arsenic-T (ug/l)	< 2		< 2		< 2	< 2
Cadmium-T (ug/l)	< 0.2		< 0.2		< 0.2	< 0.2
Chromium-T (ug/l)	< 2		< 2		< 2	< 2
Copper-T (ug/l)	< 2		< 2		< 2	< 2
Lead-T (ug/l)	< 2		< 2		< 2	< 2
Nickel-T (ug/l)	< 2		2.5		< 2	< 2
Selenium-T (ug/l)	< 2		< 2		< 2	< 2
Aluminum-T (ug/l)	< 200		1300		< 200	< 200
Barium-T (ug/l)	50		49		43	42
Calcium-T (mg/l)	67.1		58.8		73.7	62.1
Iron-T (ug/l)	131		1880		112	157
Magnesium-T (mg/l)	15.6		10.1		14.4	11.4
Manganese-T (ug/l)	34		115		31	30
Potassium-T (mg/l)	7		6		5.4	6
Sodium-T (mg/l)	9.8		8.1		9.4	6.8
Strontium-T (ug/l)	177		128		176	143
Zinc-T (ug/l)	< 10		< 10		< 10	< 10
Hardness (mg/l)	232		188		243	202

Appendix Table A Southwest Ohio River Tributary Watersheds Inorganic Water Chemistry Sampling Results (2016)

Site Location: ADAS RUN DST. ST. RT. 125

SWDO Map # 34

River Mile: 0.7 Storet ID: 302949 WAU: 050902010705 River Code: 10-113-000

Latitude/Longitude: 38.8070 / -83.6655 Drainage Area (mi2): 3.3 County Brown Ecoregion: IP USGS Quad:

Date Collected	6/30/2016	7/14/2016	7/28/2016	8/10/2016	8/23/2016
Time	3:00	10:55	10:35	10:00	10:40
Temp (C)	22.44	24.01	22.2	22.22	19.28
D.O. (mg/l) / (% sat)	9.92 / 114.6	8.17 / 97.3	8.17 / 93.9	8.68 / 99.8	8.7 / 94.5
pH (fld) SU	8.07	7.77	7.61	7.72	7.85
SpCond fld/lab (umhos/cm)	539 / 511	562 / 530	422 / 430	374 / 359	526 / 510

COD (mg/l)	< 20	< 20	24	27	< 20
TDS (mg/l)	332	322	276	244	304
TSS (mg/l)	< 5	15	52	17	< 5
Alkalinity (mg/l)	249	240	192	174	254
Chloride (mg/l)	20.9	26.6	13.6	10.4	12.2
Sulfate (mg/l)	22.9	23	19.8	15.3	21.4
Ammonia-N (mg/l)	< 0.05	< 0.05	< 0.05	0.054	< 0.05
TKN (mg/l)	0.29	0.46	0.99	1.12	0.21
Nitrate-nitrite-N (mg/l)	0.43	< 0.1	1.12	1	0.24
Nitrite-N (mg/l)	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Phosphorus-T (mg/l)	0.035	0.03	0.195	0.148	0.034
Orthophosphate, D (mg/l)					
Arsenic-T (ug/l)	< 2		< 2		< 2
Cadmium-T (ug/l)	< 0.2		< 0.2		< 0.2
Chromium-T (ug/l)	< 2		< 2		< 2
Copper-T (ug/l)	< 2		2.6		< 2
Lead-T (ug/l)	< 2		< 2		< 2
Nickel-T (ug/l)	< 2		3.6		< 2
Selenium-T (ug/l)	< 2		< 2		< 2
Aluminum-T (ug/l)	< 200		2830		< 200
Barium-T (ug/l)	65		74		59
Calcium-T (mg/l)	86.3		63.4		84.1
Iron-T (ug/l)	208		4090		152
Magnesium-T (mg/l)	15.9		10.9		15
Manganese-T (ug/l)	30		115		45
Potassium-T (mg/l)	5.1		6		4.5
Sodium-T (mg/l)	11		7.4		8.4
Strontium-T (ug/l)	172		111		160
Zinc-T (ug/l)	< 10		11		< 10
Hardness (mg/l)	281		203		272

Appendix Table A Southwest Ohio River Tributary Watersheds Inorganic Water Chemistry Sampling Results (2016)

Site Location:	EAGLE CREEK DST CONFL. WITH W FORK AND E FORK EAGLE CR					SWDO Map # 35
River Mile: 14.43	Storet ID: 303537	WAU: 050902010705	River Code: 10-100-000			
Latitude/Longitude: 38.7862 / -83.7127	Drainage Area (mi2): 107		County Brown	Ecoregion: IP	USGS Quad:	

Date Collected	5/16/2016	6/8/2016	6/30/2016	7/14/2016	7/28/2016	8/10/2016
Time	2:35	12:15	2:35	11:00	12:50	11:40
Temp (C)	14.8	20.6	27.03	27.06	24.61	24.73
D.O. (mg/l) / (% sat)	12.68 / 125.4	9.5 / 105.8	10.47 / 131.6	8.66 / 108.9	7.77 / 93.4	8.33 / 100.5
pH (fld) SU	8.36	8.13	8.15	8.11	7.97	8.03
SpCond fld/lab (umhos/cm)	455.3 / 457		449 / 424	456 / 437	388 / 386	402 / 383

COD (mg/l)	< 20		< 20	< 20	20	27
TDS (mg/l)	268	302	292	276	236	248
TSS (mg/l)	5	12	9	15	56	52
Alkalinity (mg/l)	209		188	189	169	186
Chloride (mg/l)	15.9	14.6	25.5	23.9	15	14.1
Sulfate (mg/l)	23.9	19.4	19.5	18.7	15.4	16.7
Ammonia-N (mg/l)	< 0.05	< 0.05	< 0.05	< 0.05	0.051	0.05
TKN (mg/l)	0.25	0.38	0.51	0.83	0.76	1.08
Nitrate-nitrite-N (mg/l)	0.39	1.03	0.33	0.18	0.92	0.45
Nitrite-N (mg/l)	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Phosphorus-T (mg/l)	0.026	0.073	0.075	0.07	0.205	0.15
Orthophosphate, D (mg/l)	0.014	0.046	0.029	0.028	0.083	0.037
Arsenic-T (ug/l)	< 2	< 2	< 2	< 2	< 2	< 2
Cadmium-T (ug/l)	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium-T (ug/l)	< 2	< 2	< 2	< 2	< 2	< 2
Copper-T (ug/l)	2.2	< 2	< 2	< 2	2.1	2.1
Lead-T (ug/l)	< 2	< 2	< 2	< 2	< 2	< 2
Nickel-T (ug/l)	< 2	< 2	< 2	< 2	2.6	2.8
Selenium-T (ug/l)	< 2	< 2	< 2	< 2	< 2	< 2
Aluminum-T (ug/l)	343	456	305	291	1490	1710
Barium-T (ug/l)	46	46	52	51	52	60
Calcium-T (mg/l)	76.9	73.9	62.1	56.5	53.2	56
Iron-T (ug/l)	478	659	388	440	2170	2530
Magnesium-T (mg/l)	18.2	14.9	15.2	14.6	10.3	13
Manganese-T (ug/l)	42	71	108	103	144	147
Potassium-T (mg/l)	3.7	4.5	6.6	5.8	5.8	5.1
Sodium-T (mg/l)	9.3	7.1	9.2	9.2	6.6	7.1
Strontium-T (ug/l)	158	142	142	131	111	120
Zinc-T (ug/l)	< 10	< 10	< 10	< 10	13	< 10
Hardness (mg/l)	267	242	218	201	175	193

Appendix Table A Southwest Ohio River Tributary Watersheds Inorganic Water Chemistry Sampling Results (2016)

Site Location:	EAGLE CREEK DST CONFL. WITH W FORK AND E FORK EAGLE CR					SWDO Map # 35
River Mile: 14.43	Storet ID: 303537	WAU: 050902010705	River Code: 10-100-000			
Latitude/Longitude: 38.7862 / -83.7127	Drainage Area (mi2): 107	County Brown	Ecoregion: IP	USGS Quad:		

Date Collected	8/23/2016	9/1/2016	9/27/2016	10/25/2016	11/29/2016	12/20/2016
Time	11:30	11:15	1:40	1:45	1:50	2:25
Temp (C)	21.69	24.5	25.8	13.91	8.9	0.7
D.O. (mg/l) / (% sat)	8.95 / 101.9	6.87 / 82.5	9.34 / 114.7	10.77 / 104.4	13.84 / 119.6	16.32 / 114
pH (fld) SU	8.06	7.77	7.59	8	8.07	7.73
SpCond fld/lab (umhos/cm)	448 / 436		414.7 / 418	450 / 443	511 / 509	439.5 / 410

COD (mg/l)	< 20		< 20	< 20	< 20	< 20
TDS (mg/l)	268	232	244	294	310	252
TSS (mg/l)	11	14	< 5	< 5	< 5	6
Alkalinity (mg/l)	206		193	184	226	169
Chloride (mg/l)	14.6	11.5	17.5	24.7	25	19.6
Sulfate (mg/l)	17.2	13.9	15.1	27.8	25.4	26
Ammonia-N (mg/l)	< 0.05	0.061	< 0.05	< 0.05	< 0.05	0.122
TKN (mg/l)	0.38	0.92	1.37	0.56	0.25	0.54
Nitrate-nitrite-N (mg/l)	0.31	0.51	< 0.1	0.52	< 0.1	2
Nitrite-N (mg/l)	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Phosphorus-T (mg/l)	0.069	0.137	0.029	0.138	0.024	0.142
Orthophosphate, D (mg/l)	0.036	0.078	0.012	0.105	0.026	0.109
Arsenic-T (ug/l)	< 2	< 2	< 2	< 2	< 2	< 2
Cadmium-T (ug/l)	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium-T (ug/l)	< 2	< 2	< 2	< 2	< 2	< 2
Copper-T (ug/l)	< 2	< 2	< 2	< 2	< 2	< 2
Lead-T (ug/l)	< 2	< 2	< 2	< 2	< 2	< 2
Nickel-T (ug/l)	< 2	< 2	2.1	2.1	< 2	2.1
Selenium-T (ug/l)	< 2	< 2	< 2	< 2	< 2	< 2
Aluminum-T (ug/l)	380	402	< 200	201	< 200	912
Barium-T (ug/l)	51	46	51	48	45	43
Calcium-T (mg/l)	68.8	56.9	57	58.6	70.5	61.4
Iron-T (ug/l)	536	615	92	298	61	1080
Magnesium-T (mg/l)	13.4	10.3	12	12.9	14	12.2
Manganese-T (ug/l)	78	105	51	56	25	38
Potassium-T (mg/l)	5.4	6.2	6.4	9.9	5.4	4.8
Sodium-T (mg/l)	7.8	5.3	8.6	9.5	9.3	7.6
Strontium-T (ug/l)	147	120	158	141	159	113
Zinc-T (ug/l)	< 10	< 10	< 10	< 10	< 10	< 10
Hardness (mg/l)	227	184	192	199	234	204

Appendix Table A Southwest Ohio River Tributary Watersheds Inorganic Water Chemistry Sampling Results (2016)

Site Location:	EAGLE CREEK E OF RIPLEY @ NORTH POLE RD.					SWDO Map # 36
River Mile: 6.2	Storet ID: 200689	WAU: 050902010705	River Code: 10-100-000			
Latitude/Longitude: 38.7500 / -83.7672	Drainage Area (mi2): 129	County Brown	Ecoregion: IP	USGS Quad:		

Date Collected	6/29/2016	7/14/2016	7/28/2016	8/10/2016	8/23/2016	9/1/2016
Time	2:45	1:50	2:40	2:05	1:35	1:25
Temp (C)	26.91	29.4	24.4	25.9	24.4	26
D.O. (mg/l) / (% sat)	9.42 / 118.2	11.2 / 146.9	7.08 / 84.8	7.86 / 96.7	10.46 / 125.4	8.69 / 107.2
pH (fld) SU	8.27	8.22	7.88	7.86	8.17	7.92
SpCond fld/lab (umhos/cm)	407 / 386	421 / 396	325.8 / 329	248.7 / 237	437 / 423	

COD (mg/l)	25	< 20	29	31	< 20	
TDS (mg/l)	258	254	220	166	254	186
TSS (mg/l)	< 5	9	96	47	6	15
Alkalinity (mg/l)	166	178	144	114	195	
Chloride (mg/l)	21.9	19.4	10.8	7.2	16	8.2
Sulfate (mg/l)	16.7	17.1	12.5	11.1	18	11
Ammonia-N (mg/l)	< 0.05	< 0.05	< 0.05	0.051	< 0.05	0.055
TKN (mg/l)	0.54	0.39		0.87	0.32	0.56
Nitrate-nitrite-N (mg/l)	1.24	0.26	0.86	0.39	0.26	0.53
Nitrite-N (mg/l)	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Phosphorus-T (mg/l)	0.099	0.064	0.295	0.295	0.067	0.17
Orthophosphate, D (mg/l)	0.063	0.025	0.106	0.102	0.035	0.117
Arsenic-T (ug/l)	< 2		< 2		< 2	< 2
Cadmium-T (ug/l)	< 0.2		< 0.2		< 0.2	< 0.2
Chromium-T (ug/l)	< 2		2.4		< 2	< 2
Copper-T (ug/l)	< 2		3.1		< 2	< 2
Lead-T (ug/l)	< 2		2.6		< 2	< 2
Nickel-T (ug/l)	< 2		4		< 2	< 2
Selenium-T (ug/l)	< 2		< 2		< 2	< 2
Aluminum-T (ug/l)	271		2680		219	563
Barium-T (ug/l)	44		49		49	39
Calcium-T (mg/l)	53.9		51.3		65.2	42.8
Iron-T (ug/l)	345		4140		301	842
Magnesium-T (mg/l)	11.4		8.4		13	6.8
Manganese-T (ug/l)	53		215		47	68
Potassium-T (mg/l)	6.8		5.7		5.3	6
Sodium-T (mg/l)	6.8		< 5		9	< 5
Strontium-T (ug/l)	120		110		138	93
Zinc-T (ug/l)	< 10		10		< 10	< 10
Hardness (mg/l)	182		163		216	135

Appendix Table A Southwest Ohio River Tributary Watersheds Inorganic Water Chemistry Sampling Results (2016)

Site Location: HANNAH RUN @ McCLANAHAN RD. (RD. T-110)

SWDO Map # 37

River Mile: 0.3 Storet ID: 302954 WAU: 050902010705 River Code: 10-117-000

Latitude/Longitude: 38.7881 / -83.6020 Drainage Area (mi2): 2.1 County Adams Ecoregion: IP USGS Quad:

Date Collected	7/14/2016	7/28/2016	8/10/2016	8/23/2016
Time	12:20	11:30	11:30	1:00
Temp (C)	29.88	22.27	25.95	27.7
D.O. (mg/l) / (% sat)	17.27 / 228.3	7.61 / 87.6	8.11 / 100	11.06 / 140.7
pH (fld) SU	8.26	7.57	7.67	8.07
SpCond fld/lab (umhos/cm)	505 / 483	465 / 473	448 / 431	602 / 580

COD (mg/l)	< 20	48	31	< 20
TDS (mg/l)	296	304	278	340
TSS (mg/l)	9	155	31	< 5
Alkalinity (mg/l)	224	193	192	261
Chloride (mg/l)	27.2	24.9	22.3	33.9
Sulfate (mg/l)	19.7	21.6	17.6	23.4
Ammonia-N (mg/l)	< 0.05	0.145	0.107	< 0.05
TKN (mg/l)	0.5	2.28	1.27	0.63
Nitrate-nitrite-N (mg/l)	0.3	2.19	0.81	0.14
Nitrite-N (mg/l)	< 0.02	0.034	0.025	< 0.02
Phosphorus-T (mg/l)	0.059	0.377	0.177	0.094
Orthophosphate, D (mg/l)				
Arsenic-T (ug/l)		2.3		2.1
Cadmium-T (ug/l)		< 0.2		< 0.2
Chromium-T (ug/l)		2.9		< 2
Copper-T (ug/l)		4.5		< 2
Lead-T (ug/l)		3		< 2
Nickel-T (ug/l)		5.7		< 2
Selenium-T (ug/l)		< 2		< 2
Aluminum-T (ug/l)		3420		215
Barium-T (ug/l)		63		77
Calcium-T (mg/l)		56.7		71.8
Iron-T (ug/l)		6220		426
Magnesium-T (mg/l)		19.4		25.9
Manganese-T (ug/l)		280		133
Potassium-T (mg/l)		9		8.3
Sodium-T (mg/l)		9		18.4
Strontium-T (ug/l)		88		133
Zinc-T (ug/l)		18		< 10
Hardness (mg/l)		221		286

Appendix Table A Southwest Ohio River Tributary Watersheds Inorganic Water Chemistry Sampling Results (2016)

Site Location:	LICK RUN @ OLD CINCINNATI PIKE (RD. 21)					SWDO Map #	38
River Mile: 0.95	Storet ID: 302952	WAU: 050902010705	River Code: 10-115-000				
Latitude/Longitude:	38.8064 / -83.6232	Drainage Area (mi2): 0.7	County Adams	Ecoregion: IP			

Date Collected	6/30/2016	7/14/2016	7/28/2016	8/10/2016	8/23/2016
Time	1:55	3:10	11:10	10:50	11:45
Temp (C)	19.52	23.51	21.33	21.66	19.43
D.O. (mg/l) / (% sat)	9.75 / 106.4	8.2 / 96.6	7.29 / 82.4	7.2 / 81.9	6.54 / 71.3
pH (fld) SU	7.96	7.82	7.48	7.67	7.65
SpCond fld/lab (umhos/cm)	602 / 571	629 / 591	453 / 464	582 / 557	645 / 629

COD (mg/l)	< 20	< 20	29	20	< 20
TDS (mg/l)	368	348	302	354	378
TSS (mg/l)	< 5	< 5	30	< 5	< 5
Alkalinity (mg/l)	259	262	166	218	256
Chloride (mg/l)	33.1	32.6	25.2	29.4	38.6
Sulfate (mg/l)	21.2	22.6	41.5	51.4	42.4
Ammonia-N (mg/l)	0.06	< 0.05	< 0.05	0.055	< 0.05
TKN (mg/l)	0.23	0.58	1.24	0.57	0.88
Nitrate-nitrite-N (mg/l)	2.9	1.96	0.73	1.21	0.86
Nitrite-N (mg/l)	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Phosphorus-T (mg/l)	0.022	0.022	0.147	0.042	0.037
Orthophosphate, D (mg/l)					
Arsenic-T (ug/l)	< 2		2.6		< 2
Cadmium-T (ug/l)	< 0.2		< 0.2		< 0.2
Chromium-T (ug/l)	< 2		< 2		< 2
Copper-T (ug/l)	< 2		2.1		< 2
Lead-T (ug/l)	< 2		< 2		< 2
Nickel-T (ug/l)	< 2		2.3		< 2
Selenium-T (ug/l)	< 2		< 2		< 2
Aluminum-T (ug/l)	< 200		1090		< 200
Barium-T (ug/l)	53		49		55
Calcium-T (mg/l)	74.9		45.9		70.5
Iron-T (ug/l)	215		1820		382
Magnesium-T (mg/l)	29.4		19.5		28.6
Manganese-T (ug/l)	24		94		61
Potassium-T (mg/l)	< 2		4.5		3.1
Sodium-T (mg/l)	14.1		16.9		27
Strontium-T (ug/l)	135		104		158
Zinc-T (ug/l)	< 10		< 10		< 10
Hardness (mg/l)	308		195		294

Appendix Table A Southwest Ohio River Tributary Watersheds Inorganic Water Chemistry Sampling Results (2016)

Site Location:	STRAIGHT CREEK AT ARNHEIM @ BROWNSTOWN-ARNHEIM RD.					SWDO Map # 39
River Mile: 16.75	Storet ID: X03W09	WAU: 050902010802	River Code: 10-300-000			
Latitude/Longitude: 38.9319 / -83.8292	Drainage Area (mi2): 12.5		County Brown	Ecoregion: IP	USGS Quad:	

Date Collected	7/5/2016	7/12/2016	7/26/2016	8/11/2016	9/1/2016	9/15/2016
Time	1:50	2:35	2:35	12:45	1:25	12:30
Temp (C)	23.39	25.5	27.4	26.73	24.1	21.1
D.O. (mg/l) / (% sat)	7.9 / 92.8	9.4 / 114.9	6.73 / 85	9.49 / 118.6	9.18 / 109.4	7.87 / 88.6
pH (fld) SU	7.79	8.31	7.96	7.98	7.95	7.89
SpCond fld/lab (umhos/cm)	254 / 245	344.8 / 331	308 / 302	393 / 378		558 / 550

COD (mg/l)	49	< 20	< 20	< 20		< 20
TDS (mg/l)	210	220	174	236	298	330
TSS (mg/l)	195	9	< 5	32	< 5	< 5
Alkalinity (mg/l)	73.2	144	125	163		248
Chloride (mg/l)	20.3	18.5	12.4	18.2	22.1	21.8
Sulfate (mg/l)	15.7	17.5	13.1	19.4	23	36.2
Ammonia-N (mg/l)	0.918	< 0.05	< 0.05	< 0.05	0.063	< 0.05
TKN (mg/l)	2.39	0.57	0.5	0.52	0.88	< 0.2
Nitrate-nitrite-N (mg/l)	1.64	0.22	0.15	0.35	< 0.1	0.12
Nitrite-N (mg/l)	0.064	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Phosphorus-T (mg/l)	0.343	0.049	0.046	0.116	0.055	0.063
Orthophosphate, D (mg/l)	0.188	0.03	0.012	0.072	0.028	0.043
Arsenic-T (ug/l)	2.9		2		< 2	< 2
Cadmium-T (ug/l)	< 0.2		< 0.2		< 0.2	< 0.2
Chromium-T (ug/l)	< 2		< 2		< 2	< 2
Copper-T (ug/l)	15		< 2		< 2	< 2
Lead-T (ug/l)	2.2		< 2		< 2	< 2
Nickel-T (ug/l)	2.7		< 2		< 2	2.1
Selenium-T (ug/l)	< 2		< 2		< 2	< 2
Aluminum-T (ug/l)	1530		215		< 200	< 200
Barium-T (ug/l)	43		34		53	38
Calcium-T (mg/l)	29.9		37.8		69.3	69.2
Iron-T (ug/l)	2440		313		140	65
Magnesium-T (mg/l)	8.3		9.3		16.7	12.5
Manganese-T (ug/l)	156		66		67	71
Potassium-T (mg/l)	10.3		3.8		4.5	5.5
Sodium-T (mg/l)	5.7		6.8		12.7	11.6
Strontium-T (ug/l)	84		109		193	230
Zinc-T (ug/l)	78		< 10		< 10	< 10
Hardness (mg/l)	109		133		242	224

Appendix Table A Southwest Ohio River Tributary Watersheds Inorganic Water Chemistry Sampling Results (2016)

Site Location:	STRAIGHT CREEK WSW OF RUSSELLVILLE @ ST. RT. 125					SWDO Map # 40
River Mile: 9.45	Storet ID: X03W11	WAU: 050902010802	River Code: 10-300-000			
Latitude/Longitude: 38.8561 / -83.8500	Drainage Area (mi2): 34		County Brown	Ecoregion: IP	USGS Quad:	

Date Collected	7/5/2016	7/12/2016	7/26/2016	8/11/2016	9/1/2016	9/15/2016
Time	12:25	1:50	12:40	11:30	11:56	11:05
Temp (C)	21.88	25.4	26.1	26.41	24.1	21.1
D.O. (mg/l) / (% sat)	8.34 / 95.2	10.33 / 126	8.04 / 99.3	9.11 / 113.3	8.25 / 98.4	8.55 / 96.1
pH (fld) SU	7.96	8.32	8	8.06	8.13	7.94
SpCond fld/lab (umhos/cm)	310 / 301	368.9 / 355	292.9 / 284	401 / 377		422.2 / 412

COD (mg/l)	61	< 20	27	< 20		< 20
TDS (mg/l)	206	230	200	242	264	242
TSS (mg/l)	426	< 5	28	6	< 5	< 5
Alkalinity (mg/l)	94.8	151	112	169		185
Chloride (mg/l)	22.8	22.2	14.7	17.1	18.5	19.3
Sulfate (mg/l)	23.7	19.9	11.3	18.3	17.9	20.7
Ammonia-N (mg/l)	0.117	< 0.05	< 0.05	< 0.05	0.058	< 0.05
TKN (mg/l)	2.05	0.54	0.8	0.39	0.37	0.79
Nitrate-nitrite-N (mg/l)	1.32	0.24	0.6	0.14	0.15	0.18
Nitrite-N (mg/l)	0.037	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Phosphorus-T (mg/l)	0.604	0.107	0.247	0.068	0.053	0.05
Orthophosphate, D (mg/l)	0.149	0.063	0.119	0.043	0.041	0.045
Arsenic-T (ug/l)	3.2		2.1		< 2	< 2
Cadmium-T (ug/l)	< 0.2		< 0.2		< 0.2	< 0.2
Chromium-T (ug/l)	4.4		< 2		< 2	< 2
Copper-T (ug/l)	9.4		2.2		< 2	< 2
Lead-T (ug/l)	6.6		< 2		< 2	< 2
Nickel-T (ug/l)	5.5		< 2		< 2	< 2
Selenium-T (ug/l)	< 2		< 2		< 2	< 2
Aluminum-T (ug/l)	5250		1230		< 200	< 200
Barium-T (ug/l)	82		38		39	38
Calcium-T (mg/l)	46.2		37.8		58.8	56.1
Iron-T (ug/l)	7800		1460		93	70
Magnesium-T (mg/l)	11.7		8		12.9	14
Manganese-T (ug/l)	572		74		40	41
Potassium-T (mg/l)	9.8		6.3		4.7	5.5
Sodium-T (mg/l)	7		5.4		9.8	11.2
Strontium-T (ug/l)	124		97		179	189
Zinc-T (ug/l)	33		< 10		< 10	< 10
Hardness (mg/l)	164		127		200	198

Appendix Table A Southwest Ohio River Tributary Watersheds Inorganic Water Chemistry Sampling Results (2016)

Site Location:	SYCAMORE RUN NR. FITE-HAUCK RD. AND ASH RIDGE ARNHEIM RD.					SWDO Map # 41
River Mile: 0.05	Storet ID: 302968	WAU: 050902010802	River Code: 10-316-000			
Latitude/Longitude: 38.9306 / -83.8134	Drainage Area (mi2): 1.6	County Brown	Ecoregion: IP	USGS Quad:		

Date Collected	7/5/2016	7/12/2016	7/26/2016	8/11/2016	9/15/2016
Time	2:15	3:15	4:00	1:15	12:55
Temp (C)	23.46	23.5	23.9	24.98	18.9
D.O. (mg/l) / (% sat)	8.02 / 94.3	6.09 / 71.7	7.37 / 87.6	7.46 / 90.4	1.37 / 14.8
pH (fld) SU	8.18	7.97	7.77	7.95	7.62
SpCond fld/lab (umhos/cm)	207 / 198	389.3 / 379	427.2 / 433	326 / 318	504 / 493

COD (mg/l)	48	< 20	25	23	< 20
TDS (mg/l)	142	228	250	200	296
TSS (mg/l)	90	< 5	107	5	< 5
Alkalinity (mg/l)	67.8	173	170	146	244
Chloride (mg/l)	16.1	18.9	23.9	12.5	17.3
Sulfate (mg/l)	12.1	13.7	15.9	11.6	12.6
Ammonia-N (mg/l)	0.273	0.051	0.058	< 0.05	< 0.05
TKN (mg/l)	2.08	0.52	0.86	0.74	0.32
Nitrate-nitrite-N (mg/l)	0.54	0.31	1.14	< 0.1	< 0.1
Nitrite-N (mg/l)	< 0.02	< 0.02	0.166	< 0.02	< 0.02
Phosphorus-T (mg/l)	0.328	0.074	0.515	0.112	0.109
Orthophosphate, D (mg/l)					
Arsenic-T (ug/l)	3.9		3.3		2.6
Cadmium-T (ug/l)	< 0.2		< 0.2		< 0.2
Chromium-T (ug/l)	< 2		< 2		< 2
Copper-T (ug/l)	83.4		13		4.2
Lead-T (ug/l)	< 2		2.3		< 2
Nickel-T (ug/l)	3		4		3
Selenium-T (ug/l)	< 2		< 2		< 2
Aluminum-T (ug/l)	1430		1560		< 200
Barium-T (ug/l)	43		60		52
Calcium-T (mg/l)	27.1		55.6		71.7
Iron-T (ug/l)	2840		2620		113
Magnesium-T (mg/l)	7.4		14.5		18.2
Manganese-T (ug/l)	229		233		335
Potassium-T (mg/l)	8.1		6.3		7.4
Sodium-T (mg/l)	< 5		13.5		9.6
Strontium-T (ug/l)	96		172		229
Zinc-T (ug/l)	< 10		< 10		< 10
Hardness (mg/l)	98		199		254

Appendix Table A Southwest Ohio River Tributary Watersheds Inorganic Water Chemistry Sampling Results (2016)

Site Location:	WEST FORK STRAIGHT CREEK @ WESTFORK RD. (RD. 66A)				SWDO Map # 42
River Mile: 1.25	Storet ID: 302966	WAU: 050902010802	River Code: 10-314-000		
Latitude/Longitude: 38.9112 / -83.8586	Drainage Area (mi2): 4.3	County Brown	Ecoregion: IP	USGS Quad:	

Date Collected	7/5/2016	7/12/2016	7/26/2016	8/11/2016	9/15/2016
Time	1:30	2:15	2:15	1:45	12:15
Temp (C)	23.22	27.1	26.6	30.93	22.1
D.O. (mg/l) / (% sat)	7.37 / 86.3	16.44 / 207	9.74 / 121.5	15.15 / 203.9	15.43 / 177.3
pH (fld) SU	7.57	9.28	8.1	8.75	8.61
SpCond fld/lab (umhos/cm)	241 / 229	531 / 513	411.2 / 405	517 / 554	665 / 646

COD (mg/l)	62	29	21	22	23
TDS (mg/l)	218	376	260	368	434
TSS (mg/l)	167	< 5	< 5	31	< 5
Alkalinity (mg/l)	35.1	162	153	211	195
Chloride (mg/l)	31.4	43.5	20.7	26.5	25.4
Sulfate (mg/l)	24.6	74.6	30.3	76.4	133
Ammonia-N (mg/l)	0.322	< 0.05	< 0.05	< 0.05	< 0.05
TKN (mg/l)	2.3	0.9	0.98	0.81	0.54
Nitrate-nitrite-N (mg/l)	2.29	0.18	0.45	< 0.1	< 0.1
Nitrite-N (mg/l)	0.047	< 0.02	< 0.02	< 0.02	< 0.02
Phosphorus-T (mg/l)	0.755	0.254	0.179	0.159	0.062
Orthophosphate, D (mg/l)					
Arsenic-T (ug/l)	2.8		2.6		3
Cadmium-T (ug/l)	< 0.2		< 0.2		< 0.2
Chromium-T (ug/l)	3.1		< 2		< 2
Copper-T (ug/l)	4.1		< 2		< 2
Lead-T (ug/l)	3.7		< 2		< 2
Nickel-T (ug/l)	3.2		2		2.6
Selenium-T (ug/l)	< 2		< 2		< 2
Aluminum-T (ug/l)	3380		599		< 200
Barium-T (ug/l)	64		54		54
Calcium-T (mg/l)	23.9		48.7		71.3
Iron-T (ug/l)	3680		712		< 50
Magnesium-T (mg/l)	7.4		13.7		30.7
Manganese-T (ug/l)	177		59		25
Potassium-T (mg/l)	14.4		7		7.8
Sodium-T (mg/l)	6		8.3		29.5
Strontium-T (ug/l)	69		150		375
Zinc-T (ug/l)	23		< 10		< 10
Hardness (mg/l)	90		178		304

Appendix Table A Southwest Ohio River Tributary Watersheds Inorganic Water Chemistry Sampling Results (2016)

Site Location:	STRAIGHT CREEK AT CENTERPOINT @ OLD.S. RT. 68					SWDO Map # 43
River Mile: 2.78	Storet ID: X03W12	WAU: 050902010803	River Code: 10-300-000			
Latitude/Longitude: 38.7986 / -83.8889	Drainage Area (mi2): 57		County Brown	Ecoregion: IP	USGS Quad:	

Date Collected	5/16/2016	6/8/2016	7/5/2016	7/12/2016	7/26/2016	8/11/2016
Time	12:50	11:15	11:45	12:00	12:05	11:00
Temp (C)	13.7	19.8	21.87	25.6	26.7	26.48
D.O. (mg/l) / (% sat)	12 / 115.9	9.25 / 101.5	8.71 / 99.4	8.79 / 107.6	7.97 / 99.5	7.94 / 98.9
pH (fld) SU	8.34	8.02	8.04	8.06	8.01	7.91
SpCond fld/lab (umhos/cm)	422.7 / 418		335 / 314	424.6 / 417	295.6 / 288	415 / 392

COD (mg/l)	< 20		27	< 20	< 20	< 20
TDS (mg/l)	262	294	180	266	184	230
TSS (mg/l)	< 5	5	37	8	39	18
Alkalinity (mg/l)	177		111	164	115	179
Chloride (mg/l)	20.5	16.5	22	28.4	13.4	15.3
Sulfate (mg/l)	25.8	21.5	20.9	23.5	13.9	19.6
Ammonia-N (mg/l)	< 0.05	< 0.05	0.129	< 0.05	< 0.05	< 0.05
TKN (mg/l)		0.36	0.88	0.52	0.67	0.34
Nitrate-nitrite-N (mg/l)	0.59	1.06	1.77	0.19	0.44	0.26
Nitrite-N (mg/l)		< 0.02	0.057	< 0.02	< 0.02	< 0.02
Phosphorus-T (mg/l)	0.061	0.087	0.236	0.103	0.219	0.093
Orthophosphate, D (mg/l)	0.052	0.077	0.162	0.074	0.104	0.068
Arsenic-T (ug/l)	< 2	< 2	< 2	< 2	< 2	< 2
Cadmium-T (ug/l)	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium-T (ug/l)	< 2	< 2	< 2	< 2	< 2	< 2
Copper-T (ug/l)	< 2	< 2	2	< 2	2.1	< 2
Lead-T (ug/l)	< 2	< 2	< 2	< 2	< 2	< 2
Nickel-T (ug/l)	< 2	< 2	< 2	2.2	2.1	< 2
Selenium-T (ug/l)	< 2	< 2	< 2	< 2	< 2	< 2
Aluminum-T (ug/l)	259	288	1060	215	1530	210
Barium-T (ug/l)	37	36	42	40	39	38
Calcium-T (mg/l)	71.2	68.9	45.5	58	38.1	62.9
Iron-T (ug/l)	326	295	1410	281	1990	287
Magnesium-T (mg/l)	14.4	12	10.3	11.9	8.1	12.4
Manganese-T (ug/l)	18	30	80	49	99	51
Potassium-T (mg/l)	5.5	5	8.9	7.6	5.7	6.1
Sodium-T (mg/l)	10.4	7.6	7.4	10.2	5.5	9.8
Strontium-T (ug/l)	202	189	132	175	107	210
Zinc-T (ug/l)	< 10	< 10	< 10	< 10	< 10	< 10
Hardness (mg/l)	237	218	156	194	128	208

Appendix Table A Southwest Ohio River Tributary Watersheds Inorganic Water Chemistry Sampling Results (2016)

Site Location:	STRAIGHT CREEK AT CENTERPOINT @ OLD.S. RT. 68					SWDO Map # 43
River Mile: 2.78	Storet ID: X03W12	WAU: 050902010803	River Code: 10-300-000			
Latitude/Longitude: 38.7986 / -83.8889	Drainage Area (mi2): 57		County Brown	Ecoregion: IP	USGS Quad:	

Date Collected	9/1/2016	9/15/2016	9/27/2016	10/25/2016	11/29/2016	12/20/2016
Time	9:54	10:40	2:25	2:25	2:35	3:10
Temp (C)	23.6	23.1	23.7	13.53	9.5	0.7
D.O. (mg/l) / (% sat)	7.51 / 88.6	6.11 / 71.4	9.43 / 111.5	10.9 / 104.7	13.55 / 118.7	15.88 / 111
pH (fld) SU	7.94	7.81	7.87	8.07	8.08	7.91
SpCond fld/lab (umhos/cm)		467.7 / 453	462.4 / 461	390 / 380	482.4 / 476	386.3 / 361

COD (mg/l)		< 20	< 20	< 20	< 20	< 20
TDS (mg/l)	228	284	278	246	288	226
TSS (mg/l)	19	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/l)		203	191	146	186	149
Chloride (mg/l)	12.6	20.2	25.2	22.3	26.1	16.1
Sulfate (mg/l)	19.2	26.3	33.3	30	36.8	21.6
Ammonia-N (mg/l)	0.052	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
TKN (mg/l)	0.58	1.02	0.9	0.44	< 0.2	0.38
Nitrate-nitrite-N (mg/l)	0.49	< 0.1	< 0.1	0.12	< 0.1	1.4
Nitrite-N (mg/l)	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Phosphorus-T (mg/l)	0.214	0.05	0.057	0.156	0.022	0.124
Orthophosphate, D (mg/l)	0.103	0.054	0.051	0.164	0.033	0.13
Arsenic-T (ug/l)	< 2	< 2	< 2	< 2	< 2	< 2
Cadmium-T (ug/l)	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium-T (ug/l)	< 2	< 2	< 2	< 2	< 2	< 2
Copper-T (ug/l)	< 2	< 2	< 2	< 2	< 2	< 2
Lead-T (ug/l)	< 2	< 2	< 2	< 2	< 2	< 2
Nickel-T (ug/l)	2.2	2.1	2.2	< 2	< 2	< 2
Selenium-T (ug/l)	< 2	< 2	< 2	< 2	< 2	< 2
Aluminum-T (ug/l)	1030	< 200	< 200	< 200	< 200	307
Barium-T (ug/l)	32	59	35	31	32	28
Calcium-T (mg/l)	51	80.7	64	47.8	62.1	51.5
Iron-T (ug/l)	1380	164	75	130	< 50	353
Magnesium-T (mg/l)	8.1	21.1	12.1	9.7	12.2	10.2
Manganese-T (ug/l)	55	85	71	28	21	20
Potassium-T (mg/l)	5	5.8	5.1	9.4	5	4.4
Sodium-T (mg/l)	6.6	14.2	13.1	9.5	12	7.5
Strontium-T (ug/l)	152	224	219	149	194	129
Zinc-T (ug/l)	< 10	< 10	< 10	< 10	< 10	< 10
Hardness (mg/l)	161	288	210	159	205	171

Appendix Table A Southwest Ohio River Tributary Watersheds Inorganic Water Chemistry Sampling Results (2016)

Site Location:	GEORGETOWN WWTP 001 OUTFALL TO TOWN RUN				SWDO Map # 44	
River Mile: 0.8	Storet ID: X02W03	WAU: 050902011003	River Code: 10-407-000			
Latitude/Longitude: 38.8522 / -83.9103	Drainage Area (mi2): 1.4		County Brown	Ecoregion: IP	USGS Quad:	

Date Collected	7/5/2016	7/12/2016	7/26/2016	8/11/2016	9/1/2016	9/15/2016
Time	11:10	11:05	11:10	10:15	10:45	9:40
Temp (C)	21.22	22.5	23.9	24.47		23.4
D.O. (mg/l) / (% sat)	8.38 / 94.5	7.66 / 88.8	8.12 / 96.6	8.5 / 102		8.06 / 95
pH (fld) SU	7.93	7.35	7.53	7.96		7.02
SpCond fld/lab (umhos/cm)	679 / 643	1209 / 1180	685 / 803	504 / 826		952 / 931

COD (mg/l)	< 20	32	< 20	< 20		< 20
TDS (mg/l)	410	696	470	502	516	538
TSS (mg/l)	< 5	< 5	11	< 5	< 5	< 5
Alkalinity (mg/l)	141	194	130	149		119
Chloride (mg/l)	89.9	187	110	127	128	160
Sulfate (mg/l)	59.9	77.6	68	65.7	73.1	75.4
Ammonia-N (mg/l)	0.283	0.169	0.179	0.143	0.327	0.198
TKN (mg/l)	0.99	1.87	1.04	1.08	1.49	0.92
Nitrate-nitrite-N (mg/l)	0.56	10.5	4.68	0.69	2.4	1.01
Nitrite-N (mg/l)	0.025	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Phosphorus-T (mg/l)	0.459	0.759	0.533	0.402	0.672	7.4
Orthophosphate, D (mg/l)					0.536	
Arsenic-T (ug/l)	< 2		< 2		< 2	2.3
Cadmium-T (ug/l)	< 0.2		< 0.2		< 0.2	< 0.2
Chromium-T (ug/l)	< 2		< 2		< 2	< 2
Copper-T (ug/l)	2.1		2.1		3.5	3.8
Lead-T (ug/l)	< 2		< 2		< 2	< 2
Nickel-T (ug/l)	< 2		2.8		6.3	6.8
Selenium-T (ug/l)	< 2		< 2		< 2	3.7
Aluminum-T (ug/l)	< 200		< 200		< 200	< 200
Barium-T (ug/l)	< 15		< 15		< 15	< 15
Calcium-T (mg/l)	55		56.9		58.8	43.1
Iron-T (ug/l)	148		150		157	350
Magnesium-T (mg/l)	17		17.3		19.3	17
Manganese-T (ug/l)	91		102		119	115
Potassium-T (mg/l)	9.6		12		14.1	17.9
Sodium-T (mg/l)	63.3		69.9		78.4	123
Strontium-T (ug/l)	166		192		190	134
Zinc-T (ug/l)	21		23		40	46
Hardness (mg/l)	207		213		226	178

Appendix Table A Southwest Ohio River Tributary Watersheds Inorganic Water Chemistry Sampling Results (2016)

Site Location:	TOWN RUN DST. GEORGETOWN WWTP					SWDO Map #	45
River Mile: 0.63	Storet ID: X02W04	WAU: 050902011003	River Code: 10-407-000				
Latitude/Longitude: 38.8514 / -83.9125	Drainage Area (mi2): 1.4		County Brown	Ecoregion: IP	USGS Quad:		

Date Collected	7/5/2016	7/12/2016	7/26/2016	8/11/2016	9/1/2016	9/15/2016
Time	11:00	11:13	11:00	9:50	10:58	9:50
Temp (C)	21.11	22.5	24.1	24.32	23.3	22.4
D.O. (mg/l) / (% sat)	8.7 / 97.9	7.84 / 90.8	7.81 / 93.2	8.24 / 98.6	7.74 / 91	7.36 / 85
pH (fld) SU	7.98	7.76	8.09	8.08	8.13	7.61
SpCond fld/lab (umhos/cm)	666 / 645	1153 / 1120	659 / 632	836 / 794		961 / 916

COD (mg/l)	< 20	36	21	< 20		20
TDS (mg/l)	394	700	362	502	498	526
TSS (mg/l)	5	< 5	14	< 5	< 5	< 5
Alkalinity (mg/l)	146	191	148	150		122
Chloride (mg/l)	85.5	179	71.1	124	123	156
Sulfate (mg/l)	57	75.9	47.5	66.3	71.2	77.2
Ammonia-N (mg/l)	0.236	0.137	0.08	0.111	0.23	0.147
TKN (mg/l)	0.83	1.66	0.83	0.89	1.3	1.27
Nitrate-nitrite-N (mg/l)	0.56	10.3	3.48	0.7	1.82	1.08
Nitrite-N (mg/l)	< 0.02	0.021	< 0.02	< 0.02	0.022	< 0.02
Phosphorus-T (mg/l)	0.355	0.662	0.252	0.355	0.664	7.77
Orthophosphate, D (mg/l)	0.358	0.629	0.194	0.312	0.571	6.51
Arsenic-T (ug/l)	< 2		< 2		< 2	2.3
Cadmium-T (ug/l)	< 0.2		< 0.2		< 0.2	< 0.2
Chromium-T (ug/l)	< 2		< 2		< 2	< 2
Copper-T (ug/l)	2		2.1		3	3.4
Lead-T (ug/l)	< 2		< 2		< 2	< 2
Nickel-T (ug/l)	< 2		2.2		5.9	6.6
Selenium-T (ug/l)	< 2		< 2		< 2	3.7
Aluminum-T (ug/l)	< 200		203		< 200	< 200
Barium-T (ug/l)	< 15		21		< 15	< 15
Calcium-T (mg/l)	57.3		55.6		58.3	46.1
Iron-T (ug/l)	202		379		107	271
Magnesium-T (mg/l)	16.8		14.4		18.1	17.2
Manganese-T (ug/l)	86		67		69	90
Potassium-T (mg/l)	8.8		7.6		12.7	17.8
Sodium-T (mg/l)	60.5		47.6		70.2	121
Strontium-T (ug/l)	176		183		186	144
Zinc-T (ug/l)	47		12		22	42
Hardness (mg/l)	212		198		220	186

Appendix Table A Southwest Ohio River Tributary Watersheds Inorganic Water Chemistry Sampling Results (2016)

Site Location:	TOWN RUN JUSTPST. GEORGETOWN WWTP					SWDO Map #	46
River Mile: 0.81	Storet ID: X02S05	WAU: 050902011003	River Code: 10-407-000				
Latitude/Longitude: 38.8522 / -83.9100	Drainage Area (mi2): 1.4		County Brown	Ecoregion: IP	USGS Quad:		

Date Collected	7/5/2016	7/12/2016	7/26/2016	8/11/2016	9/1/2016	9/15/2016
Time	10:35	11:21	10:45	9:55	11:10	9:55
Temp (C)	20.36	21.2	24	23.73	21.2	18.9
D.O. (mg/l) / (% sat)	8.79 / 97.5	7.9 / 89	8.48 / 100.8	7.72 / 91.4	7.39 / 83.4	5.72 / 61.6
pH (fld) SU	8.24	8.06	8.06	8.03	8.19	7.71
SpCond fld/lab (umhos/cm)	577 / 554	692 / 671	519 / 524	597 / 584		570 / 593

