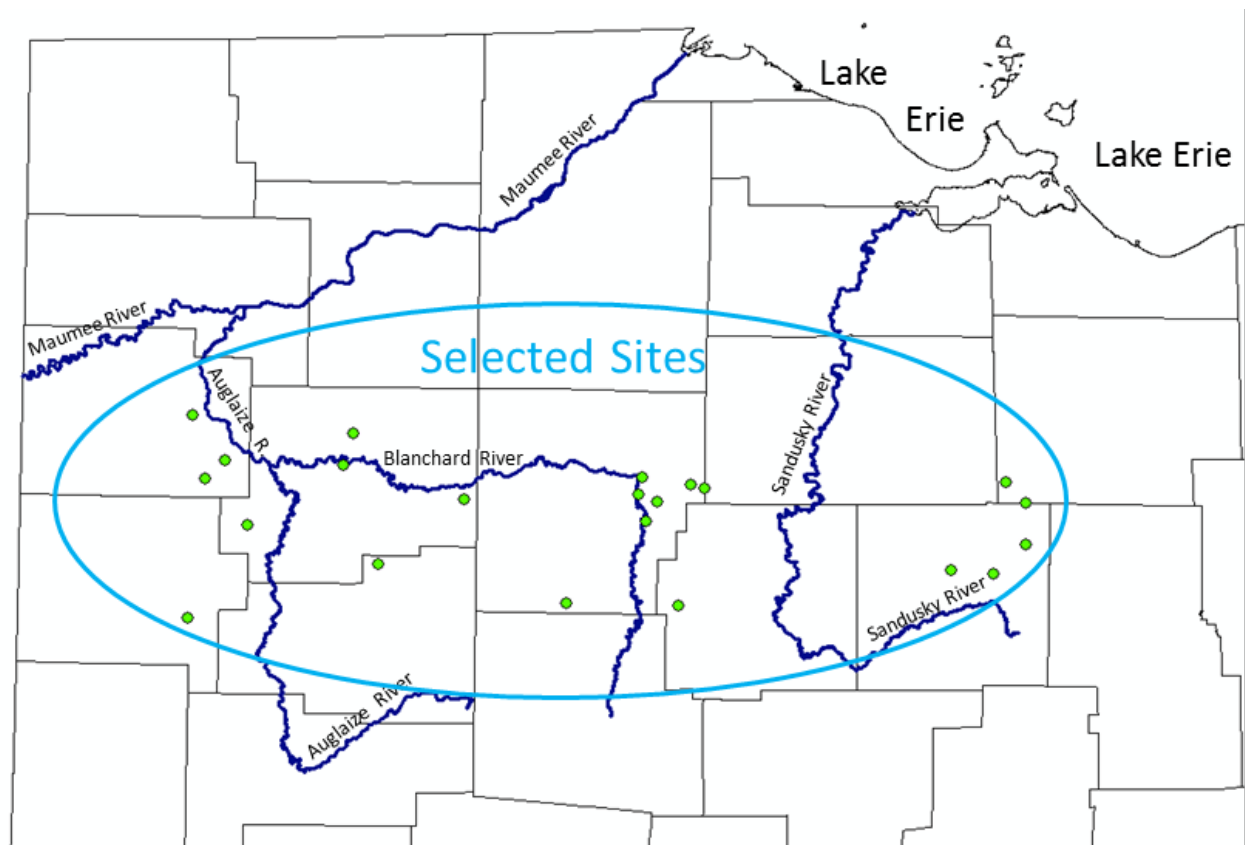


**Quality Assurance Project Plan (QAPP) for
the Biological and Habitat Study
of
Selected Northwest Ohio Streams
2017**



Quality Assurance Project Plan (QAPP) for the
Biological and Habitat Study
of
Selected Northwest Ohio Streams
2017

Allen, Crawford, Hancock, Paulding, Putnam, and Wyandot Counties

August 2017

Prepared by
State of Ohio Environmental Protection Agency

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SECTION A – PROJECT MANAGEMENT

A1 - Quality Assurance Project Plan for the Biological and Water Quality Study of Selected Northwest Ohio Streams

Brian Hall Date: 9/1/17

Chief or Assistant Chief

Jeff DeShon Date: 8/24/17
Jeff DeShon, EAS Manager

Ben Rich Date: 8/24/17
Ben Rich, Fish Biologist

Mike Bolton Date: 9/1/2017
Mike Bolton, Macroinvertebrate Biologist

Daniel J. Glomski Date: 8/23/17
Dan Glomski, NWDO Supervisor

Jeffrey W. Reynolds Date: 8/23/17
Jeff Reynolds, DSW Quality Assurance Coordinator

Dan Dudley Date: 8/29/17
Dan Dudley, STS Manager

Chris Skalski Date: 8/24/17

Chris Skalski, Project Leader

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A3 - Distribution List

A3.1 - Table 1. Ohio EPA Staff

Name/Title	Contact E-mail/Phone	
Chief or Assistant Chief		614-644-2001
Jeff Deshon, EAS Manager	jeffrey.deshon@epa.ohio.gov	614-836-8780
Angela Dripps, EAS Supervisor	angela.dripps@epa.ohio.gov	614-836-8798
Ben Rich, Fish Biologist	ben.rich@epa.ohio.gov	614-836-8772
Mike Bolton, Macroinvertebrate Biologist	michael.bolton@epa.ohio.gov	614-836-8781
Sarah Macy, Macroinvertebrate Biologist	Sarah.macy@epa.ohio.gov	614-836-8813
Dan Glomski, NWDO Supervisor	dan.glomski@epa.ohio.gov	419-373-3023
Jeff Reynolds, Quality Assurance Coordinator	jeffery.reynolds@epa.ohio.gov	614-705-1011
Dan Dudley, STS Manager	dan.dudley@epa.ohio.gov	614-644-2876
Chris Skalski, Water Quality Standards	chris.skalski@epa.ohio.gov	614-644-2144