COD (mg/l)	< 20	< 20	< 20	< 20		< 20
TDS (mg/l)	342	460	294	372	400	352
TSS (mg/l)	< 5	< 5	5	5	< 5	8
Alkalinity (mg/l)	181	241	167	206		234
Chloride (mg/l)	53.8	59.5	44.5	50.7	45	41.7
Sulfate (mg/l)	42.2	48.1	34	39.4	46.2	43.6
Ammonia-N (mg/l)	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
TKN (mg/l)	0.46	0.4	0.28	0.31	0.39	< 0.2
Nitrate-nitrite-N (mg/l)	0.78	0.29	0.44	0.24	0.23	0.18
Nitrite-N (mg/l)	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Phosphorus-T (mg/l)	0.083	0.079	0.084	0.088	0.122	0.112
Orthophosphate, D (mg/l)	0.07	0.082	0.073	0.076	0.085	0.085
Arsenic-T (ug/l)	< 2		< 2		< 2	< 2
Cadmium-T (ug/l)	< 0.2		< 0.2		< 0.2	< 0.2
Chromium-T (ug/l)	< 2		< 2		< 2	< 2
Copper-T (ug/l)	< 2		< 2		< 2	< 2
Lead-T (ug/l)	< 2		< 2		< 2	< 2
Nickel-T (ug/l)	< 2		< 2		2	3
Selenium-T (ug/l)	< 2		< 2		< 2	< 2
Aluminum-T (ug/l)	< 200		< 200		< 200	< 200
Barium-T (ug/l)	46		40		46	45
Calcium-T (mg/l)	68.6		56.7		85.2	83
Iron-T (ug/l)	188		210		124	107
Magnesium-T (mg/l)	14.8		11.8		16.8	17
Manganese-T (ug/l)	< 10		11		13	30
Potassium-T (mg/l)	3.7		3.3		3.5	3.9
Sodium-T (mg/l)	36.2		27.4		26.7	28.4
Strontium-T (ug/l)	215		182		262	269
Zinc-T (ug/l)	< 10		18		< 10	< 10
Hardness (mg/l)	232		190		282	277

Southwest Ohio River Tributary Watersheds Inorganic Water Chemistry Sampling Results
2017

REDOAK CREEK @ RD. 231A

River Code: 10-040-000

WAU: 05090201 08 01

STORET ID: 302933

River Mile: 7.2

Drainage Area: 4.0

Date Collected	7/13/2017	7/26/2017	8/10/2017
Dissolved Oxygen (DO) (mg/L)	6.38	9.82	11.78
pH (S.U.)	7.88	7.99	8.14
Specific Conductance (µmhos/cm)	541	482	503
Temperature, water (° C)	24.5	24.1	21.4
Alkalinity (mg/L)	220	198	221
Aluminum (ug/L)	< 200	219	473
Ammonia (mg/L)	0.0519	< 0.05	0.0708
Arsenic (ug/L)	< 2	< 2	< 2
Barium (ug/L)	44.8	41.1	38.9
Cadmium (ug/L)	< 0.2	< 0.2	< 0.2
Calcium (mg/L)	76.8	74.2	72.4
Chemical Oxygen Demand (COD) (mg/L)	< 20	< 20	< 20
Chloride (mg/L)	37.9	25.1	24.8
Chromium (ug/L)	< 2	< 2	< 2
Copper (ug/L)	< 2	< 2	< 2
Hardness, Ca + Mg (mg/L)	249	232	230
Iron (ug/L)	177	315	821
Lead (ug/L)	< 2	< 2	< 2
Magnesium (mg/L)	14	11.4	11.9
Manganese (ug/L)	83	37.1	62.9
Nickel (ug/L)	2.09	2.14	2.73
Nitrate+Nitrite (mg/L)	0.209	1.43	0.555
Nitrogen, Kjeldahl (mg/L)	0.359	0.362	0.963
Nitrogen, Nitrite (NO2) as NO2 (mg/L)	< 0.02	< 0.02	< 0.02
Phosphorus (mg/L)	0.0795	0.179	0.199
Potassium (mg/L)	5.85	6.88	5.61
Saturation (%)	76.5	117	133.3
Selenium (ug/L)	< 2	< 2	< 2
Sodium (mg/L)	17.2	10.3	10.8
Solids, Total Suspended (TSS) (mg/L)	< 5	< 5	76.5
Specific conductance (umhos/cm)	540	469	481
Strontium (ug/L)	181	159	160
Sulfur, sulfate (SO4) as SO4 (mg/L)	24.3	19.5	19.7
Total Dissolved Solids (mg/L)	330	300	294
Zinc (ug/L)	< 10	< 10	< 10

Southwest Ohio River Tributary Watersheds Inorganic Water Chemistry Sampling Results
2017

W. FK. REDOAK CREEK @ END OF BEALER RD. (RD. 23 STORET ID: 302934
 River Code: 10-041-000 River Mile: 0.05
 WAU: 05090201 08 01 Drainage Area: 3.9

Date Collected	7/13/2017	7/26/2017	8/10/2017
Dissolved Oxygen (DO) (mg/L)	8.63	8.42	10.24
pH (S.U.)	8.12	8.13	8.26
Specific Conductance (µmhos/cm)	475	489	480
Temperature, water (° C)	23.7	23.3	22.1
Alkalinity (mg/L)	190	208	205
Aluminum (ug/L)	< 200	< 200	< 200
Ammonia (mg/L)	< 0.05	< 0.05	0.0549
Arsenic (ug/L)	< 2	< 2	< 2
Barium (ug/L)	42.1	40.1	34.2
Cadmium (ug/L)	< 0.2	< 0.2	< 0.2
Calcium (mg/L)	73.9	79.8	69.8
Chemical Oxygen Demand (COD) (mg/L)	< 20	< 20	< 20
Chloride (mg/L)	26.3	21.1	28.8
Chromium (ug/L)	< 2	< 2	< 2
Copper (ug/L)	< 2	< 2	< 2
Hardness, Ca + Mg (mg/L)	233	245	219
Iron (ug/L)	179	122	210
Lead (ug/L)	< 2	< 2	< 2
Magnesium (mg/L)	11.8	11.1	10.9
Manganese (ug/L)	20.3	14	26.3
Nickel (ug/L)	< 2	< 2	2.22
Nitrate+Nitrite (mg/L)	0.671	2.09	0.31
Nitrogen, Kjeldahl (mg/L)	0.31	0.22	0.282
Nitrogen, Nitrite (NO ₂) as NO ₂ (mg/L)	< 0.02	< 0.02	< 0.02
Phosphorus (mg/L)	0.11	0.122	0.0935
Potassium (mg/L)	6.34	4.85	4.19
Saturation (%)	102	98.9	117.5
Selenium (ug/L)	< 2	< 2	< 2
Sodium (mg/L)	12	9.63	11.1
Solids, Total Suspended (TSS) (mg/L)	5	< 5	7
Specific conductance (umhos/cm)	464	476	464
Strontium (ug/L)	187	178	167
Sulfur, sulfate (SO ₄) as SO ₄ (mg/L)	21	21	22.5
Total Dissolved Solids (mg/L)	280	290	286
Zinc (ug/L)	< 10	< 10	< 10

Southwest Ohio River Tributary Watersheds Inorganic Water Chemistry Sampling Results
2017

BIG THREEMILE CREEK @ ROUSH HILL RD. (RD. 20)
River Code: 10-043-000
WAU: 05090201 06 04

STORET ID: 302936
River Mile: 11.12
Drainage Area: 5.8

Date Collected	7/13/2017	7/26/2017	8/10/2017
Dissolved Oxygen (DO) (mg/L)	7.15	8.6	8.67
pH (S.U.)	7.81	7.95	7.94
Specific Conductance (µmhos/cm)	543	438	462
Temperature, water (° C)	23.7	21	19.2
Alkalinity (mg/L)	230	202	224
Aluminum (ug/L)	344	615	203
Ammonia (mg/L)	0.0515	< 0.05	0.0652
Arsenic (ug/L)	< 2	< 2	< 2
Barium (ug/L)	72.4	50.7	46.5
Cadmium (ug/L)	< 0.2	< 0.2	< 0.2
Calcium (mg/L)	67.2	63.7	58.8
Chemical Oxygen Demand (COD) (mg/L)	< 20	< 20	< 20
Chloride (mg/L)	25.7	10.7	10.9
Chromium (ug/L)	< 2	< 2	< 2
Copper (ug/L)	< 2	< 2	< 2
Hardness, Ca + Mg (mg/L)	256	233	222
Iron (ug/L)	523	944	285
Lead (ug/L)	< 2	< 2	< 2
Magnesium (mg/L)	21.4	18.1	18.2
Manganese (ug/L)	92.5	45.5	27.9
Nickel (ug/L)	2.3	2.06	2.12
Nitrate+Nitrite (mg/L)	0.482	1.58	0.199
Nitrogen, Kjeldahl (mg/L)	0.505	0.268	< 0.2
Nitrogen, Nitrite (NO ₂) as NO ₂ (mg/L)	< 0.02	< 0.02	< 0.02
Phosphorus (mg/L)	0.033	0.157	0.0186
Potassium (mg/L)	5.02	3.72	3.15
Saturation (%)	84.5	96.6	94
Selenium (ug/L)	< 2	< 2	< 2
Sodium (mg/L)	16.7	5.95	6.58
Solids, Total Suspended (TSS) (mg/L)	13	12	5
Specific conductance (umhos/cm)	528	428	444
Strontium (ug/L)	122	89.6	94.2
Sulfur, sulfate (SO ₄) as SO ₄ (mg/L)	28.5	21.3	24.2
Total Dissolved Solids (mg/L)	314	270	268
Zinc (ug/L)	< 10	< 10	< 10

Southwest Ohio River Tributary Watersheds Inorganic Water Chemistry Sampling Results
2017

BEETLE CREEK ADJ. EAST FORK RD.
River Code: 10-102-000
WAU: 05090201 07 05

STORET ID: 302942
River Mile: 4.85
Drainage Area: 5.1

Date Collected	7/13/2017	7/26/2017	8/10/2017
Dissolved Oxygen (DO) (mg/L)	5.78	8.38	8.27
pH (S.U.)	7.66	7.77	7.7
Specific Conductance (µmhos/cm)	468	437	465
Temperature, water (° C)	24.1	21.2	19.5
Alkalinity (mg/L)	192	203	218
Aluminum (ug/L)	< 200	233	< 200
Ammonia (mg/L)	0.0662	< 0.05	0.062
Arsenic (ug/L)	< 2	< 2	< 2
Barium (ug/L)	61.4	61.6	49.8
Cadmium (ug/L)	< 0.2	< 0.2	< 0.2
Calcium (mg/L)	73.7	75.2	72
Chemical Oxygen Demand (COD) (mg/L)	< 20	< 20	< 20
Chloride (mg/L)	24.7	10.5	13.1
Chromium (ug/L)	< 2	< 2	< 2
Copper (ug/L)	< 2	< 2	< 2
Hardness, Ca + Mg (mg/L)	224	222	216
Iron (ug/L)	159	341	226
Lead (ug/L)	< 2	< 2	< 2
Magnesium (mg/L)	9.79	8.24	8.88
Manganese (ug/L)	116	50.9	48.6
Nickel (ug/L)	2.12	< 2	2.27
Nitrate+Nitrite (mg/L)	0.41	0.681	1.23
Nitrogen, Kjeldahl (mg/L)	0.763	0.297	0.249
Nitrogen, Nitrite (NO2) as NO2 (mg/L)	< 0.02	< 0.02	< 0.02
Phosphorus (mg/L)	0.088	0.0829	0.0457
Potassium (mg/L)	6.27	4.34	3.44
Saturation (%)	68.8	94.5	90.2
Selenium (ug/L)	< 2	< 2	< 2
Sodium (mg/L)	13.8	7.56	9.24
Solids, Total Suspended (TSS) (mg/L)	< 5	8.5	< 5
Specific conductance (umhos/cm)	452	425	452
Strontium (ug/L)	176	153	164
Sulfur, sulfate (SO4) as SO4 (mg/L)	19.2	18.4	21.9
Total Dissolved Solids (mg/L)	274	256	258
Zinc (ug/L)	< 10	12.7	< 10

Southwest Ohio River Tributary Watersheds Inorganic Water Chemistry Sampling Results
2017

BRUSHY FORK @ BRUSHY FORK RD. (RD. 241)
River Code: 10-105-000
WAU: 05090201 07 05

STORET ID: 302945
River Mile: 1.00
Drainage Area: 4.0

Date Collected	7/13/2017	7/26/2017	8/10/2017
Dissolved Oxygen (DO) (mg/L)	5.6	10.24	7.55
pH (S.U.)	7.94	8.15	7.92
Specific Conductance (µmhos/cm)	384	449	433
Temperature, water (° C)	25.6	22.1	20
Alkalinity (mg/L)	134	205	181
Aluminum (ug/L)	< 200	282	204
Ammonia (mg/L)	0.0532	< 0.05	0.0667
Arsenic (ug/L)	< 2	< 2	< 2
Barium (ug/L)	39.8	43.1	38
Cadmium (ug/L)	< 0.2	< 0.2	< 0.2
Calcium (mg/L)	52.1	77.6	60.9
Chemical Oxygen Demand (COD) (mg/L)	< 20	< 20	< 20
Chloride (mg/L)	19.8	12.4	16.5
Chromium (ug/L)	< 2	< 2	< 2
Copper (ug/L)	< 2	< 2	< 2
Hardness, Ca + Mg (mg/L)	176	235	197
Iron (ug/L)	137	388	284
Lead (ug/L)	< 2	< 2	< 2
Magnesium (mg/L)	11.1	10.1	10.9
Manganese (ug/L)	59.6	34.9	46.5
Nickel (ug/L)	< 2	2.19	2.17
Nitrate+Nitrite (mg/L)	0.109	0.18	< 0.1
Nitrogen, Kjeldahl (mg/L)	0.358	0.273	0.307
Nitrogen, Nitrite (NO2) as NO2 (mg/L)	< 0.02	< 0.02	< 0.02
Phosphorus (mg/L)	0.14	0.0425	0.0327
Potassium (mg/L)	4.84	4.19	3.7
Saturation (%)	68.5	117.4	83.1
Selenium (ug/L)	< 2	< 2	< 2
Sodium (mg/L)	9.89	6.63	8.14
Solids, Total Suspended (TSS) (mg/L)	< 5	8.5	19.5
Specific conductance (umhos/cm)	364	438	411
Strontium (ug/L)	163	169	168
Sulfur, sulfate (SO4) as SO4 (mg/L)	32.5	23.3	31.2
Total Dissolved Solids (mg/L)	234	264	254
Zinc (ug/L)	< 10	< 10	< 10

Southwest Ohio River Tributary Watersheds Inorganic Water Chemistry Sampling Results
2017

SUCK RUN @ EBENEZER RD. (RD. 33)

River Code: 10-106-000

WAU: 05090201 07 05

STORET ID: 302946

River Mile: 1.70

Drainage Area: 5.2

Date Collected	7/13/2017	7/26/2017	8/10/2017
Dissolved Oxygen (DO) (mg/L)	9.42	9.14	9.35
pH (S.U.)	8.15	8.14	8.06
Specific Conductance (µmhos/cm)	388	376	396
Temperature, water (° C)	25.5	21.9	20.2
Alkalinity (mg/L)	166	181	187
Aluminum (ug/L)	< 200	918	236
Ammonia (mg/L)	< 0.05	< 0.05	0.0636
Arsenic (ug/L)	< 2	< 2	< 2
Barium (ug/L)	55.9	55.3	45.8
Cadmium (ug/L)	< 0.2	< 0.2	< 0.2
Calcium (mg/L)	56	63.4	55.6
Chemical Oxygen Demand (COD) (mg/L)	< 20	< 20	< 20
Chloride (mg/L)	10.4	5.48	7.09
Chromium (ug/L)	< 2	< 2	< 2
Copper (ug/L)	< 2	< 2	< 2
Hardness, Ca + Mg (mg/L)	202	211	192
Iron (ug/L)	100	1490	332
Lead (ug/L)	< 2	< 2	< 2
Magnesium (mg/L)	15.2	12.9	13
Manganese (ug/L)	20.9	109	20.3
Nickel (ug/L)	< 2	2.45	2.05
Nitrate+Nitrite (mg/L)	< 0.1	< 0.1	< 0.1
Nitrogen, Kjeldahl (mg/L)	0.264	0.331	0.221
Nitrogen, Nitrite (NO2) as NO2 (mg/L)	< 0.02	< 0.02	< 0.02
Phosphorus (mg/L)	0.0238	0.358	0.0613
Potassium (mg/L)	3.17	3.21	2.44
Saturation (%)	115.3	104.4	103.3
Selenium (ug/L)	< 2	< 2	< 2
Sodium (mg/L)	6.88	< 5	< 5
Solids, Total Suspended (TSS) (mg/L)	< 5	36	23.5
Specific conductance (umhos/cm)	372	360	370
Strontium (ug/L)	167	132	134
Sulfur, sulfate (SO4) as SO4 (mg/L)	28.8	20.7	25.4
Total Dissolved Solids (mg/L)	224	220	224
Zinc (ug/L)	< 10	< 10	< 10

Southwest Ohio River Tributary Watersheds Inorganic Water Chemistry Sampling Results
2017

WASHBURN RUN DST. ST. RT. 125
River Code: 10-112-000
WAU: 05090201 07 05

STORET ID: 302948
River Mile: 1.40
Drainage Area: 1.4

Date Collected	7/13/2017	7/26/2017	8/10/2017
Dissolved Oxygen (DO) (mg/L)	7.24	7.42	8.73
pH (S.U.)	7.91	7.84	7.92
Specific Conductance (µmhos/cm)	559	460	574
Temperature, water (° C)	23	19.3	18.5
Alkalinity (mg/L)	226	212	241
Aluminum (ug/L)	< 200	< 200	< 200
Ammonia (mg/L)	< 0.05	< 0.05	0.0684
Arsenic (ug/L)	< 2	< 2	< 2
Barium (ug/L)	74	71.8	67.8
Cadmium (ug/L)	< 0.2	< 0.2	< 0.2
Calcium (mg/L)	87.7	84	82.8
Chemical Oxygen Demand (COD) (mg/L)	< 20	< 20	< 20
Chloride (mg/L)	33.5	35.4	36.6
Chromium (ug/L)	< 2	< 2	< 2
Copper (ug/L)	< 2	< 2	< 2
Hardness, Ca + Mg (mg/L)	276	261	261
Iron (ug/L)	86.6	254	105
Lead (ug/L)	< 2	< 2	< 2
Magnesium (mg/L)	13.8	12.6	13.2
Manganese (ug/L)	25.9	24.8	33.2
Nickel (ug/L)	2.15	2.48	2.49
Nitrate+Nitrite (mg/L)	0.238	1.8	0.191
Nitrogen, Kjeldahl (mg/L)	0.238	< 0.4	< 0.2
Nitrogen, Nitrite (NO2) as NO2 (mg/L)	< 0.02	< 0.02	< 0.02
Phosphorus (mg/L)	0.0344		0.0266
Potassium (mg/L)	4.73	6.29	4.53
Saturation (%)	84.5	80.6	93.2
Selenium (ug/L)	< 2	< 2	< 2
Sodium (mg/L)	13.1	12.5	14
Solids, Total Suspended (TSS) (mg/L)	< 5	< 5	< 5
Specific conductance (umhos/cm)	543	530	556
Strontium (ug/L)	183	164	171
Sulfur, sulfate (SO4) as SO4 (mg/L)	25.2	24.9	25.7
Total Dissolved Solids (mg/L)	332	320	332
Zinc (ug/L)	< 10	< 10	< 10

Appendix I

Datasonde® Continuous Recorder Results

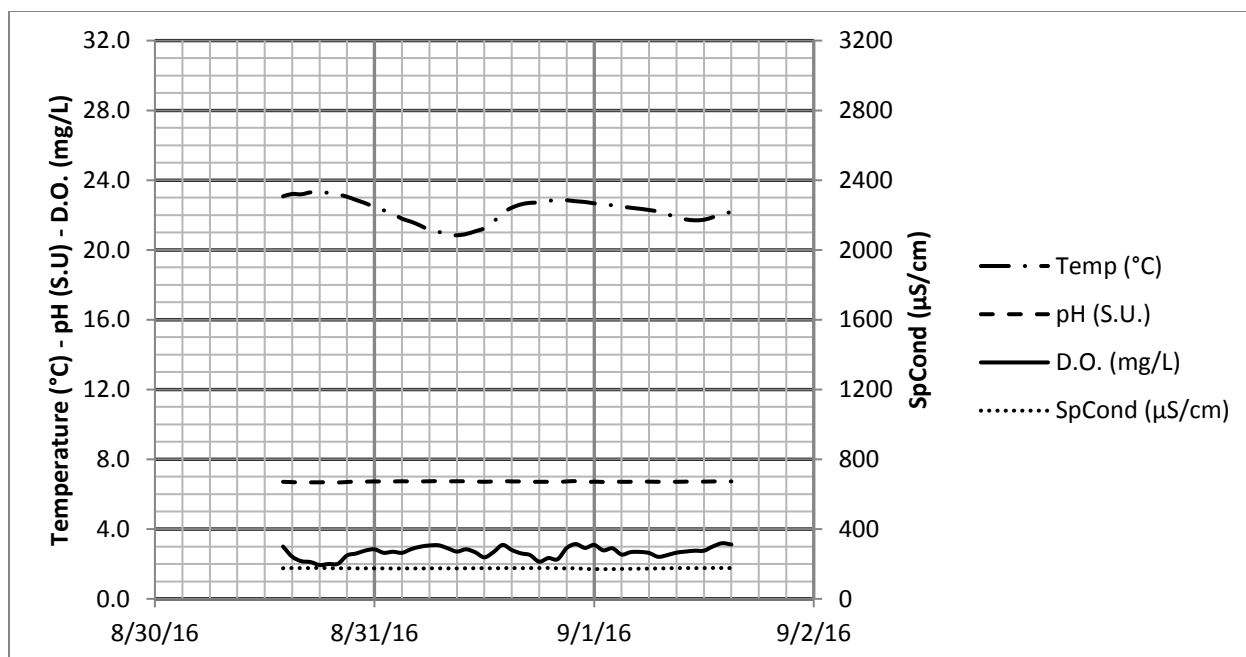


Figure 1: Plot of hourly data collected with a water quality sonde on Turkey Creek (RM 10.7; STORET: 303609). Temperature (°C), D.O. (mg/L), pH (S.U.) and specific conductance (µS/cm) are included. The data was collected from 8/30-9/1/2016.

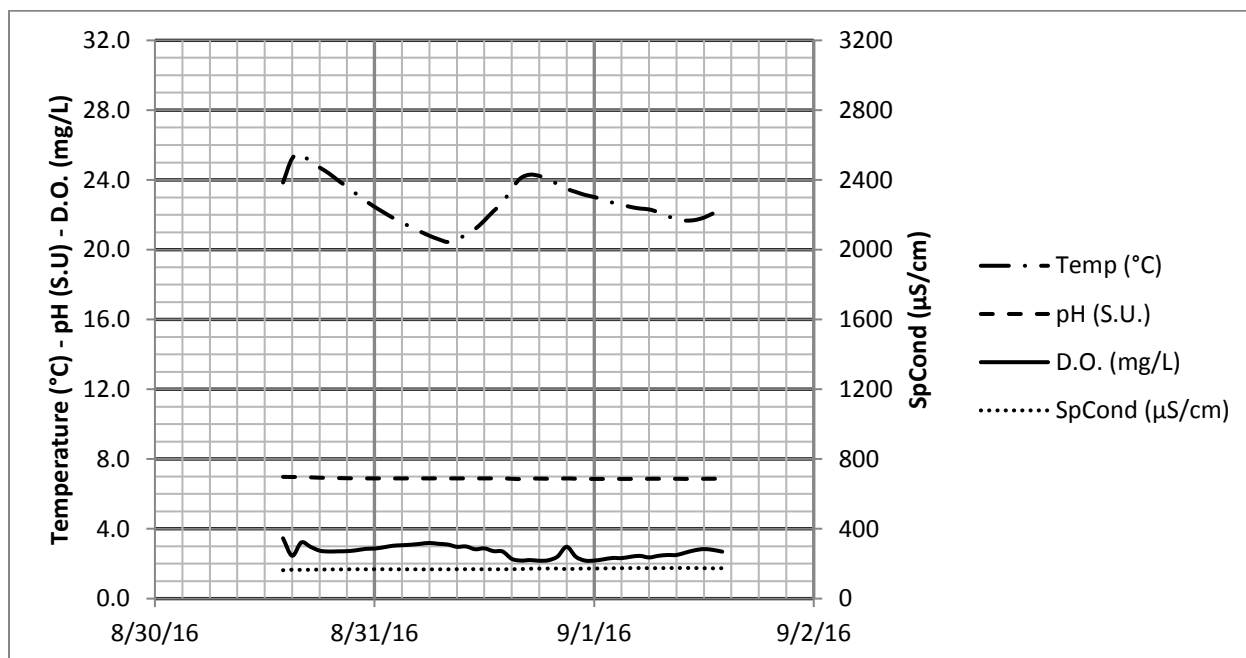


Figure 2: Plot of hourly data collected with a water quality sonde on Turkey Creek (RM 9.58; STORET: X04P03). Temperature (°C), D.O. (mg/L), pH (S.U.) and specific conductance (µS/cm) are included. The data was collected from 8/30-9/1/2016.

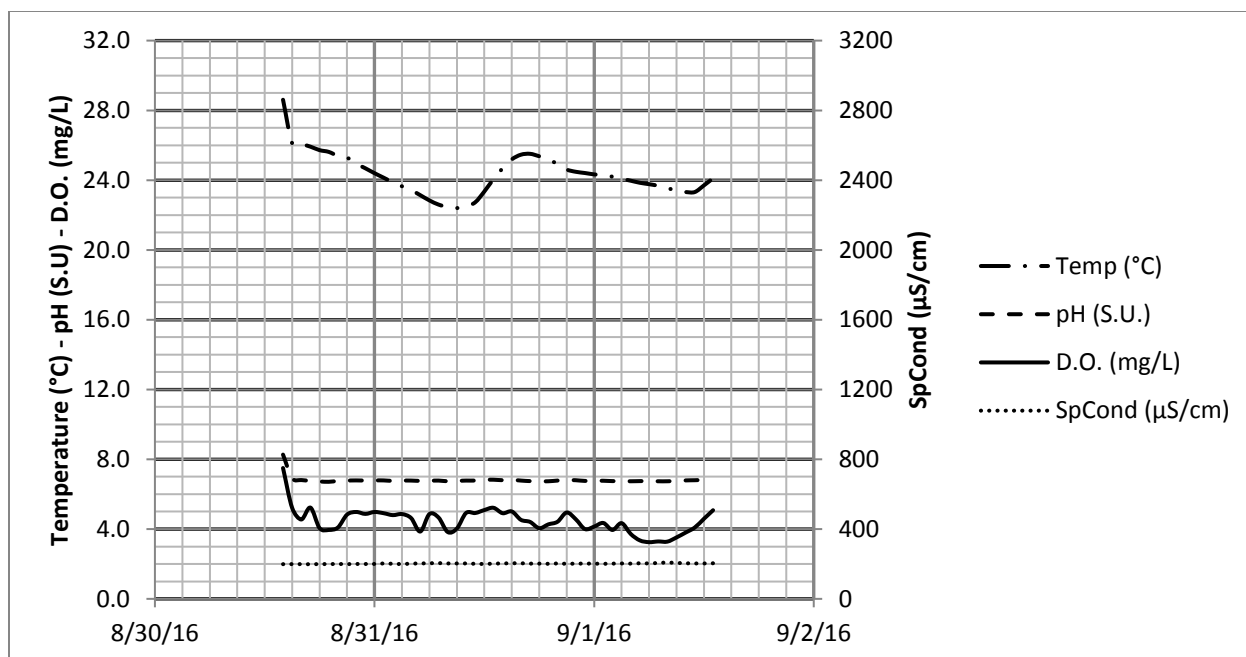


Figure 3: Plot of hourly data collected with a water quality sonde on Turkey Creek (RM 4.13; STORET: X04P02). Temperature (°C), D.O. (mg/L), pH (S.U.) and specific conductance (μS/cm) are included. The data was collected from 8/30-9/1/2016.

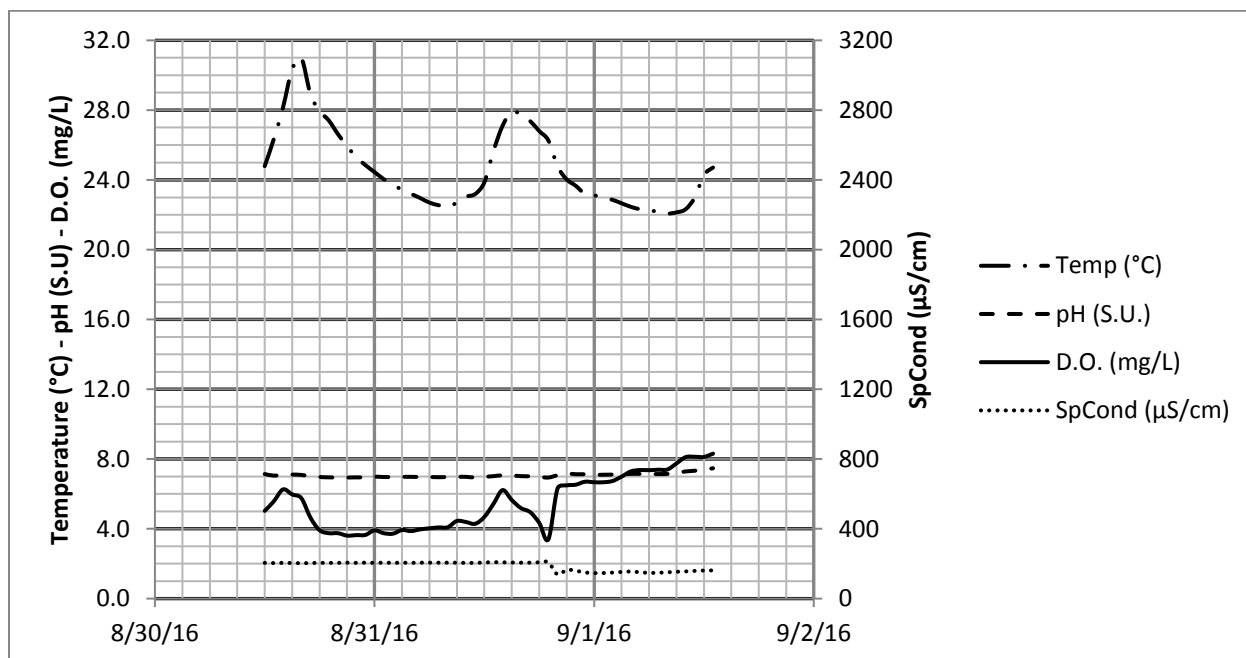


Figure 4: Plot of hourly data collected with a water quality sonde on Pond Run (RM 0.38; STORET: 303602). Temperature (°C), D.O. (mg/L), pH (S.U.) and specific conductance (μS/cm) are included. The data was collected from 8/30-9/1/2016.

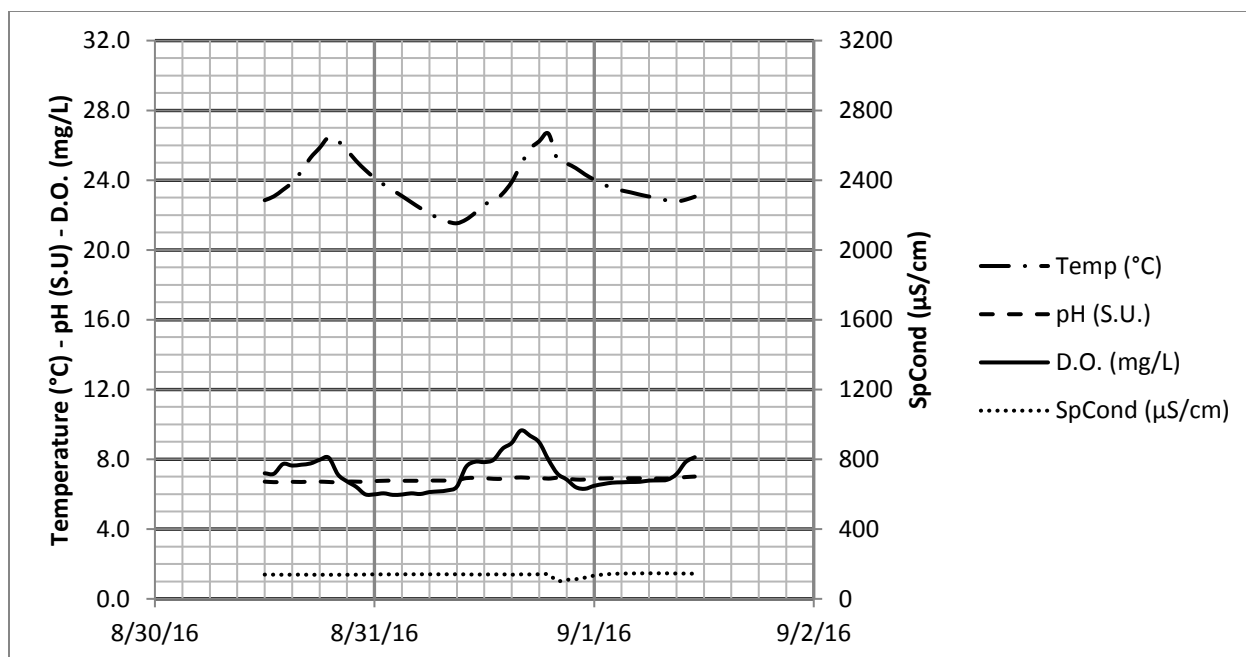


Figure 5: Plot of hourly data collected with a water quality sonde on Upper Twin Creek (RM 2.55; STORET: X04P01). Temperature (°C), D.O. (mg/L), pH (S.U.) and specific conductance (µS/cm) are included. The data was collected from 8/30-9/1/2016.

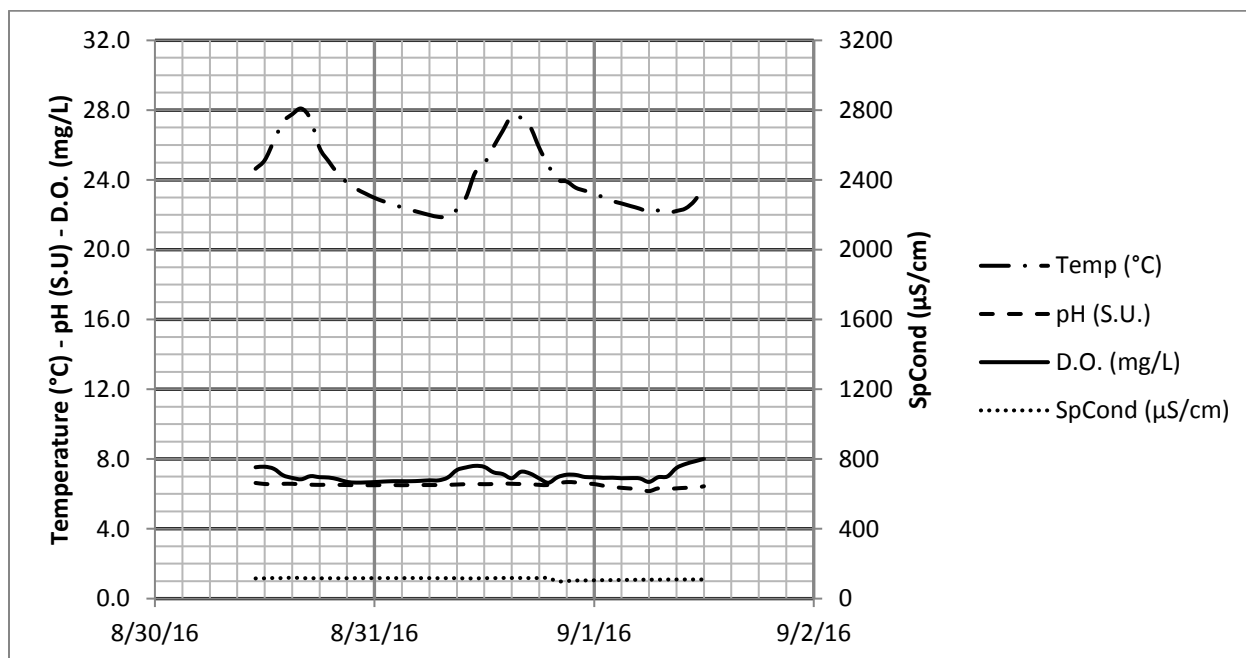


Figure 6: Plot of hourly data collected with a water quality sonde on Lower Twin Creek (RM 1.65; STORET: X99Q02). Temperature (°C), D.O. (mg/L), pH (S.U.) and specific conductance (µS/cm) are included. The data was collected from 8/30-9/1/2016.

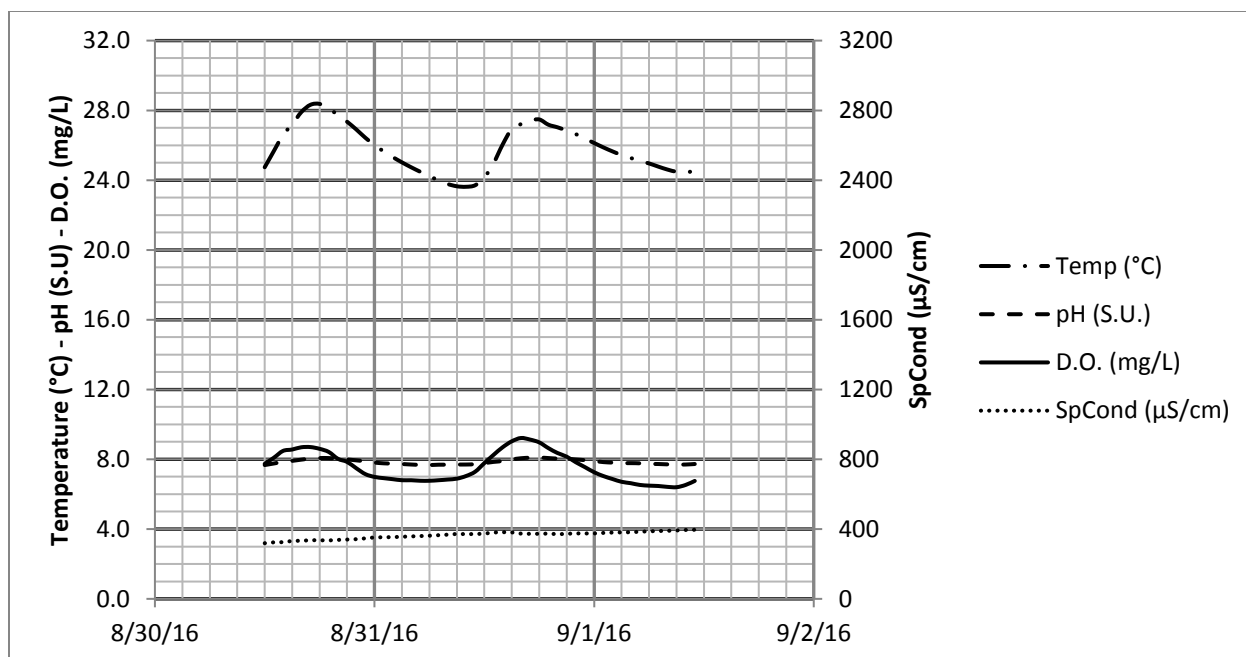


Figure 7: Plot of hourly data collected with a water quality sonde on Eagle Creek (RM 14.43; STORET: 303537). Temperature (°C), D.O. (mg/L), pH (S.U.) and specific conductance (µS/cm) are included. The data was collected from 8/30-9/1/2016.

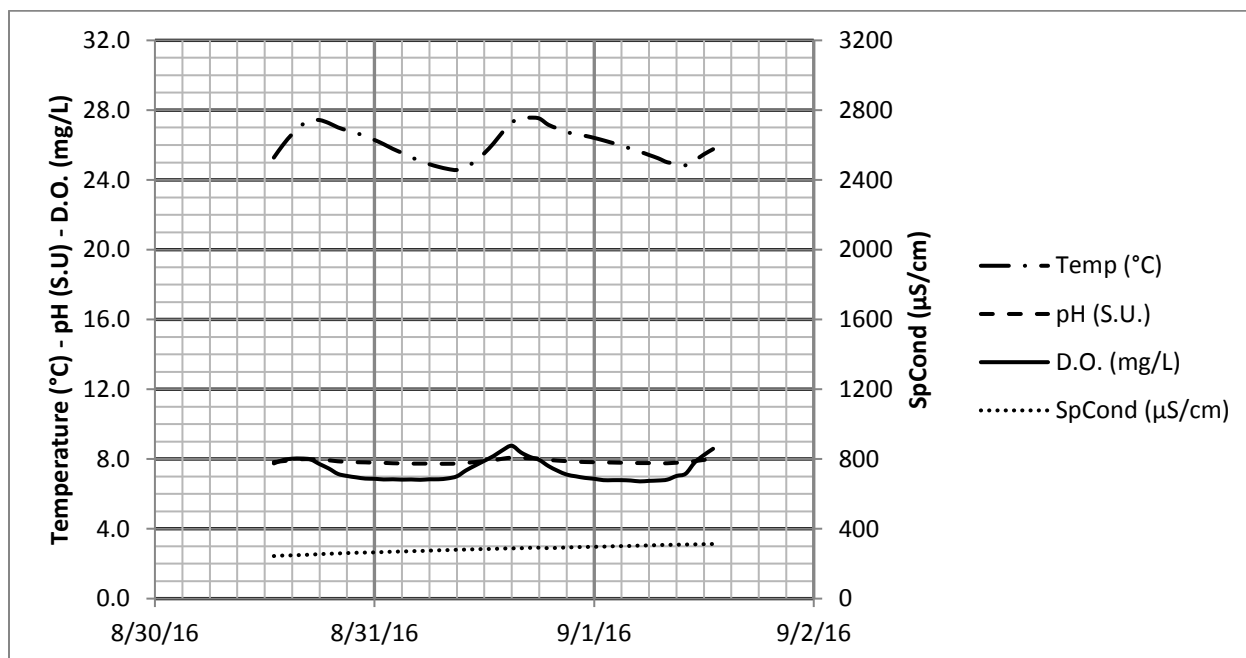


Figure 8: Plot of hourly data collected with a water quality sonde on Eagle Creek (RM 6.2; STORET: 200689). Temperature (°C), D.O. (mg/L), pH (S.U.) and specific conductance (µS/cm) are included. The data was collected from 8/30-9/1/2016.

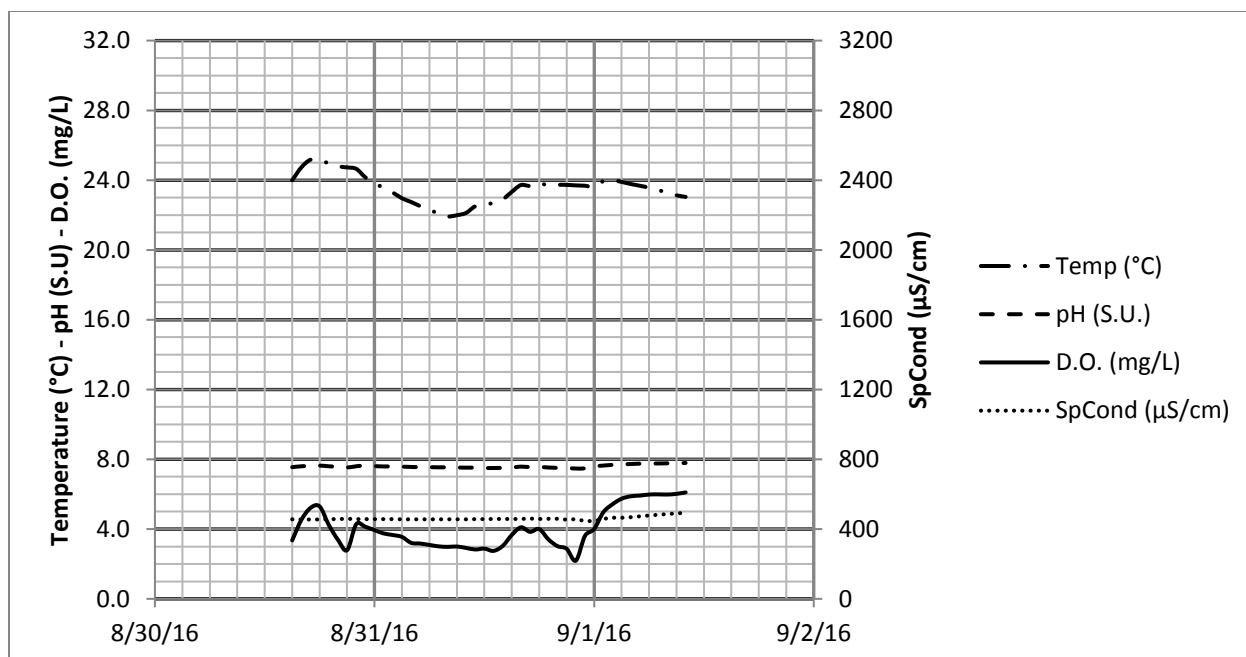


Figure 9: Plot of hourly data collected with a water quality sonde on East Fork Eagle Creek (RM 7.9; STORET: X03S03). Temperature (°C), D.O. (mg/L), pH (S.U.) and specific conductance (μS/cm) are included. The data was collected from 8/30-9/1/2016.

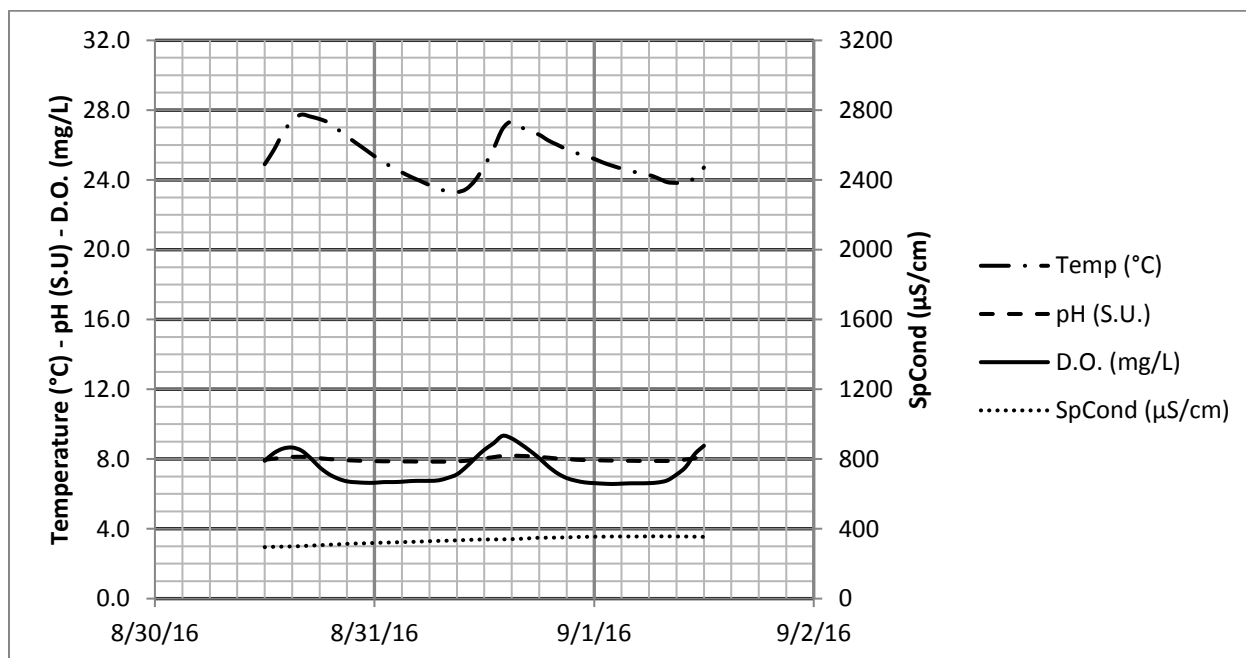


Figure 10: Plot of hourly data collected with a water quality sonde on East Fork Eagle Creek (RM 0.82; STORET: W03W04). Temperature (°C), D.O. (mg/L), pH (S.U.) and specific conductance (μS/cm) are included. The data was collected from 8/30-9/1/2016.

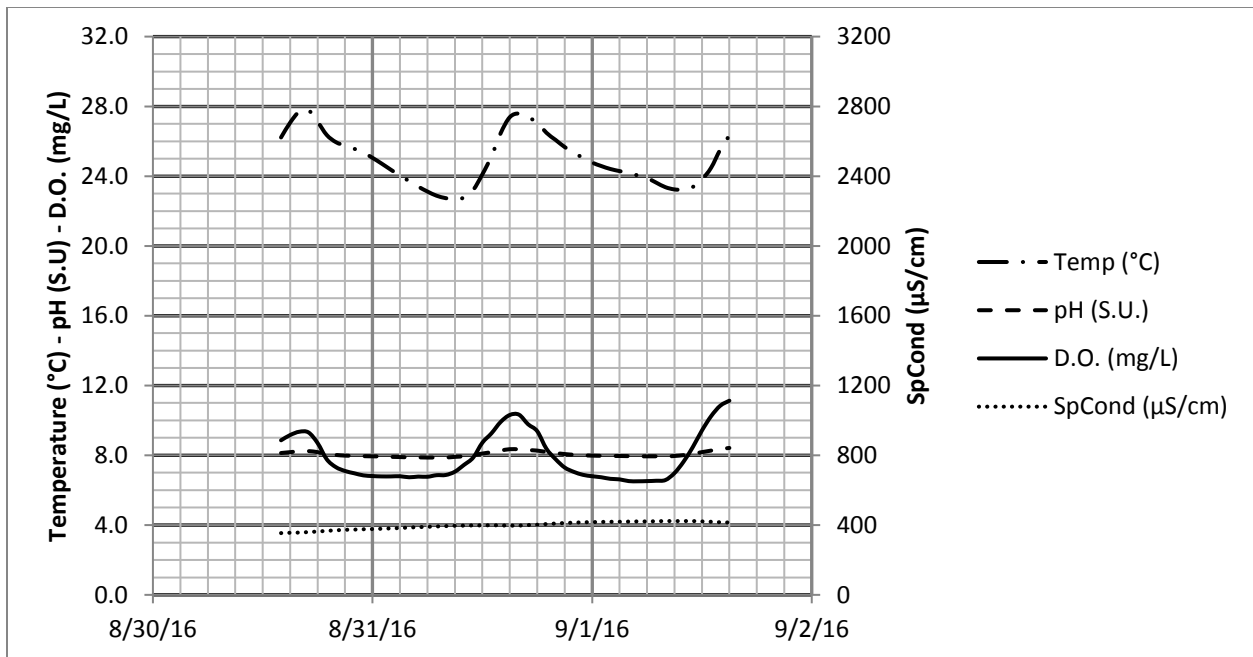


Figure 11: Plot of hourly data collected with a water quality sonde on West Fork Eagle Creek (RM 7.38; STORET: X03W05). Temperature (°C), D.O. (mg/L), pH (S.U.) and specific conductance (µS/cm) are included. The data was collected from 8/30-9/1/2016.

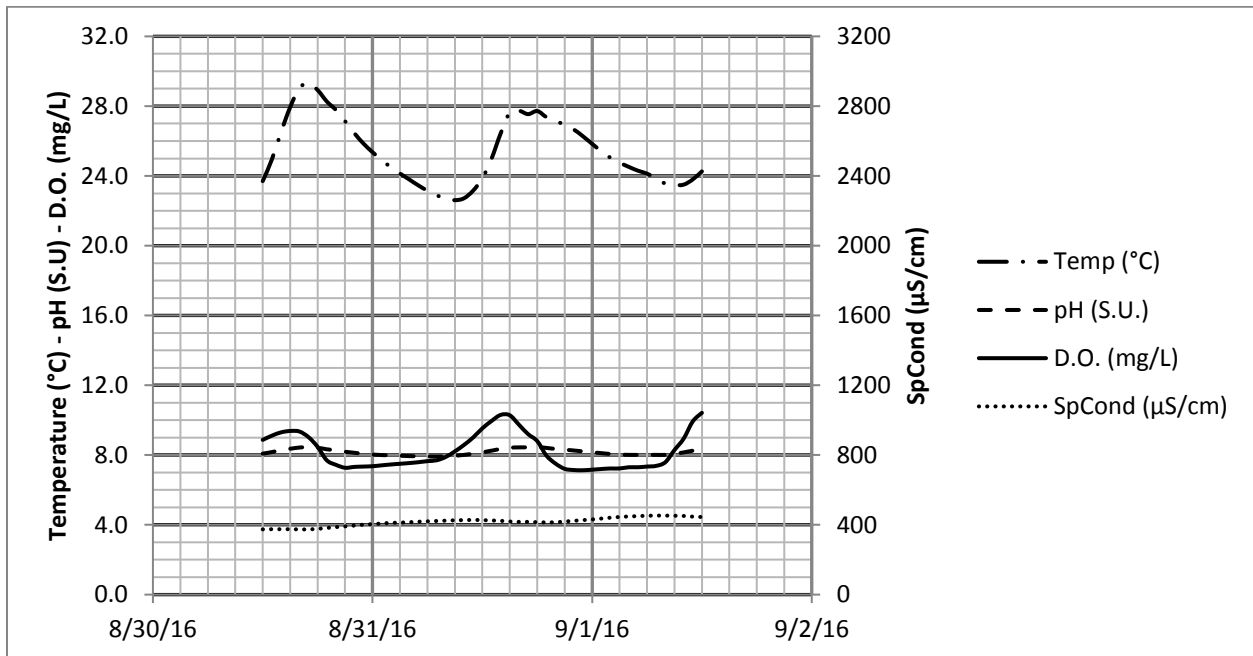


Figure 12: Plot of hourly data collected with a water quality sonde on West Fork Eagle Creek (RM 3.3; STORET:200693). Temperature (°C), D.O. (mg/L), pH (S.U.) and specific conductance (µS/cm) are included. The data was collected from 8/30-9/1/2016.

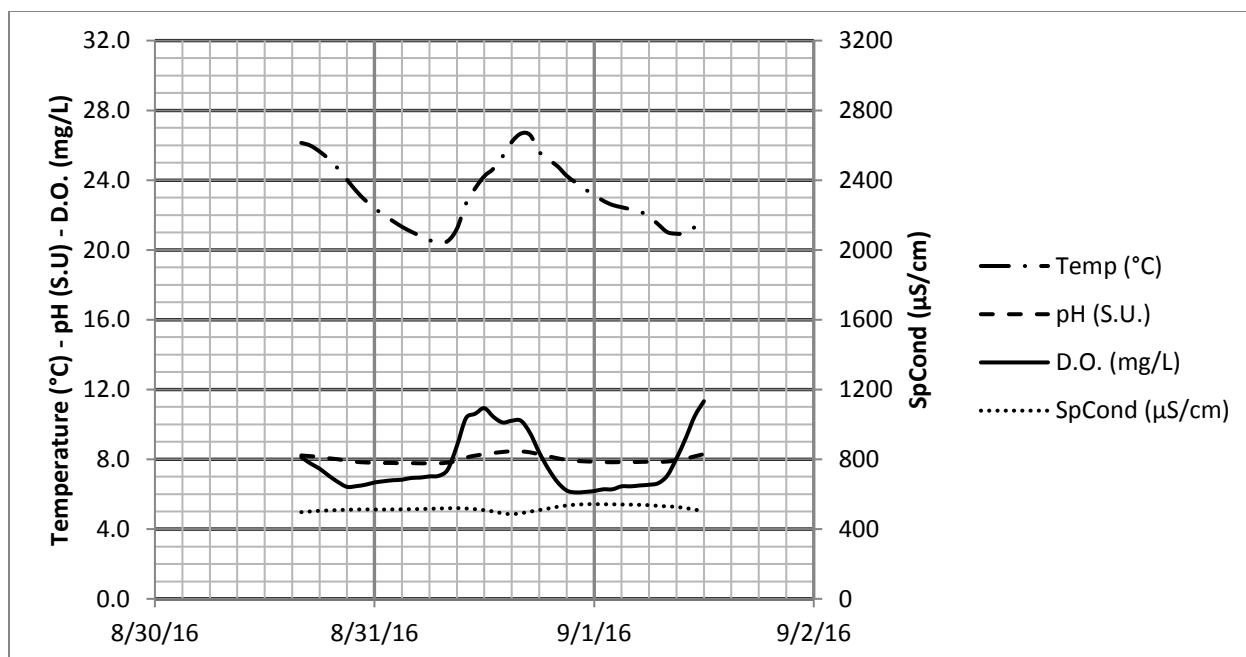


Figure 13: Plot of hourly data collected with a water quality sonde on Northwest Fork (RM 1.8; STORET: X03W07). Temperature (°C), D.O. (mg/L), pH (S.U.) and specific conductance (μS/cm) are included. The data was collected from 8/30-9/1/2016.

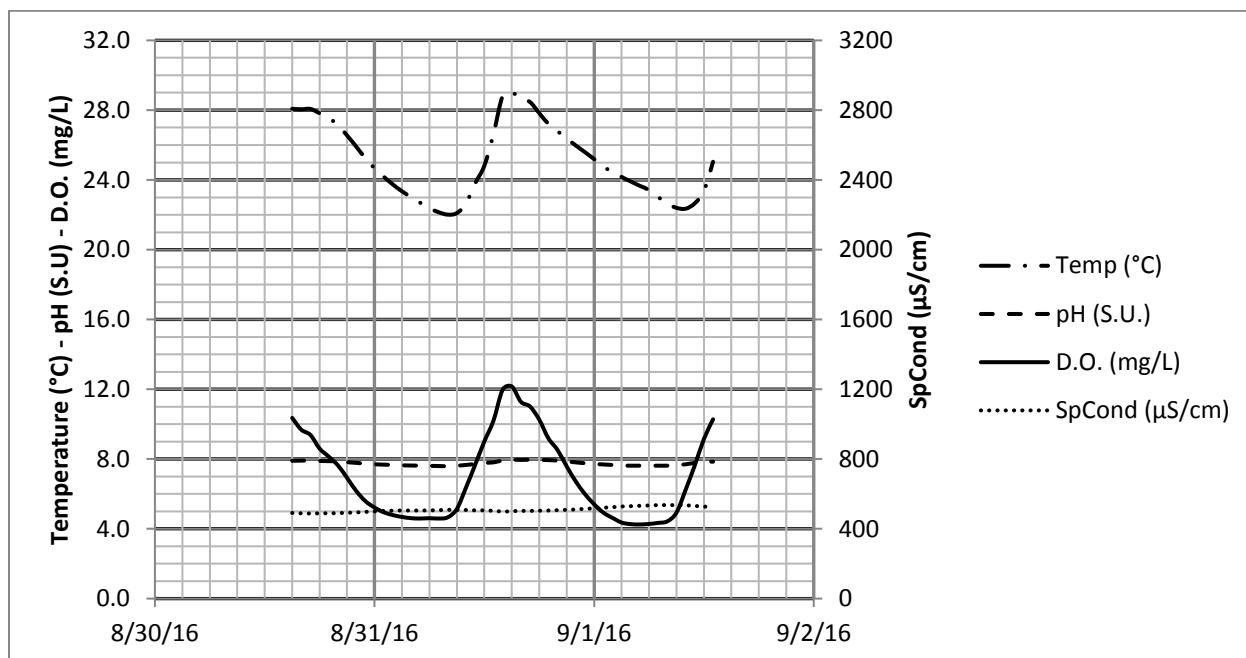


Figure 14: Plot of hourly data collected with a water quality sonde on Straight Creek (RM16.75; STORET: X03W09). Temperature (°C), D.O. (mg/L), pH (S.U.) and specific conductance (μS/cm) are included. The data was collected from 8/30-9/1/2016.

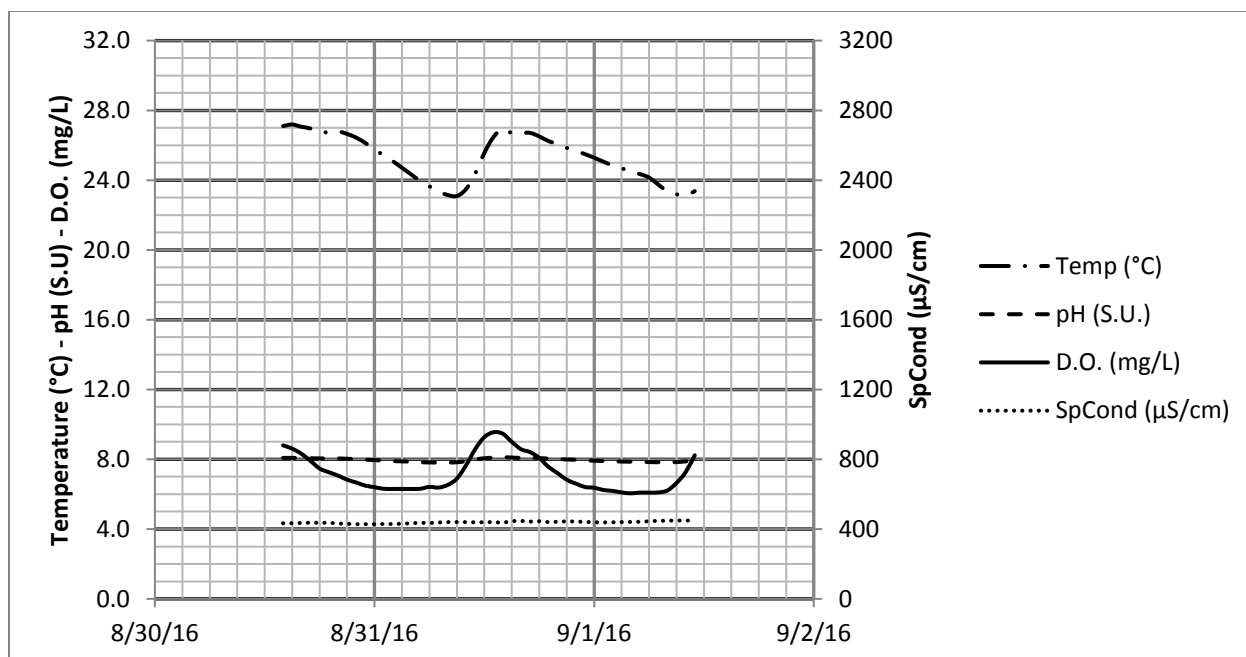


Figure 15: Plot of hourly data collected with a water quality sonde on Straight Creek (RM 9.45; STORET: X03W11). Temperature (°C), D.O. (mg/L), pH (S.U.) and specific conductance (μS/cm) are included. The data was collected from 8/30-9/1/2016.

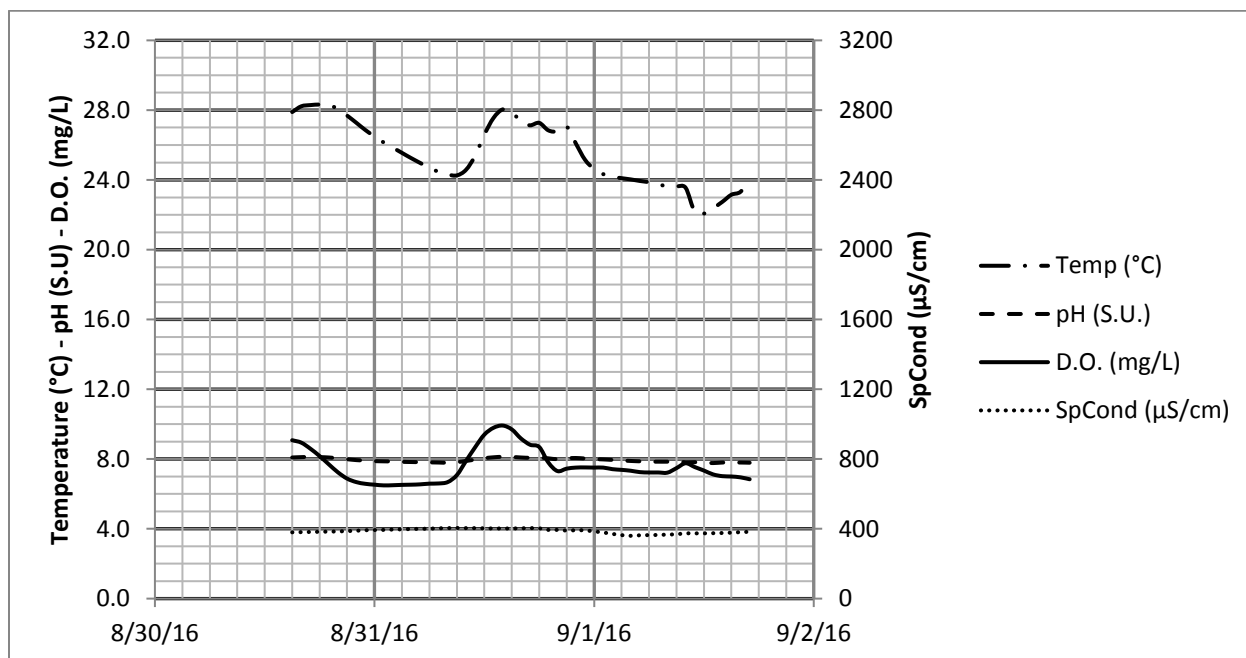


Figure 16: Plot of hourly data collected with a water quality sonde on Straight Creek (RM 2.78; STORET: X03W12). Temperature (°C), D.O. (mg/L), pH (S.U.) and specific conductance (μS/cm) are included. The data was collected from 8/30-9/1/2016.

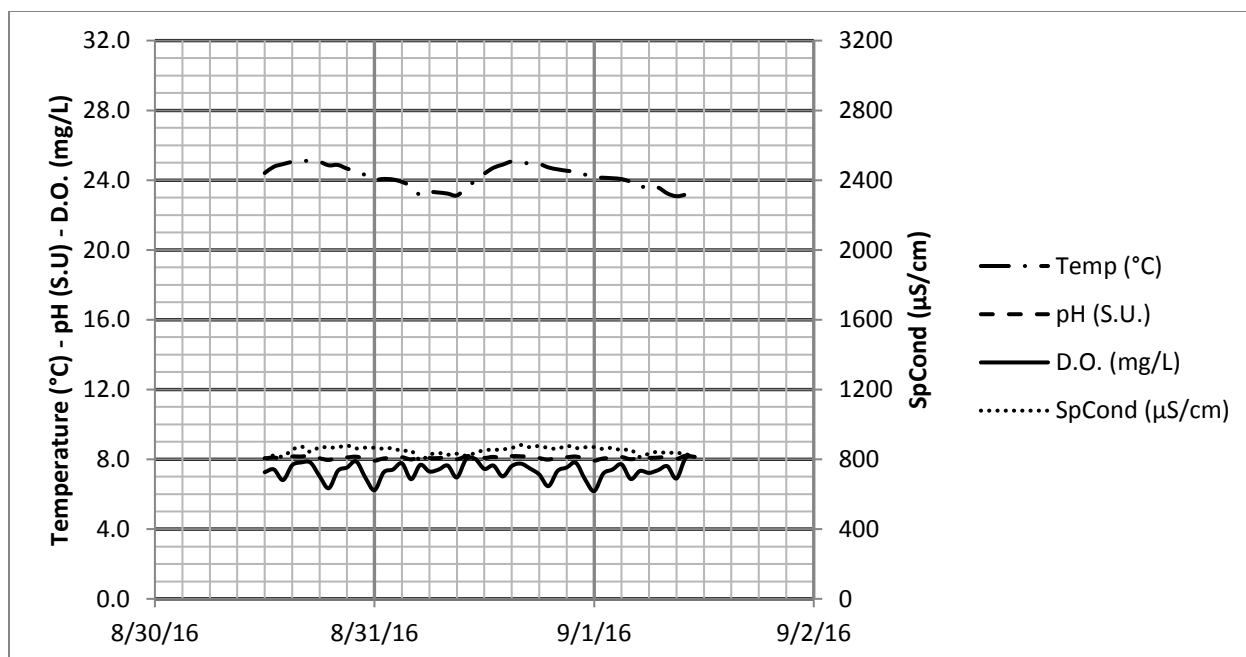


Figure 17: Plot of hourly data collected with a water quality sonde on Town Run (RM 0.63; STORET: X02W04). Temperature (°C), D.O. (mg/L), pH (S.U.) and specific conductance (μS/cm) are included. The data was collected from 8/30-9/1/2016.

Appendix J

Surface Water Bacteriological Results

Appendix Table J -- Southwest Ohio River Tributaries Watershed Bacteria Sampling Results (2016)

Station ID	Location	River Mile	WAU 05090201	Date	E.coli (#/100 ml)
303609	TURKEY CREEK DST. TURKEY CREEK LAKE	10.70	02-01	6/22/2016	4200 J
				7/07/2016	14
				7/12/2016	1
				7/19/2016	4 J
				8/04/2016	9 J
				8/18/2016	27
X04P02	TURKEY CREEK AT FRIENDSHIP @ U.S. RT. 52	4.13	02-02	6/22/2016	18 J
				7/07/2016	184
				7/19/2016	65 J
				8/04/2016	365 J
				8/18/2016	148
303602	POND RUN @ US 52 SW OF FRIENDSHIP	0.38	02-03	6/22/2016	14 J
				7/07/2016	185
				7/19/2016	15 J
				8/04/2016	4 H, J
				8/18/2016	110
303601	NACE RUN @ SHAWNEE SP MARINA UPST. DAM	0.43	02-04	6/22/2016	5820 J
				7/07/2016	2550
				7/19/2016	411 J
				8/04/2016	387 J
				8/18/2016	7310
X04P01	UPPER TWIN CREEK AT MCGAW @ U.S. RT. 52	2.55	02-05	6/22/2016	67 J
				7/07/2016	69
				7/19/2016	39 J
				8/04/2016	31 J
				8/18/2016	86

H Analysis completed outside of holding time.

J Sample qualified due to incubator temperature out of range

Appendix Table J -- Southwest Ohio River Tributaries Watershed Bacteria Sampling Results (2016)

Station ID	Location	River Mile	WAU 05090201	Date	E.coli (#/100 ml)
X99Q02	LOWER TWIN CREEK NW OF BUENA VISTA, ADJ. LOWER TWI	2.10	02-06	6/22/2016	228 J
				7/07/2016	51 J
				7/19/2016	25 J
				8/04/2016	10 J
				8/18/2016	130 J
303603	MCATEE RUN @ US 52	0.66	02-07	6/22/2016	1200 J
				7/07/2016	548
				7/19/2016	93 J
				8/04/2016	345 J
				8/18/2016	488
200741	STOUT RUN N OF ROME ADJ. BLUE CREEK RD, DST. PUNTEN	3.00	02-09	6/22/2016	1730 J
				7/07/2016	225
				7/19/2016	101 J
				8/04/2016	124 J
				8/18/2016	285
303608	SULPHUR CREEK @ SULPHUR CREEK RD.	0.35	02-10	6/22/2016	20900 J
				7/07/2016	308
				7/19/2016	68 J
				8/04/2016	23 J
				8/18/2016	1730
303612	ISAACS CREEK IN MANCHESTER @ BROADWAY ST.	1.43	06-01	6/22/2016	135 J
				7/07/2016	1200
				7/19/2016	313 J
				8/04/2016	243 J
				8/18/2016	345

H Analysis completed outside of holding time.

J Sample qualified due to incubator temperature out of range

Appendix Table J -- Southwest Ohio River Tributaries Watershed Bacteria Sampling Results (2016)

Station ID	Location	River Mile	WAU 05090201	Date	E.coli (#/100 ml)
X99Q01	L. THREEMILE CREEK E OF MAYSVILLE @ U.S. RT. 52	1.30	06-05	6/22/2016	816 J
				7/07/2016	435 J
				7/19/2016	55 J
				8/04/2016	74 J
				8/18/2016	613 J
X03S03	E. FK. EAGLE CREEK W OF WEST UNION @ TWP. RD. 231	7.90	07-02	6/22/2016	3210 J
				7/07/2016	3450
				7/19/2016	104 J
				8/04/2016	866 J
				8/18/2016	4030
200693	W. FK. EAGLE CREEK W OF DECATUR, UPST. ST. RT. 353	3.30	07-04	6/22/2016	19600 J
				7/06/2016	1990
				7/19/2016	41 J
				8/04/2016	150 J
				8/18/2016	12300
303537	EAGLE CREEK DST CONFL. WITH W FORK AND E FORK EAGLE	14.43	07-05	6/22/2016	16300 J
				7/06/2016	1410
				7/19/2016	76 J
				8/04/2016	33 J
				8/18/2016	11000
X03W11	STRAIGHT CREEK WSW OF RUSSELLVILLE @ ST. RT. 125	9.45	08-02	6/22/2016	7750 J
				7/06/2016	1550
				7/19/2016	158 J
				8/04/2016	112 J
				8/18/2016	2420

H Analysis completed outside of holding time.

J Sample qualified due to incubator temperature out of range

Appendix Table J -- Southwest Ohio River Tributaries Watershed Bacteria Sampling Results (2016)

Station ID	Location	River Mile	WAU 05090201	Date	E.coli (#/100 ml)
X03W12	STRAIGHT CREEK AT CENTERPOINT @ OLD U.S. RT. 68	2.78	08-03	6/22/2016	8210 J
				7/06/2016	2420 H
				7/19/2016	75 J
				8/04/2016	75 J
				8/18/2016	2050
X02S05	TOWN RUN JUST UPST. GEORGETOWN WWTP	0.81	10-03	6/22/2016	770 J
				7/06/2016	816 H
				7/19/2016	95 J
				8/04/2016	248 J
				8/18/2016	2420
X02S03	GEORGETOWN WWTP 001 OUTFALL TO TOWN RUN	0.80	10-03	6/22/2016	4 J
				7/06/2016	14 H
				7/19/2016	35 J
				8/04/2016	159 J
				8/18/2016	461
X02W04	TOWN RUN DST. GEORGETOWN WWTP	0.63	10-03	6/22/2016	1050 J
				7/06/2016	58 H
				7/19/2016	517 J
				8/04/2016	1990 J
				8/18/2016	687

H Analysis completed outside of holding time.

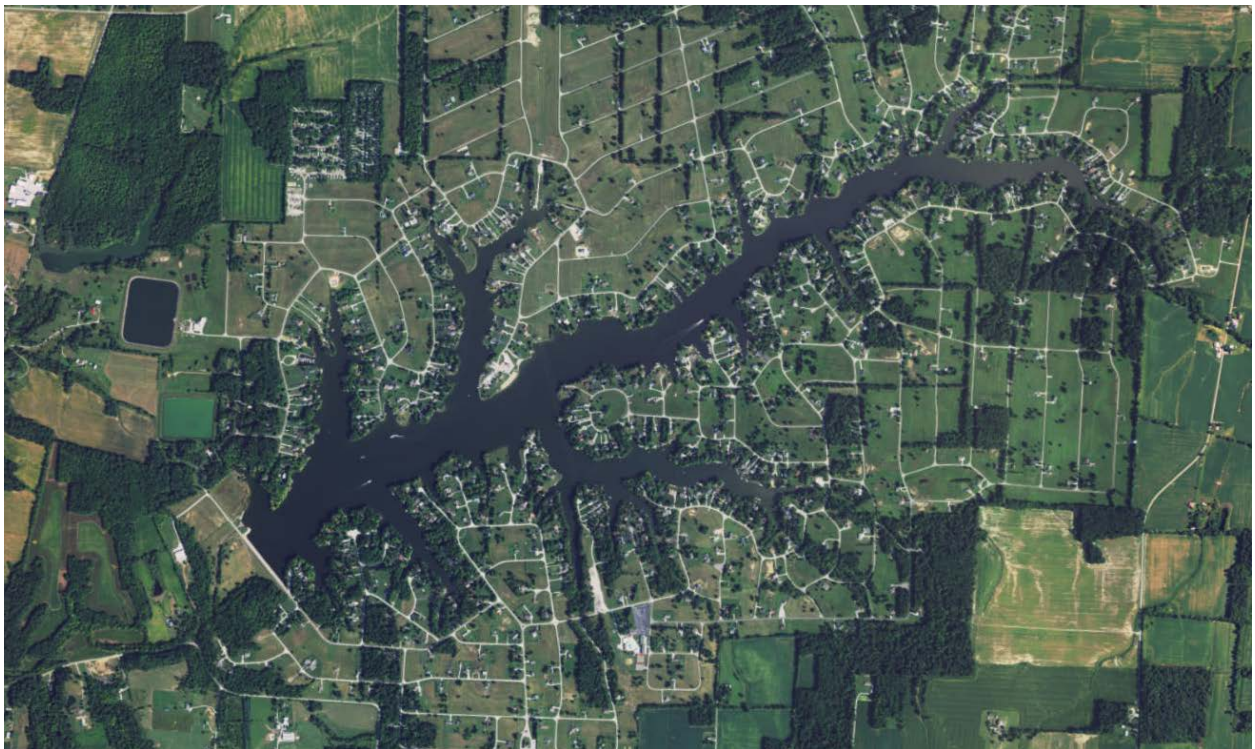
J Sample qualified due to incubator temperature out of range

Appendix K
Lake Reports



Lake Waynoka and Waynoka Water Supply Reservoirs

Inland Lake Water Quality Report



Division of Surface Water
Inland Lakes Program
August 2020

Lake Waynoka and Waynoka Water Supply Reservoirs

Inland Lake Water Quality Report

August 2020

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Introduction: Inland Lakes Monitoring

The Clean Water Act requires states to report on the status of its surface waters on a routine basis. Surface waters of the state include both streams and lakes. Lakes in Ohio include natural and artificial, or manmade, types. Natural lakes were formed by glacial activity and are fed by groundwater (seepage lake) and/or surface water (drainage lake). Constructed lakes include dugouts (ponds and quarries), upground reservoirs and impoundments. Upground reservoirs are off-stream and have surface water pumped into them, while impoundments are in-stream.

The National Hydrological Database (NHD) identifies more than 50,000 lakes in Ohio. The majority of these are small and located on private land. Ohio EPA generally limits its assessments to lakes that are open to the public with a surface area of 5 acres or more. The waterbody should also be navigable and have a maximum depth of 2 meters or more. Shallow and heavily vegetated waterbodies most likely meet the definition of a wetland. Impoundments with riverine characteristics are also omitted. Those with a residence time index (RTI) ≥ 0.5 generally behave as lakes. RTI is calculated by dividing the surface area (mi^2) by the drainage area (mi^2) and multiplying by 1000. This calculation was used in the development of a master list of lakes to be considered for inland Lakes monitoring in by the Ohio EPA. Other waterbodies that are excluded include wastewater lagoons, storm water retention basins and hatchery or aquaculture ponds.

There are about 442 lakes in Ohio that meet the conditions described above. Other potential limitations include the absence of a concrete boat ramp or a local ordinance that prohibits boating or the use of motors. The lack of a modern boat ramp does not exclude a lake from consideration, but certainly poses logistical problems. Lakes where boating is not allowed should not be assessed using inland lake methodology. If necessary, they should be sampled from the shoreline or a safe inlet or outlet structure.

The monitoring and assessment of Ohio's lakes is an important compliment to the study of stream ecosystems. The objectives remain the same and are closely tied to the goals of the Federal Clean Water Act. The objectives for monitoring inland lakes are to:

- determine beneficial uses and attainment status of applicable uses,
- identify causes and sources of impaired uses,
- track status and trends of lake quality, and
- recommend actions for improving water quality in impaired lakes.

These goals and objectives are the basis for Ohio EPA's inland lakes sampling approach.

The list of beneficial uses that may apply to inland lakes includes aquatic life, public water supply, recreation and human health (fish consumption) uses. In some instances, all beneficial uses apply to inland lakes, while in others, only certain uses apply. These uses are defined in the Ohio Water Quality Standards (Chapter 3745-1 of the Ohio Administrative Code). For the aquatic life use, 3745-1-07 (B)(1)(a) states that upground reservoirs are designated as Warmwater Habitat (WWH) and (B)(1)(c) states that all lakes and reservoirs, except upground reservoirs, are designated as Exceptional Warmwater Habitat (EWH). For the public water supply use, 3745-1-07 (B)(2)(a) states that all publicly owned lakes and reservoirs, with the exception of Piedmont Reservoir, are designated PWS. For the recreation use, 3745-1-07 (B)(3)(b) states that all surface waters of the state are designated as primary contact recreation (PCR) and (B)(3)(a) states that areas heavily used for recreation where a lifeguard or bathhouse are present are designated as bathing water.

Study Lakes

The Lake Waynoka community is a private gated community located in Brown County off Ash Ridge Arnheim Road, approximately 2 miles west of US Route 62, and south of State Route 32. It was created in the early 1970's by a real estate developer from Tennessee. The community is served by both public water supply and sanitary sewer/treatment systems.

The recreation lake (Lake Waynoka) was formed by construction of a dam on the upper reach of Straight Creek. In addition to Lake Waynoka, there are two public water supply reservoirs and a treated wastewater storage lagoon that make up the Lake Waynoka system. One of the water supplies is an impoundment of Sycamore Run – a tributary to Straight Creek, while the other is an up-ground reservoir that receives water from the Sycamore Run impoundment. Access to Lake Waynoka can be gained from a boat ramp located at about the mid-point of the lake. There is no horsepower limitation for motorboats. Public access to the two water supply reservoirs does not exist and requires coordination with the utility superintendent.



Figure 1. Geographical location of Lake Waynoka and Waynoka Water Supply Reservoirs

Attributes of Lake Waynoka & Waynoka Water Supply Reservoirs

Lake Waynoka is about 300 acres in size with a maximum depth of about 40 feet near the dam. Dredging of coves around the lake is a regular practice to maintain boat access for property owners along the shoreline. A spillway maintains a normal pool elevation, but the water level is lowered during the winter months through a bottom-release valve to facilitate the discharge of treated sanitary wastewater from the storage lagoon into Straight Creek and to protect property owner docks from ice damage.

Key Attributes of Lake Waynoka

Lake Type: Stream Impoundment

Ecoregion: Interior Plateau

Surface Area: ~300 acres

Maximum Depth: ~40 ft.

Drainage Area: ~6 mi²

Shoreline: ~15 miles

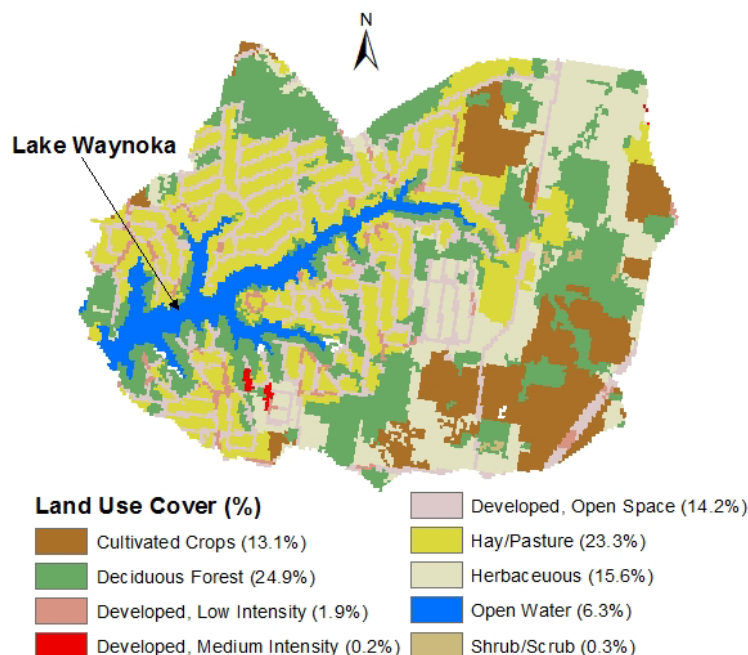


Figure 2. Lake Waynoka Land Use Cover

Lake Waynoka's up-ground water reservoir is used to store water to be treated prior to distribution. The square reservoir is constructed of earth with rock armoring on the interior embankment. Water from the supply reservoir is periodically transferred to the up-ground reservoir to ensure there is a sufficient volume of good quality water to serve the fluctuating demand of the community served. Pumps at the shore transfer water to the nearby water treatment plant.

Key Attributes of Waynoka Up-ground Reservoir

Lake Type: Constructed Up-ground Reservoir
 Surface Area: ~11.5 acres
 Drainage Area: NA

Ecoregion: Interior Plateau
 Depth: ~11.5 ft.
 Shoreline: ~0.5 mile

Lake Waynoka's Water Supply Reservoir is also known as Sycamore Run Reservoir as it is an impoundment of the upper reach of Sycamore Run. Discharge from the reservoir occurs through a four-sided outlet structure located approximately 50 feet from the shore of the earthen dam. This structure maintains a fixed overflow level. There is a pump house on the shore east of the dam where water is transferred from this reservoir to the up-ground storage reservoir. Water transfers are coordinated to occur at times when water quality is optimal and to stay ahead of periods of highest demand (summer).

Key Attributes of Waynoka Water Supply Reservoir

Lake Type: Stream Impoundment
 Ecoregion: Interior Plateau
 Surface Area: ~11 acres
 Depth: ~15 ft.
 Drainage Area: ~1 mi²
 Shoreline: ~1.2 miles

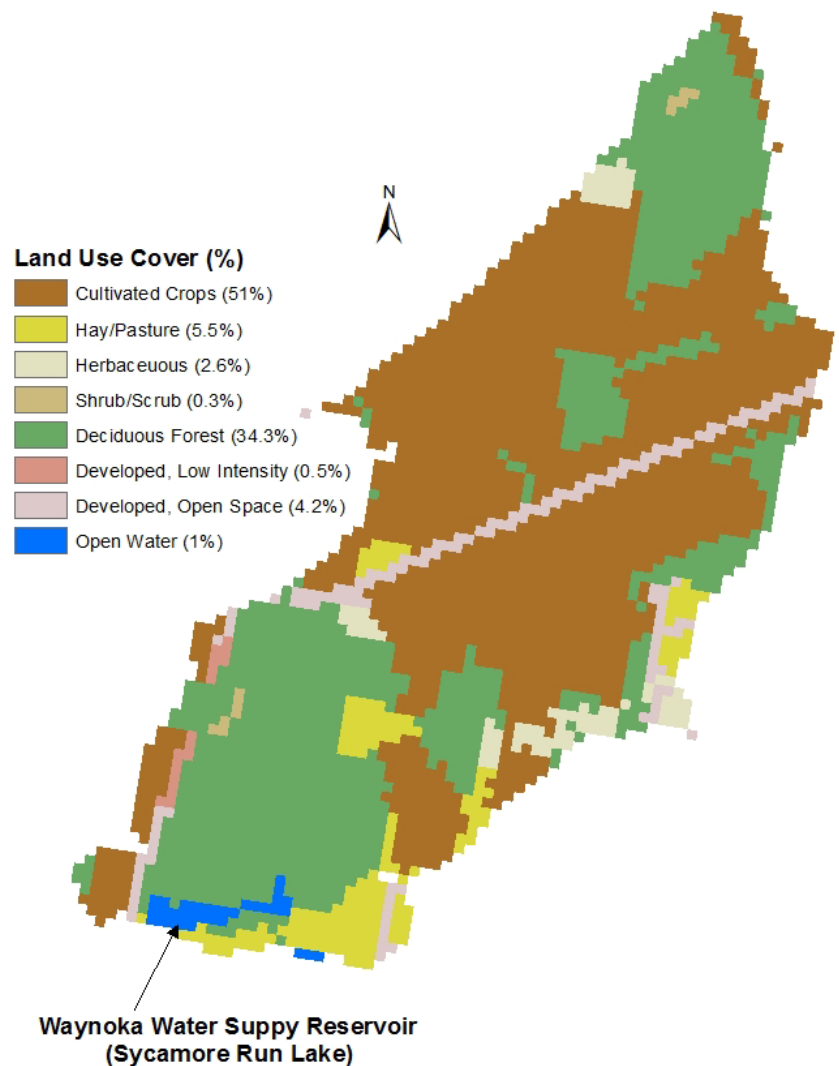


Figure 3. Water Supply Reservoir Land Use Cover

Watershed Overview

Lake Waynoka is formed from the headwaters of Straight Creek and the Waynoka Water Supply Reservoir initiates at the headwater of Sycamore Run which is a tributary to Straight Creek downstream from Lake Waynoka. The small drainage areas for both waterbodies feature flat to gently sloping topography and soils consisting mainly of Clermont Silt Loam, Rossmoyne Silt Loam and Westboro-Schaffer Silt Loam. These soils are characterized as draining somewhat poorly to very poorly.

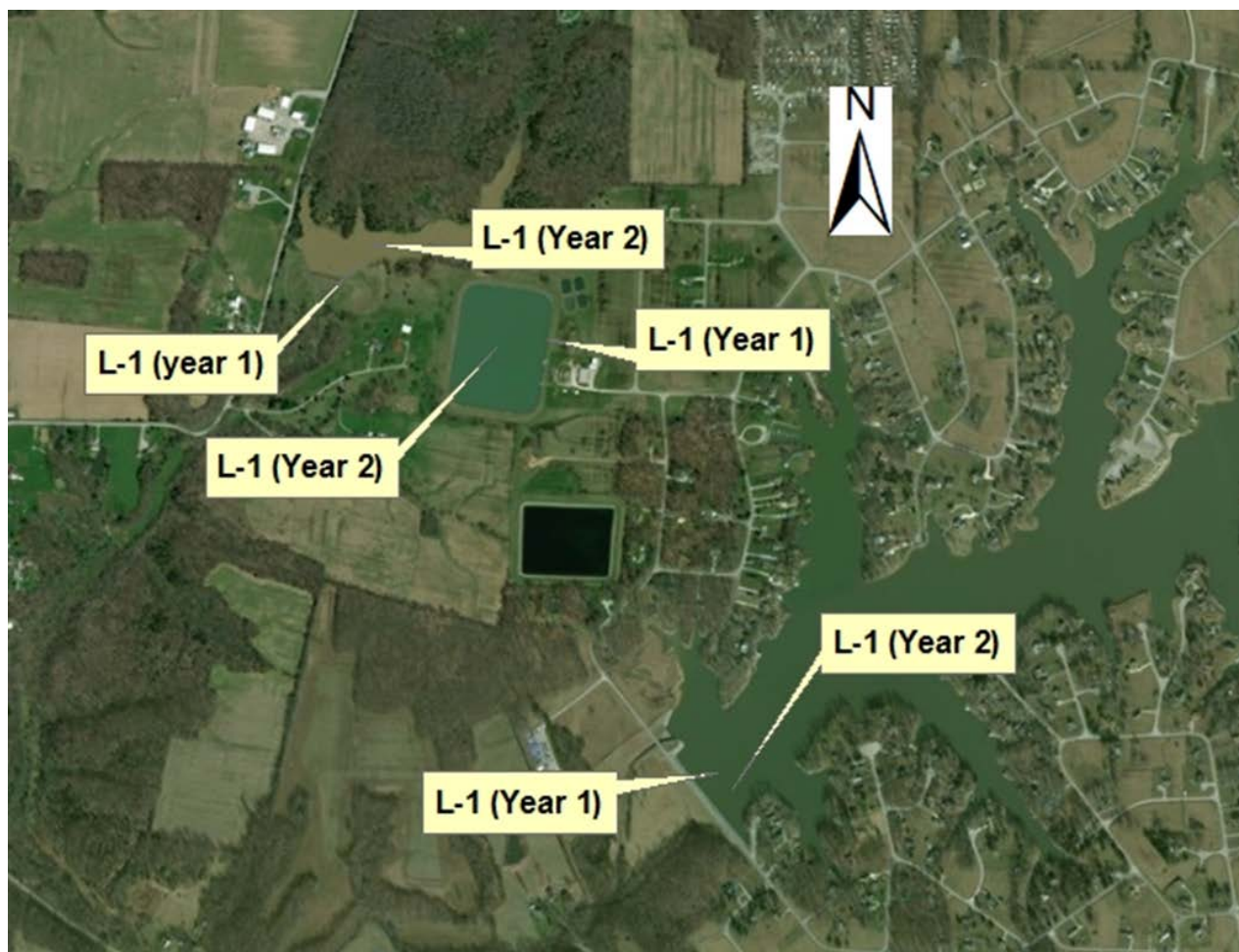


Figure 4. Locations of L-1 Monitoring Stations in 2015-2016

Results Discussion

Water Column Chemistry

In 2015 and May 2016, samples for only cyanotoxins and atrazine were collected from the upper photic zone of the two water supply reservoirs using an integrated tube sampler deployed out into the water from the shore. Beginning in June 2016, both surface and bottom samples were collected from these reservoirs using watercraft that allowed access out onto the water near the water intake structures. Also, toxin samples from the water supply reservoirs were collected from the full photic zone (twice the secchi disk depth, not greater than 2 meters) in 2016. Lake Waynoka was sampled following normal methods and procedures in both 2015 and 2016.