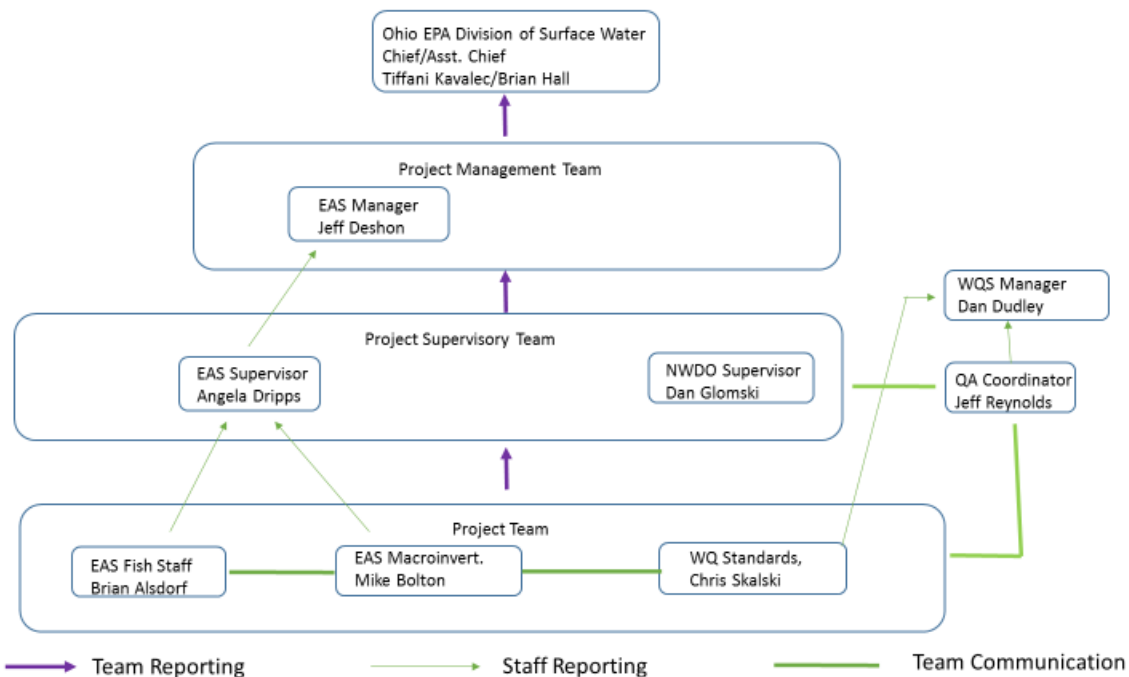
A4 – Project/Task Organization and Communication

A4.1 - Table 4. Roles & Responsibilities

Individual(s) Assigned:	Responsible for:	Authorized to:
Chief or Asst. Chief	Allocate resources, project implementation, resolve disputes.	Resolve disputes, suggest changes and edits, approve needed resources, approve overall project and QAPP
Jeff DeShon , EAS Manager Angela Dripps , EAS Supervisor	Staff assignment, signatures, payments, and reporting. Confirm intermediate and final milestones completed in a timely manner.	Review documents and reports; suggest changes and edits; obtain approvals and signatures.
Dan Dudley , WQS Manager Jeff Reynolds Quality Assurance Coordinator	QA/QC input to document development. Prepare documents and reports. Follow-up on deliverable delays and their manager for ALU information.	Review documents and reports. Review documents and reports; suggest changes and edits.
STUDY TEAM		
Chris Skalski , Project Leader	Will ensure QAPP revisions &	Prepare UAA recommendations

Individual(s) Assigned:	Responsible for:	Authorized to:
Water Quality Standards	distribution	
Ben Rich , Fish Biologist Mike Bolton , Macroinvertebrate Biologist	Scheduling and coordination of field activities. Complete field activities and quality control; field sampling and analysis, data collection, review, analysis, verification, database population and transmission. Assist with project planning.	Prepare documents and reports. Arrange for external training. Schedule field activities.

A4.2 - Figure 1: Organizational and Communication Chart



A5 – Problem Definition/Background

A5.1 Aquatic Life Use Designations

The Agency has identified the need to re-sample fifteen (15) streams in northwest Ohio to make a final determination as to the appropriate aquatic life use (ALU) designation. These streams were sampled during previous watershed surveys and initial ALU recommendations were made. However, for a variety of reasons, it was determined that previously collected data and the recommended ALU should be tabled until additional information could be collected. This study will provide the necessary data.

A5.1 - Table 5. List of selected streams in northwest Ohio.

Stream (River Code)	County
Little Auglaize River (04-130-000)	Paulding, Putnam, Van Wert
Middle Creek (04-139-000)	Paulding
Blue Creek (04-120-000)	Paulding
Bear Creek (04-162-000)	Putnam
The Outlet (lower) (Blanchard River RM 63.63) (04-192-000)	Hancock
Hydraulic Ditch (04-189-000)	Hancock
Brights Ditch (04-193-000)	Hancock
Rickenbach Ditch (04-196-003)	Wyandot
Cartwright Run (04-180-000)	Putnam
Miller City Cutoff (04-163-001)	Putnam
Buckrun Creek (04-160-008)	Hancock
Broken Sword Creek – headwaters to Eaton Road (RM 21.4) (05-035-000)	Crawford
Celery Creek (05-200-003)	Crawford, Huron
Tiro Creek (05-200-004)	Crawford
Unnamed trib. @ Sycamore Cr RM 0.85 (04-202-001)	Allen

A5.2 Petition Ditches and PL 566 Flood Control Project

The streams in this study predominately drain row crop agricultural land. They have been modified to some degree to accommodate field tile drainage and the rapid removal of water following rainfall events. The largest stream within this study area, the Little Auglaize River, was channelized in the 1960s under PL 83-566 (The Watershed Protection and Flood Prevention Act Flood Control). Information will be needed from local officials (County Engineers & SWCD offices) concerning any ongoing publicly funded drainage and flood control work to properly determine if ALUs short of the CWA 101(a) “fishable goal” are appropriate. A list of initial contacts in each county has been prepared.

A5.1 - Table 6. List of initial local contacts for drainage and flood control work.

County	Contact Information *
Paulding	Ryan Mapes, Ditch Maintenance Super., ryan.mapes@pauldingswcd.org , (419) 398-4771
Van Wert	(no drainage specialist listed) www.vanwertswcd.org , (419) 238-9591
Wyandot	Jeff Hohman, Ditch Maint. Super., jeff.hohman@oh.nacdnet.net , (419) 294-2312
Putnam	(no drainage specialist listed) www.putnamcountyohio.gov , (419) 523-5159
Hancock	(no drainage specialist listed) www.hHancockswcd.com , (419) 422-6569
Huron	Aaron Robinson, ditch maintenance, aaron.m.robinson@oh.nacdnet.net , (419) 668-4113 ext. 3
Crawford	(no drainage specialist listed) www.crawfordswcd.org , (419) 562-8280
Allen	Dan Ellerbrock, drainage specialist, dan@allenswcd.com , (419) 223-0040

* contacts from http://www.agri.ohio.gov/public_docs/forms/SWC/2017Roster.pdf

A6 – Project/Task Description

To resolve previously identified questions about the appropriate ALU designations for the 15 streams listed in section A5, biological sampling will be conducted at the sites identified in Table 7 (and depicted on page 1). Site selection is designed to fill any data gaps in assigning use designations.