Data used to determine the Aquatic Life Use status for Lake Waynoka and Waynoka Water Supply Reservoirs are summarized in the Beneficial Use Assessment section of this report. Aquatic life parameters evaluated include dissolved solids, arsenic, cadmium, chromium, copper, lead, nickel, selenium and zinc. Individual sample concentrations are first compared to Outside Mixing Zone Average (OMZA) numeric criteria in Ohio Administrative Code 3745-1-04. If the OMZA is exceeded in more than 10% of the total samples tested, for any parameter, the use is considered to be ‘non-support’ of the ALU benchmarks for lakes.

Reservoir Treatment Additives

To prevent, and in reaction to, problems associated with algal blooms, Waynoka Utilities has periodically added copper sulfate to both water supply reservoirs in the form of granules dispensed from a boat. Prior to 2016, 150 pounds of copper sulfate was typically added to the water supply reservoir (Sycamore Run) once late in the year. A water gun connected to the water transfer pumps dispersed the copper in the lake.

Beginning in May 2016, approximately 100 pounds of copper sulfate was added to the Sycamore Run reservoir once every two weeks. 150 pounds of copper sulfate has historically been added to the upground reservoir every three weeks but with the detection of saxitoxin in 2016, the frequency was increased to once every two weeks. Less copper was said to have been added as the water level was drawn down and toxin levels decreased.

When saxitoxin was detected in Sycamore Run in 2016, Waynoka Utilities added approximately 1,500 pounds of an algaecide called GreenClean® PRO, by BioSafe Systems, LLC. This product contains sodium carbonate peroxyhydrate that, when applied, becomes sodium carbonate and hydrogen peroxide. The hydrogen peroxide provides a powerful oxidation reaction, killing algal cells on contact. This product was deemed too expensive for continued use.

Application of copper sulfate in both reservoirs is now performed by dragging a perforated bucket containing granular copper sulfate around each reservoir using a boat. Applications typically begin in May and are done to achieve a stated target copper concentration of approximately 80 ug/l.

The use of copper sulfate resulted in copper being detected in each sample collected from the water supply and up-ground reservoirs during 2016. Each result exceeded the Outside Mixing Zone Average criteria, shown in Table 1.

Table 1. Copper results for Waynoka water supply reservoirs

Date	Copper (ug/l)			
	Water Supply Reservoir (Sycamore Run)		Up-Ground Water Supply Reservoir	
	Surface	Bottom	Surface	Bottom
5-18-2016	273	103	128	133
6-7-2016	101	87.5	248	103
7-6-2016	87.2	49.1	106	104
8-2-2016	16.7	17.7	122	124
9-7-2016	55.3	61.1	46.6	58.7

OMZA for Water Supply Reservoir, based on an average hardness of 64.2 mg/l (51-71 mg/l), is 6.4 ug/l

OMZA for Up-ground Water Supply Reservoir, based on an average hardness of 78.6 mg/l (74-86 mg/l), is 7.6 ug/l

NOTE: Surface samples used for assessing metals criteria; bottom samples are included for information and perspective.

Useful information was also obtained from samples collected near the bottom of each waterbody. This occurred during both years for Lake Waynoka and during the second year for the water supply reservoirs. The hypolimnion can become depleted of oxygen if consumption by decomposing organic matter exceeds reaeration by atmospheric diffusion and photosynthesis. Fish access to habitat, cool water and benthic prey can be limited if conditions become hypoxic (Dissolved oxygen < 2 mg/L). Dissolved oxygen measurements for the Up-Ground Water Supply Reservoir show that hypoxic conditions existed during July, August and September 2016, each at a depth of only 1.5 meters; many readings were less than 0.5 mg/l. Except for May, when only a surface and bottom reading were measured (with the bottom reading being 1.38 mg/l), hypoxic conditions existed in the Water Supply Reservoir (Sycamore Run) at a depth of only 1.5 meters with many readings below 0.5 mg/l.

Chemistry data from samples collected 0.5 m from the bottom of Lake Waynoka indicate that phosphorus is likely bound to sediment particles and is being released to the water column due to redox reactions that break the bond between phosphate molecules and calcium and iron. Mean total phosphorus concentration at the surface for the 10 sampling events at Lake Waynoka was 31.79 ppb and bottom mean concentration was 203.4 ppb. This release of nutrients can stimulate fall algae blooms when thermal stratification is broken and the lake “turns over”.

Results for bottom samples collected from the up-ground reservoir were similar to or less than surface sample results. This is not unexpected given that there is a minimal sediment load to the reservoir and shallow water depth. Water Supply Reservoir (Sycamore Run) bottom chemical results matched or were slightly below surface sample results. This may be explained by the shallow water depth. It is unknown whether Sycamore run receives high sediment loads from its watershed.

Sediment Chemistry

A surface sediment sample was collected from Lake Waynoka in 2015 and from the water supply reservoir in 2016 using a Petite Ponar dredge. Sediment samples were not collected from the up-ground reservoir because sediment was not expected to be present given water transfers from the water supply reservoir are conducted when suspended solids concentration is low. The 2015 sample from Lake Waynoka was analyzed for only TOC and phosphorus and the 2016 sample from the water supply reservoir was analyzed for TOC, metals, nutrients, s-VOCs (PAHs), PCBs and pesticides (organo-chlorine insecticides). There were no detections for PAHs, PCBs or pesticides.

Ohio does not currently have codified WQS for the protection of aquatic life based on sediment data, so the evaluation of results consists of referencing several commonly-cited resources to determine if sediment pollutants may potentially contribute to ecological stress. Sediment data were evaluated using Ohio Sediment Reference Values (SRVs) (Ohio EPA 2008) along with guidelines established in Development and Evaluation of Consensus-Based Sediment Quality Guidelines for Freshwater Ecosystems (MacDonald et. al. 2000). Ohio EPA SRVs represent ecoregion background conditions for metals based on data collected at Ohio reference sites. These values were developed for lotic (flowing) water bodies and are based on Ohio ecoregions. Sediment concentrations for lentic (non-flowing) surface water bodies can be screened using these values. MacDonald guidelines define two levels of ecotoxic effects. A Threshold Effect Concentration (TEC) is a level of sediment chemical quality below which harmful effects are unlikely to be observed, and can be considered comparable to background conditions. A Probable Effect Concentration (PEC) indicates a level above which harmful effects are likely to be observed. These guidelines include both metals and organic parameters.

Finally, guidelines established by the Ontario Ministry of the Environment (Persuad et. al. 1993) were used to evaluate sediment sample results for total organic carbon (TOC) and total phosphorus (TP). These guidelines include the Lowest Effect Level (LEL) and the Severe Effect Level (SEL). The LEL is a level of sediment concentration that can be tolerated by a majority of benthic organisms. The SEL is a concentration considered harmful to most benthic organisms. Values shaded orange in the table below indicate values above the Lowest Effect Level (LEL).

For the water supply reservoir, concentrations of metals were below the Ohio SRVs for the Interior Plateau ecoregion. Copper and zinc exceeded the LEL, but were still below the SEL. Nickel and zinc exceeded both the TEC and LEL, but were also still below the PEC and SEL. Thus, the sediment sample did not contain metals in concentrations exceeding the paired, more protective reference value (the PEC or the SEL). Although metals are not expected to be an issue for Lake Waynoka sediment, the lack of metals monitoring is a deficiency.

Sediment nutrient concentrations were slightly elevated for both Lake Waynoka and the Water Supply Reservoir. The TOC sample result of 3.0% (Water Supply Reservoir) and 3.7% (Lake Waynoka) exceeded the LEL of 1%. For the water supply reservoir, the cadmium level of 0.594 mg/kg exceeded the LEL of 0.3 mg/kg and the copper level of 80.4 mg/kg and zinc level of 147 mg/kg exceeded the LEL, SRV and TEC. Additionally, the sediment sample result of 1,250 mg/kg Total Phosphorous for Lake Waynoka exceeded the LEL of 600 mg/kg.

The copper concentration in the sediment of the water supply reservoir is most certainly tied to the use of copper sulfate and its tendency to be bound in sediments. It may also be indicative of copper sulfate granules not completely dissolving before falling to the bottom of the reservoir. The phosphorous concentration in Lake Waynoka sediment indicates a baseline concentration which likely represents an internal load of phosphorus that may contribute to algal growth. Given the high levels of phosphorous in the water column of the water supply reservoir, it is likely present in the sediment; further study would help verify this conclusion.

Table 2. Sediment results for Lake Waynoka and the Water Supply Reservoir

Sediment Concentrations (mg/kg)						
Parameter	Lowest Effect Level (LEL)	Ohio Reference Values (SRV)	Threshold Effect Concentration (TEC)	Probable Effect Concentration (PEC)	Lake Waynoka	Water Supply Reservoir
TOC (%)	1	-	-	-	3.7	3.0
Arsenic	6	11	9.79	33	NT	5.36
Cadmium	0.6	0.3	0.99	4.98	NT	0.594
Chromium	26	30	43.4	111	NT	16.0
Copper	16	25	31.6	149	NT	80.4
Lead	31	-	35.8	128	NT	28.7
Nickel	16	33	22.7	48.6	NT	14.5
Selenium	-	1.6	-	-	NT	ND
Aluminum	-	28,000	-	-	NT	18,500
Barium	-	170	-	-	NT	160
Calcium	-	94,000	-	-	NT	5,130
Iron	-	31,000	-	-	NT	21,800
Magnesium	-	20,000	-	-	NT	2,700
Manganese	460	1,400	-	-	NT	359
Potassium	-	5,900	-	-	NT	ND
Sodium	-	-	-	-	NT	ND
Strontium	-	-	-	-	NT	ND
Zinc	120	100	121	459	NT	147
T-Phosphorus	600	-	-	-	1,250	NT
NT=Not Tested ND = Not Detected SRV values applicable to Interior Plateau Above LEL Above SRV						

Phytoplankton Results

The phytoplankton community in each water body included in this study was characterized based on water samples collected from the photic zone using an integrated tube sampler deployed to twice the Secchi depth, to a maximum of 2 meters (m). Samples were collected at L1 in Lake Waynoka and the Water Supply Reservoir (Sycamore Run) during three of the five sampling events (May, July, and September) of 2016, and during May and September 2016 in the Up-Ground reservoir (severe weather prevented collection in July). Samples were preserved with Lugol's solution and submitted to BSA Environmental Services, Inc. for analysis. The phytoplankton present in a representative aliquot were identified to at least genus level (usually species), and cell densities (cells/L) and bio-volumes ($\mu\text{m}^3/\text{L}$) were estimated in accordance with *Standard Methods for the Examination of Water and Wastewater* Method No. 10200 (Rice, Baird, & Eaton, 2017).

Phytoplankton communities typically exhibit a seasonal succession when factors like water temperature, nutrients, transparency and photoperiod favor certain types. Grazing by larval fish and zooplankton also effect community composition. Temperate lakes in Ohio are usually dominated by diatoms in the spring until micronutrients like silica are depleted by blue green algae (cyanobacteria) in the fall when an ability to control buoyancy and fix nitrogen from the atmosphere gives certain types a competitive advantage.

The population at each water body contained five to seven different classes of algae. When breaking down the results by sampling event, the total biovolume of cyanobacteria was notably higher in the mid to late summer samples – especially in the water supply reservoir (98%). The breakdown of the phytoplankton dynamics from each sampling event is presented in Figures 5-7 below.

A community dominated by cyanobacteria is of concern when toxin-producing phytoplankton are present. Discussion of cyanotoxin sampling results is contained below in the Recreation Use Assessment section.

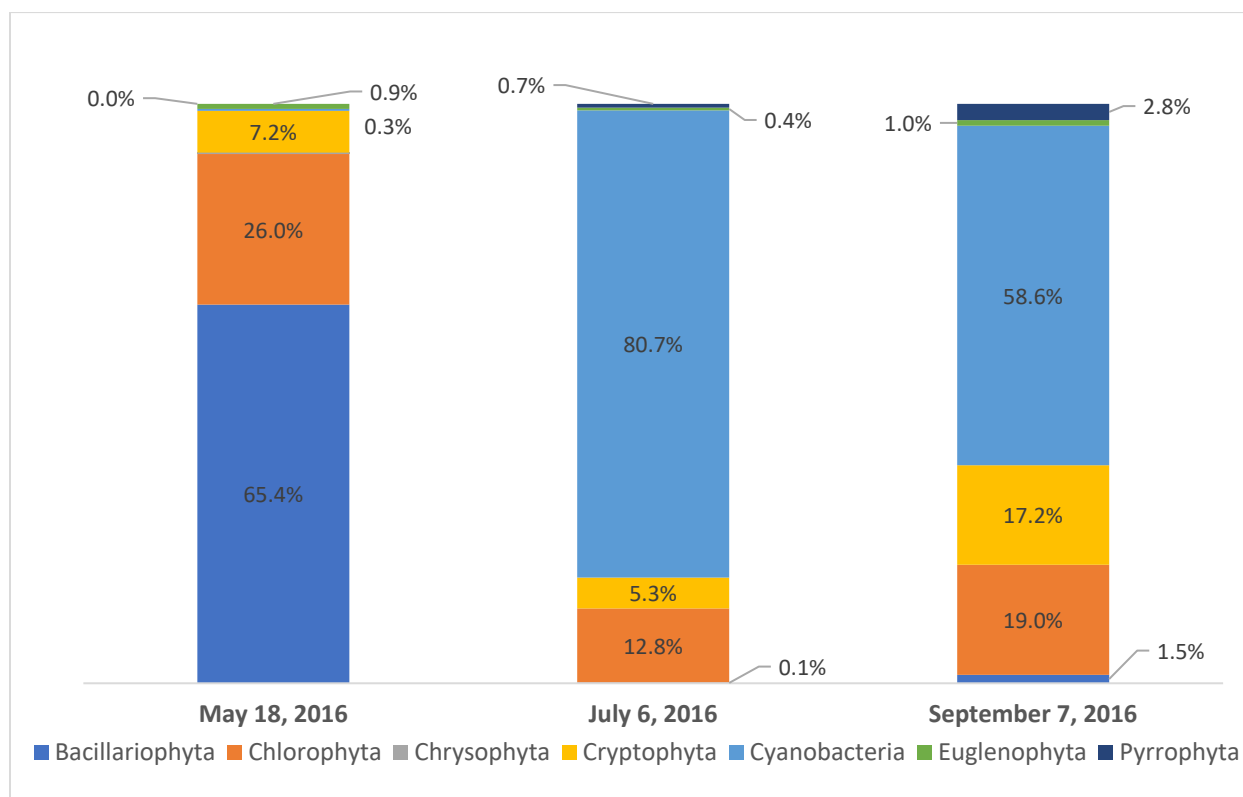


Figure 5. Percent Phytoplankton Biovolume (um³/L) in the Water Supply Reservoir

Genera of phytoplankton that can produce cyanotoxins (D'Anglada, 2016) identified within the samples collected at the Water Supply Reservoir in July included *Aphanizomenon*, *Aphanocapsa*, *Dolichospermum*, *Merismopedia*, *Planktonlyngbya*, and *Pseudanabaena* with *Pseudanabaena* dominating (35%).

The sample for September included *Aphanizomenon*, *Dolichospermum*, and *Planktonlyngbya*, with *Planktonlyngbya* dominating (90%). Toxin-producing phytoplankton identified in the September sample for the Up-Ground Reservoir included *Aphanizomenon*, *Dolichospermum*, *Microcystis* and *Planktonlyngbya* with *Microcystis* dominating (78%).

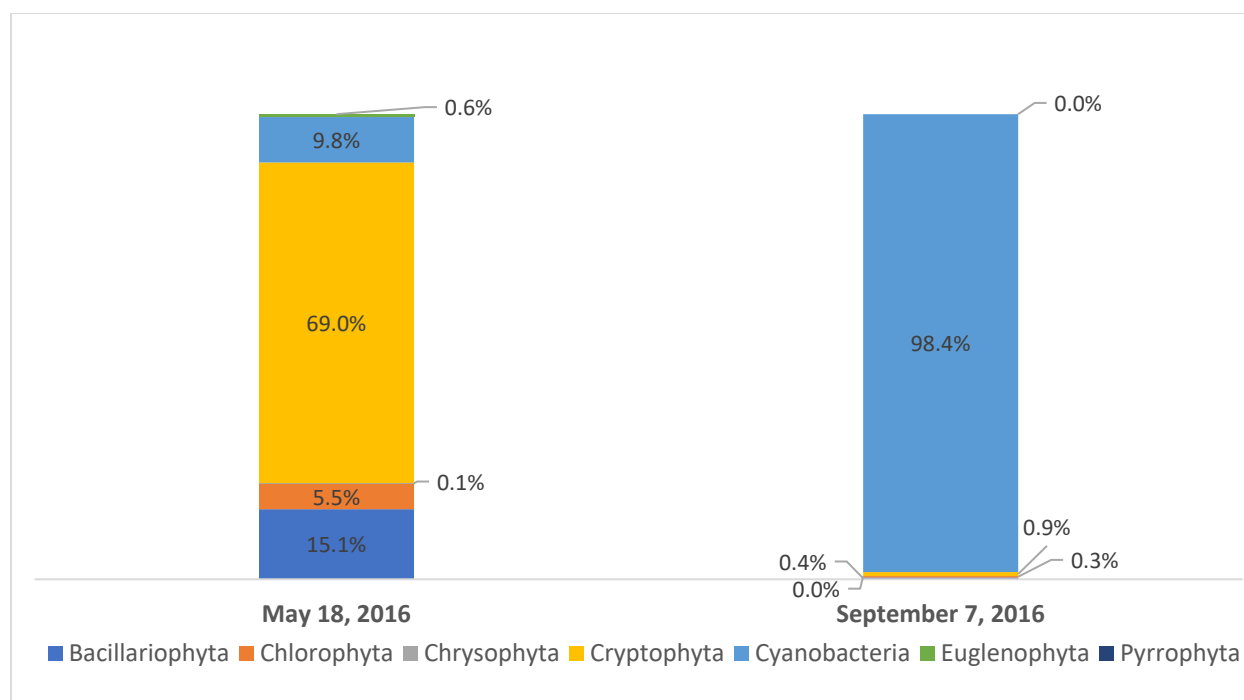


Figure 6. Percent Phytoplankton Biovolume (um³/L) in the Up-Ground Reservoir

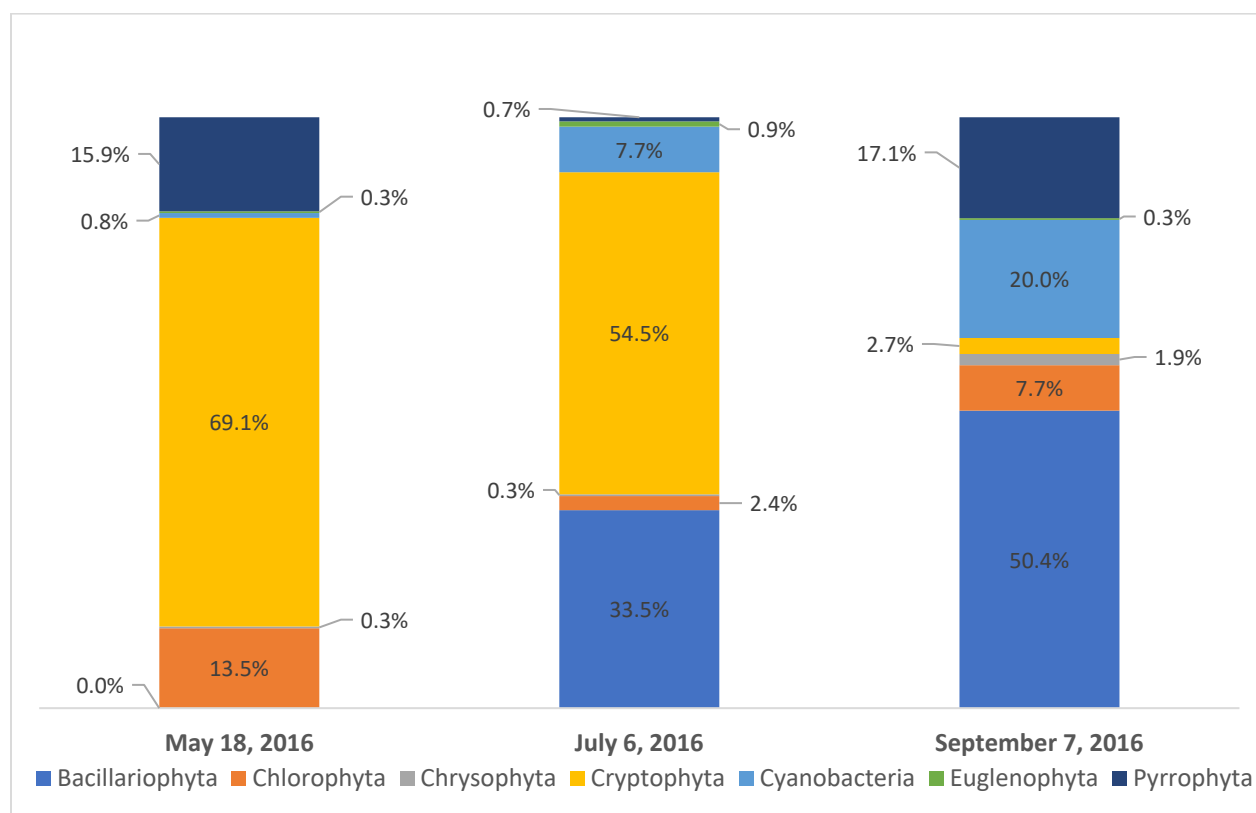


Figure 7. Percent Phytoplankton Biovolume (um³/L) in Lake Waynoka

Beneficial Use Assessments

Public Drinking Water Use Assessment

The public drinking water supply use was only evaluated for the water supply reservoir as water from this water body is the sole source of water to the up-ground reservoir. All available data for the water supply reservoir supports its use as a source of public drinking water.

Recreation Use Assessment

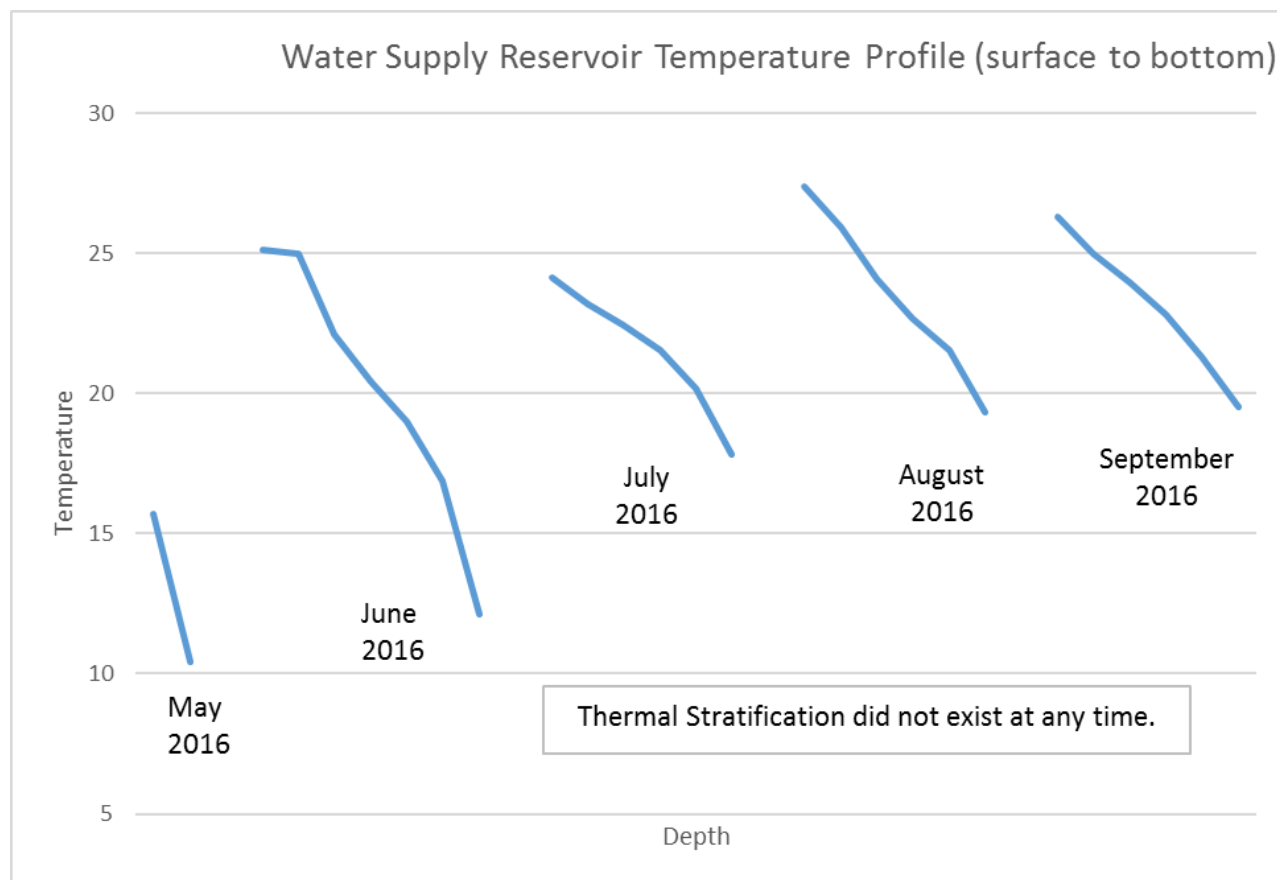
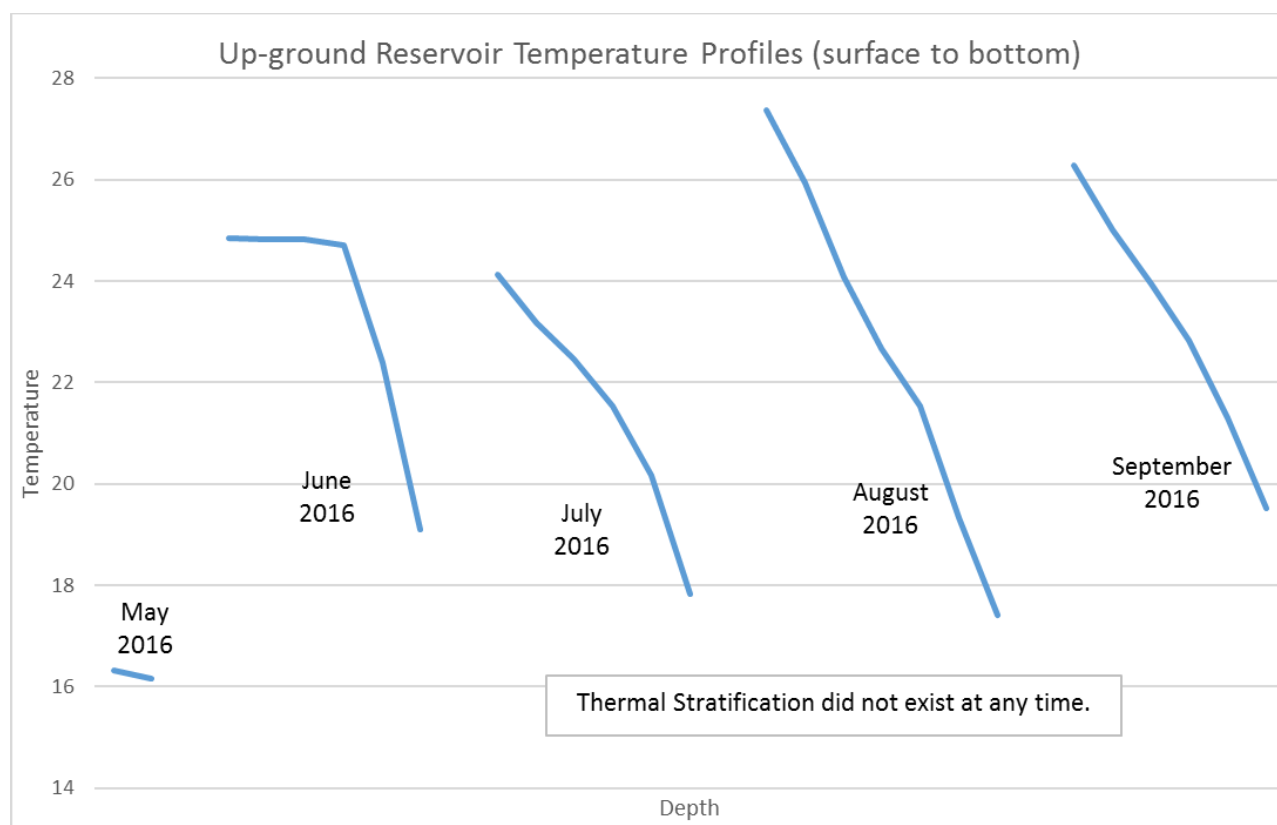
The recreation use of Lake Waynoka was evaluated by measuring levels of *Escherichia* coliform bacteria at the lake L-1 station and at the swimming beach near the marina. The L-1 site was sampled 5 times and the beach site 4 times over the two-year assessment period instead of the normal 10 times each. Geometric mean values are normally compared to the bathing water criterion of 126 CFU/100 ml. Although all results were below this criterion level and indicate the recreation use is supported, the insufficient number of data points do not allow this determination to be made without qualification. Neither of the two reservoirs are accessible to the public and therefore were not evaluated for recreational use.

Human Health - Fish Consumption

No consumption advisors have been issued for the three waterbodies beyond the state-wide advisory. Statewide fish consumption advisories can be found at the following link: <http://www.epa.ohio.gov/dsw/fishadvisory/index.aspx>.

Aquatic Life Use Assessment

The aquatic life use (ALU) designation for all inland lakes in Ohio is exceptional warmwater habitat (EWH) except for upground reservoirs which are designated warmwater habitat (WWH). In order to evaluate the ALU in Alum Creek Lake, ammonia, dissolved oxygen, pH, total dissolved solids and various metals were analyzed. Statewide water quality criteria for these parameters are summarized in Table 35-1 of the Ohio water quality standards. Other important parameters for assessing lake condition in the Waynoka Lake system included nutrient parameters (e.g. total phosphorus, total nitrogen) and biological response variables (e.g. chlorophyll-a). Where criteria do not exist, a common approach to assessing relative lake condition is to compare lake water quality sampling data to a regionally derived percentile (e.g. 25th) of existing lake data. The lower 25th percentile generally represents minimally impacted conditions protective of designated uses. For Ohio EPA, inland lake aquatic life use benchmarks were calculated for total nitrogen (T-N), total phosphorus (T-P) and chlorophyll-a (Chl. a) based on the lower 25th percentile of lake median data and for secchi depth based on the upper 75th percentile of lake median data. All data used for benchmarks were collected by Ohio EPA from Ohio inland lakes between 1989 and 2006.



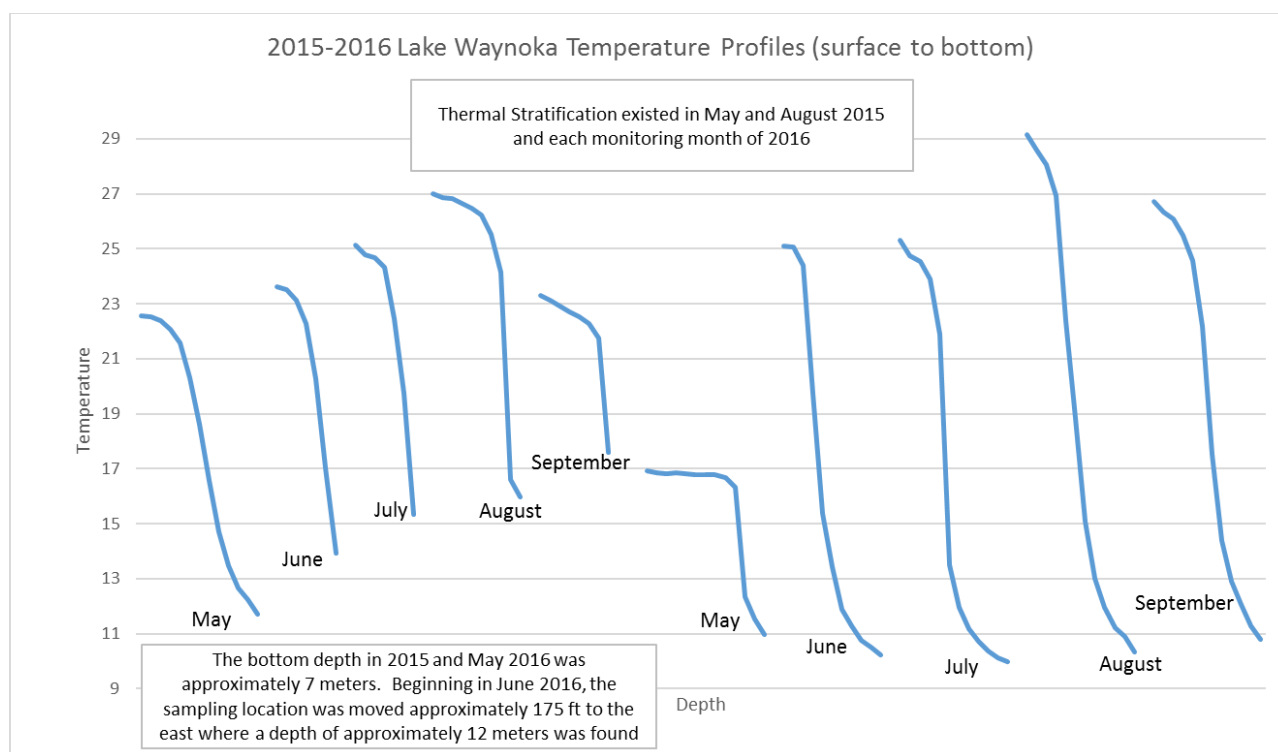


Figure 8-10. Temperature profiles for each Waynoka waterbody

Using the established assessment methodology, the three waterbodies were evaluated as follows:

- *Lake Waynoka* met Exceptional Warmwater Habitat (EWH) criteria.
- Although data (other than T-N) was only collected during the second of the two-year study period, *Waynoka Water Supply Reservoir* produced Dissolved oxygen levels that were below the EWH OMZM criteria of 5mg/L during every sampling event. Both response variables, chlorophyll a and secchi transparency (secchi disc), exceeded their target values. Additionally, the two causal parameters, T-N and T-O significantly exceeded their ALU targets.
- Second year data from *Waynoka Up-Ground Water Supply Reservoir* revealed similar results to the *Waynoka Water Supply Reservoir*. Sixty percent of the of the average (water column) D.O. values were below the EWH OMZM criteria. Again, both response variables exceeded their targets indicating nutrient enriched conditions. It appears this reservoir's algal response is mostly driven by T-P since T-N values were well below their benchmarks.

Table 3. Summary of important lake data in Lake Waynoka

	Parameter						
	Chl. a (µg/L)	Secchi (m)	T-N (µg/L)	T-P (µg/L)	D.O. (mg/L)	pH (SU)	NH ₃ -N (mg/l)
ALU Bechmark values	Median ≤14.0	Median ≥1.19	Median ≤688	Median ≤34	>90% of Averages ≥5.0	>90% Medians 6.5>pH<9.0	>90% Results <WQS
Sampling Date			Surface Sample Results	Surface Sample Results			Result (WQS)
5-19-2015	9.8	2.04	600	7.7	7.4 ⁽¹⁾	7.7 ⁽²⁾	<0.03 (1.7) ⁽³⁾
6-10-2015	18.3	1.28	670	10.9	7.6 ⁽¹⁾	7.7 ⁽²⁾	0.049 (1.6) ⁽³⁾
7-16-2015	13	1.13	450	11.6	7.1 ⁽¹⁾	7.8 ⁽²⁾	<0.03 (0.9) ⁽³⁾
8-11-2015	24.2	1.04	600	12.2	6.9 ⁽¹⁾	7.8 ⁽²⁾	<0.04 (0.8) ⁽³⁾
9-16-2015	13.6	1.03	450	11.9	4.4 ⁽¹⁾	7.3 ⁽²⁾	<0.03 (1.7) ⁽³⁾
5-18-2016	37.8	1.06	660	<20	10.1 ⁽¹⁾	8.5 ⁽²⁾	0.062 (0.7) ⁽³⁾
6-7-2016	7.2	1.5	470	26	7.3 ⁽¹⁾	7.9 ⁽²⁾	<0.03 (0.9) ⁽³⁾
7-6-2016	7.3	1.85	520	22	5.3 ⁽¹⁾	7.6 ⁽²⁾	<0.03 (1.5) ⁽³⁾
8-2-2016	14.6	1.23	550	19	7.2 ⁽¹⁾	7.8 ⁽²⁾	<0.03 (0.8) ⁽³⁾
9-7-2016	12.1	1.27	420	24	5.5 ⁽¹⁾	7.5 ⁽²⁾	<0.03 (1.1) ⁽³⁾
Median	13.3	1.25	470	19.5			

(1) Thermal stratification existed; value is average of the results in the epilimnion

(2) Thermal stratification existed; value is median of the results in the epilimnion

(3) WQS criteria based on measured temperature and pH values at the depth the sample was collected.

Table 4. Summary of important lake data in Lake Waynoka Water Supply Reservoir (Sycamore Run)

	Parameter						
	Chl. a (µg/L)	Secchi (m)	T-N (µg/L)	T-P (µg/L)	D.O. (mg/L)	pH (SU)	NH ₃ -N (mg/l)
ALU Bechmark values	Median ≤14.0	Median ≥1.19	Median ≤688	Median ≤34	>90% of Averages ≥5.0	>90% Medians 6.5>pH<9.0	>90% Results <WQS
Sampling Date			Surface Sample Results	Surface Sample Results			Result (WQS)
5-19-15	Not Monitored	Not Monitored	50 ⁽¹⁾	Not Monitored	Not Monitored	Not Monitored	Not Monitored
6-10-15			50 ⁽¹⁾				
7-16-15			140 ⁽¹⁾				
8-11-15			50 ⁽¹⁾				
9-16-15			60 ⁽¹⁾				
5-18-16	6.6	0.41	1,670	437	2.4 ⁽²⁾	6.9 ⁽³⁾	0.269 (2.1) ⁽⁴⁾
6-7-16	40.4	0.34	1,040	315	2.4 ⁽²⁾	6.9 ⁽³⁾	<0.03 (0.1) ⁽⁴⁾
7-6-16	85.8	0.43	1,930	232	2.3 ⁽²⁾	7.4 ⁽³⁾	<0.03 (0.3) ⁽⁴⁾
8-2-16	50.9	0.49	1,490	161	2.4 ⁽²⁾	6.8 ⁽³⁾	<0.03 (0.1) ⁽⁴⁾
9-7-16	49.9	0.54	1,220	139	1.8 ⁽²⁾	6.9 ⁽³⁾	<0.03 (1.0) ⁽⁴⁾
Median	49.9	0.43	1,490	232			

Table 5. Summary of important lake data in Lake Waynoka Up-Ground Water Supply Reservoir

	Parameter						
	Chl. a	Secchi	T-N	T-P	D.O.	pH	NH ₃ -N
	(µg/L)	(m)	(µg/L)	(µg/L)	(mg/L)	(SU)	(mg/l)
ALU Benchmark values	Median ≤6.0	Median ≥2.60	Median ≤1,225	Median ≤18	>90% of Averages ≥5.0	>90% Medians 6.5>pH<9.0	>90% Average <WQS
Sample Date			surface sample results	surface sample results			Result (WQS)
5-19-15	Not Monitored	Not Monitored	50 ⁽¹⁾	Not Monitored	Not Monitored	Not Monitored	Not Monitored
6-10-15			50 ⁽¹⁾				
7-16-15			220 ⁽¹⁾				
8-11-15			50 ⁽¹⁾				
9-16-15			60 ⁽¹⁾				
5-18-16	5.8	1.4	420	136	9.3 ⁽²⁾	8.0 ⁽³⁾	<30 (1.3) ⁽⁴⁾
6-7-16	6.2	1.14	620	94	9.3 ⁽²⁾	8.9 ⁽³⁾	<30 (0.1) ⁽⁴⁾
7-6-16	28.5	1.7	840	53	2.3 ⁽²⁾	7.4 ⁽³⁾	<30 (0.3) ⁽⁴⁾
8-2-16	10.8	1.31	590	20	2.1 ⁽²⁾	6.8 ⁽³⁾	<30 (0.1) ⁽⁴⁾
9-7-16	31.2	0.55	620	46	1.8 ⁽²⁾	6.9 ⁽³⁾	<30 (1.0) ⁽⁴⁾
Median	10.8	1.31	620	53			

(1) Nitrate+Nitrite only – no TKN sample. Value not used to evaluate lake habitat criteria

(2) Thermal stratification did not exist; value is average of all water column results

(3) Thermal stratification did not exist; value is median of all water column results

(4) Criteria based on measured temperature and pH values

Trend Assessment

Lake Waynoka and the upground reservoir were assessed in August 1992 and May 1993 as a part of a Section 314 Clean Lakes Assessment Grant. This data was integrated into Volume 3 of the 1996 *Ohio Water Resource Inventory 305(b) Report*, which can be found at epa.ohio.gov/portals/35/documents/96vol3.pdf (Ohio EPA, 1996). The report describes trophic state index (TSI) as one of several metrics used to assess the condition of Ohio's public lakes. Carlson's TSI is a numerical representation of a lake's state of productivity along a scale of 0 to 100. Each major division (10, 20, 30, etc.) represents a doubling in algal biomass based on transparency, total phosphorus and chlorophyll-*a* measurements (Carlson, 1977). Unproductive, oligotrophic lakes score on the lower end of the scale, mesotrophic lakes are in the middle and eutrophic/hyper-eutrophic lakes occupy the upper end of the continuum. In the 1996 report, Lake Waynoka was determined to have a final TSI of 69.0, a hypereutrophic condition, and the upground reservoir was determined to have a final TSI of 46.0 - a mesotrophic condition.

The Carlson TSI values were calculated for samples collected from the three Waynoka waterbodies using formulas from Reckhow and Chapra (Reckhow & Chapra, 1983) as follows:

$$\text{Secchi disk TSI} = 60 - 14.41 \ln (\text{SD meters})$$

$$\text{Chlorophyll-}a \text{ TSI} = 9.81 \ln (\text{Chl-}a \text{ ug/l}) + 30.6$$

$$\text{Total phosphorus TSI} = 14.42 \ln (\text{TP ug/l}) + 4.15$$

The linear regressions for Carlson's TSI were calculated using data collected from thousands of lakes in and outside the U.S. The TSI represents absolute values that can be applied to most lakes to characterize their trophic status and general condition. Per Carlson's (1977) recommendation, average summer (July, August, September) chlorophyll-*a* and spring (April, May, June) total phosphorus TSI values were used to determine the final TSI value.

<38 TSI = Oligotrophic
 38-47 TSI = Mesotrophic
 48-66 TSI = Eutrophic
 >66 TSI = Hypereutrophic

Transparency based (Secchi depth) TSI values were calculated but Carlson warns against using transparency as a variable in waters with high non-algal turbidity, namely, sediment and silt (Carlson, 1980). Such is the case with many lakes and more specifically, reservoirs in Ohio. Secchi data was eliminated from the "trophic state" assessment process in 1988.

Summer Secchi depth TSI values are otherwise useful if compared against summer chlorophyll-*a* TSI values. A higher TSI based on Secchi depth may indicate non-algal turbidity and possible light limitation of algal growth.

Because Ohio does not have a very robust baseline of lake data, the use of TSI as a general tool for trend assessment is appropriate. Based on data collected in 2015-2016, the final TSI for Lake Waynoka was calculated to be 54, which is markedly lower than the previous TSI value of 69. The opposite trend exists for the upground reservoir where the classification went from mesotrophic to almost hypereutrophic. Higher phosphorous appears to be the likely cause for this change. Where no previous monitoring data or TSI value exists for the water supply reservoir, the current TSI value of 78 shows hypereutrophic conditions associated with high phosphorous that warrants attention.

Table 6. Trophic state classification, data and trends in trophic state for Lake Waynoka data

Date	SD (m) Data	TSI SD	Chl. <i>a</i> (µg/L)	TSI Chl- <i>a</i>	TP (µg/L)	TSI TP	Final TSI ⁽¹⁾	Trophic Classification
8-5-92	1.00	60	20.03	<u>74</u>	100	71	69	Hypereutrophic
8-26-92	1.84	51	7.3	<u>59</u>				
5-26-93	0.53	69			120	<u>73</u>		
5-19-15	-		9.8	53	7.7	<u>34</u>	54	Eutrophic
6-10-15	1.28	56	18.3	59	10.9	<u>39</u>		
7-16-15	1.13	58	13	<u>56</u>	11.6	39		
8-11-15	1.04	59	24.2	<u>62</u>	12	40		
9-16-15	1.03	60	13.6	<u>56</u>	15	43		
5-18-16	1.06	59	37.8	66	250	<u>84</u>		
6-7-16	1.5	54	7.2	50	26	<u>51</u>		
7-6-16	1.85	51	7.3	<u>50</u>	22	49		
8-2-16	1.23	57	14.6	<u>57</u>	19	47		
9-7-16	1.27	57	12.1	<u>55</u>	24	50		

Table 7. Trophic state classification, data and trends in trophic state for Upground Reservoir data

Table 7. Trophic state classification, data and trends in trophic state for Upground Reservoir data

Date	SD (m) Data	TSI SD	Chl. <i>a</i> (µg/L)	TSI Chl- <i>a</i>	TP (µg/L)	TSI TP	Final TSI ⁽¹⁾	Trophic Classification
8-5-92	0.78	64	9.47	<u>53</u>	50	61	46	Mesotrophic
8-26-92	0.91	61	4.76	<u>46</u>				
5-26-93	0.82	63			12	<u>40</u>		
5-18-16	1.4	55	5.8	48	136	<u>75</u>	65	Eutrophic
6-7-16	1.14	58	6.2	48	94	<u>70</u>		
7-6-16	1.31	56	28.5	<u>63</u>	53	61		
8-2-16	0.55	69	10.8	<u>54</u>	20	47		
9-7-16	1.4	55	31.2	<u>64</u>	46	59		

Table 8. Trophic state classification, data for Water Supply Reservoir data

Date	SD (m) Data	TSI SD	Chl. <i>a</i> (µg/L)	TSI Chl- <i>a</i>	TP (µg/L)	TSI TP	Final TSI ⁽¹⁾	Trophic Classification
5-18-16	0.41	73	6.6	49	437	<u>92</u>	78	Hypereutrophic
6-7-16	0.34	76	40.4	67	315	<u>87</u>		
7-6-16	0.43	72	85.8	<u>74</u>	232	83		
8-2-16	0.49	70	50.9	<u>69</u>	161	77		
9-7-16	0.54	69	49.9	<u>69</u>	139	75		

⁽¹⁾ Values used to establish Final TSI are underlined

Higher phosphorous appears to be the likely cause for this change. Where no previous monitoring data or TSI value exists for the water supply reservoir, the current TSI value of 78 shows hypereutrophic conditions associated with high phosphorous that warrants attention.

Conclusions

There are several possible causes for the negative impacts to water quality in the Water Supply Reservoir (Sycamore Run) and the Up-ground Water Supply Reservoir.

Improvement in land use practices in the small watershed tributary to Sycamore Run reservoir would likely address the very high nitrogen and phosphorous concentrations in the reservoir. Also, it would be worthwhile to investigate the possibility that nutrients in the approximately 15,000 gpd backwash from the water treatment plant, permitted through NPDES permit 1GW00003, are being recycled to the reservoir. This is pertinent given reservoir's long hydraulic residence time – especially during warm, dry periods that correlate with algal growth. Reducing nutrient enrichment would subsequently reduce the need for pesticides for controlling algae.

The use of copper sulfate for algae control is the cause for the high copper levels in the water supply reservoirs and in Sycamore Run. Because copper toxicity increases with higher alkalinity, basing the dosage

of copper sulfate on water alkalinity would likely help address the high levels of copper in both reservoirs and in Sycamore Run. Guidance literature suggests copper sulfate dosage concentrations should be based on $(\text{total alkalinity}) \div (100)$ and not dosing when alkalinity is <50 mg/l (IFAS Extension, 1989).

Pesticide application otherwise needs to occur in accordance with Pesticide Discharge general permit OHG870002 with permit authorization to discharge pesticides obtained prior to pesticide use. A pesticide management plan, part of the Pesticide Discharge general permit, would address the need to ensure water quality standards in the reservoir and Sycamore Run are protected.

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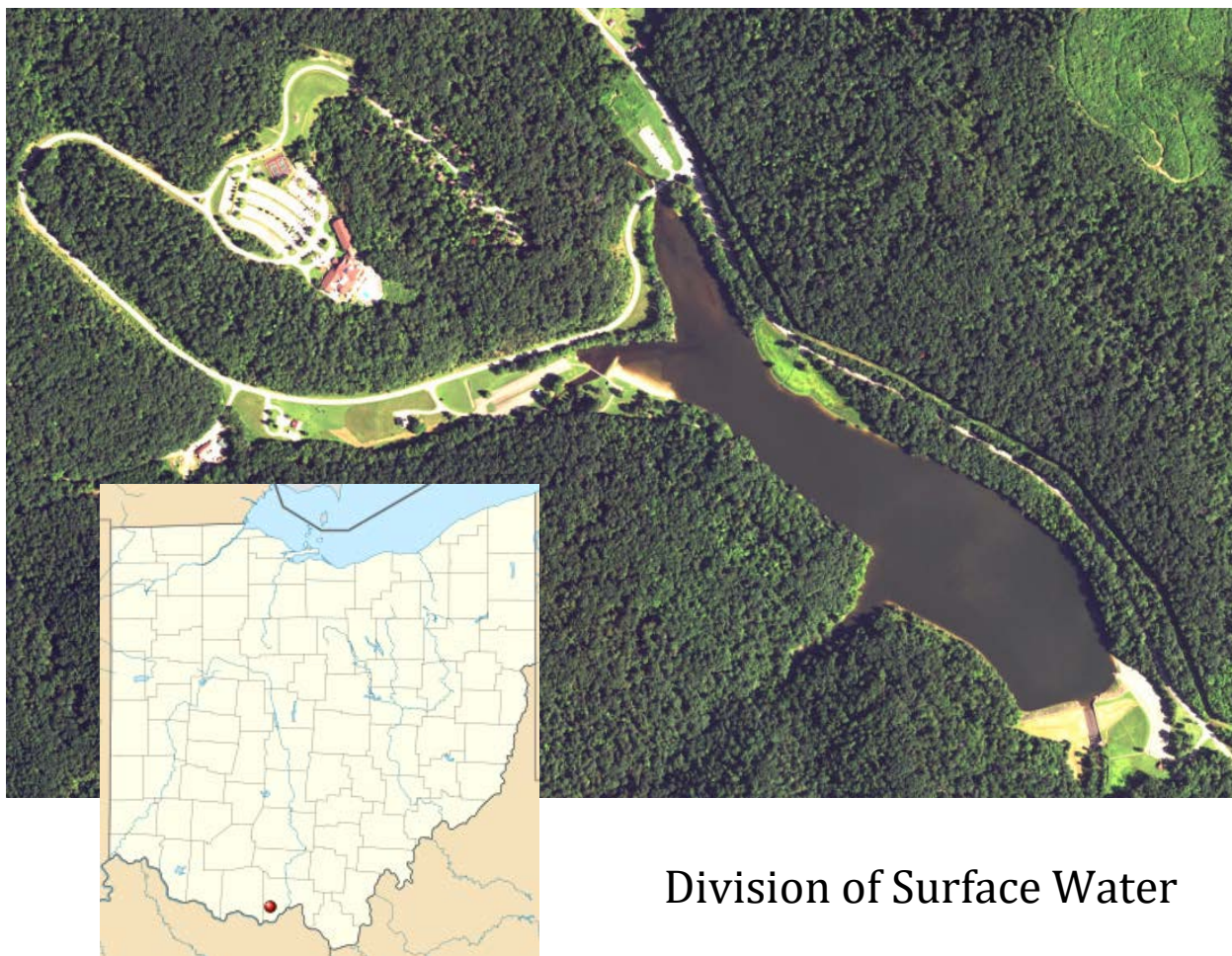
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Turkey Creek Lake

INLAND LAKE WATER QUALITY REPORT



Division of Surface Water

April 2019

Turkey Creek Lake

Inland Lake Water Quality Report

February 2018

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Introduction: Inland Lakes Monitoring

Ohio EPA has implemented a sampling strategy that focuses on evaluating chemical conditions near the surface and physical conditions in the water column of inland lakes. Physical profile measurements are summarized either for the entire water column or the epilimnion depending on the existence of thermal stratification. The sampling target consists of an even distribution of 10 sampling events divided over a two-year period and collected during the recreation season of May 1 through October 31. Because of restricted resources, the second year of sampling at Turkey Creek Lake was cancelled and, therefore, the use status assessment is qualified to be from a limited dataset. However, it is believed that observed conditions and monitoring data would likely have been the similar in the second study year because of the nature of the watershed.

Key parameters analyzed in lakes include chlorophyll-*a*, ammonia, dissolved oxygen (DO), pH, total dissolved solids along with various metals for multiple beneficial use assessments. Other parameters used to evaluate lakes include Secchi depth, total phosphorus and total nitrogen. Details of the sampling protocol used at the time of this sampling are outlined in the [2016 Inland Lakes Sampling Procedure Manual](#) (Ohio EPA, 2016), available as Appendix I of the [Ohio EPA Surface Water Field Sampling Manual](#) (Ohio EPA, 2015). Ohio EPA has revised those sampling protocols in the [2019 Inland Lakes Sampling Procedure Manual](#) (Ohio EPA, 2019). Sampling objectives for inland lake surveys are defined in Ohio EPA's Inland Lakes Sampling Quality Assurance Project Plan (QAPP), and the rules relative to inland lakes beneficial uses are described in the 2010 and successive Water Quality Monitoring Integrated Reports.

Study Lake

Turkey Creek Lake is part of the 1,095-acre Shawnee State Park located within the 63,000-acre Shawnee State Forest in Scioto County (Figure 1). Turkey Creek Lake is formed by the impoundment of its two major tributaries, Turkey Creek and Lampblack Run. The lake is nestled in the state forest, approximately 6 miles northwest of the town of Friendship, OH at the intersection of State Forest Service Road 16 (NF-126) and State Route 125. The lake can be accessed via a concrete boat ramp located on the south side of the lake accessible from a driveway on the west side of SR 125.



Figure 1. Location of Turkey Creek Lake in Southern Ohio

Attributes of Turkey Creek Lake

Turkey Creek Lake is approximately 43 acres in size with a maximum depth of 30 feet. It is contained within the Western Allegheny Plateau ecoregion, in Southern Ohio. The lake receives the majority of its water from Turkey Creek and is fed by approximately 9 acres of drainage (Table 1).

Table 1. Key Attributes of Turkey Creek Lake

Ecoregion:	Western Allegheny Plateau
Lake Type:	Dammed Impoundment
Surface Area:	43 acres
Watershed:	8.7 square miles
Maximum Depth:	9.14 meters (30 ft.)
Shoreline:	15 miles

Watershed Overview

The Turkey Creek Lake dam is located at latitude 38.73348, Longitude -83.18921. The area of the watershed above the dam, including the lake, is 8.69 square miles (Figure 2). The drainage gradient in the watershed is approximately 91 feet per mile. The watershed is heavily (97.5 percent) forested with only about 5 percent of the watershed developed. The average percent impervious area determined by National Land Cover Dataset (NLCD) in 2011 was 0.5 percent. The mean annual precipitation in the Turkey Creek Lake watershed is about 39 inches per year (USGS StreamStats).

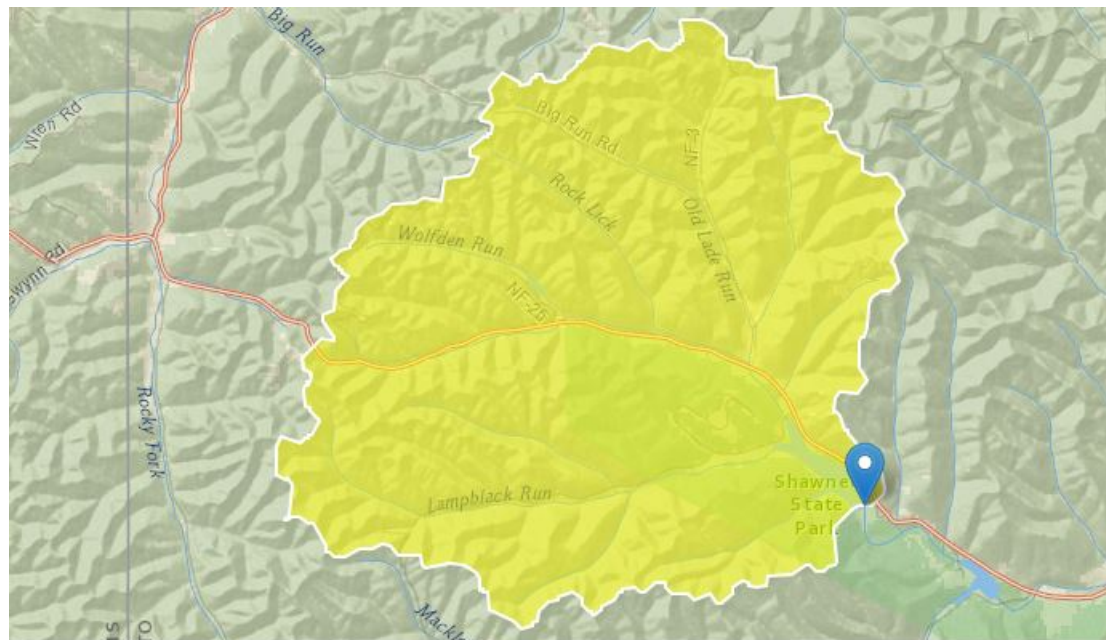


Figure 2. Turkey Creek Lake Watershed

The moderately small drainage area includes roads, parking lots and buildings associated with the Shawnee State Park lodge. A wastewater treatment plant serving the lodge is located approximately 0.3 mile from the lake (and 0.5 mile from the swimming beach). The treatment plant has a design flow of 40,000 gpd and its NPDES permit number is OPP00029.

Results Discussion

Water Column Chemistry

A physical profile of the water column was evaluated during each sampling event at the L1 sampling location during 2016. Readings were recorded at the surface of Turkey Creek Lake (which is defined as a 0.5-meter depth), at 1.0-meter intervals thereafter, with a final measurement at 0.5 meters above the bottom of the lake (Ohio EPA, Inland Lakes Sampling Procedure Manual, 2016).

Physical conditions remained fairly stable throughout the sampling season. The L1 sampling location is at the deepest portion of the lake, near the dam (Lat. 38.7739, Lon -83.1900) (Figure 3). All sampling events showed a moderate to strong degree of stratification at L-1. Thermal stratification often occurs in deeper lakes during the warm summer months, consisting of an upper mixed zone (epilimnion), a slightly denser middle zone (metalimnion), and a lower zone (hypolimnion) where mixing is impeded by a density barrier caused by lower water temperatures near the bottom of a lake.



Figure 3. Location of sampling location L-1 near the Turkey Creek Lake dam

Turkey Creek is a moderately deep inland lake in Ohio with a maximum depth of 30 feet at L-1. The lake did experience stratification making it a typical *dimictic* lake. A sharp decrease in temperature and dissolved oxygen is often noted in stratified lakes where the hypolimnion forms. In the case of

Turkey Creek Lake, a temperature change was observed between the 4.5- to 6.5-m depth measurement, depending the sampling date (Figure 4).

The hypolimnion of productive lakes can become depleted of oxygen (hypoxic) if consumption by decomposing organic matter exceeds reaeration by atmospheric diffusion and photosynthesis. Dissolved oxygen levels in the metalimnion and epilimnion can swing significantly over a 24-hour period under such conditions. Fish access to habitat, cool water and benthic prey can be limited if any part of the water column becomes hypoxic. An oxygen deficit, defined for the purposes of this report as a concentration of 4 mg/L or less, was documented on the bottom during all sampling events at L1.

Table 2. Dissolved oxygen concentration (mg/l) in Turkey Creek Lake during the 2016 sampling season.

	D.O. – Surface	D.O. – Bottom	Mean D.O. – Whole Water Column	Mean D.O. – Epilimnion
Aquatic Life Criterion				≥5.0
5/24/2016	9.16	4.57	7.73	Not Stratified
6/14/2016	8.50	0.27	5.19	8.94
7/12/2016	8.63	0.18	3.75	8.63
8/16/2016	8.16	0.23	3.63	8.45
9/13/2016	7.14	0.24	3.22	7.48

Except for May, when the minimum dissolved oxygen level in the unstratified water column was 4.5 mg/l, the zone of oxygen deficiency extended from the bottom of the lake to a depth of between 3.5 to 5.5 meters. Under these conditions, organically bound phosphate in lake sediments decomposes and is converted to orthophosphate (the biologically available form of phosphate), that can then be released to the water column for uptake. Because orthophosphate is a reactive form of phosphorus, its concentration is often a good indication of the amount of phosphorus that is readily available for plant and algae growth.

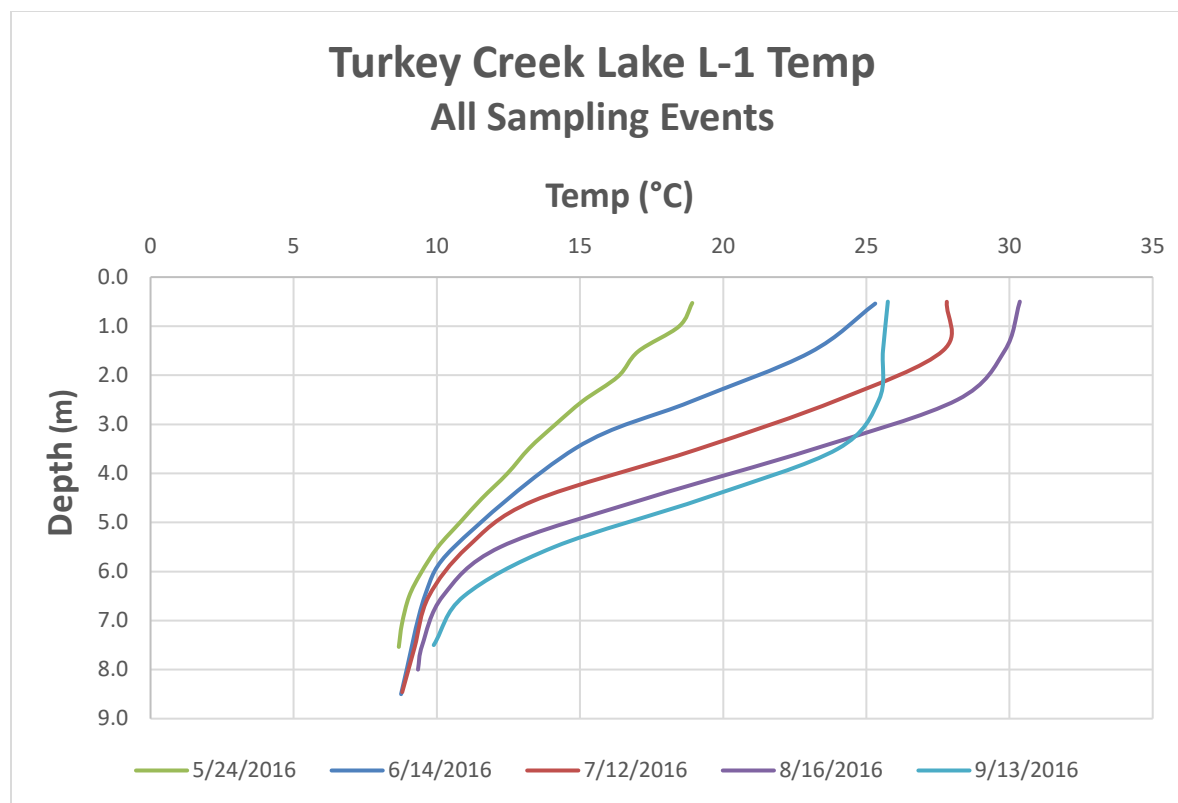


Figure 4. Temperature profiles at the L-1 sampling location of Turkey Creek Lake.

Sediment Chemistry

A surface sediment sample was collected on September 13, 2016 using a Petite Ponar dredge. The sediment sample was analyzed for TOC, metals, nutrients (except for phosphorous), s-VOCs (PAHs), PCBs and pesticides (organo-chlorine insecticides). There were no detections for PAHs, PCBs or pesticides.

Ohio does not currently have codified WQS for the protection of aquatic life based on sediment data, so the evaluation of results consists of referencing several commonly-cited resources to determine if sediment pollutants may potentially contribute to ecological stress. Sediment data were evaluated using Ohio Sediment Reference Values (SRVs) (Ohio EPA 2008) along with guidelines established in Development and Evaluation of Consensus-Based Sediment Quality Guidelines for Freshwater Ecosystems (MacDonald et. al. 2000). Ohio EPA SRVs represent ecoregion background conditions for metals based on data collected at Ohio reference sites. These values were developed for lotic (flowing) water bodies and are based on Ohio ecoregions. Sediment concentrations for lentic (non-flowing) surface water bodies can be screened using these values. MacDonald guidelines define two levels of ecotoxic effects. A Threshold Effect Concentration (TEC) is a level of sediment chemical quality below which harmful effects are unlikely to be observed and can be considered comparable to background conditions. A Probable Effect Concentration (PEC) indicates a level above which harmful effects are likely to be observed. These guidelines include both metals and organic parameters.

Finally, guidelines established by the Ontario Ministry of the Environment (Persuad et. al. 1993) were used to evaluate sediment sample results for total organic carbon (TOC) and total phosphorus (TP). These guidelines include the Lowest Effect Level (LEL) and the Severe Effect Level (SEL). The LEL is a level of sediment concentration that can be tolerated by most benthic organisms. The SEL is a concentration considered harmful to most benthic organisms. Values shaded orange in the table below indicate values above the Sediment Reference Level (SRV) and values shown in red font indicate values above the Lowest Effect Level (LEL).

Arsenic and Cadmium were slightly above Ohio SRVs for the Western Allegheny Plateau ecoregion. Arsenic, TOC, Copper, Nickel, and zinc were above the LEL, but were still below the SEL. Arsenic, Nickel and Zinc were above the TEC. No parameters were above the PEC (Table 3).

Table 3. Sediment Concentrations in Turkey Creek Lake and Screening Values

Sediment Concentrations (mg/kg)					
Parameter	Lowest Effect Level (LEL)	Ohio Reference Values (SRV)	Threshold Effect Concentration (TEC)	Probable Effect Concentration (PEC)	Turkey Creek Lake
TOC (%)	1	-	-	-	2.5
Arsenic	6	19	9.79	33	20.6
Cadmium	0.6	0.8	0.99	4.98	0.86
Chromium	26	53	43.4	111	21.5
Copper	16	33	31.6	149	16.7
Lead	31	-	35.8	128	20.0
Nickel	16	61	22.7	48.6	33.7
Selenium	-	2.6	-	-	ND
Aluminum	-	53,000	-	-	15,500
Barium	-	360	-	-	160
Calcium	-	27,000	-	-	ND
Iron	-	51,000	-	-	44,300
Magnesium	-	9,900	-	-	2,570
Manganese	460	3,000	-	-	417
Potassium	-	14,000	-	-	ND
Strontium	-	250	-	-	ND
Zinc	120	170	121	459	161
T-Phosphorus	600	-	-	-	NT
NT=Not Tested ND = Not Detected SRV values applicable in Western Allegheny Plateau Above LEL Above SRV					

Phytoplankton Results

The phytoplankton community was characterized based on water samples collected from the photic zone using an integrated tube sampler deployed to twice the Secchi depth, up to a maximum of 2 meters (m). Samples were collected during three of the five sampling events (May, July, and September) of 2016. Samples were preserved with Lugol's solution and submitted to BSA Environmental Services, Inc. for analysis. The phytoplankton present in a representative aliquot were identified to at least genus level (usually species), and cell densities (cells/L) and bio-volumes ($\mu\text{m}^3/\text{L}$) were estimated in accordance with *Standard Methods for the Examination of Water and Wastewater* Method No. 10200 (Rice, Baird, & Eaton, 2017).

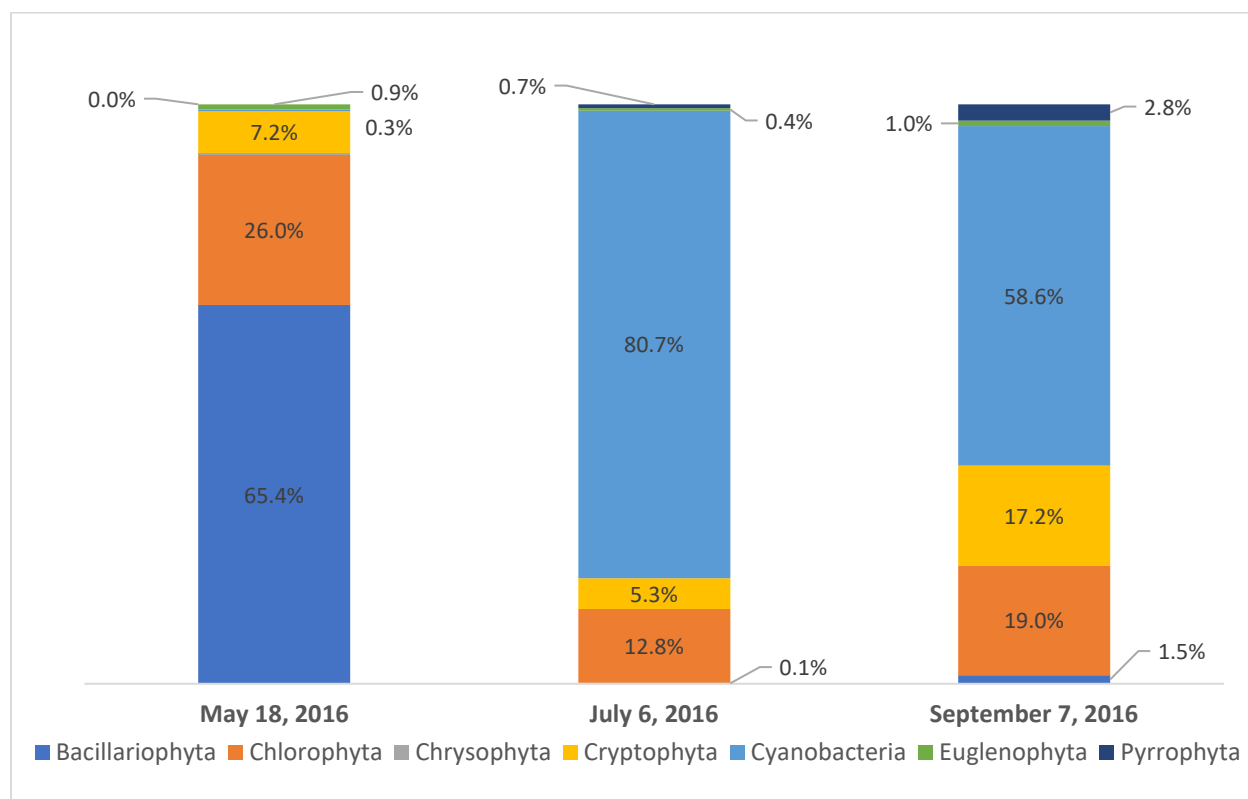


Figure 5. Percent Phytoplankton Biovolume ($\mu\text{m}^3/\text{L}$) in Turkey Creek Lake.

Phytoplankton communities typically exhibit a seasonal succession when factors like water temperature, nutrients, transparency and photoperiod favor certain types. Grazing by larval fish and zooplankton also effect community composition. Temperate lakes in Ohio are usually dominated by diatoms in the spring until micronutrients like silica are depleted by blue green algae (cyanobacteria) in the fall when an ability to control buoyancy and fix nitrogen from the atmosphere gives certain types a competitive advantage.

The population returned from the study period at each water body contained five to seven different classes of algae. When breaking down the results by sampling event, the total biovolume of cyanobacteria was notably higher in the mid to late summer samples. The breakdown of the phytoplankton dynamics from each sampling event is presented in Figure 5. A community dominated by cyanobacteria is of concern when toxin-producing phytoplankton are present.

Discussion of cyanotoxin sampling results is contained below in the Recreation Use Assessment section. Genera of phytoplankton that can produce cyanotoxins (D'Anglada, 2016) identified within the samples collected at the Water Supply Reservoir in July included *Aphanizomenon*, *Aphanocapsa*, *Dolichospermum*, *Merismopedia*, *Planktonlyngbya*, and *Pseudanabaena* with *Pseudanabaena* dominating (35%). The sample for September included *Aphanizomenon*, *Dolichospermum*, and *Planktonlyngbya*, with *Planktonlyngbya* dominating (90%).

Beneficial Use Assessments

Public Drinking Water Use Assessment

Like all public lakes in Ohio (except Piedmont Reservoir), Turkey Creek Lake is designated a public water supply (PWS) in the Ohio WQS. However, Turkey Creek Lake is currently not being used as a public drinking water supply.

Recreation Use Assessment

The recreation use of Turkey Creek Lake was not evaluated for *Escherichia coli*form (e-coli) bacteria because of the inability to analyze samples within the prescribed holding time. Because of the swimming beach located at the north end of the lake, Ohio Department of Natural Resources conducts both e-coli and cyanotoxin monitoring throughout the recreation season and is responsible for posting advisories if necessary. Results from each of the five monitoring events conducted by Ohio EPA revealed no detections of cyanotoxins.

Human Health - Fish Consumption

No consumption advisors have been issued beyond the state-wide advisory. Statewide fish consumption advisories can be found at the following link:

<http://www.epa.ohio.gov/dsw/fishadvisory/index.aspx>.

Aquatic Life Use Assessment

The current aquatic life use designation for all inland lakes in Ohio is EWH except for upground reservoirs that are designated warmwater habitat (WWH). Important criteria for assessing lake condition include nutrient parameters (e.g. total phosphorus, total nitrogen) and biological response variables (e.g. chlorophyll-a). Presently, no nutrient or biological criteria exists for inland lakes in Ohio. Ohio EPA is currently evaluating data and methodologies to develop appropriate ALU criteria for inland lakes.

Where criteria do not exist, a common approach to assessing relative lake condition is to compare lake water quality sampling data to a regionally derived percentile (e.g. 25th) of existing lake data. The lower 25th percentile generally represents minimally impacted conditions protective of designated uses. For Ohio EPA, inland lake aquatic life use benchmarks were calculated for total nitrogen (T-N), total phosphorus (T-P) and chlorophyll-a (Chl. a) based on the lower 25th percentile of lake median data and for secchi depth based on the upper 75th percentile of lake median data. All data used for benchmarks were collected by Ohio EPA from Ohio inland lakes between 1989 and 2006.

Lake samples were collected from near the surface of Turkey Creek Lake five times during the 2016 recreation season. Statewide Outside Mixing Zone Average (OMZA) water quality criteria listed in tables 35-1 through 35-12 of section 3745-1-35 of the OAC (Water Quality Standards) were used for most parameters to evaluate the existing EWH designated use for Turkey Creek Lake. Dissolved Oxygen is compared against the statewide OMZM (M=minimum) criteria. There were no exceedances of EWH chemical criteria based on the results from samples collected in Turkey Creek Lake during the summer of 2016 (Table 4).

Table 4. Summary of important data collected in Turkey Creek Lake.

ALU Targets/Benchmarks					WQS Criteria		
Parameter	Chl. <i>a</i> (µg/L)	Secchi (m)	TN (µg/L)	TP (µg/L)	D.O. (mg/L)	pH (SU)	NH3-N (mg/l)
Target & WQS	≤6.2 median	2.16 min	≤350 median	≤14 median	≥5.0	6.5>pH<9.0	(WQS)
5-24-2016	4.4	2.3	420	17	7.7 ⁽²⁾	7.0 ⁽⁴⁾	<0.03 (2.1) ⁽⁵⁾
6-14-2016	5.3	1.98	260	11.7	8.9 ⁽³⁾	7.3 ⁽⁴⁾	<0.03 (1.6) ⁽⁵⁾
7-12-2016	5.8	2.36	300	11	8.6 ⁽³⁾	7.8 ⁽⁴⁾	<0.03 (1.0) ⁽⁵⁾
8-16-2016	5.4	2.35	330	12	8.5 ⁽³⁾	7.8 ⁽⁴⁾	<0.03 (0.9) ⁽⁵⁾
9-13-2016	15.8	1.66	310	15	7.5 ⁽³⁾	7.5 ⁽⁴⁾	<0.03 (1.4) ⁽⁵⁾
Median	5.4	2.3	310	12			
% Exceeded	0 %	0 %	0 %	0 %	0 %	0 %	0 %

(1) Values are sum of TKN and Nitrate+Nitrite. Where results were reported to be below detection, the detection limit was used.

(2) Value is average of measurements in entire water column as there was no thermal stratification

(3) Value is average of measurements in epilimnion as thermal stratification existed.

(4) Value is median of measurements in epilimnion. Median values for the entire water column during each event were all between 6.5 and 9.0 S.U.

(5) WQS value is the OMZA from Table 35-6 of OAC 3745-1-35 and is based on average temperature and median pH in epilimnion.

In addition to the parameters listed in Table 4, other parameters that were monitored include dissolved solids, arsenic, cadmium, chromium, copper, lead, nickel, selenium and zinc. None of the sample results exceeded the Outside Mixing Zone Average aquatic life criteria established in Ohio Administrative Code 3745-1.

Bottom Samples

Useful information was also obtained from samples collected near the bottom of the lake. The hypolimnion can become depleted of oxygen if consumption by decomposing organic matter exceeds reaeration by atmospheric diffusion and photosynthesis. Fish access to habitat, cool water and benthic prey can be limited if conditions become hypoxic (Dissolved oxygen < 2 mg/L). Dissolved oxygen measurements show that hypoxic conditions existed at a depth of 5.5 meters in June and 4.5 meters in July, August and September. Mean total phosphorus concentration at the surface for the five sampling events was 13 ppb and the mean concentration for bottom samples

was 30 ppb. These low levels and nominal difference do not point to the existence of phosphorous in sediment being released through redox reactions under the anoxic conditions measured at the bottom of the lake.

Trend Assessment

Turkey Creek Lake was assessed in August 1992 and May 1993 as a part of a Section 314 Clean Lakes Assessment Grant. This data was integrated into Volume 3 of the 1996 *Ohio Water Resource Inventory 305(b) Report*, which can be found at epa.ohio.gov/portals/35/documents/96vol3.pdf (Ohio EPA, 1996). The report describes trophic state index (TSI) as one of several metrics used to assess the condition of Ohio's public lakes. Carlson's TSI is a numerical representation of a lake's state of productivity along a scale of 0 to 100. Each major division (10, 20, 30, etc.) represents a doubling in algal biomass based on transparency, total phosphorus and chlorophyll-*a* measurements (Carlson, 1977). Unproductive, oligotrophic lakes score on the lower end of the scale, mesotrophic lakes are in the middle and eutrophic/hyper-eutrophic lakes occupy the upper end of the continuum. Trophic State Index ranges based on Carlson's classification system are as follows:

-Oligotrophic (lacking nutrients):	Less than 38 TSI
-Mesotrophic (midrange nutrient availability):	38-47 TSI
-Eutrophic (nutrient enriched):	48-66 TSI
-Hypereutrophic (over Enriched):	>66 TSI

In the 1996 report, Turkey Creek Lake was determined to have a final TSI of 36.0, an oligotrophic condition. The Carlson TSI values were calculated for samples collected from Turkey Creek Lake using formulas from Reckhow and Chapra (Reckhow & Chapra, 1983) as follows:

$$\text{Secchi disk TSI} = 60 - 14.41 \ln (\text{SD meters})$$

$$\text{Chlorophyll-}a \text{ TSI} = 9.81 \ln (\text{Chl-}a \text{ ug/l}) + 30.6$$

$$\text{Total phosphorus TSI} = 14.42 \ln (\text{TP ug/l}) + 4.15$$

The linear regressions for Carlson's TSI were calculated using data collected from thousands of lakes in and outside the U.S. The TSI represents absolute values that can be applied to most lakes to characterize their trophic status and general condition. Per Carlson's (1977) recommendation, average summer (July, August, September) chlorophyll-*a* and spring (April, May, June) total phosphorus TSI values were used to determine the final TSI value.

Table 5. Trophic state classification, TSI data and trends in trophic state for Turkey Creek Lake data.

Date	SD (m) Data	TSI SD	Chl. <i>a</i> (µg/L)	TSI Chl- <i>a</i>	TP (µg/L)	TSI TP	Final TSI ⁽¹⁾	Trophic Classification ⁽²⁾
8-5-92	1.9	33*	-	-	12	40	36	Oligotrophic
8-27-92	3.44	42	2.2	<u>38</u>	8	34		
5-25-93	4.11	40	-		8	<u>34</u>		

5-24-16	2.3	48	4.4	45	17	<u>45</u>	48 (47.6)	Eutrophic
6-14-16	1.98	50	5.3	47	11.7	<u>40</u>		
7-12-16	2.36	48	5.8	<u>48</u>	11	39		
8-16-16	2.35	48	5.4	<u>47</u>	12	40		
9-13-16	1.66	53	15.8	<u>58</u>	15	43		

⁽¹⁾ Based on average chlorophyll-a TSI values for summer (July, August, September) and/or average of Total Phosphorous TSI values for spring (April, May, June). When seasonal TSI values are available for both, the average is used to derive the annual Final TSI. Values used to establish Final TSI are underlined.

*This value from the 1996 report should have been listed as 51

Transparency based (Secchi depth) TSI values were calculated but Carlson warns against using transparency as a variable in waters with high non-algal turbidity, namely, sediment and silt (Carlson, 1980). Such is the case with many lakes and more specifically, reservoirs in Ohio. Secchi data was eliminated from the “trophic state” assessment process in 1988.

Summer Secchi depth TSI values are otherwise useful if compared against summer chlorophyll-a TSI values. A higher TSI based on Secchi depth may indicate non-algal turbidity and possible light limitation of algal growth.

Because Ohio does not have a very robust baseline of lake data, the use of TSI as a general tool for trend assessment is appropriate. Based on data collected in 2016, the final TSI for Turkey Creek Lake was calculated to be 48, which is markedly higher than the 1996 TSI value of 36 (Table 5). The current TSI value is reflective of higher chlorophyll-a and TP concentrations observed in Turkey Creek Lake in 2016. The notably higher chlorophyll-a result in September impacted the Final TSI and resulted in the trophic classification otherwise being mesotrophic.

Conclusions

When it comes time to expand or replace the wastewater treatment plant serving the state park lodge that discharges upstream from Turkey Creek Lake, consideration should be given to locating it downstream – possibly along US 52 with a discharge to the Ohio River. Prevention and mitigation of erosion along logging roads, especially on steep hillsides, would be beneficial to tributary streams and the lake.

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Appendix L

NPDES Permitted Facilities

NPDES Permitted Facilities and Illicit Discharges

To protect Ohio's water resources, Ohio EPA issues wastewater discharge, or National Pollutant Discharge Elimination System (NPDES), permits. These permits authorize the discharge of substances that meet water quality standards and establish other conditions related to the management of the discharge and related processes such as sludge disposal. NPDES permits regulate wastewater discharges by limiting the quantities of pollutants to be discharged and imposing monitoring requirements and other conditions. The limits and/or requirements in the permit help ensure compliance with Ohio's Water Quality Standards and federal regulations, all of which were written to protect public health and the environment.

There are two types of **NPDES permits**; individual and general. An individual NPDES permit is unique to each facility. The limitations and requirements in an individual permit are based on the facility's operations, type and amount of discharge and receiving stream among other factors. Because some of the individual permits contain very similar or, in many cases, identical effluent limitations and requirements, their contents have been compiled into one permit that can be applied to certain categories of discharges. This is a general permit.

A general permit is one permit that covers facilities that have similar operations and type of discharge. A general NPDES permit is a potential alternative to an individual NPDES permit and affords coverage to new and existing dischargers that meet the eligibility criteria given in the general permit. General permits are used to cover discharges that will have a minimal effect on the environment.

NPDES permits are usually issued for up to five years. Upon expiration, the permit is revised if necessary and renewed. More information about Ohio EPA's NPDES permit program can be found at epa.ohio.gov/dsw/permits/index.aspx

A comprehensive list of NPDES-permitted facilities located within the Southern Ohio River Tributaries watershed project area is found in 1. Detailed descriptions of major NPDES-permitted facilities and other, significant minor facilities are provided as well. These descriptions provide general background information about the industry or community, an overview of wastewater treatment system components, a table of numeric effluent violations reported by the entity, and a brief discussion of the facility's two-year compliance history leading up to the survey year.

For more information regarding any NPDES-permitted facility, please search Ohio EPA's **eDocument search engine (eDocs)**. To conduct the search for facilities located in the Southern Ohio River Tributaries watershed, type the associated Ohio EPA permit number, shown in the table below, in the Secondary ID field. There is no need to include the suffix in the search (for example, for Manchester WWTP use OPB00024 not OPB00024*GD).

Also, feel free to contact the Division of Surface Water in the Southwest District Office and speak directly with a compliance inspector. The general office number is (937) 285-6357.

For facilities that are a significant source of phosphorus and nitrogen to the receiving stream, such as sanitary wastewater treatment facilities, nutrient loading tables are provided. Nutrient loadings are a product of discharge concentrations and discharge flows; therefore, the long-term loading profiles provided in the charts illustrate: 1) facility nutrient loading trends; and 2) the magnitude of a facility's contribution to the receiving stream when compared to other sources of nutrients.

Table 1 — Individual NPDES permitted facilities in the Southern Ohio River Tributaries watershed.

Nested Subwatershed (05090201)	Ohio Permit Number	Facility Name	Design Flow ¹ (MGD)	Average Flow (MGD) ²	Type of Waste	Stream and River Mile at Discharge	County
02 01	OPP00029	ODNR - Shawnee State Park Lodge & Cabins	0.04	0.013	Sanitary	Turkey Creek 11.83	Scioto
02 01	OPP00035	Shawnee State Park Campground WWTP	0.025	0.0018	Sanitary	Turkey Creek 10.28	Scioto
06 01	OIB00022	Dayton Power & Light Co Killen Electric Generating	15	8.0	Sanitary	Ohio River 389.40	Adams
06 01	OIY00002	Adams County Water Co Inc.			Water treatment backwash	Ohio River 589.28	Adams
06 01	OPB00024	Manchester WWTP	0.3	0.14	Sanitary	Ohio River 583.71	Adams
06 05	OIB00049	DP&L JM Stuart Generating Station	361	321	Industrial	Buzzards Roost Creek Little, Threemile Creek and Ohio River 576.37	Adams
06 05	1PB00100	Aberdeen WWTP	0.385	0.310	Sanitary	Ohio River 572.57	Brown
07 01	1PA00104	Russellville WWTP			Sanitary	Honey Creek 0.82	Brown
08 01	1PB00103	Ripley STP	0.4	0.24	Sanitary	Ohio River 564.3	Brown
08 02	1PS00013	Waynoka Regional W & SD			Sanitary	Straight Creek 18.45	Brown
08 04	1IN00293	US Shoe Site aka former US Shoe Facility	0.072	No discharge during survey	Industrial	Ohio River 565.1	Brown
10 03	1PB00101	Georgetown WWTP	1.1	0.83	Sanitary	Town Run	Brown

1 Design flows that are greater than 1.0 million gallons per day (MGD) classify a facility as a major discharger.

2 Average flows are displayed for 2014 through October of 2016 unless otherwise noted.

3 Russellville WWTP and Waynoka Regional W & SD are controlled discharge.

City of Georgetown WWTP (Ohio EPA Permit #1PB00101)

The Georgetown WWTP serves approximately 4,331 residents in the Village of Georgetown. Sewer services for the city are provided by a wastewater treatment plant with an average daily design flow of 1.1 MGD. Sanitary waste from the village receives treatment through a bar screen, grit removal, flow equalization, sequencing batch reactor, chemical addition for phosphorus, tertiary clarifiers if needed, ultraviolet disinfection, and post aeration. Georgetown WWTP has a bypass of the grit chamber and a bypass of its tertiary clarifier (the clarifier is only used when necessary). There are no bypasses of biological treatment processes. The final treated effluent is discharged to Town Run.

The sanitary sewer collection system for the city is made up of 100% separate sanitary sewers.

The Georgetown WWTP completed its last upgrade in 2014. During this upgrade Georgetown changed from contact stabilization activated sludge to sequencing batch reactors. Two new lift stations with wet weather high flow pumps and storage basins were constructed. Chemical feed for phosphorus reduction was also added. Estimated inflow and infiltration rate to the system is 0.05 MGD.

In December 2014 Georgetown received a NOV for violating their compliance schedule to meet permit limits by September 2014. Georgetown responded with a list of issues they were working on in relation to startup after construction and how they would come back into compliance. Another NOV was sent in May 2015 as Georgetown was still violating limits. At that time the proper chemical feed for phosphorus was still not installed. Ohio EPA most recently conducted a compliance sampling inspection on September 29, 2016. This inspection noted Georgetown had changed the chemical feed for phosphorus to go into the SBR mixer area instead of the influent head works area for better control of phosphorus. A NOV was associated with this inspection as no Collection Systems Operator had been designated by Georgetown. This violation was resolved in October 2016. A bioassay performed on November 3-4, 2014 at the Georgetown WWTP effluent from outfall 001 was not acutely toxic to *Pimephales promelas* or *Ceriodaphnia dubia*. Compliance history for the plant during the sampling period showed the facility reported a 7-day limit violation for both total phosphorus and nitrogen-ammonia for the month of July 2016 and a 7-day limit violation for total phosphorus in August 2016. All compliance history from January 2014 – March 2019 is presented in Table 2.

Nutrient loadings from the Georgetown WWTP from 2007 through 2016 were evaluated and annual statistics for nitrate-nitrate and total phosphorus loading are depicted in Figures A and B. The median flow at the plant peaked in 2011 at just above the ADDF and then became more consistent in following years. Both phosphorus and nitrate+nitrite loads showed a decrease after plant upgrades were started in 2014.

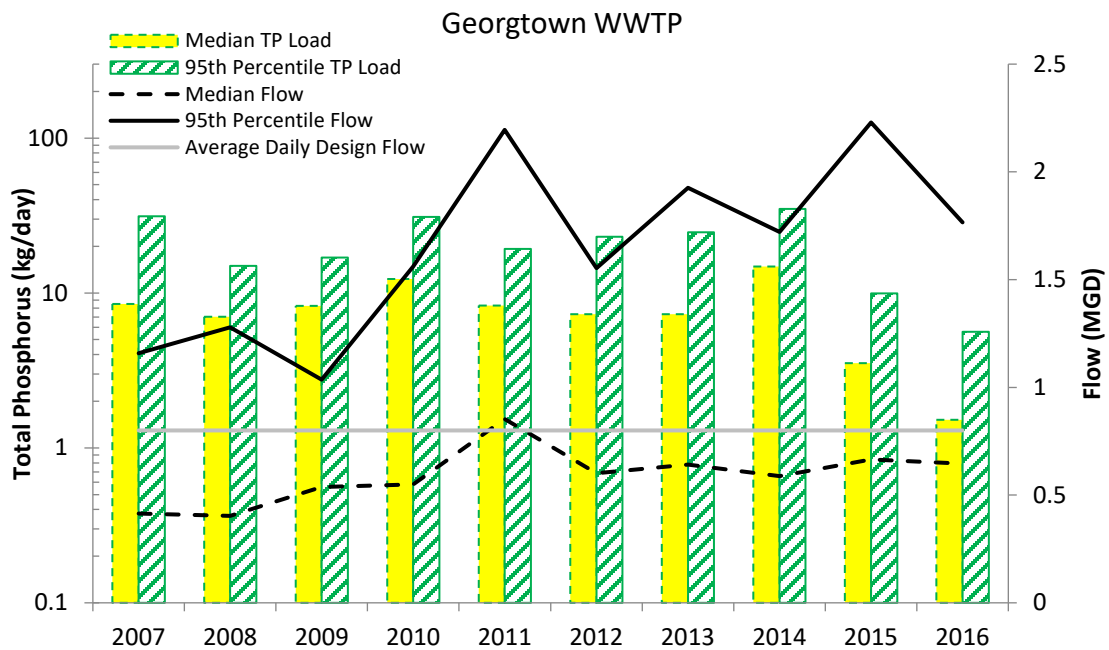


Figure A – Annual Nitrate-Nitrite loadings for the Georgetown WWTP from 2007-2016.