A total of 22 sampling stations are allocated to this effort and will provide for the assessment of 15 streams. Ambient biology and macrohabitat quality (QHEI) will be collected concurrently at these sites. Field measurements of water temperature, pH, conductivity and dissolved oxygen will be taken. No other water chemistry data or fish tissue samples are required to fulfill the objectives of this survey. Scheduling of field work is done by the crew leaders and must account for usual weather events and atypical stream flow conditions. The crew leaders should plan and schedule work considering the best time(s) when favorable stream flows will likely be present in small and larger watersheds.

A6 - Table 7. List of sampling locations.

<i>STATION</i>	<i>NAME</i>	<i>RM</i>	<i>Area (mi²)</i>	<i>HUC12</i>	<i>USGS Quad</i>	<i>LAT.</i>
Little Auglaize River (04-130-000)						
P02K02	Wren-Landeck Road	42.66	54.0	04100007-06-03	Van Wert	40.801
P02S03	County Road P	22.51	96.0	04100007-06-04	Putnam	40.947
P02S01	County Road 60	8.72	184.0	04100007-08-06	Paulding	41.049
Middle Creek (04-139-000)						
303869	State Route 114	6.12	97.0	04100007-08-05	Paulding	41.019
Blue Creek (04-120-000)						
P06S02	County Road 151	3.43	104.0	04100007-10-04	Paulding	41.118
303870	Township Road 108	4.73	88.2	04100007-10-04	Paulding	41.107
Bear Creek (04-162-000)						
303859	County Road 15	0.85	12.0	04100008-06-04	Putnam	41.044
Miller City Cutoff (04-163-001)						
P05K79	State Route 613	0.37	12.5	04100010-07-06	Putnam	41.0935
Cartwright Run (04-180-000)						
P05K59	Putnam County Road M	0.02	5.0	04100008-05-04	Putnam	40.993
Brights Ditch (04-193-000)						
P05K34	Hancock County Road 252	2.4	10.3	04100008-02-01	Hancock	40.993
P05K13	Marion Township Road 244	0.34	28.4	04100008-02-01	Hancock	41.005
Buckrun Creek (04-160-008)						
303860	Amanda Township Road 190	0.86	10.5	04100008-02-03	Hancock	40.963

<i>STATION</i>	<i>NAME</i>	<i>RM</i>	<i>Area (mi²)</i>	<i>HUC12</i>	<i>USGS Quad</i>	<i>LAT.</i>
Rickenbach Ditch (04-196-003)						
P05K29	U.S. Route 30	1.18	3.3	04100008-01-04	Wyandot	40.833
Hydraulic Ditch (04-189-000)						
P05K43	U.S. Route 30	1.5	7.6	04100008-03-01	Hancock	40.834
The Outlet (Lower) (Blanchard River RM 63.63) (04-192-000)						
P05K36	Hancock/Seneca County Line Road	7.68	7.1	04100008-02-02	Hancock	41.015
P05K37	Hancock County Road 237	6.05	20.2	04100008-02-02	Hancock	41.021
P05K39	State Route 568	0.5	37.8	04100008-02-02	Hancock	41.032
Unnamed tributary at Sycamore Creek RM 0.85 (04-202-001)						
301008	Searfoss Road (Morris Road)	0.26	5.6	04100007-05-02	Allen	40.890
Tiro Creek (05-200-004)						
303861	Sawyer Road	0.12	2.1	04100011-08-02	Crawford	40.931
Celery Creek (05-200-003)						
201399	Huron-Crawford County Line Road	4.56	6.1	04100011-08-02	Huron	40.996
303862	Weis Road	0.45	13.4	04100011-08-02	Huron	41.029
Brokensword Creek (05-035-000) – headwaters to Eaton Road (RM 21.4)						
U02G09	State Route 98	29.52	10.9	04100011-03-01	Crawford	40.888
U02G07	Schwemley Road	25.48	32.6	04100011-03-01	Crawford	40.89

* RM listed is from the RMI topographical map; EA3 lists station at RM 5.6

F-single pass fish sampling

MQ-macroinvertebrate quantitative sampling

F2-two pass fish sampling

Mq-macroinvertebrate qualitative sampling

Q – physical habitat assessment

FM-field measurements

A7 – Quality Objectives and Criteria

- 1) Gather ambient environmental information (biological and physical habitat) from selected streams to assess aquatic life use attainment and to recommend an appropriate use (using procedures described in the Biocriteria for Aquatic Life User's Manual and OAC 3745-1-07), if needed;
- 2) Document any changes in the biological and physical conditions of the study areas where historical information exists, thus expanding the Ohio EPA data base for statewide trends analysis (e.g., 305[b]).

Pursuant to Ohio's Credible Data Law (ORC 6111.51 - .52) level 3 data is required to meet objective 1. The methods to be used and the locations sampled in this study represent level 3 credible data quality. The reporting of trend data requires either level 3 or level 2 credible data. Therefore, both quality objectives will be met through the successful execution of this monitoring plan.

A8 – Special Training/Certification

DSW has developed an Access database to document initial trainings and refreshers. All staff involved in collecting any type of environmental sample must complete training associated with that sampling method. The first line supervisors shall ensure staff have the necessary safety and skill set training (initial and refresher training) prior to sampling. Annual chemical sampling refresher training covers a rotating sequence of difference methods, instruments, and other issues pertinent to field sampling. Biological trainings and Quality Assurance refresher activities are described in the Biological Criteria Manual Volume 3 Ohio EPA 2015b). Training for biological and habitat sampling is logged in the division's TrainTrack Access database. Initial trainings and refreshers follow from the descriptions in the biocriteria manuals.

A9 – Documents and Records

The final Quality Assurance Project Plan (QAPP) will be provided to the appropriate project personnel by email as detailed in the distribution list. As the plan is updated, each person on the distribution list will be sent an email with the most current document. The most current date of revision will be included in the document name and in the header of the document.

The QHEI habitat form (EPA 4520), fish data sheet (EPA 4508), and macroinvertebrate field sheet will be maintained in their original form (in paper files at EAS) and information from those forms will be included in the Agency's Ecological Assessment and Analysis Application (EA³) database. The EA³ database is backed up on a secure server.

Field measurements taken with a YSI® multiprobe will be recorded electronically and uploaded after DES checks in the samples. If a YSI® meter is used that does not have datalogging capabilities, a field sheet will be completed and the data will be input manually into the database for storage and dissemination (any field sheets will be maintained in paper files at NWDO?). The data will be placed directly into Agency databases that have secure backup and ease of retrieval.

The format for all data recording will be consistent with the requirements and procedures used for data validation and assessment described in this QAPP. Files generated according to applicable and attached standard operating procedures (such as raw data, results of QC checks, problems encountered, etc.) will be documented and reported to the study team.