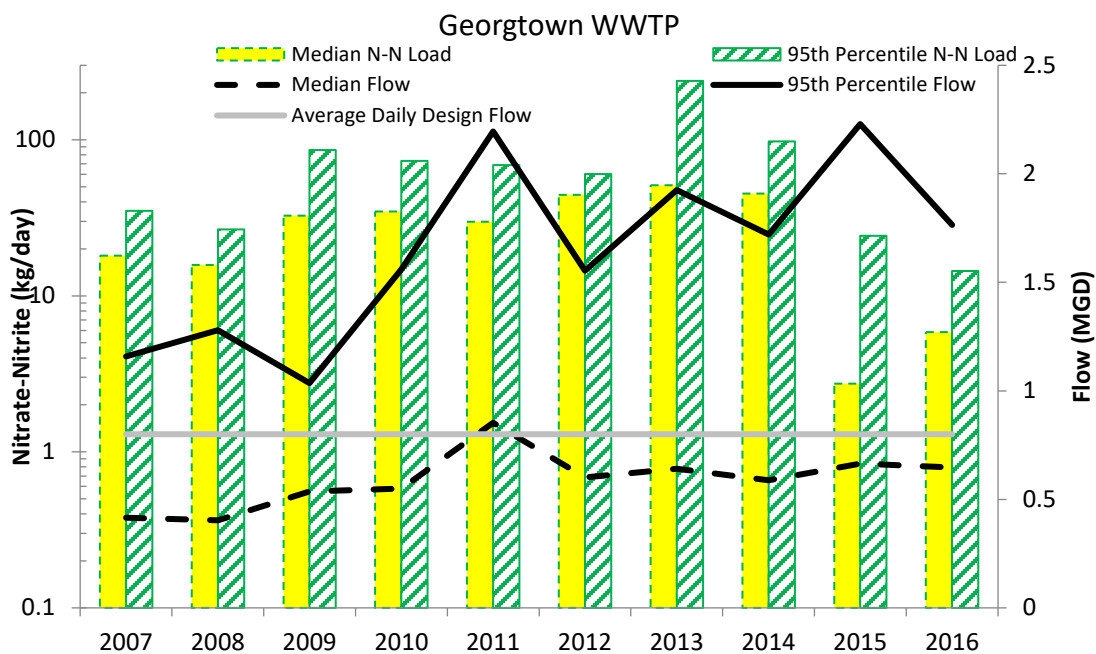


Figure B – Annual Total Phosphorus loadings for the Georgetown WWTP from 2007-2016.

Table 2 – Georgetown WWTP permit limit compliance.

Permit No	Reporting Period	Station	Parameter	Limit Type	Limit	Reported Value	Violation Date
1PB00101*ID	January 2014	001	Total Suspended Solids	7D Conc	26.0	39.5	1/8/2014
1PB00101*ID	January 2014	001	Total Suspended Solids	7D Qty	78.8	189.312	1/8/2014

Permit No	Reporting Period	Station	Parameter	Limit Type	Limit	Reported Value	Violation Date
1PB00101*ID	January 2014	001	Total Suspended Solids	7D Conc	26.0	34.5	1/15/2014
1PB00101*ID	January 2014	001	Total Suspended Solids	7D Qty	78.8	114.520	1/15/2014
1PB00101*ID	January 2014	001	Total Suspended Solids	30D Conc	17.0	24.875	1/1/2014
1PB00101*ID	January 2014	001	Total Suspended Solids	30D Qty	51.5	100.155	1/1/2014
1PB00101*ID	February 2014	001	Total Suspended Solids	7D Qty	78.8	102.861	2/15/2014
1PB00101*ID	April 2014	001	Total Suspended Solids	7D Qty	78.8	352.468	4/1/2014
1PB00101*ID	April 2014	001	Total Suspended Solids	7D Qty	78.8	88.0693	4/8/2014
1PB00101*ID	April 2014	001	Total Suspended Solids	30D Qty	51.5	114.318	4/1/2014
1PB00101*ID	April 2014	001	Nitrogen, Ammonia (NH3	7D Qty	24.2	65.4979	4/1/2014
1PB00101*ID	April 2014	001	Nitrogen, Ammonia (NH3	30D Qty	16.0	21.7884	4/1/2014
1PB00101*ID	April 2014	001	CBOD 5 day	7D Qty	69.7	108.593	4/1/2014
1PB00101*ID	April 2014	001	CBOD 5 day	30D Qty	45.5	45.5102	4/1/2014
1PB00101*ID	July 2014	001	pH	1D Conc	6.5	6.2	7/14/2014
1PB00101*ID	July 2014	001	pH	1D Conc	6.5	6.1	7/16/2014
1PB00101*ID	July 2014	001	pH	1D Conc	6.5	6.4	7/17/2014
1PB00101*ID	July 2014	001	pH	1D Conc	6.5	6.4	7/18/2014
1PB00101*ID	July 2014	001	Total Suspended Solids	30D Conc	12.0	16.	7/1/2014
1PB00101*ID	July 2014	001	Total Suspended Solids	7D Conc	18.0	31.	7/22/2014
1PB00101*ID	August 2014	001	pH	1D Conc	6.5	6.3	8/10/2014
1PB00101*ID	August 2014	001	pH	1D Conc	6.5	6.2	8/11/2014
1PB00101*ID	August 2014	001	Total Suspended Solids	7D Conc	18.0	21.	8/15/2014
1PB00101*ID	August 2014	001	Total Suspended Solids	30D Conc	12.0	12.625	8/1/2014
1PB00101*ID	September 2014	001	Phosphorus, Total (P)	7D Conc	1.5	11.	9/1/2014
1PB00101*ID	September 2014	001	Phosphorus, Total (P)	7D Qty	6.3	15.4465	9/1/2014
1PB00101*ID	September 2014	001	Phosphorus, Total (P)	7D Conc	1.5	8.	9/8/2014
1PB00101*ID	September 2014	001	Phosphorus, Total (P)	7D Qty	6.3	21.5593	9/8/2014
1PB00101*ID	September 2014	001	Phosphorus, Total (P)	7D Conc	1.5	12.	9/15/2014
1PB00101*ID	September 2014	001	Phosphorus, Total (P)	7D Qty	6.3	14.8069	9/15/2014
1PB00101*ID	September 2014	001	Phosphorus, Total (P)	30D Conc	1.0	14.5	9/1/2014
1PB00101*ID	September 2014	001	Phosphorus, Total (P)	7D Conc	1.5	27.	9/22/2014
1PB00101*ID	September 2014	001	Phosphorus, Total (P)	30D Qty	4.2	21.3843	9/1/2014
1PB00101*ID	September 2014	001	Phosphorus, Total (P)	7D Qty	6.3	33.7243	9/22/2014
1PB00101*ID	September 2014	001	Nitrogen, Ammonia (NH3	7D Conc	0.90	1.32	9/1/2014
1PB00101*ID	September 2014	001	Nitrogen, Ammonia (NH3	30D Conc	0.60	1.90917	9/1/2014
1PB00101*ID	September 2014	001	Nitrogen, Ammonia (NH3	7D Conc	0.90	5.22667	9/15/2014
1PB00101*ID	September 2014	001	Nitrogen, Ammonia (NH3	30D Qty	2.5	3.21342	9/1/2014
1PB00101*ID	September 2014	001	Nitrogen, Ammonia (NH3	7D Qty	3.8	8.62333	9/15/2014
1PB00101*ID	October 2014	001	Nitrogen, Ammonia (NH3	7D Conc	0.90	2.66	10/1/2014
1PB00101*ID	October 2014	001	Nitrogen, Ammonia (NH3	7D Qty	3.8	11.8434	10/1/2014
1PB00101*ID	October 2014	001	Nitrogen, Ammonia (NH3	7D Conc	0.90	3.87	10/8/2014
1PB00101*ID	October 2014	001	Nitrogen, Ammonia (NH3	7D Qty	3.8	15.0476	10/8/2014
1PB00101*ID	October 2014	001	Nitrogen, Ammonia (NH3	30D Conc	0.60	1.88667	10/1/2014
1PB00101*ID	October 2014	001	Nitrogen, Ammonia (NH3	30D Qty	2.5	7.51609	10/1/2014
1PB00101*ID	October 2014	001	Phosphorus, Total (P)	7D Conc	1.5	11.6	10/1/2014
1PB00101*ID	October 2014	001	Phosphorus, Total (P)	7D Qty	6.3	15.1914	10/1/2014
1PB00101*ID	October 2014	001	Phosphorus, Total (P)	7D Conc	1.5	2.75	10/8/2014
1PB00101*ID	October 2014	001	Phosphorus, Total (P)	7D Qty	6.3	11.2518	10/8/2014
1PB00101*ID	October 2014	001	Phosphorus, Total (P)	7D Conc	1.5	10.6	10/15/2014
1PB00101*ID	October 2014	001	Phosphorus, Total (P)	7D Qty	6.3	22.0264	10/15/2014
1PB00101*ID	October 2014	001	Phosphorus, Total (P)	30D Conc	1.0	10.1875	10/1/2014

Permit No	Reporting Period	Station	Parameter	Limit Type	Limit	Reported Value	Violation Date
1PB00101*ID	October 2014	001	Phosphorus, Total (P)	30D Qty	4.2	19.9217	10/1/2014
1PB00101*ID	October 2014	001	Phosphorus, Total (P)	7D Qty	6.3	31.2171	10/22/2014
1PB00101*ID	November 2014	001	Phosphorus, Total (P)	7D Conc	1.5	18.55	11/1/2014
1PB00101*ID	November 2014	001	Phosphorus, Total (P)	7D Qty	6.3	35.1058	11/1/2014
1PB00101*ID	November 2014	001	Phosphorus, Total (P)	7D Conc	1.5	3.5	11/8/2014
1PB00101*ID	November 2014	001	Phosphorus, Total (P)	7D Conc	1.5	3.	11/15/2014
1PB00101*ID	November 2014	001	Phosphorus, Total (P)	30D Conc	1.0	7.075	11/1/2014
1PB00101*ID	November 2014	001	Phosphorus, Total (P)	7D Conc	1.5	3.25	11/22/2014
1PB00101*ID	November 2014	001	Phosphorus, Total (P)	30D Qty	4.2	13.4265	11/1/2014
1PB00101*ID	November 2014	001	Phosphorus, Total (P)	7D Qty	6.3	7.04862	11/22/2014
1PB00101*ID	December 2014	001	Phosphorus, Total (P)	7D Conc	1.5	2.6	12/1/2014
1PB00101*ID	December 2014	001	Phosphorus, Total (P)	7D Conc	1.5	4.25	12/15/2014
1PB00101*ID	December 2014	001	Phosphorus, Total (P)	7D Qty	6.3	14.7832	12/15/2014
1PB00101*ID	December 2014	001	Phosphorus, Total (P)	30D Conc	1.0	2.35	12/1/2014
1PB00101*ID	December 2014	001	Phosphorus, Total (P)	30D Qty	4.2	7.60004	12/1/2014
1PB00101*ID	December 2014	001	Phosphorus, Total (P)	7D Qty	6.3	6.90763	12/22/2014
1PB00101*ID	January 2015	001	Phosphorus, Total (P)	7D Conc	1.5	3.5	1/15/2015
1PB00101*ID	January 2015	001	Phosphorus, Total (P)	7D Qty	6.3	8.80959	1/15/2015
1PB00101*ID	January 2015	001	Phosphorus, Total (P)	30D Conc	1.0	1.8475	1/1/2015
1PB00101*ID	January 2015	001	Phosphorus, Total (P)	7D Conc	1.5	2.2	1/22/2015
1PB00101*ID	January 2015	001	Phosphorus, Total (P)	30D Qty	4.2	4.95204	1/1/2015
1PB00101*ID	January 2015	001	Phosphorus, Total (P)	7D Qty	6.3	6.42844	1/22/2015
1PB00101*ID	February 2015	001	Phosphorus, Total (P)	7D Conc	1.5	1.76	2/1/2015
1PB00101*ID	February 2015	001	Phosphorus, Total (P)	7D Conc	1.5	3.	2/8/2015
1PB00101*ID	February 2015	001	Phosphorus, Total (P)	7D Qty	6.3	6.32474	2/8/2015
1PB00101*ID	February 2015	001	Phosphorus, Total (P)	7D Conc	1.5	1.6	2/15/2015
1PB00101*ID	February 2015	001	Phosphorus, Total (P)	30D Conc	1.0	1.9025	2/1/2015
1PB00101*ID	February 2015	001	Phosphorus, Total (P)	30D Qty	4.2	4.28169	2/1/2015
1PB00101*ID	March 2015	001	Total Suspended Solids	7D Conc	18.0	37.3333	3/1/2015
1PB00101*ID	March 2015	001	Total Suspended Solids	7D Qty	75.0	407.011	3/1/2015
1PB00101*ID	March 2015	001	Total Suspended Solids	7D Qty	75.0	105.749	3/8/2015
1PB00101*ID	March 2015	001	Total Suspended Solids	30D Conc	10.0	13.1666	3/1/2015
1PB00101*ID	March 2015	001	Total Suspended Solids	30D Qty	41.7	131.294	3/1/2015
1PB00101*ID	March 2015	001	CBOD 5 day	7D Qty	50.0	60.2731	3/1/2015
1PB00101*ID	March 2015	001	Phosphorus, Total (P)	7D Qty	6.3	6.71327	3/8/2015
1PB00101*ID	March 2015	001	Phosphorus, Total (P)	7D Conc	1.5	2.35	3/15/2015
1PB00101*ID	March 2015	001	Phosphorus, Total (P)	7D Qty	6.3	7.61391	3/15/2015
1PB00101*ID	March 2015	001	Phosphorus, Total (P)	30D Conc	1.0	1.44	3/1/2015
1PB00101*ID	March 2015	001	Phosphorus, Total (P)	30D Qty	4.2	5.87012	3/1/2015
1PB00101*ID	April 2015	001	Phosphorus, Total (P)	7D Conc	1.5	1.52	4/1/2015
1PB00101*ID	April 2015	001	Phosphorus, Total (P)	7D Qty	6.3	10.2004	4/1/2015
1PB00101*ID	April 2015	001	Phosphorus, Total (P)	30D Conc	1.0	1.085	4/1/2015
1PB00101*ID	April 2015	001	Phosphorus, Total (P)	30D Qty	4.2	5.21518	4/1/2015
1PB00101*ID	May 2015	001	Nitrogen, Ammonia (NH3	7D Conc	0.90	1.44333	5/1/2015
1PB00101*ID	May 2015	001	Phosphorus, Total (P)	7D Conc	1.5	4.34	5/1/2015
1PB00101*ID	May 2015	001	Phosphorus, Total (P)	7D Qty	6.3	9.09339	5/1/2015
1PB00101*ID	May 2015	001	Phosphorus, Total (P)	7D Conc	1.5	2.95	5/8/2015
1PB00101*ID	May 2015	001	Phosphorus, Total (P)	7D Conc	1.5	2.05	5/15/2015
1PB00101*ID	May 2015	001	Phosphorus, Total (P)	30D Conc	1.0	3.23833	5/1/2015
1PB00101*ID	May 2015	001	Phosphorus, Total (P)	7D Conc	1.5	2.875	5/22/2015

Permit No	Reporting Period	Station	Parameter	Limit Type	Limit	Reported Value	Violation Date
1PB00101*ID	May 2015	001	Phosphorus, Total (P)	30D Qty	4.2	6.2756	5/1/2015
1PB00101*ID	June 2015	001	Phosphorus, Total (P)	7D Conc	1.5	5.16	6/1/2015
1PB00101*ID	June 2015	001	Phosphorus, Total (P)	7D Qty	6.3	9.04267	6/1/2015
1PB00101*ID	June 2015	001	Phosphorus, Total (P)	7D Conc	1.5	5.05	6/8/2015
1PB00101*ID	June 2015	001	Phosphorus, Total (P)	7D Qty	6.3	9.80561	6/8/2015
1PB00101*ID	June 2015	001	Phosphorus, Total (P)	7D Conc	1.5	8.1	6/15/2015
1PB00101*ID	June 2015	001	Phosphorus, Total (P)	7D Qty	6.3	21.6755	6/15/2015
1PB00101*ID	June 2015	001	Phosphorus, Total (P)	30D Conc	1.0	5.1425	6/1/2015
1PB00101*ID	June 2015	001	Phosphorus, Total (P)	7D Conc	1.5	2.26	6/22/2015
1PB00101*ID	June 2015	001	Phosphorus, Total (P)	30D Qty	4.2	11.3199	6/1/2015
1PB00101*ID	July 2015	001	Phosphorus, Total (P)	30D Qty	4.2	4.25711	7/1/2015
1PB00101*ID	July 2015	001	Phosphorus, Total (P)	7D Qty	6.3	6.67065	7/22/2015
1PB00101*ID	August 2015	001	Nitrogen, Ammonia (NH3	7D Conc	0.90	.94333	8/15/2015
1PB00101*ID	September 2015	001	Phosphorus, Total (P)	30D Conc	1.0	1.0475	9/1/2015
1PB00101*ID	September 2015	001	Phosphorus, Total (P)	7D Conc	1.5	1.8	9/22/2015
1PB00101*JD	December 2015	001	Phosphorus, Total (P)	7D Qty	6.3	6.7105	12/1/2015
1PB00101*JD	July 2016	001	Nitrogen, Ammonia (NH3	7D Qty	3.8	4.4491	7/22/2016
1PB00101*JD	July 2016	001	Phosphorus, Total (P)	7D Qty	6.3	6.41985	7/22/2016
1PB00101*JD	August 2016	001	Phosphorus, Total (P)	7D Qty	6.3	7.42163	8/15/2016

Village of Russellville WWTP (Ohio EPA Permit # 1PA00104)

The village of Russellville wastewater treatment plant (WWTP) provides sanitary wastewater treatment to approximately 453 people in Russellville and 25 people in Macon. The municipal WWTP consists of one aerated lagoon and one secondary nonaerated lagoon. The intended primary disposal at Russellville is irrigation of treated wastewater in appropriate weather conditions, on a 14-acre area during the period of April through November. When irrigation is not possible, treated effluent can be control discharged to Honey Creek, with a ratio of 5:1 (stream flow to plant final effluent flow), and no discharge is allowed when the upstream flow is less than 0.5 MGD. However, due to maintenance issues, irrigation has been rarely used as the method for effluent disposal. During the survey, the plant discharged once in May (.137 million gallons per day (MGD)), three times in July (average .266 MGD), once in August (.156 MGD), once in October (0.225 MGD) and twice in December (average .271 MGD). The village's sanitary waste is 100 percent separated and discharges into Honey Creek at river mile 0.82.

The Russellville WWTP had permit limit violations for *E. coli* during the sampling period (May through December). These permit limit exceedances are documented in Table 2. No other violations were reported when discharging from the lagoon during the sampling period.

Table 2 — Russellville WWTP permit limit compliance.

Permit No	Reporting Period	Station	Parameter	Limit Type	Limit	Reported Value	Violation Date
1PA00104*DD	July 2016	001	<i>E. coli</i>	7D Conc	2318	2600	7/1/2016
1PA00104*DD	August 2016	001	<i>E. coli</i>	7D Conc	2318	3500	8/15/2016
1PA00104*DD	October 2016	001	<i>E. coli</i>	7D Conc	2318	4500	10/15/2016

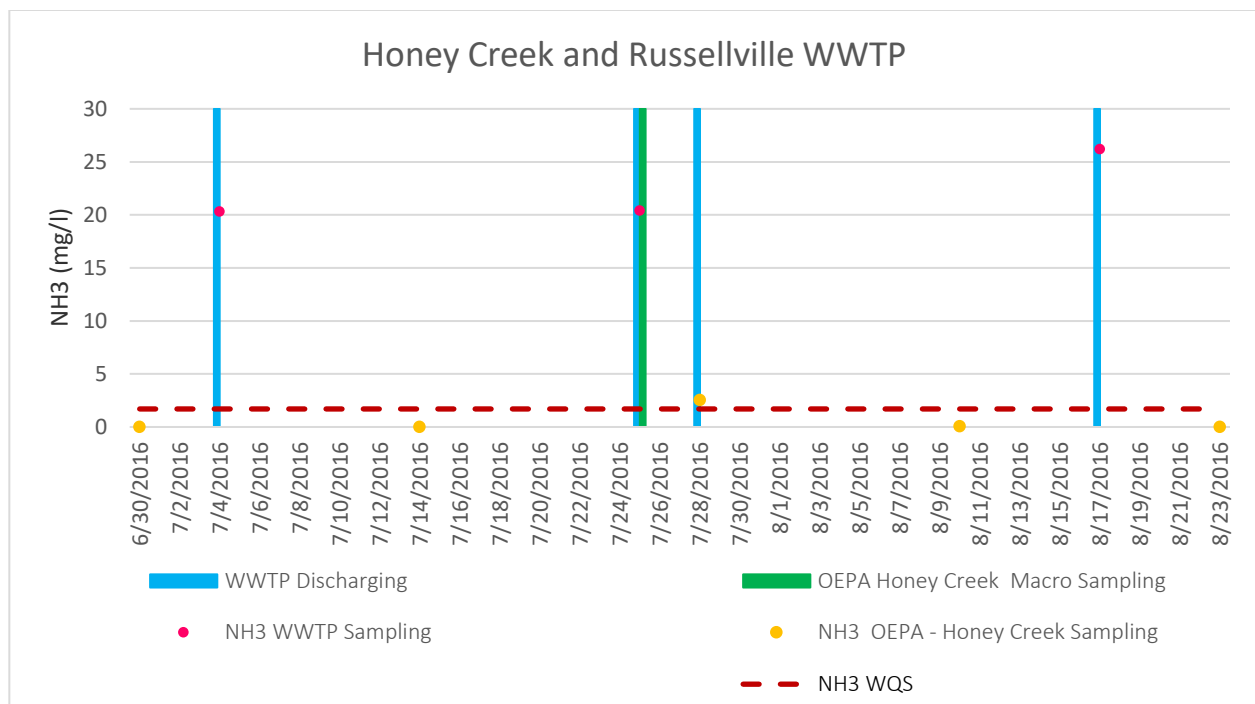


Figure 1 — Nitrogen-ammonia in Honey Creek and from the Russellville WWTP.

During the months of June, July, and August, Ohio EPA staff took stream samples from Honey Creek that were tested for nitrogen-ammonia among other parameters. Ohio EPA sampled Honey Creek approximately 0.7 miles downstream from the Russellville WWTP discharge location. As Figure 2 illustrates, one of the sampling events recorded an instream nitrogen-ammonia concentration of 2.53 mg/L, which exceeds the WQS of 1.7 mg/L. This sampling event coincided with a day in which the Russellville WWTP was discharging to Honey Creek.

At the time of the survey, the Russellville WWTP did not have effluent limits for nitrogen-ammonia, they do conduct ammonia monitoring in their effluent. Ammonia results reported by Russellville during this timeframe ranged from 20.3 mg/L to 26.2 mg/L. For comparison, conventional treatment technologies utilized in WWTPs throughout the state routinely discharge treated water with nitrogen-ammonia concentrations less than 1 mg/L.

Despite a stream-flow to discharge-flow ratio of 6:1 on July 28, 2016, the Ohio EPA ammonia sample collected downstream of the WWTP discharge exceeded WQS. Four other samples taken during the survey were either non-detects or well below the WQS for ammonia. It is worth mentioning that these samples were taken five or more days after the WWTP ceased discharging to Honey Creek. This information strongly suggests that ammonia concentrations in Honey Creek elevate during the time the plant discharges and return to background at some point after the discharge ends.

Ohio EPA also sampled macroinvertebrates in Honey Creek on a day Russellville WWTP was discharging, with the sampling score showing Honey Creek to be impacted. Refer to the Macroinvertebrate Community section in the report for more information.

In response to conditions observed during the 2016 survey, when the Russellville WWTP NPDES permit was renewed in 2018, 4.5 mg/L weekly and 3.0 mg/L monthly summer nitrogen-ammonia limits were added to the permit.

Waynoka Regional Water and Sewer District (Ohio EPA Permit # 1PS00013)

Waynoka Regional Water and Sewer District (WRWSD) WWTP provides services to approximately 700 homes. The wastewater treatment plant capacity is based on an average daily flow of 102,500 gallons per day and consists of pre-aeration, oxidation ditch, and secondary clarification prior to discharging to a contained storage pond. During the non-summer months of November through April, the WRWSD is permitted to discharge from the storage pond to Straight Creek (River Mile 18.45) at a stream-flow to discharge-flow ratio of 5:1. As a result, the facility did not discharge during the biological assessment season in 2016 (June 15 - October 15). The WWTP capacity is sized based on an average daily flow of 0.1025 MGD. The WRWSD reported total suspended solids violations in December of 2016. WRWSD staff attributed the violations to excessive algae buildup in the storage pond and, as a result, are evaluating methods for controlling the growth. WRWSD communicates with Ohio EPA staff as they work through this process-improvement.

Appendix M

Atrazine, Nitrate, and

Cyanotoxin Results For

Assessing Public Drinking

Water Beneficial Use

Atrazine, nitrate, and cyanotoxin results to assess public drinking water beneficial use for samples collected during the survey.

Station: 204216		LAKE WAYNOKA WATER SUPPLY RESERVOIR (SYCAMORE RUN), L-1			
Basin Code	River Mile	Drainage Area	Lat	Long	Hydro Unit
10-316-000	1.00	6.60	38.9419	-83.8033	050902010802

Parameters	2015-05-19	2015-06-10	2015-07-16	2015-08-11	2015-09-16
Atrazine (ug/L)	<0.2	<0.2	<0.2	<0.2	<0.2
Nitrate+nitrite (mg/L)	<0.1	<0.1	0.14	<0.1	<0.1
Cylindrospermopsin (ug/L)	<0.05	<0.05	<0.05	<0.05	<0.05
Microcystins (ug/L)	<0.3	<0.3	<0.3	<0.3	<0.3
Saxitoxins (ug/L)	NA	0.056	<0.022	0.042	>0.44

	2016-05-18	2016-06-07	2016-07-06	2016-08-02	2016-09-07
Atrazine (ug/L)	2.6	1.2	4.5	1.8	0.5
Nitrate+nitrite (mg/L), surface	0.48	<0.1	<0.1	<0.1	<0.1
Nitrate+nitrite (mg/L), bottom	0.15	<0.1	0.12	<0.1	<0.1
Cylindrospermopsin (ug/L)	<0.05	<0.05	<0.05	<0.05	<0.05
Microcystins (ug/L)	<0.3	<0.3	<0.3	<0.3	<0.3
Saxitoxins (ug/L)	<0.022	<0.022	<0.022	<0.022	<0.022

Station: 204246		WAYNOKA UPGROUND WATER SUPPLY RESERVOIR, L-1			
Basin Code	River Mile	Drainage Area	Lat	Long	Hydro Unit
10-316-001	0.40	0.20	38.939605	-83.800245	050902010802

Parameters	2015-05-19	2015-06-10	2015-07-16	2015-08-11	2015-09-16
Atrazine (ug/L)	<0.2	0.47	0.50	0.38	0.43
Nitrate+nitrite (mg/L)	<0.1	<0.1	0.22	<0.1	<0.1
Cylindrospermopsin (ug/L)	<0.05	<0.05	<0.05	<0.05	<0.05
Microcystins (ug/L)	<0.3	<0.3	<0.3	<0.3	<0.3
Saxitoxins (ug/L)	NA	<0.022	<0.022	<0.022	<0.022

	2016-05-18	2016-06-07	2016-07-06	2016-08-02	2016-09-07
Atrazine (ug/L)	<0.2	0.29	0.44	0.47	0.30
Nitrate+nitrite (mg/L), surface	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrate+nitrite (mg/L), bottom	<0.1	<0.1	<0.1	<0.1	<0.1
Cylindrospermopsin (ug/L)	<0.05	<0.05	<0.05	<0.05	<0.05
Microcystins (ug/L)	<0.3	<0.3	<0.3	<0.3	<0.3
Saxitoxins (ug/L)	<0.022	<0.022	<0.022	<0.022	<0.022

Appendix N

Stream Chlorophyll a Results

Chlorophyll *a* samples are collected at a subset of stations selected for nutrient assessment. Benthic chlorophyll *a* is used to estimate algal biomass attached to bottom substrates and sestonic chlorophyll *a* is used to estimate algal biomass suspended in the water column. Both types of samples are collected and preserved using the methods outlined in Ohio EPA's Surface Water Field Sampling Manual – Appendix II, July 31, 2015 (Ohio EPA, 2015).

Stream (Stream Code)				Sestonic		Benthic	
Station	River Mile	AU ^a	Drainage Area (mi ²)	Sample Date	Chlorophyll <i>a</i> (µg/L)	Sample Date	Chlorophyll <i>a</i> (mg/m ²)
Turkey Creek (10-508-000)							
X04P02	4.1	02-02	39	9/1/2016	0.8	8/31/2016	45.4
X04P03	9.58	02-02	16.5	9/1/2016	0.5	8/30/2016	63.8
303609	10.70	02-01	8.72	9/1/2016	0.5	8/31/2016	28.2
Town Run (10-407-000)							
X02W04	0.63	10-03	1.4	9/1/2016	0.9	8/30/2016	49.5
X02S05	0.81	10-03	1.4	9/1/2016	<0.3		
Straight Creek (10-300-000)							
X03W12	2.78	08-02	57			8/31/2016	58.6
X03W11	9.45	08-02	34	9/1/2016	1.0	8/31/2016	37.2
X03W09	16.75	08-02	12.5	9/1/2016	0.9	8/31/2016	50.4
West Fork Eagle Creek (10-120-000)							
200693	3.3	07-04	54	9/1/2016	2.7	8/31/2016	60.0
X03W05	7.38	07-01	28	9/1/2016	4.2	8/31/2016	63.7
Northwest Fork (Tributary to West Fork Eagle Creek (RM 7.05)) (10-120-001)							
X03W07	1.8	07-01	7.2	9/1/2016	1.5	8/31/2016	44.2
East Fork Eagle Creek (10-110-000)							
X03W04	0.82	07-03	48	9/1/2016	1.6	8/31/2016	145.0
X03S03	7.90	07-02	15.1			8/31/2016	88.1
Eagle Creek (10-100-000)							
200689	6.2	07-05	129	9/1/2016	2.7	8/31/2016	73.4
303537	14.43	07-05	108	9/1/2016	3.9	8/31/2016	115.0
Pond Run (10-099-000)							
303602	0.38	02-03	11.35	9/1/2016	1.0	8/31/2016	39.3
Upper Twin Creek (10-085-000)							
X04P01	2.6	02-05	12.8	9/1/2016	0.6	8/31/2016	35.4
Lower Twin Creek (10-082-000)							
X99Q02	1.65	02-06	15.1	9/1/2016	0.4	8/31/2016	44.5

Appendix O
Supplemental Field Meter Readings
2015

Station ID	Station Name (existing ALU)				River Code
Date	Time	Temp (°C)	Cond (µS/cm)	DO (%)	DO (mg/L)
302931	Cornick Run adj. Old U.S. Rt. 68 (Rd. 30) (EWH)				10-038-000
6/4/2015	12:20	22.48	598.8	112.1	9.5
RED OAK CREEK BASIN					
302932	Red Oak Creek dst. W. Fk. Red Oak Creek (WWH)				10-040-000
6/4/2015	11:50	19.74	537.2	110.5	9.84
7/15/2015	13:15	20.51	405.7	98.8	8.63
302933	<i>Red Oak Creek @ Rd. 231A (WWH)</i>				<i>10-040-000</i>
6/4/2015	11:15	18.69	608	96.4	8.78
7/15/2015	13:31	20.75	367.5	96.6	8.42
X03W01	Red Oak Creek at Stringtown @ Ripley Rd. (WWH)				10-040-000
6/4/2015	12:50	20.34	576.8	103.7	9.13
7/15/2015	13:49	20.26	409	100.8	8.82
302934	<i>W. Fk. Red Oak Creek @ end of Bealer Rd. (Rd. 231) (WWH)</i>				<i>10-041-000</i>
6/4/2015	11:45	17.91	586.1	92.7	8.58
7/15/2015	13:08	20.35	421.7	98.7	8.61
THREEMILE CREEK BASIN					
302935	Big Threemile Creek @ St. Rt. 41 (WWH)				10-043-000
5/28/2015	12:15	22.78*	476.8	121.0	10.24
7/28/2015	11:40	24.02	616.2	110.3	9.06
302936	<i>Big Threemile Creek @ Roush Hill Rd. (Rd. 20) (WWH)</i>				<i>10-043-000</i>
5/28/2015	12:05	20.46	548.0	89.9	7.93
7/28/2015	11:55	21.83	610	95.4	8.2
X03W02	Big Threemile Creek NE of Aberdeen @ St. Rt. 763 (WWH)				10-043-000
5/28/2015	12:45	22.78*	449.5	106.4	8.98
7/28/2015	11:00	23.43	529.6	99.8	8.3
302937	Slickaway Run @ Stringtown Rd. (Rd. 251) (EWH)				10-044-000
5/28/2015	12:50	19.37	631.2	79.0	7.11
7/28/2015	11:05	22.18	928.1	83.4	7.05
302938	Ellis Run @ Ellis Run Rd. (Rd. 44) nr. Ellsberry (EWH)				10-047-000
5/28/2015	12:35	21.37*	420.0	93.7	8.14
7/28/2015	11:20	23.31	744.8	86	7.14
302939	Meffords Run adj. Meffords Run Rd. (Rd. 248) (EWH)				10-048-000
5/28/2015	12:25	20.51	455.2	92.0	8.09
7/28/2015	11:30	23.62	712.8	90.4	7.46

Italicized font denotes sites also sampled for water chemistry in 2016 or 2017.

* symbol indicates water quality standard (WQS) exceedance.

Station ID	Station Name (existing ALU)				River Code
Date	Time	Temp (°C)	Cond (µS/cm)	DO (%)	DO (mg/L)
EAGLE CREEK BASIN					
302940	Baylor Run @ Scoffield Rd. (EWH)				10-101-000
6/1/2015	12:52	17.6	594.3	44.6	4.10
7/15/2015	14:15	18.85	476.6	96.1	8.68
7/28/2015	13:40	22.15	543.8	84.4	7.22
302941	Beetle Creek @ Griffith Rd. (EWH)				10-102-000
6/1/2015	13:06	17.56	471	101.8	9.54
7/28/2015	12:40	24.72	474.1	107.5	8.77
302942	Beetle Creek adj. East Fork Rd. (EWH)				10-102-000
6/1/2015	12:05	16.27	445.2	80.5	7.62
7/28/2015	12:15	24.41	702.5	94.1	7.66
302943	Lafferty Run @ North Pole Rd. (Rd. 13b) (EWH)				10-103-000
6/23/2015	14:45	23.79	517.5	94.3	7.74
7/28/2015	12:50	22.5	459.8	93.6	8.11
302945	Brushy Fork @ Brushy Fork Rd. (Rd. 241) (EWH)				10-105-000
6/1/2015	11:45	16.99	456.4	82.5	7.8
302946	Suck Run @ Ebenezer Rd. (Rd. 33) (EWH)				10-106-000
6/1/2015	11:30	17.75	403	95.2	8.98
8/19/2015	13:35	24.3	657.2	103.6	8.43
302947	Town Branch adj. East Fork Rd. (Rd. 221) (EWH)				10-111-000
9/14/2015	12:10	17.85	474.3	128.3	11.95
302948	Washburn Run dst. St. Rt. 125 (EWH)				10-112-000
6/1/2015	10:45	15.53	618.1	79.4	7.7
7/28/2015	14:20	24.62	565.1	101.2	8.24
9/14/2015	12:30	16.69	932.5	95.3	9.08
302949	Adas Run dst. St. Rt. 125 (EWH)				10-113-000
6/1/2015	10:30	17.85	511.5	81.3	6.95
8/19/2015	14:01	23.42	870.5	86.6	7.13
9/14/2015	12:45	16.85	622	80.6	7.69
302950	Hills Fork @ St. Rt. 125 (EWH)				10-114-000
6/1/2015	10:10	19.47	494	78.2	7.03
7/28/2015	14:40	25.14	805.4	109.9	8.87
9/14/2015	13:00	16.86	495.6	85.3	8.13
302951	Hills Fork @ Eckmansville Rd. (Rd. 2) (EWH)				10-114-000
6/4/2015	10:30	16.74	514.9	58.9	5.62
9/14/2015	13:30	15.87	488.3	61.1	5.86

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Station ID	Station Name (existing ALU)				River Code
Date	Time	Temp (°C)	Cond (µS/cm)	DO (%)	DO (mg/L)
302952	<i>Lick Run @ Old Cincinnati Pike (Rd. 21) (EWH)</i>				10-115-000
6/1/2015	10:02	16.87	570.1	71.5	6.77
8/19/2015	14:15	23.66	1009	96.2	7.94
9/14/2015	13:10	16.59	656.3	89.9	8.57
302953	<i>Gordon Run @ Deatley Rd. (EWH)</i>				10-116-000
6/4/2015	10:45	17.67	486.6	84.7	7.88
9/14/2015	13:55	15.61	420.1	90	8.78
302954	<i>Hannah Run @ McClanahan Rd. (RD. T-110) (EWH)</i>				10-117-000
6/1/2015	9:50	15.69	681.2	69.4	6.68
OHIO BRUSH CREEK BASIN					
302767	<i>Mackenzie Run upst. Waggoner Riffle Rd. (EWH)</i>				10-203-000
5/28/2015	11:15	18.39	633.7	96.9	8.90
8/19/2015	12:30	22.33	1010	94.7	8
STRAIGHT CREEK BASIN					
302955	<i>Sink Creek adj. Old A and P Rd. (Rd. 67A) (EWH)</i>				10-301-000
6/22/2015	11:38	22.15	409.7	78.9	6.64
7/14/2015	11:37	20.28	341.8	96.5	8.43
8/26/2015	11:34	18.59	439.6	78.2	7.18
302956	<i>Rangle Run adj. Rangle Run Rd. (Rd. 541) (EWH)</i>				10-302-000
6/22/2015	12:07	21.32	462.4	80.6	6.98
7/14/2015	11:57	20.18	315.6	97	8.48
8/26/2015	11:47	18.36	558.4	66.8	6.18
302957	<i>Sheep Run upst. Centerpoint Rd. (Rd. 67b) (EWH)</i>				10-303-000
6/22/2015	12:25	23.74	516.3	99.2	8.19
7/14/2015	12:10	19.85	391.9	95.9	8.44
8/26/2015	12:06	19.37	893.1	91	8.17
302958	<i>Campbell Run @ Old U.S. Rt. 68 (Rd. 30) (EWH)</i>				10-304-000
6/22/2015	12:38	24.38	535.2	96.1	7.85
7/14/2015	12:15	19.07	414	97.3	8.68
8/26/2015	12:17	19.6	864.2	91.3	8.17
302959	<i>Evans Run adj. Straight Creek Rd. at confluence (EWH)</i>				10-305-000
6/22/2015	14:20	23.77	552.3	88.9	7.35
8/26/2015	12:36	21.51	935	37.5	3.26 [†]
302960	<i>Washburn Run about 100 Yds. dst. Hockman Rd. (EWH)</i>				10-307-000
6/23/2015	13:20	24.49	546.1	97.3	7.92
7/14/2015	13:50	22.5	400.5	101	8.43
8/26/2015	14:01	19.04	773.4	132.5	11.9

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Station ID	Station Name (existing ALU)				River Code
Date	Time	Temp (°C)	Cond (µS/cm)	DO (%)	DO (mg/L)
302961	Bull Run near mouth	(EWH)			10-308-000
6/23/2015	13:30	22.81	569.5	78.3	6.46
7/14/2015	14:00	23.21	383.5	93.6	7.69
8/26/2015	14:12	18.57	913.2	71.8	6.6
302962	Scott Run @ U.S. Rt. 68	(EWH)			10-309-000
6/22/2015	15:00	23.08	560.5	94.8	7.93
7/14/2015	13:25	21.08	464.1	97.2	8.26
8/26/2015	13:45	17.72	964.2	77	7.21
302963	Camp Run @ Day Hill-Arnheim Rd.	(EWH)			10-310-000
6/23/2015	10:50	23.63	475.9	90	7.39
7/14/2015	14:40	24.21	338.5	102.3	8.26
302964	Myers Run @ Martin-Hollow Rd. (Rd. 68)	(EWH)			10-311-000
6/23/2015	11:00	23.91	543	115.9	9.58
7/14/2015	14:28	23.3	408.3	103.1	8.52
302965	Honey Run adj. Day Hill-Arnheim Rd.	(EWH)			10-313-000
6/23/2015	11:20	24.35	557.8	71.1	5.7
7/14/2015	14:52	23.91	325.7	97.3	7.91
302966	West Fork Straight Creek @ Westfork Rd. (Rd. 66A)	(EWH)			10-314-000
6/23/2015	11:30	24.85	526.2	105.9	8.54
7/14/2015	15:05	24.07	257.6	96.2	7.8
302967	Buck Run @ Ash Ridge Arnheim Rd. (Rd. 17B)	(EWH)			10-315-000
6/23/2015	11:50	24.11	510.7	93.9	7.65
7/15/2015	11:15	20.85	298.4	93.4	8.08
302968	Sycamore Run nr. Fite-Hauck Rd. & Ash Ridge Arnheim Rd.	(EWH)			10-316-000
6/23/2015	12:05	23.35	372	83.9	6.91
7/15/2015	11:40	22.52	189.6	90.4	7.55
TURKEY CREEK BASIN					
302183	Odell Creek W of Friendship @ Driveway off Odell Creek Rd.	(CWH)			10-516-000
6/11/2013	09:55	18.78	250.0	96.9	8.76
7/9/2013	09:30	20.07	141.90	96.40	8.59
302184	Pond Lick Run NW of Friendship, near mouth adj. Shawnee Rd.	(CWH)			10-517-000
6/11/2013	10:08	18.20	121.5	97.2	8.89
7/9/2013	09:40	20.60	89.80	96.20	8.48
302770	Rock Lick upst. NF 1	(CWH)			10-518-000
5/28/2015	9:50	16.33	91.5	89.7	8.61
8/19/2015	10:55	--	--	--	--

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Station ID	Station Name (existing ALU)				River Code
Date	Time	Temp (°C)	Cond (µS/cm)	DO (%)	DO (mg/L)
302185	Brush Fork just W of Pond Lick Lake @ mouth (CWH)				10-519-000
6/11/2013	10:52	17.07	83.0	90.9	8.51
7/9/2013	10:00	18.51	66.20	91.90	8.44
302186	Wes Run NW of Friendship, near mouth adj. Odell Cemetery Rd. (CWH)				10-520-000
6/11/2013	11:30		No Flow		
7/9/2013	10:05		No Flow		
302187	Harber Fork near Camp Oyo, near mouth @ Shawnee Rd. (CWH)				10-523-000
6/11/2013	11:40	18.49	140.7	93.1	8.47
7/9/2013	10:21	19.90	103.60	95.60	8.54
302188	Mackletree Run just upst. Roosevelt Lake @ Mackletree Rd. (CWH)				10-524-000
6/11/2013	11:55	18.73	93.8	97.7	8.87
7/9/2013	10:30	20.17	82.00	99.10	8.79
302189	Lampblack Run just upst. Turkey Creek Lake @ Parking Lot (CWH)				10-526-000
6/11/2013	12:13	18.40	169.5	100.5	9.17
7/9/2013	10:43	19.15	85.10	99.20	8.98
302190	Old Lade Run near mouth, adj. Big Run Rd. (CWH)				10-527-000
6/11/2013	12:31	19.52	88.6	93.1	8.27
7/9/2013	10:53	20.10	77.30	95.50	8.48
302768	Wolfden Run upst. Wolfden Lake (CWH)				10-530-000
5/28/2015	10:30	17.21	94.7	86.5	8.16
8/19/2015	11:38	20.99	144.6	87.7	7.57

Italicized font denotes sites also sampled for water chemistry in 2016 or 2017.