A9.1 - Document/record control

The recording media for the project will use a combination of paper and electronic means to document site conditions. Data gathered using paper will be recorded using indelible ink, and changes to such data records will be made by drawing a single line through the error with an initial by the responsible person. Similar methods will be used for electronic data recording.

The Study Team Leader shall retain the most recent version of the QAPP and be responsible for distribution of the current version of the QAPP to the project team. Agency management and the QA will approve updates to the QAPP, as needed. The QA Coordinator shall retain copies of all management reports, memoranda, and all correspondence between team members identified in Section A (these documents will be stored in the STS/Quality/QAPPs folder on the M drive).

A9.2 - Document storage

The Quality Assurance Coordinator will maintain a central project file, which will act as a repository for all data collected or generated as part of this project. The project file will include both electronic data (e.g., the QAPP and development or revision emails) and any hard copies and will be stored at the Ohio EPA office. Biological and habitat data will be stored in the Ecological Assessment and Analysis Application (EA³) database. Field sheets and notes will be maintained in paper files at EAS. All files will be retained by Ohio EPA indefinitely (for a minimum of 10 years).

SECTION B – DATA GENERATION AND ACQUISITION

B1 – Sampling Process Design

This study is intended to fill the data gaps identified during the second wave of use designations that resulted in the deferral of assigning/reassigning ALUs pending the collection of additional data. In most cases, the sites are existing stations in EA³. Data collection will be performed using standards methods and frequencies as described in the biocriteria manuals. The assessment will be conducted during the 2017 field sampling season.

B2 – Sampling Methods

All biological, data processing, and data analysis methods and procedures adhere to those specified in the Biological Criteria for the Protection of Aquatic Life, Volumes II - III (Ohio EPA 1987, 1989a, 2015b), 2015 Updates to the Biological Criteria for the Protection of Aquatic Life, Volume II (Ohio EPA 2015a), and The Qualitative Habitat Evaluation Index (QHEI); Rationale, Methods, and Application (Ohio EPA 1989b, 2006) for habitat assessment.

B2.1 - Stream Habitat Evaluation

Physical habitat is evaluated using the Qualitative Habitat Evaluation Index (QHEI) developed by the Ohio EPA for streams and rivers in Ohio (Ohio EPA 1989b). Various attributes of the available habitat are scored based on their overall importance to the establishment of viable, diverse aquatic faunas. Evaluations of type and quality of substrate, amount of in-stream cover, channel morphology, extent of riparian canopy, pool and riffle development and quality, and stream gradient are among the metrics used to evaluate the characteristics of a stream segment, not just the characteristics of a single sampling site. Site habitat and riparian areas will be photographed.

B2.2 - Biological Community Assessment

Macroinvertebrates will be collected from artificial substrates and from the natural habitats. Quantitative sampling will be conducted at reference sites and at sites with drainage areas more than 20 mi². Qualitative sampling will be conducted at all sites but will be the primary collection method for headwater sites with drainages smaller than 20 mi². The artificial substrate collection provides quantitative data and consists of a composite sample of five modified Hester-Dendy (HD) multiple-plate samplers colonized for six weeks. At the time of the artificial substrate collection and at sites where only qualitative data collection procedures are being used, a qualitative multihabitat composite sample is collected. This sampling effort consists 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, and margin). Fish will be sampled at each sampling location with pulsed DC current. Two passes will be conducted at sites larger than 20 mi² and at reference sites. Detailed biological sampling protocols are documented in the Ohio EPA manual Biological Criteria for the Protection of Aquatic Life, Volume III (OEPA 2015b).

B.2.3 Field Parameters

Field parameters will be recorded (but no chemical samples will be collected for lab analysis) by NWDO personnel to confirm water quality is generally consistent with previous sampling efforts at the sites in question.

B3 – Sample Handling and Custody

Fish collected with electrofishing procedures are initially roughly sorted into appropriately sized containers upon capture. At the end of the electrofishing sampling run, the collected fish are identified, counted, and tallied on the fish data sheet. For larger streams, individual (large fish) or bulk (small fish) weights are also taken per the Biocriteria Volume III field manual procedures. As the sample is processed in the field, most fish are returned live to the waterbody except for a few specimens which may be vouchered in a 10% formalin solution and returned to the laboratory if uncertain or difficult field identifications so warrant. After processing of the electrofishing sample, the QHEI form is completed to assess habitat conditions in the electrofishing zone just completed.

Artificial substrates collected for quantitative macroinvertebrate sample analysis are set and retrieved from the waterbody per the Biocriteria Volume III field manual procedures. Upon retrieval, artificial substrates are placed in appropriately sized containers, preserved with a 10% formalin solution, and returned to the laboratory for subsequent processing and analysis. Macroinvertebrate specimens collected using qualitative sampling procedures outlined in the Biocriteria Volume III field manual are composited in a 4-ounce sampling jar, preserved with a 70% ethanol solution, and returned to the laboratory for subsequent analysis. At the time of collection of the artificial substrates and/or qualitative sample, the macroinvertebrate field sheet is completed to document site conditions, sample retrieval issues, and field observations of diversity and abundance of organisms collected. Macroinvertebrate samples are stored indefinitely at the lab.

B4 – Analytical Methods

Field meters will be used to collect water quality data (pH, Conductivity, Dissolved Oxygen (mg/l and % saturation), and Temperature) on the day(s) biological samples are collected. No other chemical water quality analyses will be performed as part of this study. Macroinvertebrate samples will be analyzed at the lab using the method described in the previously cited biocriteria manual. Sample labels are also described in that guidance.

B5 – Quality Control

Quality control measures for fish and macroinvertebrate sampling are described in the referenced biocriteria manuals.

B6 – Instrument/Equipment Testing and Calibration, Inspection, and Maintenance

The team leaders have several years of experience operating and maintaining most of the equipment to be used during this project. The team leaders will inspect the equipment prior to and during the sampling. The team leaders will ensure that all equipment remains in functional working condition.

The YSI® multiprobes will be calibrated in accordance with standard protocol prior to each day that the equipment is to be used. A standard provided by DES will be used to calibrate conductivity and pH. The oxygen sensor will be calibrated in ambient air. A log book is maintained for each multiprobe. This log book contains the date of each calibration and standardized pertinent information proving that the device is within specifications. If any of the multiprobe sonde parameters does not conform to the specifications provided in the standard protocol, the sonde will be repaired or another unit will be used until the sonde is repaired or replaced. The calibration readings as well as the all repairs are recorded in the log book. Any needed corrective measures and their resolutions will be included in instrument logs. Instrument log records will be maintained at field offices.

Other equipment used will follow specifications provided in the biological and habitat methods cited.

B7 – Inspection/Acceptance of Supplies and Consumables

Supplies and consumables will be inspected upon receipt by the field sampling teams. Nearly all the supplies utilized for this project are maintained and used during the normal business operations of the Ohio EPA. The field team leaders will be responsible to ensure that all sample containers and all needed supplies and consumables are available in advance of all field work. It will be their responsibility to maintain and replenish stock. Consumable supplies include sample

containers, ethanol and formalin preservatives, and miscellaneous field supplies such as distilled water, sampling gear disinfectant, disposable gloves, paper towels, and paper field forms. Field personnel will confirm that all reagents are within applicable shelf life.

B8 – Data Management

B8.1 – EA³

Knowledge of the Division of Surface Water (DSW) biological data sheets and Ecological Assessment and Analysis Application (EA³) program is needed to manage data. The station ID numbers that are assigned to each sampling location are created using EA³. Project names are also created in EA³ so stations can be grouped together to facilitate data assessment.

The sites listed in this study plan table are coded with EA³ Station IDs that link data across several tables. They must be included on all field, lab and sample sheets and reported with all data results. If for some reason a location other than the one listed in the study plan is sampled, and that location is a trivial distance away from the one listed in the table and is fully representative of the EA³ Station, use the river mile listed in the study plan, and simply record the location information separately. An exact river mile can be assigned later to an Absolute Location Point (ALP) if warranted. If the location is not representative of the site listed on the study plan due to distance or a confounding factor, it should probably not be sampled, but if it is, it should be separated as a new station. It is also imperative that, if a new station is sampled, the study plan coordinator be notified so that this information can be distributed to all the study team.

B8.2 - YSI® Pro Series Units

The YSI® Pro Series units have an internal file storage system. A site list based on Station ID # is first created using YSI® Pro Series Data Manager V1.1.8 software installed on a desktop PC. The field meter is then connected to the PC via a USB port so the site list can be uploaded to the meter. Data is saved in the field by selecting the correct Station from the menu. After sampling is completed the files are downloaded to the Data Manager software. They are then exported as an Excel file and, upon completion of the survey, are provided to the project manager who designates a network folder for retaining the data.

B8.3- Fish and QHEI Data Sheets

The original fish, macroinvertebrate, and QHEI field and data sheets will be archived at the Groveport Field Office. Data from the field and data sheets are manually entered into EA³ using the appropriate data entry screen. The sheets are double entered to eliminate mistakes.

SECTION C: ASSESSMENT AND OVERSIGHT

C1 – During Sampling Assessments/Analysis and Response Actions

C1.1 – Assessments

Periodic assessment of field sites, field equipment, and laboratory equipment is necessary to ensure that sampling goes smoothly and data obtained meets project needs. This is an ongoing process that continues every day on which the project is implemented as well as larger scale assessments that take place less frequently (*e.g.*, annually). The assessments generally will focus on readiness and consistency of implementation but also are looking for continual improvement opportunities.

Daily assessments (for each day of project activities, as applicable) will include assessment of field equipment and supplies, laboratory equipment and supplies, completeness of the day's samples and associated field notes, future needs, etc.

C1.2 - Response Actions

Despite best preparations staff performing assessments may find situations requiring corrective actions (CAs). Small day-to-day level assessment findings are often addressed by the individual doing the assessment in the field or in the lab and are common enough to the process, so as not to necessitate a formal response.

C1.3 - Reporting and Resolution of Issues

Any audits or other assessments that reveal findings of practice or procedure that do not conform to the written QAPP will be corrected as soon as possible. The Study Team and QA Coordinator will be notified regarding deviations.

C1.4 - Data Completeness

Success of the project and the resulting assignment of recommended ALUs will require collection of all listed data at all, or nearly all, of the listed locations. Potential data gaps will be monitored as the project progresses and the project schedule will be revised to fill these gaps where they are determined to be significant or to potentially impact the fulfillment of project objectives. Fortunately, in this study we have previous data they may suffice to fill data gaps if some data is missing from this survey. The assigned biological crew leaders should contact Chris Skalski if weather or other circumstances arise that place completion of the planned work in jeopardy. Changes that substantially alter the sampling detailed in the QAPP should be emailed to the project team and potentially result in a QAPP revision (that will be distributed to those on the list).

C2 – Reports to Management

Biweekly or monthly oral progress reports are to be provided to management on the survey/study and what steps are being taken to resolve any issues or problems. This may include access problems early on that lead to changes of sites and weather or resource problems during sampling. After the samples have been evaluated, the team leader and project biologist will have a meeting to evaluate the use recommendations. They will also generate a written report that will document the project conclusions and accompany the ensuing rulemaking process.

C2.1 – Use Attainment

Attainment/non-attainment of aquatic life uses will be determined) by using biological criteria codified in Ohio Administrative Code (OAC) 3745-1-07, Table 7-17 (assessed with Volume II of the Biological Criteria for the Protection of Aquatic Life, <http://epa.ohio.gov/dsw/bioassess/BioCriteriaProtAqLife.aspx>). Numerical biological criteria are based on multimetric biological indices including the Index of Biotic Integrity (IBI) and modified Index of Well-Being (MIwb), indices measuring the response of the fish community, and the Invertebrate Community Index (ICI), which indicates the response of the macroinvertebrate community. Macroinvertebrate data collected from sites where only qualitative protocols are used to collect samples will be assessed with various attributes of the macroinvertebrate community including, but not limited to, total, EPT, and sensitive taxa diversity. A narrative assessment of the data will be coupled with the fish assessment to confirm or recommend an appropriate aquatic life use.

Performance expectations for the basic aquatic life uses (Warmwater Habitat [WWH], Exceptional Warmwater Habitat [EWH], and Modified Warmwater Habitat [MWH] were developed using the regional reference site approach (Hughes et al. 1986; Omernik 1987). This fits the practical definition of biological integrity as the biological performance of the natural habitats within a region (Karr and Dudley 1981). Attainment of an aquatic life use is FULL if all three indices (or those available) meet the applicable criteria, PARTIAL if at least one of the indices did not attain and performance did not fall below the fair category, and NON if all indices either fail to attain or any index indicates poor or very poor performance.

C2.2 – Stream Habitat Evaluation

Complete and accurate stream habitat assessment data along with the survey's biological findings are essential to achieving the data quality objectives identified in A7. It is the tool that allows the biologist to support conclusions about the aquatic life potential in segments of streams degraded because of chemical pollution, thermal stresses or other stressors. Use designation recommendations are not made on QHEI data alone; there must be biological data available too. Various attributes of the available habitat are scored based on their overall importance to the establishment of viable, diverse aquatic faunas. Evaluations of type and quality of substrate, amount of in-stream cover, channel morphology, extent of riparian canopy, pool and riffle development and quality, and stream gradient are among the metrics used to evaluate the characteristics of a stream segment, not just the characteristics of a single sampling site. As such, individual sites may have much 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 higher than 60 were generally conducive to the establishment of warmwater faunas while those which scored more than 75-80 often typify habitat conditions which can support exceptional faunas.