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Appendix P
Lake Sampling Results

Southwest Ohio River Tributaries -- Lake Sampling -- Profile Measurements
2015

LAKE WAYNOKA L-1

STORET ID: 303122

Field Meter Readings

Pg. 1

Date Time	Temp	SpCond	ODO	ODOsat	pH	Depth
M/D/Y HH:MM:SS	C	uS	mg/L	%	S.U.	meters
5/19/2015 10:41	22.58	175	7.62	88.2	7.71	0.5
5/19/2015 10:43	22.54	175	7.79	90	7.74	1.0
5/19/2015 10:45	22.38	175	7.77	89.5	7.74	1.5
5/19/2015 10:46	22.07	175	7.22	82.7	7.72	2.0
5/19/2015 10:47	21.57	175	6.67	75.6	7.67	2.5
5/19/2015 10:49	20.32	175	4.56	50.4	7.56	3.0
5/19/2015 10:50	18.63	173	3.16	33.9	7.46	3.5
5/19/2015 10:52	16.57	169	1.45	14.9	7.3	4.0
5/19/2015 10:53	14.72	167	1.1	10.9	7.22	4.5
5/19/2015 10:54	13.46	167	0.94	9.1	7.16	5.0
5/19/2015 10:55	12.66	165	0.81	7.6	7.11	5.5
5/19/2015 10:56	12.24	165	0.7	6.5	7.08	6.0
5/19/2015 10:58	11.72	168	0.49	4.5	7.04	6.5
6/10/2015 11:14	23.63	188	8.44	99.6	7.7	0.5
6/10/2015 11:15	23.5	188	8.22	96.7	7.7	1.0
6/10/2015 11:16	23.14	188	7.82	91.4	7.67	2.0
6/10/2015 11:17	22.28	188	5.86	67.4	7.58	3.0
6/10/2015 11:20	20.28	186	1.19	13.2	7.34	4.0
6/10/2015 11:21	17.03	184	0.35	3.6	7.23	5.0
6/10/2015 11:23	13.94	182	0.23	2.2	7.16	6.0
7/16/2015 12:17	25.13	188	8.16	99	8.04	0.5
7/16/2015 12:18	24.8	188	7.63	92.1	7.8	1.5
7/16/2015 12:20	24.67	189	6.8	81.8	7.71	2.5
7/16/2015 12:21	24.33	189	5.85	70	7.59	3.5
7/16/2015 12:22	22.46	189	0.98	11.3	7.45	4.5
7/16/2015 12:23	19.73	197	0.36	4	7.35	5.5
7/16/2015 12:24	15.33	206	0.24	2.4	7.29	6.5
8/11/2015 11:36	27.02	180	8.08	101.4	8.02	0.5
8/11/2015 11:37	26.88	182	8.07	101.1	7.95	1.0
8/11/2015 11:38	26.83	182	7.93	99.2	7.9	1.5
8/11/2015 11:40	26.65	182	7.47	93.2	7.82	2.0
8/11/2015 11:41	26.47	182	7.2	89.5	7.75	2.5
8/11/2015 11:43	26.23	182	6.42	79.4	7.68	3.5
8/11/2015 11:44	25.51	182	3	36.7	7.51	4.0
8/11/2015 11:45	24.14	179	0.68	8.1	7.38	4.5
8/11/2015 11:50	16.61	215	0.18	1.9	7.15	6.5
8/11/2015 11:51	15.97	238	0.13	1.3	7.08	7.0

Southwest Ohio River Tributaries -- Lake Sampling -- Profile Measurements
2015

LAKE WAYNOKA L-1

STORET ID: 303122

Field Meter Readings

Pg. 2

Date Time	Temp	SpCond	ODO	ODOsat	pH	Depth
M/D/Y HH:MM:SS	C	uS	mg/L	%	S.U.	meters
9/16/2015 12:20	23.3	187	6.98	81.9	7.67	0.5
9/16/2015 12:21	23.13	186	6.46	75.5	7.48	1.5
9/16/2015 12:23	22.91	186	5.44	63.3	7.35	2.5
9/16/2015 12:24	22.71	186	4.96	57.5	7.29	3.5
9/16/2015 12:27	22.3	189	2.68	30.8	7.17	4.5
9/16/2015 12:29	21.74	195	0.38	4.3	7.08	5.5
9/16/2015 12:31	17.61	239	0.19	2	7.01	6.5

Southwest Ohio River Tributaries -- Lake Sampling -- Water Chemistry

2015 SURFACE

LAKE WAYNOKA L-1

STORET ID: 303122

Inorganics and Toxins

Parameter	5/19/2015	6/10/2015	7/16/2015	8/11/2015	9/16/2015
Cylindrospermopsin	< 0.05 µg/L U		< 0.05 µg/L U		< 0.05 µg/L U
Microcystins	< 0.3 µg/L U		< 0.3 µg/L J		< 0.3 µg/L U
Saxitoxin			< 0.022 µg/L U		< 0.022 µg/L U
Escherichia coli	8 #/100ml	5 #/100ml	28 #/100ml		1 #/100ml
Sample Depth	0.5 m	0.53 m	0.51 m	0.51 m	0.5 m
Dissolved Oxygen (DO)	7.62 mg/L	8.44 mg/L	8.16 mg/L	8.08 mg/L	6.98 mg/L
pH	7.71 S.U.	7.7 S.U.	8.04 S.U.	8.02 S.U.	7.67 S.U.
Saturation	88.2 %	99.6 %	99 %	101.4 %	81.9 %
Secchi Disk Depth	2.04 m	1.28 m	1.13 m	1.04 m	1.03 m
Specific Conductance	175 µmhos/cm	188 µmhos/cm	188 µmhos/cm	180 µmhos/cm	187 µmhos/cm
Temperature, water	22.58 ° C	23.63 ° C	25.13 ° C	27.02 ° C	23.3 ° C
Alkalinity, Total	72.3 mg/L	81.4 mg/L	76 mg/L	75.3 mg/L	83.1 mg/L
Aluminum	< 200.0 µg/L U	< 200.0 µg/L U	< 200.0 µg/L U	< 200.0 µg/L U	< 200.0 µg/L U
Ammonia	< 0.05 mg/L U	< 0.05 mg/L U	< 0.05 mg/L U	< 0.05 mg/L U	< 0.05 mg/L U
Arsenic	< 2.0 µg/L U	< 2.0 µg/L U	2.5 ug/L	3.1 ug/L	3.6 ug/L
Barium	21 ug/L	20 ug/L	21 ug/L	21 ug/L	19 ug/L
Bicarbonate	72.3 mg/L	81.4 mg/L	76 mg/L	75.3 mg/L	83.1 mg/L
Cadmium	< 0.2 µg/L U	< 0.2 µg/L U	< 0.2 µg/L U	< 0.2 µg/L U	< 0.2 µg/L U
Calcium	22.5 mg/L	23.8 mg/L	22.6 mg/L	23.9 mg/L	23.1 mg/L
Carbon, Total Organic (TOC)	6.87 mg/L	6.83 mg/L	7.51 mg/L	7.3 mg/L	6.6 mg/L
Carbonate ion (CO3-2)	< 5.0 mg/L U	< 5.0 mg/L U	< 5.0 mg/L U	< 5.0 mg/L U	< 5.0 mg/L U
Chloride	5 mg/L	5.6 mg/L	< 5.0 mg/L U	< 5.0 mg/L U	< 5.0 mg/L U
Chlorophyll a	9.8 ug/L	18.3 ug/L	13 ug/L	24.2 ug/L	13.6 ug/L
Chromium	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U
Copper	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U
Hardness, Ca + Mg	82 mg/L	87 mg/L	82 mg/L	86 mg/L	84 mg/L
Iron	152 ug/L	99 ug/L	158 ug/L	86 ug/L	78 ug/L
Lead	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U
Magnesium	6.2 mg/L	6.7 mg/L	6.2 mg/L	6.4 mg/L	6.4 mg/L
Manganese	38 ug/L	47 ug/L	49 ug/L	48 ug/L	130 ug/L
Nickel	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U
Nitrate+Nitrite	< 0.1 mg/L U	< 0.1 mg/L U	< 0.1 mg/L U	< 0.1 mg/L U	< 0.1 mg/L U
Nitrogen, Kjeldahl	0.6 mg/L	0.67 mg/L	0.45 mg/L	0.6 mg/L	0.45 mg/L
Nitrogen, Nitrite (NO2) as NO2	< 0.02 mg/L U	< 0.02 mg/L U	< 0.02 mg/L U	< 0.02 mg/L U	< 0.02 mg/L U
Orthophosphate, dissolved	0.0016 mg/L	0.0038 mg/L	0.0031 mg/L	0.0038 mg/L	0.0048 mg/L
Pheophytin-a	< 0.4 µg/L UJ	1.4 ug/L J	3.9 ug/L J	2.4 ug/L J	3.8 ug/L J
Phosphorus	< 0.01 mg/L U	0.0109 mg/L	0.0116 mg/L	0.0122 mg/L	0.0119 mg/L
Phosphorus, Low Level	0.0077 mg/L				
Potassium	2.6 mg/L	2.8 mg/L	2.9 mg/L	3.1 mg/L	3.1 mg/L
Selenium	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U
Sodium	< 5.0 mg/L U	< 5.0 mg/L U	< 5.0 mg/L U	< 5.0 mg/L U	< 5.0 mg/L U
Solids, Total Suspended (TSS)	< 5.0 mg/L U	< 5.0 mg/L U	5 mg/L	< 5.0 mg/L U	< 5.0 mg/L U
Strontium	66 ug/L	73 ug/L	68 ug/L	68 ug/L	68 ug/L
Sulfur, sulfate (SO4) as SO4	12.2 mg/L	11.4 mg/L	8.4 mg/L	8.4 mg/L	7.4 mg/L
Total Dissolved Solids	120 mg/L	112 mg/L	120 mg/L	116 mg/L	108 mg/L
Turbidity	2.86 NTU	3.08 NTU	4.27 NTU	3.23 NTU	3.07 NTU
Zinc	< 10.0 µg/L U	< 10.0 µg/L U	< 10.0 µg/L U	< 10.0 µg/L U	< 10.0 µg/L U

Southwest Ohio River Tributaries -- Lake Sampling -- Water Chemistry

2015 BOTTOM

LAKE WAYNOKA L-1

STORET ID: 303122

Inorganics

Parameter	5/19/2015		6/10/2015		7/16/2015		8/11/2015		9/16/2015	
Sample Depth	6.51 m		6.03 m		6.51 m		7.05 m		6.49 m	
Dissolved Oxygen (DO)	0.49 mg/L		0.23 mg/L		0.24 mg/L		0.13 mg/L		0.19 mg/L	
pH	7.04 S.U.		7.16 S.U.		7.29 S.U.		7.08 S.U.		7.01 S.U.	
Saturation	4.5 %		2.2 %		2.4 %		1.3 %		2 %	
Specific Conductance	168 µmhos/cm		182 µmhos/cm		206 µmhos/cm		238 µmhos/cm		239 µmhos/cm	
Temperature, water	11.72 ° C		13.94 ° C		15.33 ° C		15.97 ° C		17.61 ° C	
Alkalinity, Total	73.8 mg/L		78.7 mg/L		79.4 mg/L		89.3 mg/L		110 mg/L	
Aluminum	267 ug/L		< 200.0 µg/L	U	< 200.0 µg/L	U	< 200.0 µg/L	U	< 200.0 µg/L	U
Ammonia	0.156 mg/L		0.261 mg/L		0.214 mg/L		0.465 mg/L		0.646 mg/L	
Arsenic	< 2.0 µg/L	U	3.7 ug/L		7.3 ug/L		13.3 ug/L		13.9 ug/L	
Barium	23 ug/L		31 ug/L		35 ug/L		37 ug/L		84 ug/L	
Bicarbonate	73.8 mg/L		78.7 mg/L		79.4 mg/L		89.3 mg/L		110 mg/L	
Cadmium	< 0.2 µg/L	U	< 0.2 µg/L	U	< 0.2 µg/L	U	< 0.2 µg/L	U	< 0.2 µg/L	U
Calcium	21.3 mg/L		22.7 mg/L		23 mg/L		25.9 mg/L		27.8 mg/L	
Carbon, Total Organic (TOC)	6.81 mg/L		7.08 mg/L		6.98 mg/L		7.56 mg/L		7.47 mg/L	
Carbonate ion (CO3-2)	< 5.0 mg/L	U	< 5.0 mg/L	U	< 5.0 mg/L	U	< 5.0 mg/L	U	< 5.0 mg/L	U
Chloride	< 5.0 mg/L	U	5.1 mg/L		< 5.0 mg/L	U	5.2 mg/L		5.1 mg/L	
Chromium	< 2.0 µg/L	U	< 2.0 µg/L	U	< 2.0 µg/L	U	< 2.0 µg/L	U	< 2.0 µg/L	U
Copper	< 2.0 µg/L	U	< 2.0 µg/L	U	< 2.0 µg/L	U	< 2.0 µg/L	U	< 2.0 µg/L	U
Hardness, Ca + Mg	78 mg/L		83 mg/L		83 mg/L		92 mg/L		96 mg/L	
Iron	354 ug/L		257 ug/L		147 ug/L		370 ug/L		131 ug/L	
Lead	< 2.0 µg/L	U	< 2.0 µg/L	U	< 2.0 µg/L	U	< 2.0 µg/L	U	< 2.0 µg/L	U
Magnesium	6 mg/L		6.4 mg/L		6.3 mg/L		6.6 mg/L		6.4 mg/L	
Manganese	661 ug/L		1900 ug/L		2040 ug/L		4210 ug/L		4350 ug/L	
Nickel	< 2.0 µg/L	U	< 2.0 µg/L	U	< 2.0 µg/L	U	< 2.0 µg/L	U	< 2.0 µg/L	U
Nitrate+Nitrite	< 0.1 mg/L	U	< 0.1 mg/L	U	< 0.1 mg/L	U	< 0.1 mg/L	U	< 0.1 mg/L	U
Nitrogen, Kjeldahl	0.74 mg/L		0.91 mg/L		0.71 mg/L		1.03 mg/L		1.18 mg/L	
Nitrogen, Nitrite (NO2) as NO2	< 0.02 mg/L	U	< 0.02 mg/L	U	< 0.02 mg/L	U	< 0.02 mg/L	U	< 0.02 mg/L	U
Orthophosphate, dissolved	0.01 mg/L									
Phosphorus	0.02 mg/L		< 0.01 mg/L	U	0.036 mg/L		0.029 mg/L		0.033 mg/L	
Potassium	2.6 mg/L		2.8 mg/L		2.8 mg/L		3.1 mg/L		3.1 mg/L	
Selenium	< 2.0 µg/L	U	< 2.0 µg/L	U	< 2.0 µg/L	U	< 2.0 µg/L	U	< 2.0 µg/L	U
Sodium	< 5.0 mg/L	U	< 5.0 mg/L	U	< 5.0 mg/L	U	< 5.0 mg/L	U	< 5.0 mg/L	U
Solids, Total Suspended (TSS)	< 5.0 mg/L	U	6 mg/L		5 mg/L		< 5.0 mg/L	U	< 5.0 mg/L	U
Strontium	63 ug/L		70 ug/L		69 ug/L		74 ug/L		78 ug/L	
Sulfur, sulfate (SO4) as SO4	12.2 mg/L		10.8 mg/L		7.6 mg/L		6.7 mg/L		< 5.0 mg/L	U
Total Dissolved Solids	114 mg/L		110 mg/L		114 mg/L		132 mg/L		132 mg/L	
Turbidity	5.47 NTU		3.8 NTU		5.68 NTU		3.86 NTU		4.85 NTU	
Zinc	< 10.0 µg/L	U	< 10.0 µg/L	U	< 10.0 µg/L	U	< 10.0 µg/L	U	< 10.0 µg/L	U

Southwest Ohio River Tributaries -- Lake Sampling -- Sediments
2015

LAKE WAYNOKA L-1

STORET ID: 303122

Inorganics

Parameter	8/11/2015	Qualifier
Carbon, Total Organic (TOC)	3.7 %	
Phosphorus	1250 mg/kg	
% Solids	23 %	
Substrate - clay	29 %	
Substrate - clay, medium	5.8 %	
Substrate - claypan soil	5.8 %	
Substrate - sand, coarse	46 %	
Substrate - silt, coarse	0 %	
Substrate - silt, fine	5.8 %	
Substrate - silt, medium	1.9 %	
Substrate - silt, very fine	5.8 %	

Southwest Ohio River Tributaries -- Lake Sampling -- Water Chemistry
2015 SURFACE

SYCAMORE RUN RESERVOIR

STORET ID: 204216

aka LAKE WAYNOKA WATER SUPPLY RESERVOIR, L-1

Inorganics and Toxins

Parameter	5/19/2015		6/10/2015		7/16/2015		8/11/2015		9/16/2015	
Cylindrospermopsin	< 0.05 µg/L	U	< 0.05 µg/L	U	< 0.05 µg/L	U	< 0.05 µg/L	U	< 0.05 µg/L	U
Microcystins	< 0.3 µg/L	U	< 0.3 µg/L	U	< 0.3 µg/L	J	< 0.3 µg/L	U	< 0.3 µg/L	U
Saxitoxin			0.056 ug/L		< 0.022 µg/L	U	0.042 ug/L		0.44 ug/L	E
Nitrate+Nitrite	< 0.1 mg/L	U	< 0.1 mg/L	U	0.14 mg/L	J	< 0.1 mg/L	U	< 0.1 mg/L	U
Atrazine	< 0.2 µg/L	U	< 0.2 µg/L	U	< 0.2 µg/L	U	< 0.2 µg/L	U	< 0.2 µg/L	U
Copper										

Parameter	10/23/2015	
Cylindrospermopsin		
Microcystins		
Saxitoxin		
Nitrate+Nitrite		
Atrazine		
Copper	33.6 ug/L	

Southwest Ohio River Tributaries -- Lake Sampling -- Water Chemistry
2015 SURFACE

WAYNOKA UPGROUND RESERVOIR

STORET ID: 204246

Inorganics and Toxins

Parameter	5/19/2015		6/10/2015		7/16/2015		8/11/2015		9/16/2015	
Cylindrospermopsin	< 0.05 µg/L	U	< 0.05 µg/L	U	< 0.05 µg/L	U	< 0.05 µg/L	U	< 0.05 µg/L	U
Microcystins	< 0.3 µg/L	U	< 0.3 µg/L	U	< 0.3 µg/L	J	< 0.3 µg/L	U	< 0.3 µg/L	U
Saxitoxin			< 0.022 µg/L	U	< 0.022 µg/L	U	< 0.022 µg/L	U	< 0.022 µg/L	U
Nitrate+Nitrite	< 0.1 mg/L	U	< 0.1 mg/L	U	0.22 mg/L	J	< 0.1 mg/L	U	< 0.1 mg/L	U
Atrazine	< 0.2 µg/L	U	0.47 ug/L		0.5 ug/L		0.38 ug/L		0.43 ug/L	

Southwest Ohio River Tributaries -- Lake Sampling -- Profile Measurements
2016

LAKE WAYNOKA L-1

STORET ID: 303122

Field Meter Readings

Pg. 1

Date Time	Temp	SpCond	ODO	ODOsat	pH	Depth
M/D/Y HH:MM:SS	C	uS	mg/L	%	S.U.	meters
5/18/2016 13:55	16.92	196	7.24	74.9	8.27	0.5
5/18/2016 13:57	16.87	196	10.06	103.8	8.45	1.0
5/18/2016 13:57	16.83	196	10.36	106.9	8.47	1.5
5/18/2016 13:58	16.84	196	10.49	108.2	8.46	2.1
5/18/2016 13:59	16.81	197	10.55	108.8	8.49	2.5
5/18/2016 13:59	16.8	196	10.57	109	8.47	3.0
5/18/2016 14:00	16.8	196	10.58	109	8.47	3.5
5/18/2016 14:00	16.78	196	10.57	109	8.47	4.0
5/18/2016 14:01	16.68	196	10.47	107.7	8.44	4.5
5/18/2016 14:01	16.33	197	10.22	104.3	8.34	5.0
5/18/2016 14:02	12.34	197	7.31	68.4	8.01	5.5
5/18/2016 14:02	11.52	196	4.97	45.6	7.79	6.0
5/18/2016 14:03	10.97	197	3.98	36.1	7.67	6.5
6/7/2016 13:37	25.09	210	7.54	91.5	7.93	0.5
6/7/2016 13:38	25.06	210	7.6	92.1	7.94	1.5
6/7/2016 13:40	24.4	210	6.74	80.7	7.78	2.5
6/7/2016 13:43	19.73	206	1.61	17.6	7.2	3.5
6/7/2016 13:45	15.38	205	0.28	2.8	7.1	4.6
6/7/2016 13:46	13.42	205	0.21	2.1	7.09	5.4
6/7/2016 13:47	11.88	204	0.17	1.6	7.08	6.5
6/7/2016 13:48	11.27	204	0.16	1.4	7.07	7.5
6/7/2016 13:49	10.74	204	0.12	1.1	7.07	8.5
6/7/2016 13:50	10.5	206	0.11	1	7.08	9.5
6/7/2016 13:51	10.22	213	0.1	0.9	7.06	10.5
7/6/2016 10:46	25.3	219	6.36	77.4	7.69	0.5
7/6/2016 10:49	24.76	218	5.87	70.8	7.59	1.5
7/6/2016 10:51	24.53	218	5.21	62.6	7.52	2.5
7/6/2016 10:52	23.92	217	3.87	46	7.39	3.5
7/6/2016 10:56	21.9	214	0.63	7.1	7.16	4.6
7/6/2016 10:58	13.51	212	0.29	2.8	7.13	6.5
7/6/2016 10:59	11.96	211	0.2	1.9	7.09	7.5
7/6/2016 11:00	11.17	212	0.16	1.5	7.11	8.5
7/6/2016 11:01	10.72	213	0.14	1.2	7.13	9.6
7/6/2016 11:02	10.36	218	0.12	1.1	7.15	10.6
7/6/2016 11:03	10.11	227	0.13	1.2	7.17	11.5
7/6/2016 11:04	9.97	234	0.1	0.9	7.21	12.5

Southwest Ohio River Tributaries -- Lake Sampling -- Profile Measurements

LAKE WAYNOKA L-1

STORET ID: 303122

Field Meter Readings

Pg. 2

Date Time	Temp	SpCond	ODO	ODOsat	pH	Depth
M/D/Y HH:MM:SS	C	uS	mg/L	%		meters
8/2/2016 14:44	29.17	206	7.6	99.1	7.86	0.5
8/2/2016 14:52	28.59	205	7.48	96.6	7.84	1.5
8/2/2016 14:46	28.07	206	6.63	84.8	7.7	2.5
8/2/2016 14:48	26.95	205	2.85	35.7	7.38	3.5
8/2/2016 14:55	22.39	199	0.76	8.8	7.14	4.5
8/2/2016 14:56	18.83	220	0.47	5.1	7.11	5.6
8/2/2016 14:57	15.08	224	0.34	3.4	7.1	6.5
8/2/2016 14:58	13.01	223	0.27	2.6	7.08	7.5
8/2/2016 14:59	11.95	222	0.23	2.2	7.04	8.5
8/2/2016 15:00	11.23	224	0.22	2	7.01	9.5
8/2/2016 15:01	10.88	227	0.22	2	6.98	10.6
8/2/2016 15:02	10.34	238	0.17	1.6	6.94	11.4
9/7/2016 15:42	26.73	201	8.19	102.3	7.83	0.5
9/7/2016 15:43	26.33	201	7.65	94.9	7.74	1.5
9/7/2016 15:45	26.08	201	5.95	73.5	7.5	2.5
9/7/2016 15:47	25.48	201	3.99	48.7	7.35	3.5
9/7/2016 15:48	24.57	198	1.96	23.5	7.16	4.5
9/7/2016 15:50	22.18	216	0.42	4.8	7.08	5.5
9/7/2016 15:51	17.51	248	0.31	3.2	7.16	6.5
9/7/2016 15:53	14.37	239	0.24	2.4	7.06	7.5
9/7/2016 15:54	12.91	237	0.23	2.1	7	8.5
9/7/2016 15:55	12.05	237	0.19	1.8	6.97	9.5
9/7/2016 15:56	11.28	241	0.17	1.6	6.95	10.5
9/7/2016 15:58	10.79	252	0.15	1.4	6.91	11.5

Southwest Ohio River Tributaries -- Lake Sampling -- Water Chemistry

2016 SURFACE

LAKE WAYNOKA L-1

STORET ID: 303122

Inorganics and Toxins

Parameter	5/18/2016	6/07/2016	7/06/2016	8/02/2016	9/07/2016
Cylindrospermopsin	< 0.05 µg/L J	< 0.05 µg/L U	< 0.05 µg/L U	< 0.05 µg/L U	< 0.05 µg/L U
Microcystins	< 0.3 µg/L U	< 0.3 µg/L J	< 0.3 µg/L U	< 0.3 µg/L U	< 0.3 µg/L U
Saxitoxin	< 0.022 µg/L U	< 0.022 µg/L U	< 0.022 µg/L U	< 0.022 µg/L U	< 0.022 µg/L U
Sample Depth	0.5 m	0.5 m	0.5 m	0.5 m	0.5 m
Secchi Disk Depth	1.06 m	1.5 m	1.85 m	1.23 m	1.27 m
pH	8.27 S.U.	7.93 S.U.	7.69 S.U.	7.86 S.U.	7.83 S.U.
Dissolved Oxygen (DO)	7.24 mg/L	7.54 mg/L	6.36 mg/L	7.6 mg/L	8.19 mg/L
Saturation	74.9 %	91.5 %	77.4 %	99.1 %	102.3 %
Specific Conductance	196 µmhos/cm	210 µmhos/cm	219 µmhos/cm	206 µmhos/cm	201 µmhos/cm
Temperature, water	16.92 ° C	25.09 ° C	25.3 ° C	29.17 ° C	26.73 ° C
Alkalinity, Total	79 mg/L	83.3 mg/L	89.4 mg/L	79.4 mg/L	84 mg/L
Aluminum	< 200.0 µg/L U	< 200.0 µg/L U	< 200.0 µg/L U	< 200.0 µg/L U	< 200.0 µg/L U
Ammonia	0.062 mg/L	< 0.05 mg/L U	< 0.05 mg/L U	< 0.05 mg/L U	< 0.05 mg/L U
Arsenic	< 2.0 µg/L U	< 2.0 µg/L U	2.7 ug/L	2.8 ug/L	3 ug/L
Barium	22 ug/L	22 ug/L	24 ug/L	24 ug/L	20 ug/L
Bicarbonate	79 mg/L	83.3 mg/L	89.4 mg/L	79.4 mg/L	84 mg/L
Cadmium	< 0.2 µg/L U	< 0.2 µg/L U	< 0.2 µg/L U	< 0.2 µg/L U	< 0.2 µg/L U
Calcium	23 mg/L	23.7 mg/L	28.2 mg/L	24.6 mg/L	22.7 mg/L
Carbon, Total Organic (TOC)	6.8 mg/L	6.44 mg/L	6.38 mg/L	5.64 mg/L	6.35 mg/L
Carbonate ion (CO3-2)	< 5.0 mg/L U	< 5.0 mg/L U	< 5.0 mg/L U	< 5.0 mg/L U	< 5.0 mg/L U
Chloride	6.2 mg/L	6 mg/L	6.9 mg/L	6.6 mg/L	6.3 mg/L
Chlorophyll a	37.8 ug/L	7.2 ug/L	7.3 ug/L	14.6 ug/L	12.1 ug/L
Chromium	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U
Copper	< 2.0 µg/L U	2.4 ug/L	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U
Hardness, Ca + Mg	85 mg/L	86 mg/L	103 mg/L	90 mg/L	83 mg/L
Iron	173 ug/L	96 ug/L	67 ug/L	98 ug/L	58 ug/L
Lead	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U
Magnesium	6.6 mg/L	6.8 mg/L	8 mg/L	6.9 mg/L	6.4 mg/L
Manganese	17 ug/L	39 ug/L	49 ug/L	56 ug/L	59 ug/L
Nickel	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U
Nitrate+Nitrite	< 0.1 mg/L U	< 0.1 mg/L U	< 0.1 mg/L U	< 0.1 mg/L U	< 0.1 mg/L U
Nitrogen, Kjeldahl	0.66 mg/L	0.47 mg/L	0.52 mg/L	0.55 mg/L	0.42 mg/L
Nitrogen, Nitrite (NO2) as NO2	< 0.02 mg/L U	< 0.02 mg/L U	< 0.02 mg/L U	< 0.02 mg/L U	< 0.02 mg/L U
Orthophosphate, dissolved		< 0.01 mg/L U	< 0.01 mg/L U	< 0.01 mg/L U	< 0.01 mg/L U
Pheophytin-a	< 9.3 µg/L UJ	3.1 ug/L J	3.5 ug/L J	2.2 ug/L J	4.2 ug/L J
Phosphorus	0.02 mg/L	0.026 mg/L	0.022 mg/L	0.019 mg/L	0.024 mg/L
Potassium	2.8 mg/L	3 mg/L	3.7 mg/L	3.7 mg/L	3.6 mg/L
Selenium	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U
Sodium	< 5.0 mg/L U	< 5.0 mg/L U	< 5.0 mg/L U	< 5.0 mg/L U	< 5.0 mg/L U
Solids, Total Suspended (TSS)	5 mg/L	< 5.0 mg/L U	< 5.0 mg/L U	< 5.0 mg/L U	< 5.0 mg/L U
Strontium	71 ug/L	74 ug/L	86 ug/L	76 ug/L	68 ug/L
Sulfur, sulfate (SO4) as SO4	14.5 mg/L	13.7 mg/L	12.4 mg/L	10.2 mg/L	10.6 mg/L
Total Dissolved Solids	134 mg/L	130 mg/L	132 mg/L	122 mg/L	110 mg/L
Turbidity	5.99 NTU	2.99 NTU	2.05 NTU	2.87 NTU	2.31 NTU
Zinc	< 10.0 µg/L U	< 10.0 µg/L U	< 10.0 µg/L U	< 10.0 µg/L U	< 10.0 µg/L U

Southwest Ohio River Tributaries -- Lake Sampling -- Water Chemistry

2016 BOTTOM

LAKE WAYNOKA L-1

STORET ID: 303122

Inorganics

Parameter	5/18/2016	6/07/2016	7/06/2016	8/02/2016	9/07/2016
Sample Depth	6 m	10.5 m	12.5 m	10.5 m	11.5 m
pH	7.79 S.U.	7.06 S.U.	7.21 S.U.	6.98 S.U.	6.91 S.U.
Dissolved Oxygen (DO)	4.97 mg/L	0.1 mg/L	0.1 mg/L	0.22 mg/L	0.15 mg/L
Saturation	45.6 %	0.9 %	0.9 %	2 %	1.4 %
Specific Conductance	196 µmhos/cm	213 µmhos/cm	234 µmhos/cm	227 µmhos/cm	252 µmhos/cm
Temperature, water	11.52 ° C	10.22 ° C	9.97 ° C	10.88 ° C	10.79 ° C
Alkalinity, Total	75.1 mg/L	88.1 mg/L	99.8 mg/L	98.6 mg/L	114 mg/L
Aluminum	261 ug/L	234 ug/L	< 200.0 µg/L U	257 ug/L	< 200.0 µg/L U
Ammonia	< 0.05 mg/L U	0.312 mg/L	1.1 mg/L	0.811 mg/L	1.61 mg/L
Arsenic	< 2.0 µg/L U	11.6 ug/L	19.8 ug/L	20.4 ug/L	31.5 ug/L
Barium	25 ug/L	34 ug/L	45 ug/L	53 ug/L	67 ug/L
Bicarbonate	75.1 mg/L	88.1 mg/L	99.8 mg/L	98.6 mg/L	114 mg/L
Cadmium	< 0.2 µg/L U	< 0.2 µg/L U	< 0.2 µg/L U	< 0.2 µg/L U	< 0.2 µg/L U
Calcium	23.4 mg/L	24.6 mg/L	25.4 mg/L	26.3 mg/L	26.6 mg/L
Carbon, Total Organic (TOC)	5.62 mg/L	5.89 mg/L	8.15 mg/L	7.25 mg/L	8.19 mg/L
Carbonate ion (CO3-2)	< 5.0 mg/L U	< 5.0 mg/L U	< 5.0 mg/L U	< 5.0 mg/L U	< 5.0 mg/L U
Chloride	5.6 mg/L	5.8 mg/L	5.9 mg/L	5.6 mg/L	6.2 mg/L
Chromium	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U
Copper	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U
Hardness, Ca + Mg	87 mg/L	90 mg/L	93 mg/L	96 mg/L	96 mg/L
Iron	319 ug/L	1240 ug/L	3590 ug/L	3150 ug/L	5510 ug/L
Lead	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U
Magnesium	6.9 mg/L	7.1 mg/L	7.2 mg/L	7.4 mg/L	7.2 mg/L
Manganese	66 ug/L	1990 ug/L	2960 ug/L	3430 ug/L	4240 ug/L
Nickel	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U
Nitrate+Nitrite	0.28 mg/L	< 0.1 mg/L U	< 0.1 mg/L U	0.1 mg/L	
Nitrogen, Kjeldahl	0.48 mg/L	0.87 mg/L	1.7 mg/L	1.33 mg/L	2.25 mg/L
Nitrogen, Nitrite (NO2) as NO2	< 0.02 mg/L U	< 0.02 mg/L U	< 0.02 mg/L U	< 0.02 mg/L U	< 0.02 mg/L U
		0.046 mg/L	0.296 mg/L	0.239 mg/L	0.499 mg/L
Phosphorus	0.028 mg/L	0.144 mg/L	0.471 mg/L	0.3 mg/L	0.754 mg/L
Potassium	2.7 mg/L	2.8 mg/L	2.8 mg/L	2.9 mg/L	2.9 mg/L
Selenium	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U
Sodium	< 5.0 mg/L U	< 5.0 mg/L U	< 5.0 mg/L U	< 5.0 mg/L U	< 5.0 mg/L U
Solids, Total Suspended (TSS)	< 5.0 mg/L U	< 5.0 mg/L U	< 5.0 mg/L U	< 5.0 mg/L U	< 5.0 mg/L U
Strontium	73 ug/L	77 ug/L	78 ug/L	82 ug/L	81 ug/L
Sulfur, sulfate (SO4) as SO4	16 mg/L	11.6 mg/L	7.8 mg/L	7.2 mg/L	< 5.0 mg/L U
Total Dissolved Solids	122 mg/L	138 mg/L	140 mg/L	142 mg/L	140 mg/L
Turbidity	8.84 NTU	16.8 NTU	9.88 NTU	7.56 NTU	10.8 NTU
Zinc	< 10.0 µg/L U	< 10.0 µg/L U	< 10.0 µg/L U	< 10.0 µg/L U	12 ug/L

Southwest Ohio River Tributaries -- Lake Sampling -- Profile Measurements
2016

SYCAMORE RUN RESERVOIR

STORET ID: 204216

aka LAKE WAYNOKA WATER SUPPLY RESERVOIR, L-1

Field Meter Readings

Pg. 1

Date Time	Temp	SpCond	ODOsat	ODO	pH	Depth
M/D/Y HH:MM:SS	C	uS	%	mg/L	S.U.	m
6/7/16 15:40	25.1	0.17	118.4	9.8	8.9	0.5
6/7/16 15:45	25	0.17	56.8	4.85	8	1.0
6/7/16 15:50	22.1	0.18	9.7	0.84	7.1	1.5
6/7/16 15:55	20.4	0.15	4.3	0.39	6.88	2.0
6/7/16 16:00	19	0.14	3.2	0.3	6.83	2.5
6/7/16 16:05	16.9	0.16	2.9	0.28	6.8	3.0
6/7/16 16:10	12.1	0.22	1.8	0.19	6.86	3.5
7/6/2016 13:17	24.12	185	84.5	7.09	8.61	0.5
7/6/2016 13:19	23.18	184	43.5	3.71	7.93	1.0
7/6/2016 13:20	22.45	183	21.9	1.89	7.51	1.5
7/6/2016 13:21	21.53	170	6.2	0.55	7.21	2.0
7/6/2016 13:22	20.16	171	3.9	0.35	6.97	2.5
7/6/2016 13:24	17.83	223	2.8	0.27	6.78	3.1
8/2/2016 11:50	27.38	143	128.4	10.16	9.23	0.5
8/2/2016 11:53	25.93	127	40.3	3.27	7.5	1.0
8/2/2016 11:58	24.08	112	3.5	0.29	6.86	1.5
8/2/2016 12:00	22.68	116	2.8	0.25	6.77	2.0
8/2/2016 12:02	21.53	132	2.6	0.23	6.69	2.5
8/2/2016 12:06	19.33	214	1.8	0.17	6.62	3.1
8/2/2016 12:08	17.41	307	1.6	0.15	6.6	3.5
9/7/2016 10:57	26.29	126	86.5	6.98	7.94	0.5
9/7/2016 10:59	25	126	29.3	2.42	7.35	1.0
9/7/2016 11:02	23.94	128	5.1	0.43	7.02	1.5
9/7/2016 11:03	22.82	128	3.8	0.33	6.73	2.0
9/7/2016 11:05	21.3	147	3.1	0.28	6.56	2.5
9/7/2016 11:06	19.51	233	2.6	0.24	6.47	3.0

Southwest Ohio River Tributaries -- Lake Sampling -- Water Chemistry

2016 SURFACE

SYCAMORE RUN RESERVOIR

STORET ID: 204216

aka LAKE WAYNOKA WATER SUPPLY RESERVOIR, L-1

Inorganics and Toxins

Parameter	5/18/2016	6/07/2016	7/06/2016	8/02/2016	9/07/2016
Cylindrospermopsin	< 0.05 µg/L J	< 0.05 µg/L U	< 0.05 µg/L U	< 0.05 µg/L U	< 0.05 µg/L U
Microcystins	< 0.3 µg/L U	< 0.3 µg/L J	< 0.3 µg/L U	< 0.3 µg/L U	< 0.3 µg/L U
Saxitoxin	< 0.022 µg/L U		< 0.022 µg/L U	< 0.022 µg/L U	< 0.022 µg/L U
Dissolved Oxygen (DO)	3.48 mg/L	9.8 mg/L	7.09 mg/L	10.16 mg/L	6.98 mg/L
pH	7.04 S.U.	8.9 S.U.	8.61 S.U.	9.23 S.U.	7.94 S.U.
Sample Depth	0.5 m	0.5 m	0.5 m	0.5 m	0.5 m
Saturation	35.1 %	118.4 %	84.5 %	128.4 %	86.5 %
Secchi Disk Depth	0.41 m	0.34 m	0.43 m	0.49 m	0.54 m
Specific Conductance	188 µmhos/cm	70 µmhos/cm	85 µmhos/cm	43 µmhos/cm	26 µmhos/cm
Temperature, water	15.71 ° C	25.1 ° C	24.12 ° C	27.38 ° C	26.29 ° C
Alkalinity, Total (total h	54.8 mg/L	52.3 mg/L	59.8 mg/L	52.2 mg/L	53.2 mg/L
Aluminum	928 ug/L	388 ug/L	232 ug/L	254 ug/L	< 200.0 µg/L U
Ammonia	0.269 mg/L	< 0.05 mg/L U	< 0.05 mg/L U	< 0.05 mg/L U	< 0.05 mg/L U
Arsenic	3.3 ug/L	3.1 ug/L	4 ug/L	3.3 ug/L	2.6 ug/L
Barium	31 ug/L	29 ug/L	30 ug/L	24 ug/L	18 ug/L
Bicarbonate	54.8 mg/L	43.4 mg/L	30.6 mg/L	38.6 mg/L	53.2 mg/L
Cadmium	< 0.2 µg/L U	< 0.2 µg/L U	< 0.2 µg/L U	< 0.2 µg/L U	< 0.2 µg/L U
Calcium	19.4 mg/L	17.6 mg/L	21.9 mg/L	16.9 mg/L	14.5 mg/L
Carbon, Total Organic	10.7 mg/L	9.99 mg/L	10.6 mg/L	7.73 mg/L	8.27 mg/L
Carbonate ion (CO3-2)	< 5.0 mg/L U	8.9 mg/L	29.2 mg/L	13.6 mg/L	< 5.0 mg/L U
Chloride	16.6 mg/L	12.4 mg/L	13.6 mg/L	7.4 mg/L	< 5.0 mg/L U
Chlorophyll a, corrected	6.6 ug/L	40.4 ug/L	85.8 ug/L	50.9 ug/L	49.9 ug/L
Chromium	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U
Copper	273 ug/L	101 ug/L	87.2 ug/L	16.7 ug/L	55.3 ug/L
Hardness, Ca + Mg	71 mg/L	62 mg/L	77 mg/L	60 mg/L	51 mg/L
Iron	1350 ug/L	672 ug/L	387 ug/L	314 ug/L	271 ug/L
Lead	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U
Magnesium	5.5 mg/L	4.7 mg/L	5.5 mg/L	4.2 mg/L	3.5 mg/L
Manganese	160 ug/L	108 ug/L	104 ug/L	61 ug/L	64 ug/L
Nickel	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U
Nitrate+Nitrite	0.48 mg/L	< 0.1 mg/L U	< 0.1 mg/L U	< 0.1 mg/L U	< 0.1 mg/L U
Nitrogen, Kjeldahl	1.19 mg/L	0.99 mg/L	1.88 mg/L	1.44 mg/L	1.17 mg/L
Nitrogen, Nitrite (NO2)	0.036 mg/L	< 0.02 mg/L U	< 0.02 mg/L U	< 0.02 mg/L U	< 0.02 mg/L U
Orthophosphate, dissolved		0.106 mg/L	0.031 mg/L	0.058 mg/L	0.033 mg/L
Pheophytin-a	3.4 ug/L J	3.4 ug/L J	22.9 ug/L J	< 14.0 µg/L UJ	< 14.0 µg/L UJ
Phosphorus	0.437 mg/L	0.315 mg/L	0.232 mg/L	0.161 mg/L	0.139 mg/L
Potassium	8.6 mg/L	6.5 mg/L	7.5 mg/L	5.3 mg/L	4.4 mg/L
Selenium	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U
Sodium	< 5.0 mg/L U	< 5.0 mg/L U	< 5.0 mg/L U	< 5.0 mg/L U	< 5.0 mg/L U
Solids, Total Suspended	8 mg/L	20 mg/L	17 mg/L	14 mg/L	10 mg/L
Strontium	76 ug/L	68 ug/L	82 ug/L	63 ug/L	52 ug/L
Sulfur, sulfate (SO4) as	12.9 mg/L	10.1 mg/L	10 mg/L	6.2 mg/L	< 5.0 mg/L U
Total Dissolved Solids	148 mg/L	120 mg/L	132 mg/L	98 mg/L	82 mg/L
Turbidity	27.4 NTU	20.1 NTU	14.8 NTU	7.89 NTU	6.36 NTU
Zinc	< 10.0 µg/L U	< 10.0 µg/L U	< 10.0 µg/L U	< 10.0 µg/L U	< 10.0 µg/L U
Atrazine	2.6 ug/L	1.2 ug/L	4.5 ug/L	1.8 ug/L	0.53 ug/L

Parameter	6/14/2016
Cylindrospermopsin	< 0.05 µg/L U
Microcystins	< 0.3 µg/L U
Saxitoxin	< 0.022 µg/L U

This was a re-sample to capture all three cyanotoxins.

Sampled from shore using integrated tube sampler to a depth of about 0.5 meter.