SECTION D: DATA VALIDATION AND USABILITY

D1 – Data Review, Verification, and Validation

All fish, macroinvertebrate, and habitat data, field, and laboratory sheets are hand-entered into the EA³ database using a double data entry method. This helps ensure issues due to data entry errors are minimized. Final approval of data involves a reconciliation between the paper forms and the electronic data which is completed by the data collector or a database administrator in the Ecological Assessment Section (EAS). Upon approval in EA³, field and laboratory data cannot be revised without intervention from database administrators in the Agency's Office of Information Technology Services.

D2 – Verification and Validation Methods

Biological and habitat field sampling results will be verified and validated based on field staff experience and qualifications, and adherence to training and QA/QC procedures for current and new field staff available in Subsection 1, Part A (macroinvertebrates) and Subsection 2, Part A (Fish and Habitat) in Biological Criteria for the Protection of Aquatic Life: Volume III. Standardized Biological Field Sampling and Laboratory Methods for Assessing Fish and Macroinvertebrate Communities (June 2015, available at: <http://epa.ohio.gov/dsw/bioassess/BioCriteriaProtAqLife.aspx>).

D3 – Reconciliation with User Requirements

Issues related to biological and habitat data uncertainty, including any patterns of analytical or field QC uncertainties, will be assessed by field staff and their management. For most situations, issues can be addressed with acknowledgement of factors captured in the sample metadata which can confirm, explain, and document the data quality concern. Significant, persistent, or unresolved issues will be brought to the attention of the project Study Team, division QC personnel, and EAS and/or DSW management for further evaluation. This combination of personnel will assess how to best label affected data for storage in the EA³ database and how to eliminate or limit any similar problems going forward. Consideration will also be given on how best to memorialize data limitations or anomalies as the data is transferred to other databases, including STORET, so that future users of the sampling data are aware of any data quality issues or limitations.

APPENDICES

Appendix 1 – Table 8. Summary of Sampling Effort

Type of Sample	# Sites	# Passes	Total #
<i>Biological Communities</i>			
Fish (Wading) (F2)	9	2	18
Fish (Headwater) (F1)	13	1	13
Macroinvertebrate (HD) (MQ)	9	1	9
Macroinvertebrate (Qualitative) (Mq)	13	1	13
<i>Physical Habitat</i>			
QHEI (Q)	22	1	22
<i>Water Chemistry</i>			
Field Measurements (FM)	22	3	66

F-single pass fish sampling

MQ-macroinvertebrate quantitative sampling

F2-two pass fish sampling

Mq- macroinvertebrate qualitative sampling

Q – physical habitat assessment

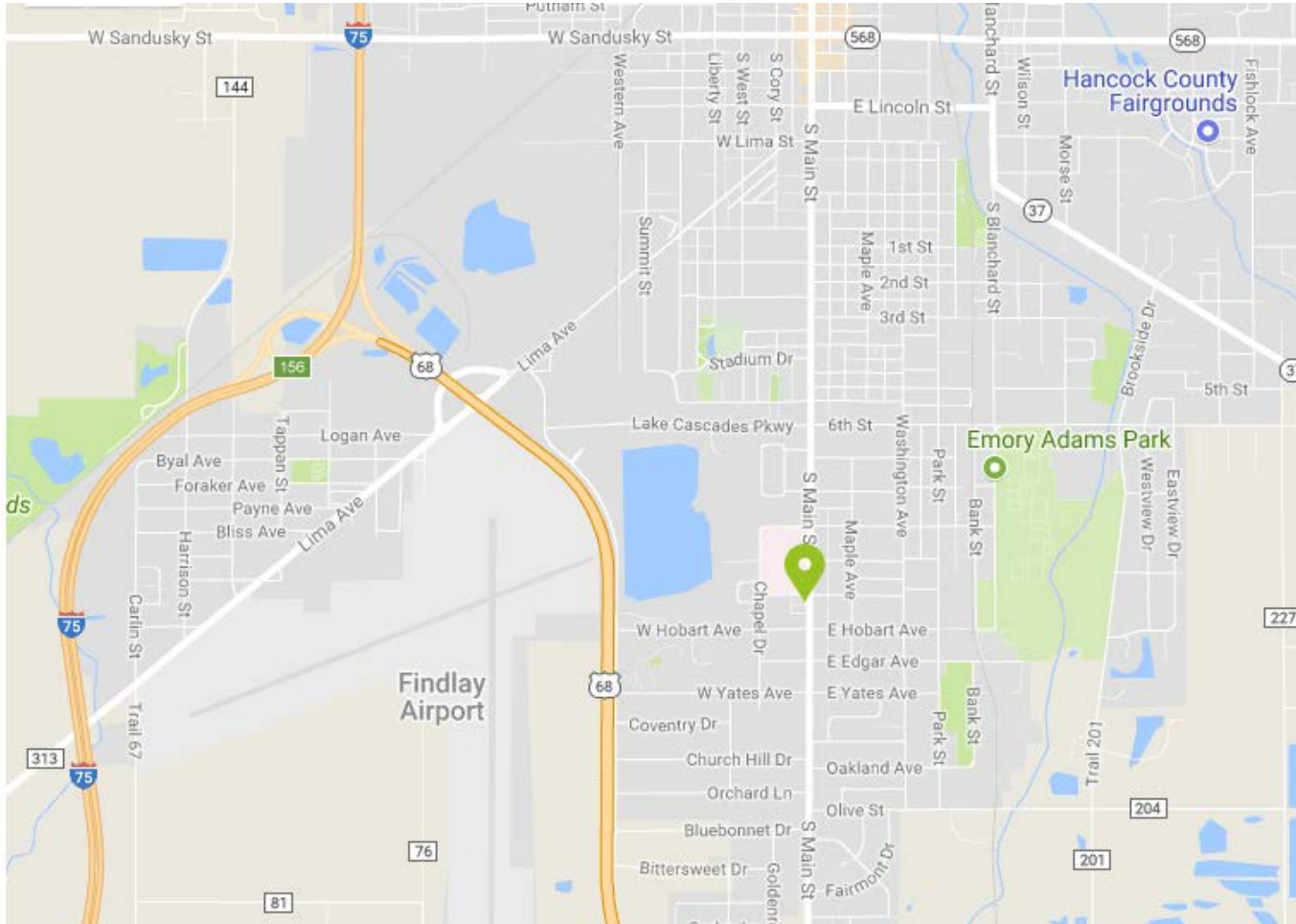
C-chemistry sampling

Appendix 2 – Table 9. Safety Contacts and Hospital Locations

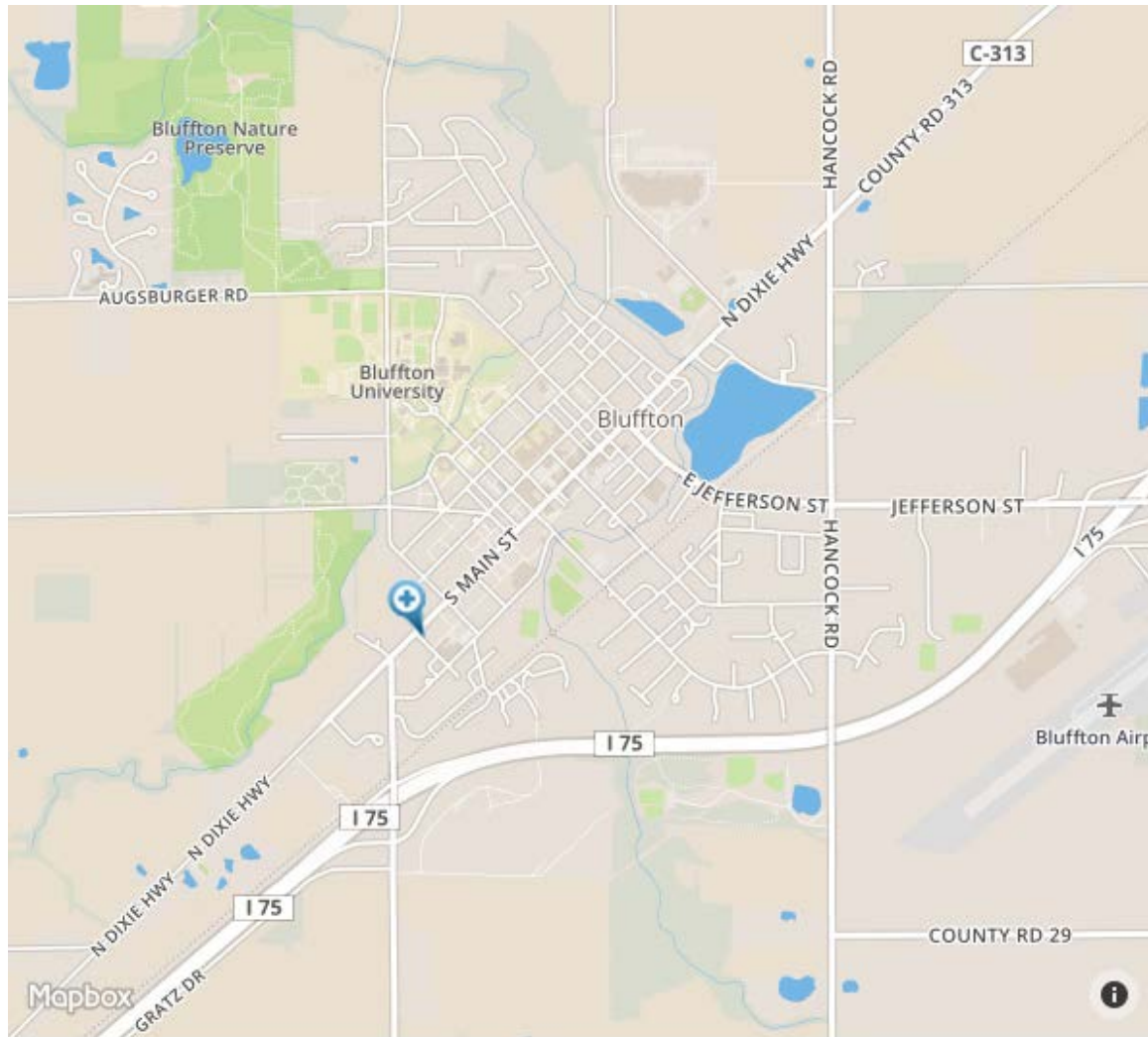
Safety	
ODNR Wildlife Officers:	County Sheriff Offices:
Allen County – Craig Barr (419) 429-8379	Allen County – (419) 227-3535
Crawford County – VACANT (419) 429-8380	Crawford County – (419) 562-7906
Hancock County – VACANT (419) 429-8384	Hancock County – (419) 422-2424
Huron County – Nathan Kauffmann (419) 429-8387	Huron County – (419) 668-6912
Paulding County – VACANT (419) 429-8390	Paulding County – (419) 399-0171
Putnam County – Jason Porinchok (419) 429-8391	Putnam County – (419) 523-3208
Wyandot County – Nathan West (419) 429-8398	Wyandot County – (419) 294-2362
Hospitals	
Hancock County:	Allen County:
Blanchard Valley Hospital 1900 S. Main St. Findlay, OH 45840 (419) 423-4500	Bluffton Hospital 139 Garau Street Bluffton, OH 45817 (419) 358-9010
Crawford County:	Wyandot County
Bucyrus Hospital (Avita Health System) 629 N. Sandusky Ave. Bucyrus, OH 44820 (419) 562-4677	Wyandot Memorial Hospital 885 N. Sandusky Ave. Upper Sandusky, OH 43351 (419)294-4991