Southwest Ohio River Tributaries -- Lake Sampling -- Water Chemistry

2016 BOTTOM

SYCAMORE RUN RESERVOIR

STORET ID: 204216

aka LAKE WAYNOKA WATER SUPPLY RESERVOIR, L-1

Inorganics

Parameter	5/18/2016	6/07/2016	7/06/2016	8/02/2016	9/07/2016
Sample Depth	3.5 m	3.5 m	10.03 m	3 m	3 m
pH	6.77 S.U.	6.86 S.U.	6.78 S.U.	6.6 S.U.	6.47 S.U.
Dissolved Oxygen (DO)	1.38 mg/L	0.19 mg/L	0.27 mg/L	0.15 mg/L	0.24 mg/L
Saturation	12.3 %	1.8 %	2.8 %	1.6 %	2.6 %
Specific Conductance	192 µmhos/cm	20 µmhos/cm	23 µmhos/cm	07 µmhos/cm	33 µmhos/cm
Temperature, water	10.42 ° C	12.1 ° C	17.83 ° C	17.41 ° C	19.51 ° C
Alkalinity, Total	62.6 mg/L	61.9 mg/L	65.6 mg/L	57.7 mg/L	59.9 mg/L
Aluminum	1600 ug/L	1080 ug/L	2720 ug/L	867 ug/L	< 200.0 µg/L U
Ammonia	0.929 mg/L	0.78 mg/L	0.725 mg/L	2.96 mg/L	1.36 mg/L
Arsenic	6.1 ug/L	5.3 ug/L	4.1 ug/L	3.3 ug/L	2.9 ug/L
Barium	33 ug/L	44 ug/L	37 ug/L	24 ug/L	30 ug/L
Bicarbonate	62.6 mg/L	61.9 mg/L	65.6 mg/L	57.7 mg/L	59.9 mg/L
Cadmium	< 0.2 µg/L U	< 0.2 µg/L U	< 0.2 µg/L U	< 0.2 µg/L U	< 0.2 µg/L U
Calcium	19.1 mg/L	19 mg/L	20.2 mg/L	14.2 mg/L	14.1 mg/L
Carbon, Total Organic (TOC)	10.7 mg/L	9.73 mg/L	9.14 mg/L	8.69 mg/L	7.14 mg/L
Carbonate ion (CO3-2)	< 5.0 mg/L U	< 5.0 mg/L U	< 5.0 mg/L U	< 5.0 mg/L U	< 5.0 mg/L U
Chloride	13.6 mg/L	12.5 mg/L	12.1 mg/L	6.8 mg/L	< 5.0 mg/L U
Chromium	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U
Copper	103 ug/L	87.5 ug/L	49.1 ug/L	17.7 ug/L	61.1 ug/L
Hardness, Ca + Mg	70 mg/L	66 mg/L	72 mg/L	50 mg/L	49 mg/L
Iron	3160 ug/L	2530 ug/L	1600 ug/L	2970 ug/L	1930 ug/L
Lead	2.1 ug/L	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U
Magnesium	5.3 mg/L	5 mg/L	5.3 mg/L	3.6 mg/L	3.4 mg/L
Manganese	632 ug/L	661 ug/L	828 ug/L	1020 ug/L	692 ug/L
Nickel	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U
Nitrate+Nitrite	0.15 mg/L	< 0.1 mg/L U	0.12 mg/L	< 0.1 mg/L U	< 0.1 mg/L U
Nitrogen, Kjeldahl	2.21 mg/L	1.77 mg/L	2.02 mg/L	3.84 mg/L	2.27 mg/L
Nitrogen, Nitrite (NO2) as NO2	< 0.02 mg/L U	< 0.02 mg/L U	< 0.02 mg/L U	< 0.02 mg/L U	< 0.02 mg/L U
Orthophosphate, dissolved		0.632 mg/L	0.575 mg/L	0.847 mg/L	0.356 mg/L
Phosphorus	1.02 mg/L	0.849 mg/L	0.507 mg/L	0.899 mg/L	0.544 mg/L
Potassium	7 mg/L	7 mg/L	7.2 mg/L	5.4 mg/L	4.7 mg/L
Selenium	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U
Sodium	< 5.0 mg/L U	< 5.0 mg/L U	< 5.0 mg/L U	< 5.0 mg/L U	< 5.0 mg/L U
Solids, Total Suspended (TSS)	18 mg/L	34 mg/L	26 mg/L	17 mg/L	9 mg/L
Strontium	76 ug/L	73 ug/L	79 ug/L	56 ug/L	52 ug/L
Sulfur, sulfate (SO4) as SO4	10.3 mg/L	9.4 mg/L	7.2 mg/L	< 5.0 mg/L U	< 5.0 mg/L U
Total Dissolved Solids	150 mg/L	130 mg/L	118 mg/L	100 mg/L	90 mg/L
Turbidity	49.5 NTU	45.2 NTU	38.2 NTU	28.5 NTU	11.8 NTU
Zinc	12 ug/L	10 ug/L	32 ug/L	< 10.0 µg/L U	< 10.0 µg/L U

Southwest Ohio River Tributaries -- Lake Sampling -- Profile Measurements
2016

WAYNOKA UPGROUND RESERVOIR

STORET ID: 204246

Field Meter Readings

Pg. 1

Date Time	Temp	SpCond	ODOsat	ODO	pH	Depth
M/D/Y HH:MM:SS	C	uS	%	mg/L	S.U.	meters
6/7/2016 11:15	24.85	180	113.2	9.38	8.9	0.5
6/7/2016 11:18	24.83	181	114.5	9.49	8.89	1.0
6/7/2016 11:19	24.83	181	114.6	9.49	8.89	1.5
6/7/2016 11:20	24.71	181	115.1	9.56	8.89	2.0
6/7/2016 11:21	22.4	182	121.5	10.53	8.89	2.5
6/7/2016 11:22	19.09	196	81.1	7.51	7.83	3.0
8/2/2016 10:39	28.96	183	107.8	8.29	8.82	0.5
8/2/2016 10:40	28.86	183	108.5	8.36	8.84	1.0
8/2/2016 10:41	28.81	183	108.6	8.37	8.85	1.5
8/2/2016 10:42	28.75	183	107.3	8.29	8.83	2.0
8/2/2016 10:47	25.99	224	4.3	0.35	7.4	2.6
8/2/2016 10:48	21.88	351	3.9	0.34	7.1	3.1
9/7/2016 13:05	28.22	194	162.3	12.65	9.15	0.5
9/7/2016 13:07	26.48	194	159.6	12.84	9.02	1.0
9/7/2016 13:08	25.89	197	114.2	9.28	8.58	1.5
9/7/2016 13:11	25.55	200	68.4	5.59	7.89	2.0
9/7/2016 13:15	24.44	224	6.7	0.56	7.39	2.5

Southwest Ohio River Tributaries -- Lake Sampling -- Water Chemistry

2016 SURFACE

WAYNOKA UPGROUND WATER SUPPLY RESERVOIR, L-1

STORET ID: 204246

Inorganics and Toxins

Parameter	5/18/2016	6/07/2016	7/06/2016	8/02/2016	9/07/2016
Cylindrospermopsin	< 0.05 µg/L J	< 0.05 µg/L U	< 0.05 µg/L U	< 0.05 µg/L U	< 0.05 µg/L U
Microcystins	< 0.3 µg/L U	< 0.3 µg/L J	< 0.3 µg/L U	< 0.3 µg/L U	< 0.3 µg/L U
Saxitoxin	< 0.022 µg/L U		< 0.022 µg/L U	< 0.022 µg/L U	< 0.022 µg/L U
Secchi Disk Depth	1.4 m	1.14 m	1.07 m	1.31 m	162.3 %
pH	8.03 S.U.	8.9 S.U.		8.82 S.U.	12.65 mg/L
Sample Depth	0.5 m	0.5 m		0.5 m	9.15 S.U.
Dissolved Oxygen (DO)	9.54 mg/L	9.38 mg/L		8.29 mg/L	0.55 m
Saturation	97.3 %	113.2 %		107.8 %	0.5 m
Specific Conductance	178 µmhos/cm	180 µmhos/cm		183 µmhos/cm	194 µmhos/cm
Temperature, water	16.31 ° C	24.85 ° C		28.96 ° C	28.22 ° C
Alkalinity, Total	66.1 mg/L	67.5 mg/L	69.4 mg/L	70.9 mg/L	83.7 mg/L
Aluminum	312 ug/L	< 200.0 µg/L U	< 200.0 µg/L U	< 200.0 µg/L U	< 200.0 µg/L U
Ammonia	< 0.05 mg/L U	< 0.05 mg/L U	< 0.05 mg/L U	< 0.05 mg/L U	< 0.05 mg/L U
Arsenic	< 2.0 µg/L U	< 2.0 µg/L U	2.1 ug/L	2.5 ug/L	2.6 ug/L
Barium	40 ug/L	37 ug/L	35 ug/L	35 ug/L	24 ug/L
Bicarbonate	66.1 mg/L	58.9 mg/L	51.1 mg/L	64 mg/L	59.3 mg/L
Cadmium	< 0.2 µg/L U	< 0.2 µg/L U	< 0.2 µg/L U	< 0.2 µg/L U	< 0.2 µg/L U
Calcium	20.8 mg/L	21.2 mg/L	22.1 mg/L	22.9 mg/L	24.7 mg/L
Carbon, Total Organic (TOC)	3.62 mg/L	6.01 mg/L	7.1 mg/L	5.78 mg/L	6.28 mg/L
Carbonate ion (CO3-2)	< 5.0 mg/L U	8.6 mg/L	18.3 mg/L	6.9 mg/L	24.5 mg/L
Chloride	< 5.0 mg/L U	5.7 mg/L	6.4 mg/L	6.4 mg/L	6.2 mg/L
Chlorophyll a	5.8 ug/L	6.2 ug/L	28.5 ug/L	10.8 ug/L	31.2 ug/L
Chromium	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U
Copper	128 ug/L	248 ug/L	106 ug/L	122 ug/L	46.6 ug/L
Hardness, Ca + Mg	74 mg/L	74 mg/L	78 mg/L	81 mg/L	86 mg/L
Iron	289 ug/L	252 ug/L	51 ug/L	< 50.0 µg/L U	57 ug/L
Lead	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U
Magnesium	5.4 mg/L	5.4 mg/L	5.5 mg/L	5.7 mg/L	5.9 mg/L
Manganese	24 ug/L	95 ug/L	57 ug/L	45 ug/L	91 ug/L
Nickel	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U
Nitrate+Nitrite	0.1 mg/L	< 0.1 mg/L U	< 0.1 mg/L U	< 0.1 mg/L U	< 0.1 mg/L U
Nitrogen, Kjeldahl	0.41 mg/L	0.57 mg/L	0.79 mg/L	0.54 mg/L	0.57 mg/L
Nitrogen, Nitrite (NO2) as NO2	< 0.02 mg/L U	< 0.02 mg/L U	< 0.02 mg/L U	< 0.02 mg/L U	< 0.02 mg/L U
Orthophosphate, dissolved		0.015 mg/L	< 0.01 mg/L U	< 0.01 mg/L U	< 0.01 mg/L U
Pheophytin-a	1.8 ug/L J	2.5 ug/L J	< 7.0 µg/L UJ	1.7 ug/L J	2.9 ug/L J
Phosphorus	0.136 mg/L	0.094 mg/L	0.053 mg/L	0.02 mg/L	0.046 mg/L
Potassium	3.3 mg/L	3.9 mg/L	4.1 mg/L	4.1 mg/L	4 mg/L
Selenium	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U
Sodium	< 5.0 mg/L U	< 5.0 mg/L U	< 5.0 mg/L U	< 5.0 mg/L U	< 5.0 mg/L U
Solids, Total Suspended (TSS)	< 5.0 mg/L U	5 mg/L	< 5.0 mg/L U	< 5.0 mg/L U	8 mg/L
Strontium	80 ug/L	80 ug/L	80 ug/L	85 ug/L	88 ug/L
Sulfur, sulfate (SO4) as SO4	15.4 mg/L	13.8 mg/L	12.2 mg/L	11.1 mg/L	10.3 mg/L
Total Dissolved Solids	118 mg/L	120 mg/L	112 mg/L	110 mg/L	116 mg/L
Turbidity	5 NTU	5.66 NTU	3.9 NTU	2.59 NTU	5.18 NTU
Zinc	< 10.0 µg/L U	< 10.0 µg/L U	< 10.0 µg/L U	< 10.0 µg/L U	< 10.0 µg/L U
Atrazine	< 0.2 µg/L U	0.29 ug/L	0.44 ug/L	0.47 ug/L	0.3 ug/L

Parameter	6/14/2016
Cylindrospermopsin	< 0.05 µg/L U
Microcystins	< 0.3 µg/L U
Saxitoxin	< 0.022 µg/L U

This was a re-sample to capture all three cyanotoxins.

Sampled from shore using integrated tube sampler to a depth of about 0.5 meter.

Southwest Ohio River Tributaries -- Lake Sampling -- Water Chemistry

2016 BOTTOM

WAYNOKA UPGROUND WATER SUPPLY RESERVOIR, L-1

STORET ID: 204246

Inorganics

Parameter	5/18/2016	6/07/2016	7/06/2016	8/02/2016	9/07/2016
Sample Depth	2.5 m	3 m		2.5 m	2 m
pH	7.92 S.U.	7.83 S.U.		7.1 S.U.	7.89 S.U.
Dissolved Oxygen (DO)	9 mg/L	7.51 mg/L		0.34 mg/L	5.59 mg/L
Saturation	91.5 %	81.1 %		3.9 %	68.4 %
Specific Conductance	78 µmhos/cm	96 µmhos/cm		351 µmhos/cm	0.55 m
Temperature, water	16.15 ° C	19.09 ° C		21.88 ° C	00 µmhos/cm
Alkalinity, Total	67.5 mg/L	71.5 mg/L	71.5 mg/L	71.4 mg/L	85 mg/L
Aluminum	341 ug/L	< 200.0 µg/L U	< 200.0 µg/L U	< 200.0 µg/L U	< 200.0 µg/L U
Ammonia	< 0.05 mg/L U	< 0.05 mg/L U	< 0.05 mg/L U	< 0.05 mg/L U	0.052 mg/L
Arsenic	< 2.0 µg/L U	< 2.0 µg/L U	2.1 ug/L	2.4 ug/L	2.5 ug/L
Barium	40 ug/L	41 ug/L	35 ug/L	35 ug/L	28 ug/L
Bicarbonate	67.5 mg/L	61.9 mg/L	55.9 mg/L	64.6 mg/L	85 mg/L
Cadmium	< 0.2 µg/L U	< 0.2 µg/L U	< 0.2 µg/L U	< 0.2 µg/L U	< 0.2 µg/L U
Calcium	20.9 mg/L	22.1 mg/L	21.8 mg/L	22.9 mg/L	24.9 mg/L
Carbon, Total Organic (TOC)	3.69 mg/L	4.69 mg/L	7.08 mg/L	5.92 mg/L	5.32 mg/L
Carbonate ion (CO3-2)	< 5.0 mg/L U	9.6 mg/L	15.7 mg/L	6.8 mg/L	< 5.0 mg/L U
Chloride	5.1 mg/L	5.2 mg/L	6.5 mg/L	6.1 mg/L	6.3 mg/L
Chromium	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U
Copper	133 ug/L	103 ug/L	104 ug/L	124 ug/L	58.7 ug/L
Hardness, Ca + Mg	74 mg/L	77 mg/L	77 mg/L	81 mg/L	87 mg/L
Iron	287 ug/L	134 ug/L	56 ug/L	< 50.0 µg/L U	90 ug/L
Lead	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U
Magnesium	5.4 mg/L	5.6 mg/L	5.4 mg/L	5.7 mg/L	5.9 mg/L
Manganese	24 ug/L	45 ug/L	63 ug/L	49 ug/L	177 ug/L
Nickel	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U
Nitrate+Nitrite	< 0.1 mg/L U	< 0.1 mg/L U	< 0.1 mg/L U	< 0.1 mg/L U	< 0.1 mg/L U
Nitrogen, Kjeldahl	0.58 mg/L	1.19 mg/L	0.76 mg/L	0.61 mg/L	0.69 mg/L
Nitrogen, Nitrite (NO2) as NO2	< 0.02 mg/L U	< 0.02 mg/L U	< 0.02 mg/L U	< 0.02 mg/L U	< 0.02 mg/L U
Orthophosphate, dissolved		< 0.01 mg/L U	< 0.01 mg/L U	< 0.01 mg/L U	< 0.01 mg/L U
Phosphorus	0.023 mg/L	0.082 mg/L	0.047 mg/L	0.028 mg/L	0.047 mg/L
Potassium	3.3 mg/L	3.6 mg/L	4 mg/L	4.1 mg/L	4 mg/L
Selenium	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U
Sodium	< 5.0 mg/L U	< 5.0 mg/L U	< 5.0 mg/L U	< 5.0 mg/L U	< 5.0 mg/L U
Solids, Total Suspended (TSS)	< 5.0 mg/L U	< 5.0 mg/L U	< 5.0 mg/L U	< 5.0 mg/L U	6 mg/L
Strontium	81 ug/L	84 ug/L	79 ug/L	85 ug/L	89 ug/L
Sulfur, sulfate (SO4) as SO4	15.5 mg/L	13.8 mg/L	12.5 mg/L	11 mg/L	10 mg/L
Total Dissolved Solids	112 mg/L	114 mg/L	110 mg/L	118 mg/L	120 mg/L
Turbidity	5.49 NTU	3.98 NTU	4.19 NTU	2.73 NTU	5.42 NTU
Zinc	< 10.0 µg/L U	< 10.0 µg/L U	< 10.0 µg/L U	< 10.0 µg/L U	< 10.0 µg/L U

Southwest Ohio River Tributaries -- Lake Sampling -- Sediments

2016

LAKE WAYNOKA WATER SUPPLY RESERVOIR, L-1

STORET ID: 204216 Pg. 1

aka SYCAMORE RUN RESERVOIR

Inorganics

Parameter	9/07/2016	Qualifier
% Solids	27.50%	
Carbon, Total Organic (TOC)	3%	
Aluminum	18500 mg/kg	
Arsenic	5.36 mg/kg	
Barium	160 mg/kg	
Cadmium	0.594 mg/kg	
Calcium	5130 mg/kg	
Chromium	16 mg/kg	
Copper	80.4 mg/kg	
Iron	21800 mg/kg	J
Lead	28.7 mg/kg	
Magnesium	2700 mg/kg	
Manganese	359 mg/kg	
Nickel	14.5 mg/kg	
Potassium	< 2500.0 mg/kg	U
Selenium	< 2.5 mg/kg	U
Sodium	< 6250.0 mg/kg	U
Strontium	< 38.0 mg/kg	U
Zinc	147 mg/kg	B

Organics

Parameter	9/07/2016	Qualifier
% Solids	28.50%	
4-Chloro-3-methylphenol	< 6.95 mg/kg	U
Acenaphthene	< 1.39 mg/kg	U
Acenaphthylene	< 1.39 mg/kg	U
Acetophenone	< 1.39 mg/kg	U
Acetylaminofluorene, 2-	< 1.39 mg/kg	U
Aldrin	< 14.0 µg/kg	U
Aniline	< 1.39 mg/kg	U
Anthracene	< 1.39 mg/kg	U
BHC-alpha	< 14.0 µg/kg	U
BHC-beta	< 14.0 µg/kg	U
BHC-delta	< 14.0 µg/kg	U
BHC-gamma (Lindane)	< 14.0 µg/kg	U
Benzo[a]anthracene	< 1.39 mg/kg	U
Benzo[a]pyrene	< 1.39 mg/kg	U
Benzo[b]fluoranthene	< 1.39 mg/kg	U
Benzo[g,h,i]perylene	< 1.39 mg/kg	U
Benzo[k]fluoranthene	< 1.39 mg/kg	U
Benzyl alcohol	< 1.39 mg/kg	U
Bromophenyl-4 phenyl ether	< 1.39 mg/kg	U
Butyl benzyl phthalate	< 1.39 mg/kg	U
Chlordane, cis	< 14.0 µg/kg	U
Chlordane, trans	< 14.0 µg/kg	U
Chloronaphthalene-2	< 1.39 mg/kg	U
Chlorophenol-2	< 1.39 mg/kg	U
Chlorophenyl-4 phenyl ether	< 1.39 mg/kg	U
Chrysene	< 1.39 mg/kg	U
Cresol, o-	< 1.39 mg/kg	U
Cresol, p-	< 6.95 mg/kg	U
DDD	< 14.0 µg/kg	U
DDE	< 14.0 µg/kg	U
DDT	< 14.0 µg/kg	U
DNBP, 4,6-Dinitro-2-sec-butylphenol	< 1.39 mg/kg	U
Dibenzo[a,h]anthracene	< 1.39 mg/kg	U
Dibenzofuran	< 1.39 mg/kg	U
Dibutyl phthalate	< 1.39 mg/kg	U
Dichlorobenzene, 1,2-	< 1.39 mg/kg	U
Dichlorobenzene, 1,3-	< 1.39 mg/kg	U
Dichlorobenzene, 1,4-	< 1.39 mg/kg	U
Dichlorobenzidine, 3,3'-	< 7.0 mg/kg	U
Dichlorophenol, 2,4-	< 1.39 mg/kg	U
Dichlorophenol, 2,6-	< 1.39 mg/kg	U
Dieldrin	< 14.0 µg/kg	U
Diethyl phthalate	< 1.39 mg/kg	U
Dimethyl phthalate	< 1.39 mg/kg	U
Dimethylaminoazobenzene, 4-	< 1.39 mg/kg	U
Dimethylbenz(a)anthracene, 7,12-	< 1.4 mg/kg	U
Dimethylphenol, 2,4-	< 1.39 mg/kg	U
Dinitro-o-cresol	< 6.95 mg/kg	U

Southwest Ohio River Tributaries -- Lake Sampling -- Sediments

LAKE WAYNOKA WATER SUPPLY RESERVOIR, L-1 STORET ID:

204216

2016

Pg. 2

aka SYCAMORE RUN RESEVOIR

Organics cont.

Parameter	9/07/2016	Qualifier
Dinitrobenzene, m-	< 1.39 mg/kg	U
Dinitrophenol, 2,4-	< 7.0 mg/kg	U
Dinitrotoluene, 2,4-	< 1.39 mg/kg	U
Dinitrotoluene, 2,6-	< 1.39 mg/kg	U
Diphenylamine	< 1.39 mg/kg	U
Endosulfan sulfate	< 14.0 µg/kg	U
Endosulfan, alpha-	< 14.0 µg/kg	U
Endosulfan, beta-	< 14.0 µg/kg	U
Endrin	< 14.0 µg/kg	U
Endrin aldehyde	< 14.0 µg/kg	U
Ethyl methanesulfonate	< 1.39 mg/kg	U
Fluoranthene	< 1.39 mg/kg	U
Fluorene	< 1.39 mg/kg	U
Heptachlor	< 14.0 µg/kg	U
Heptachlor epoxide	< 14.0 µg/kg	U
Hexachlorobenzene	< 1.39 mg/kg	U
Hexachlorobenzene	< 14.0 µg/kg	U
Hexachlorobutadiene	< 1.39 mg/kg	U
Hexachlorocyclopentadiene	< 1.39 mg/kg	U
Hexachloroethane	< 1.39 mg/kg	U
Hexachloropropene	< 1.39 mg/kg	U
Indeno[1,2,3-cd]pyrene	< 1.39 mg/kg	U
Isophorone	< 1.39 mg/kg	U
Methoxychlor	< 14.0 µg/kg	U
Methyl methanesulfonate	< 1.39 mg/kg	U
Methylcholanthrene, 3-	< 1.39 mg/kg	U
Methylnaphthalene, 2-	< 1.39 mg/kg	U
Mirex	< 14.0 µg/kg	U
Naphthalene	< 1.39 mg/kg	U
Naphthalenedione, 1,4-	< 1.39 mg/kg	U
Nitro-benzene	< 1.39 mg/kg	U
Nitroaniline, 2-	< 1.39 mg/kg	U
Nitroaniline, 4-	< 1.39 mg/kg	U
Nitrophenol, 2-	< 1.39 mg/kg	U
Nitrophenol, 4-	< 7.0 mg/kg	U
Nitrosodibutylamine, n-	< 1.39 mg/kg	U
Nitrosodipropylamine, n-	< 1.39 mg/kg	U
Nitrosomorpholine, n-	< 1.39 mg/kg	U
Nitrosopiperidine, n-	< 1.39 mg/kg	U
Nitrosopyrrolidine, n-	< 1.39 mg/kg	U
Nonachlor, cis-	< 14.0 µg/kg	U
Nonachlor, trans-	< 14.0 µg/kg	U
Oxychlordan	< 14.0 µg/kg	U
PCB-Aroclor 1016	< 70.0 µg/kg	U
PCB-Aroclor 1221	< 70.0 µg/kg	U
PCB-Aroclor 1232	< 70.0 µg/kg	U
PCB-Aroclor 1242	< 70.0 µg/kg	U
PCB-Aroclor 1248	< 70.0 µg/kg	U
PCB-Aroclor 1254	< 70.0 µg/kg	U
PCB-Aroclor 1260	< 70.0 µg/kg	U

Organics cont.

Parameter	9/07/2016	Qualifier
Pentachlorobenzene	< 1.39 mg/kg	U
Pentachlorophenol (PCP)	< 6.95 mg/kg	U
Phenacetin	< 1.39 mg/kg	U
Phenanthrene	< 1.39 mg/kg	U
Phenol	< 1.39 mg/kg	U
Picoline, 2-	< 1.39 mg/kg	U
Pronamide	< 1.39 mg/kg	U
Pyrene	< 1.39 mg/kg	U
Safrole	< 1.39 mg/kg	U
Tetrachlorobenzene, 1,2,4,5-	< 1.39 mg/kg	U
Tetrachlorophenol, 2,3,4,6-	< 1.39 mg/kg	U
Toxaphene	< 70.0 µg/kg	U
Trichlorobenzene, 1,2,4-	< 1.39 mg/kg	U
Trichlorophenol, 2,4,5-	< 1.39 mg/kg	U
Trichlorophenol, 2,4,6- (TCPh)	< 1.39 mg/kg	U
bis(2-Chloroisopropyl) ether	< 1.39 mg/kg	U
bis(2-chloroethoxy) methane	< 1.39 mg/kg	U
bis(2-chloroethyl) ether	< 1.39 mg/kg	U
bis(2-ethylhexyl) phthalate (DEHP)	< 1.39 mg/kg	U
bis(n-octyl) phthalate	< 1.39 mg/kg	U

Southwest Ohio River Tributaries -- Lake Sampling -- Profile Measurements

2016

TURKEY CREEK LAKE, L-1

STORET ID: 204483

Field Meter Readings

Pg. 1

Date Time	Temp	SpCond	ODO	ODOsat	pH	Depth
M/D/Y HH:MM:SS	C	uS	mg/L	%	S.U.	meters
5/24/2016 11:04	18.92	91	9.16	98.6	6.93	0.5
5/24/2016 11:04	18.46	90	9.61	102.4	7.02	1.0
5/24/2016 11:05	17.03	91	9.82	101.7	7.07	1.5
5/24/2016 11:05	16.33	91	9.86	100.6	7.03	2.0
5/24/2016 11:05	15.1	90	9.87	98.1	6.99	2.5
5/24/2016 11:05	14.13	90	9.62	93.6	6.95	3.0
5/24/2016 11:06	13.23	91	9.19	87.6	6.88	3.5
5/24/2016 11:06	12.46	93	8.59	80.6	6.8	4.0
5/24/2016 11:06	11.56	95	8.01	73.6	6.73	4.5
5/24/2016 11:07	10.82	97	7.09	64	6.67	5.0
5/24/2016 11:07	10.03	98	6.09	54	6.6	5.5
5/24/2016 11:07	9.44	99	5.4	47.2	6.56	6.0
5/24/2016 11:08	9.03	100	4.5	39	6.49	6.5
5/24/2016 11:08	8.78	101	4.55	39.1	6.46	7.1
5/24/2016 11:08	8.67	102	4.57	39.2	6.41	7.5
6/14/2016 11:06	25.31	94	8.5	103.5	7.43	0.5
6/14/2016 11:11	23.02	93	9.37	109.3	7.18	1.5
6/14/2016 11:12	18.86	87	8.63	92.7	6.98	2.5
6/14/2016 11:14	14.84	92	7.61	75.2	6.8	3.5
6/14/2016 11:19	10.58	101	1.53	13.8	6.46	5.5
6/14/2016 11:22	9.59	102	0.42	3.7	6.5	6.5
6/14/2016 11:23	8.75	124	0.27	2.3	6.57	8.5
7/12/2016 11:51	27.81	103	8.63	109.9	7.79	0.5
7/12/2016 11:52	27.68	103	8.62	109.5	7.75	1.5
7/12/2016 11:54	24.02	102	11.23	133.4	7.81	2.5
7/12/2016 11:57	19.09	96	3.63	39.2	6.59	3.5
7/12/2016 12:00	13.35	101	0.55	5.3	6.13	4.6
7/12/2016 12:02	11.07	103	0.36	3.3	6.16	5.5
7/12/2016 12:03	9.71	121	0.34	3	6.21	6.5
7/12/2016 12:04	9.22	133	0.22	1.9	6.5	7.6
7/12/2016 12:06	8.79	162	0.18	1.6	6.67	8.5

Southwest Ohio River Tributaries -- Lake Sampling -- Profile Measurements

TURKEY CREEK LAKE, L-1

STORET ID: 204483

Field Meter Readings

Pg. 2

Date Time	Temp	SpCond	ODO	ODOsat	pH	Depth
M/D/Y HH:MM:SS	C	uS	mg/L	%	S.U.	meters
8/16/2016 13:01	30.36	114	8.16	108.7	7.82	0.6
8/16/2016 13:02	29.83	114	8.13	107.3	7.81	1.5
8/16/2016 13:12	28.18	111	9.07	116.2	7.43	2.6
8/16/2016 13:13	23.18	108	3.95	46.3	6.94	3.5
8/16/2016 13:14	17.38	104	1.57	16.4	6.66	4.6
8/16/2016 13:16	12.22	113	0.86	8.3	6.52	5.5
8/16/2016 13:19	10.21	143	0.47	4.2	6.65	6.5
8/16/2016 13:22	9.49	159	0.26	2.2	6.78	7.5
8/16/2016 13:23	9.34	168	0.23	2	6.8	8.1
9/13/2016 12:21	25.75	114	7.14	87.6	7.42	0.5
9/13/2016 12:22	25.58	114	7.71	94.3	7.48	1.5
9/13/2016 12:23	25.44	114	7.6	92.7	7.48	2.5
9/13/2016 12:26	24	111	1.88	22.4	6.92	3.5
9/13/2016 12:27	19.38	110	0.55	6	6.68	4.5
9/13/2016 12:28	14.1	135	0.35	3.4	6.19	5.5
9/13/2016 12:29	10.95	159	0.28	2.6	6.17	6.5
9/13/2016 12:30	9.89	184	0.24	2.2	6.27	7.5
9/13/2016 12:31	9.65	189	0.27	2.4	6.35	8.0

Southwest Ohio River Tributaries -- Lake Sampling -- Water Chemistry

2016

SURFACE

TURKEY CREEK LAKE, L-1

STORET ID: 204483

Inorganics

Parameter	5/24/2016	6/14/2016	7/12/2016	8/16/2016	9/13/2016
Dissolved Oxygen (DO)	9.16 mg/L	8.5 mg/L	8.63 mg/L	8.16 mg/L	7.14 mg/L
pH	6.93 S.U.	7.43 S.U.	7.79 S.U.	7.82 S.U.	7.42 S.U.
Sample Depth	0.5 m	0.5 m	0.5 m	0.5 m	0.5 m
Saturation	98.6 %	103.50%	109.9 %	108.7 %	87.6 %
Secchi Disk Depth	2.3 m	1.98 m	2.36 m	2.35 m	1.66 m
Specific Conductance	91 µmhos/cm	94 µmhos/cm	103 µmhos/cm	114 µmhos/cm	114 µmhos/cm
Temperature, water	18.92 ° C	25.31 ° C	27.81 ° C	30.36 ° C	25.75 ° C
Alkalinity, Total	14.9 mg/L	18.3 mg/L	21.5 mg/L	24.8 mg/L	28.8 mg/L
Aluminum	< 200.0 µg/L U	< 200.0 µg/L U	< 200.0 µg/L U	< 200.0 µg/L U	< 200.0 µg/L U
Ammonia	< 0.05 mg/L U	< 0.05 mg/L U	< 0.05 mg/L U	< 0.05 mg/L U	< 0.05 mg/L U
Arsenic	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U
Barium	19 ug/L	20 ug/L	22 ug/L	22 ug/L	24 ug/L
Bicarbonate	14.9 mg/L	18.3 mg/L	21.5 mg/L	24.8 mg/L	28.8 mg/L
Cadmium	< 0.2 µg/L U	< 0.2 µg/L U	< 0.2 µg/L U	< 0.2 µg/L U	< 0.2 µg/L U
Calcium	3.9 mg/L	4.3 mg/L	5.1 mg/L	5.4 mg/L	5.6 mg/L
Carbon, Total Organic (TOC)	2.3 mg/L	3.01 mg/L	3.15 mg/L	3.72 mg/L	4.66 mg/L
Carbonate ion (CO3-2)	< 5.0 mg/L U	< 5.0 mg/L U	< 5.0 mg/L U	< 5.0 mg/L U	< 5.0 mg/L U
Chloride	< 5.0 mg/L U	< 5.0 mg/L U	< 5.0 mg/L U	5.9 mg/L	6.2 mg/L
Chromium	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U
Copper	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U
Hardness, Ca + Mg	27 mg/L	28 mg/L	32 mg/L	33 mg/L	34 mg/L
Iron	177 ug/L	204 ug/L	244 ug/L	218 ug/L	208 ug/L
Lead	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U
Magnesium	4.1 mg/L	4.3 mg/L	4.7 mg/L	4.8 mg/L	4.9 mg/L
Manganese	35 ug/L	25 ug/L	21 ug/L	30 ug/L	44 ug/L
Nickel	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U
Nitrate+Nitrite	0.21 mg/L	0.16 mg/L	< 0.1 mg/L U	< 0.1 mg/L U	< 0.1 mg/L U
Nitrogen, Kjeldahl	0.21 mg/L	< 0.2 mg/L U	0.25 mg/L	0.27 mg/L	0.26 mg/L
Nitrogen, Nitrite (NO2) as NO2	< 0.02 mg/L U	< 0.02 mg/L U	< 0.02 mg/L U	< 0.02 mg/L U	< 0.02 mg/L U
Orthophosphate, dissolved	< 0.01 mg/L U	0.0043 mg/L	< 0.01 mg/L U	< 0.01 mg/L U	< 0.01 mg/L U
Phosphorus	0.017 mg/L	0.0117 mg/L	0.011 mg/L	0.012 mg/L	0.015 mg/L
Potassium	< 2.0 mg/L U	< 2.0 mg/L U	< 2.0 mg/L U	< 2.0 mg/L U	< 2.0 mg/L U
Selenium	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U
Sodium	5.1 mg/L	5.3 mg/L	6 mg/L	6.6 mg/L	6.8 mg/L
Solids, Total Suspended (TSS)	< 5.0 mg/L U	< 5.0 mg/L U	< 5.0 mg/L U	< 5.0 mg/L U	< 5.0 mg/L U
Strontium	33 ug/L	34 ug/L	37 ug/L	39 ug/L	40 ug/L
Sulfur, sulfate (SO4) as SO4	17 mg/L	17.5 mg/L	16.5 mg/L	16 mg/L	16.1 mg/L
Total Dissolved Solids	80 mg/L	72 mg/L	60 mg/L	66 mg/L	70 mg/L
Turbidity	3.54 NTU	2.11 NTU	2.02 NTU	2.09 NTU	3.48 NTU
Zinc	< 10.0 µg/L U	< 10.0 µg/L U	< 10.0 µg/L U	< 10.0 µg/L U	< 10.0 µg/L U
Chlorophyll a, corrected for pheophytin	4.4 ug/L	5.3 ug/L	5.8 ug/L	5.4 ug/L	15.8 ug/L
Pheophytin-a	0.9 ug/L J	1.7 ug/L J	2.6 ug/L J	1.6 ug/L J	0.8 ug/L J

Southwest Ohio River Tributaries -- Lake Sampling -- Water Chemistry

2016

BOTTOM

TURKEY CREEK LAKE, L-1

STORET ID: 204483

Inorganics

Parameter	5/24/2016	6/14/2016	7/12/2016	8/16/2016	9/13/2016
Dissolved Oxygen (DO)	4.57 mg/L	0.27 mg/L	1.6 mg/L	0.23 mg/L	0.27 mg/L
pH	6.41 S.U.	6.57 S.U.	6.67 S.U.	6.8 S.U.	6.35 S.U.
Sample Depth	7.5 m	9 m	8.5 m	8 m	8 m
Saturation	39.2 %	2.30%	0.18 %	2 %	2.4 %
Specific Conductance	102 µmhos/cm	124 µmhos/cm	162 µmhos/cm	168 µmhos/cm	189 µmhos/cm
Temperature, water	8.67 ° C	8.75 ° C	8.79 ° C	9.34 ° C	9.65 ° C
Alkalinity, Total	17.4 mg/L	25 mg/L	38.7 mg/L	39.1 mg/L	57.2 mg/L
Aluminum	< 200.0 µg/L U	< 200.0 µg/L U	< 200.0 µg/L U	< 200.0 µg/L U	< 200.0 µg/L U
Ammonia	0.241 mg/L	0.478 mg/L	0.819 mg/L	0.596 mg/L	1.08 mg/L
Arsenic	< 2.0 µg/L U	< 2.0 µg/L U	5.2 ug/L	4.9 ug/L	11.3 ug/L
Barium	25 ug/L	38 ug/L	43 ug/L	55 ug/L	70 ug/L
Bicarbonate	17.4 mg/L	25 mg/L	38.7 mg/L	39.1 mg/L	57.2 mg/L
Cadmium	< 0.2 µg/L U	< 0.2 µg/L U	< 0.2 µg/L U	< 0.2 µg/L U	< 0.2 µg/L U
Calcium	4.4 mg/L	4.8 mg/L	5.5 mg/L	5.7 mg/L	6.6 mg/L
Carbon, Total Organic (TOC)	< 2.0 mg/L U	3.12 mg/L	5.37 mg/L	5.07 mg/L	7.58 mg/L
Carbonate ion (CO3-2)	< 5.0 mg/L U	< 5.0 mg/L U	< 5.0 mg/L U	< 5.0 mg/L U	< 5.0 mg/L U
Chloride	5.3 mg/L	5.9 mg/L	6.2 mg/L	5.9 mg/L	6.9 mg/L
Chromium	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U
Copper	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U
Hardness, Ca + Mg	29 mg/L	31 mg/L	33 mg/L	34 mg/L	38 mg/L
Iron	787 ug/L	3280 ug/L	9950 ug/L	8360 ug/L	18900 ug/L
Lead	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U
Magnesium	4.4 mg/L	4.5 mg/L	4.7 mg/L	4.8 mg/L	5.2 mg/L
Manganese	711 ug/L	1390 ug/L	2450 ug/L	2960 ug/L	4120 ug/L
Nickel	< 2.0 µg/L U	2.1 ug/L	2.1 ug/L	2.5 ug/L	< 2.0 µg/L U
Nitrate+Nitrite	0.14 mg/L	< 0.1 mg/L U	< 0.1 mg/L U	< 0.1 mg/L U	0.12 mg/L
Nitrogen, Kjeldahl	0.33 mg/L	0.71 mg/L	1.13 mg/L	1.36 mg/L	2.1 mg/L
Nitrogen, Nitrite (NO2) as NO2	< 0.02 mg/L U	< 0.02 mg/L U	< 0.02 mg/L U	< 0.02 mg/L U	< 0.02 mg/L U
Orthophosphate, dissolved			< 0.01 mg/L U	< 0.01 mg/L U	< 0.01 mg/L U
Phosphorus	< 0.01 mg/L U	0.031 mg/L	0.028 mg/L	0.029 mg/L	0.039 mg/L
Potassium	< 2.0 mg/L U	< 2.0 mg/L U	< 2.0 mg/L U	< 2.0 mg/L U	< 2.0 mg/L U
Selenium	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U	< 2.0 µg/L U
Sodium	5.5 mg/L	5.6 mg/L	5.5 mg/L	5.5 mg/L	5.7 mg/L
Solids, Total Suspended (TSS)	< 5.0 mg/L U	10 mg/L	10 mg/L	13 mg/L	12 mg/L
Strontium	36 ug/L	38 ug/L	42 ug/L	43 ug/L	50 ug/L
Sulfur, sulfate (SO4) as SO4	16.8 mg/L	15.1 mg/L	8.6 mg/L	9 mg/L	< 5.0 mg/L U
Total Dissolved Solids	84 mg/L	78 mg/L	82 mg/L	84 mg/L	86 mg/L
Turbidity	8.08 NTU	20.3 NTU	10.7 NTU	12.8 NTU	19.6 NTU
Zinc	< 10.0 µg/L U	< 10.0 µg/L U	< 10.0 µg/L U	< 10.0 µg/L U	< 10.0 µg/L U

Southwest Ohio River Tributaries -- Lake Sampling -- Water Chemistry
2016

TURKEY CREEK LAKE, L-1

STORET ID: 204483

TOXINS

Parameter	5/24/2016		5/24/2016		7/12/2016		8/16/2016		9/13/2016	
	Surface		Bottom		Surface		Surface		Surface	
Cylindrospermopsin	< 0.05 µg/L	U	< 0.05 µg/L	U	< 0.05 µg/L	U	< 0.05 µg/L	U	< 0.05 µg/L	U
Microcystins	< 0.3 µg/L	U	< 0.3 µg/L	U	< 0.3 µg/L	U	< 0.3 µg/L	U	< 0.3 µg/L	U
Saxitoxin	< 0.022 µg/L	U			< 0.022 µg/L	U	< 0.022 µg/L	U	< 0.022 µg/L	U

Southwest Ohio River Tributaries -- Lake Sampling -- Sediments

2016

TURKEY CREEK LAKE, L-1

STORET ID: 204483

Pg. 1

Inorganics

Parameter	9/13/2016	Qualifier
% Solids	30.50%	
Aluminum	15500 mg/kg	
Arsenic	20.6 mg/kg	
Barium	160 mg/kg	
Cadmium	0.857 mg/kg	
Calcium	< 2190.0 mg/kg	U
Carbon, Total Organic (TOC)	2.50%	
Chromium	21.5 mg/kg	
Copper	16.7 mg/kg	
Iron	44300 mg/kg	
Lead	20 mg/kg	
Magnesium	2570 mg/kg	
Manganese	417 mg/kg	
Mercury	< 0.065 mg/kg	U
Nickel	33.7 mg/kg	
Potassium	< 2190.0 mg/kg	U
Selenium	< 2.19 mg/kg	U
Sodium	< 5460.0 mg/kg	U
Strontium	< 33.0 mg/kg	U
Zinc	161 mg/kg	B

Organics

Parameter	9/13/2016	Qualifier
% Solids	32.30%	
4-Chloro-3-methylphenol	< 6.17 mg/kg	U
Acenaphthene	< 1.23 mg/kg	U
Acenaphthylene	< 1.23 mg/kg	U
Acetophenone	< 1.23 mg/kg	U
Acetylaminofluorene, 2-	< 1.23 mg/kg	U
Aldrin	< 12.2 µg/kg	U
Aniline	< 1.23 mg/kg	U
Anthracene	< 1.23 mg/kg	U
BHC-alpha	< 12.2 µg/kg	U
BHC-beta	< 12.2 µg/kg	U
BHC-delta	< 12.2 µg/kg	U
BHC-gamma (Lindane)	< 12.2 µg/kg	U
Benzo[a]anthracene	< 1.23 mg/kg	U
Benzo[a]pyrene	< 1.23 mg/kg	U
Benzo[b]fluoranthene	< 1.23 mg/kg	U
Benzo[g,h,i]perylene	< 1.23 mg/kg	U
Benzo[k]fluoranthene	< 1.23 mg/kg	U
Benzyl alcohol	< 1.23 mg/kg	U
Bromophenyl-4 phenyl ether	< 1.23 mg/kg	U
Butyl benzyl phthalate	< 1.23 mg/kg	U
Chloronaphthalene-2	< 1.23 mg/kg	U
Chlorophenol-2	< 1.23 mg/kg	U
Chlorophenyl-4 phenyl ether	< 1.23 mg/kg	U
Chrysene	< 1.23 mg/kg	U
Cresol, o-	< 1.23 mg/kg	U
Cresol, p-	< 6.17 mg/kg	U
DDD	< 12.2 µg/kg	U
DDE	< 12.2 µg/kg	U
DDT	< 12.2 µg/kg	U
DNBP, 4,6-Dinitro-2-sec-butylphenol	< 1.23 mg/kg	U
Dibenzof[a,h]anthracene	< 1.23 mg/kg	U
Dibenzofuran	< 1.23 mg/kg	U
Dibutyl phthalate	< 1.23 mg/kg	U
Dichlorobenzene, 1,2-	< 1.23 mg/kg	U
Dichlorobenzene, 1,3-	< 1.23 mg/kg	U
Dichlorobenzene, 1,4-	< 1.23 mg/kg	U
Dichlorobenzidine, 3,3'-	< 6.2 mg/kg	U
Dichlorophenol, 2,4-	< 1.23 mg/kg	U
Dichlorophenol, 2,6-	< 1.23 mg/kg	U
Dieldrin	< 12.2 µg/kg	U
Diethyl phthalate	< 1.23 mg/kg	U
Dimethyl phthalate	< 1.23 mg/kg	U
Dimethylaminoazobenzene, 4-	< 1.23 mg/kg	U
Dimethylbenz(a)anthracene, 7,12-	< 1.2 mg/kg	U
Dimethylphenol, 2,4-	< 1.23 mg/kg	U
Dinitro-o-cresol	< 6.17 mg/kg	U
Dinitrobenzene, m-	< 1.23 mg/kg	U

Southwest Ohio River Tributaries -- Lake Sampling -- Sediments

TURKEY CREEK LAKE, L-1

STORET ID: 204483 Pg. 2

Organics (cont.)

Parameter	9/13/2016	Qualifier
Dinitrophenol, 2,4-	< 6.2 mg/kg	U
Dinitrotoluene, 2,4-	< 1.23 mg/kg	U
Dinitrotoluene, 2,6-	< 1.23 mg/kg	U
Diphenylamine	< 1.23 mg/kg	U
Endosulfan sulfate	< 12.2 µg/kg	U
Endosulfan, alpha-	< 12.2 µg/kg	U
Endosulfan, beta-	< 12.2 µg/kg	U
Endrin	< 12.2 µg/kg	U
Endrin aldehyde	< 12.2 µg/kg	U
Ethyl methanesulfonate	< 1.23 mg/kg	U
Fluoranthene	< 1.23 mg/kg	U
Fluorene	< 1.23 mg/kg	U
Heptachlor	< 12.2 µg/kg	U
Heptachlor epoxide	< 12.2 µg/kg	U
Hexachlorobenzene	< 12.2 µg/kg	U
Hexachlorobenzene	< 1.23 mg/kg	U
Hexachlorobutadiene	< 1.23 mg/kg	U
Hexachlorocyclopentadiene	< 1.23 mg/kg	U
Hexachloroethane	< 1.23 mg/kg	U
Hexachloropropene	< 1.23 mg/kg	U
Indeno[1,2,3-cd]pyrene	< 1.23 mg/kg	U
Isophorone	< 1.23 mg/kg	U
Methoxychlor	< 12.2 µg/kg	U
Methyl methanesulfonate	< 1.23 mg/kg	U
Methylcholanthrene, 3-	< 1.23 mg/kg	U
Methylnaphthalene, 2-	< 1.23 mg/kg	U
Mirex	< 12.2 µg/kg	U
Naphthalene	< 1.23 mg/kg	U
Naphthalenedione, 1,4-	< 1.23 mg/kg	U
Nitro-benzene	< 1.23 mg/kg	U
Nitroaniline, 2-	< 1.23 mg/kg	U
Nitroaniline, 4-	< 1.23 mg/kg	U
Nitrophenol, 2-	< 1.23 mg/kg	U
Nitrophenol, 4-	< 6.2 mg/kg	U
Nitrosodibutylamine, n-	< 1.23 mg/kg	U
Nitrosodipropylamine, n-	< 1.23 mg/kg	U
Nitrosomorpholine, n-	< 1.23 mg/kg	U
Nitrosopiperidine, n-	< 1.23 mg/kg	U
Nitrosopyrrolidine, n-	< 1.23 mg/kg	U
PCB-Aroclor 1016	< 61.2 µg/kg	U
PCB-Aroclor 1221	< 61.2 µg/kg	U
PCB-Aroclor 1232	< 61.2 µg/kg	U
PCB-Aroclor 1242	< 61.2 µg/kg	U
PCB-Aroclor 1248	< 61.2 µg/kg	U
PCB-Aroclor 1254	< 61.2 µg/kg	U
PCB-Aroclor 1260	< 61.2 µg/kg	U
Pentachlorobenzene	< 1.23 mg/kg	U
Pentachlorophenol (PCP)	< 6.17 mg/kg	U

Organics (cont.)

Parameter	9/13/2016	Qualifier
Phenacetin	< 1.23 mg/kg	U
Phenanthrene	< 1.23 mg/kg	U
Phenol	< 1.23 mg/kg	U
Picoline, 2-	< 1.23 mg/kg	U
Pronamide	< 1.23 mg/kg	U
Pyrene	< 1.23 mg/kg	U
Safrole	< 1.23 mg/kg	U
Tetrachlorobenzene, 1,2,4,5-	< 1.23 mg/kg	U
Tetrachlorophenol, 2,3,4,6-	< 1.23 mg/kg	U
Trichlorobenzene, 1,2,4-	< 1.23 mg/kg	U
Trichlorophenol, 2,4,5-	< 1.23 mg/kg	U
Trichlorophenol, 2,4,6- (TCPH)	< 1.23 mg/kg	U
bis(2-Chloroisopropyl) ether	< 1.23 mg/kg	U
bis(2-chloroethoxy) methane	< 1.23 mg/kg	U
bis(2-chloroethyl) ether	< 1.23 mg/kg	U
bis(2-ethylhexyl) phthalate (DEHP)	< 1.23 mg/kg	U
bis(n-octyl) phthalate	< 1.23 mg/kg	U