HOSPITAL MAPS

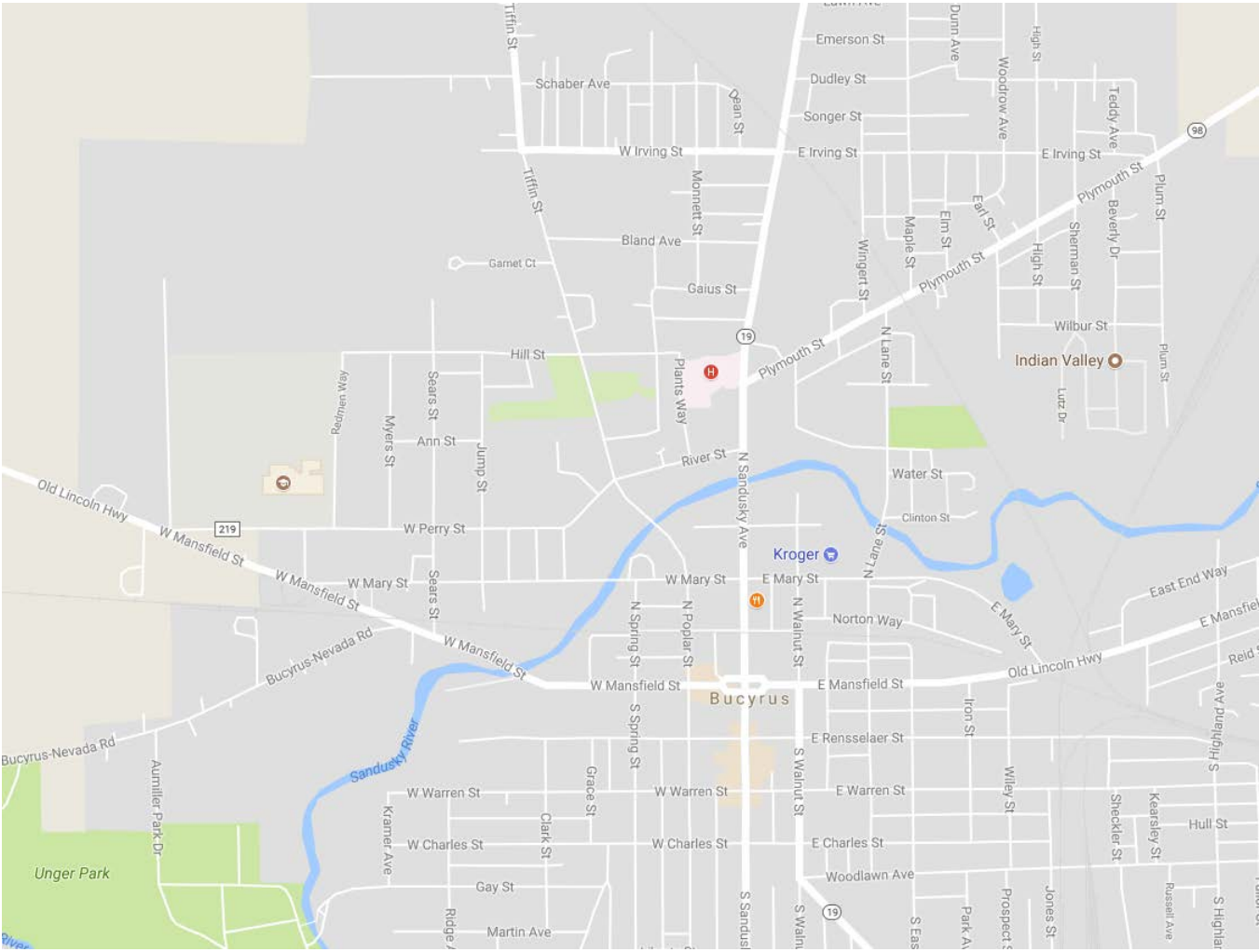
Blanchard Valley Hospital, 1900 S. Main Street, Findlay (©Google 2017)



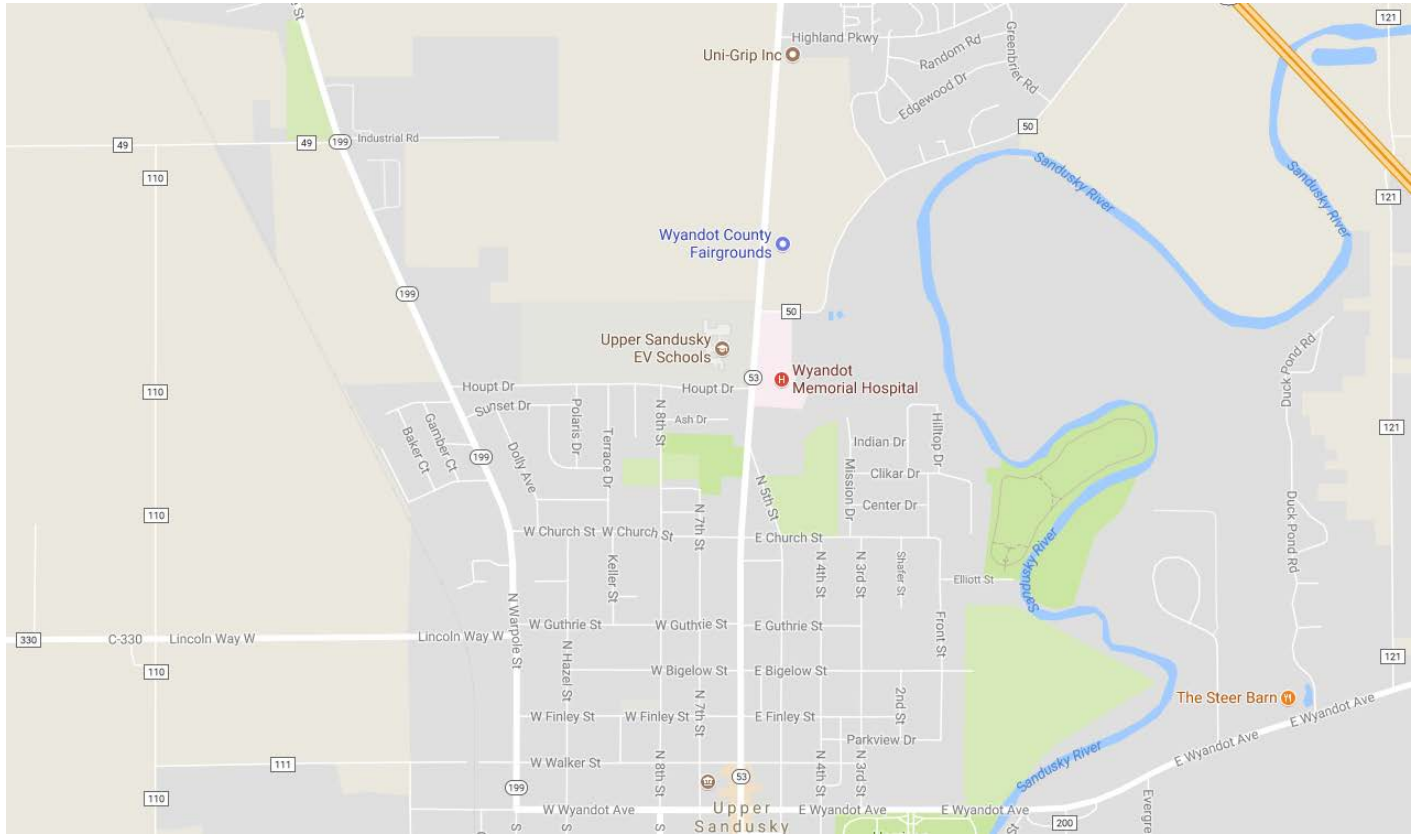
Bluffton Hospital, 139 Garau Street, Bluffton (©Mapbox 2017)



Bucyrus Hospital (Avita Health System), 629 N. Sandusky Ave, Bucyrus (©Google 2017)



Wyandotte Memorial Hospital, 885 N. Sandusky Ave, Upper Sandusky (©Google 2017)



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