

Scope of work for Operation of the Tributary Loading Station on the Scioto River and Interpretation of Water Quality Data

Submitted to
Dr. Fang Cheng
Department of Public Utilities
Division of Sewerage and Drainage
The City of Columbus, Ohio

by
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Period Covered by this Request: 1 January 2019 through 31 December 2019

Work to be accomplished:

We request that the City of Columbus provide funds to support the operation of water quality monitoring stations on the Scioto River in Chillicothe, which would be conducted in collaboration with the Division of Sewerage and Drainage (DSD). The water quality information produced by our operation of this station and our analysis of NPDES data in the Scioto watershed through our prior agreements has proven to be highly valuable to DSD.

This year we request at total of \$47,000. That level of funding will permit us to do the following:

- (1) Continue to produce water quality data through our intensive sampling protocol, analysis of suspended sediments and nutrients (including forms of phosphorus and nitrogen as well as other nutrients), computation and characterization of nutrient and suspended sediment concentrations and loads from the Scioto River to the Ohio River as calculated from the Chillicothe station;
- (2) Upload the Scioto River data to our public data download website and interpret the data compared to all of the Ohio River and Lake Erie tributaries that comprise the Heidelberg Tributary Loading Program (HTLP);
- (3) Analyze total dissolved solids, alkalinity and hardness in a subset of samples collected at the Chillicothe station during both base flow and storm runoff events as coordinated with DSD personnel;
- (4) Assist OEPA in calculations that compare point-source and nonpoint-source loads of total phosphorus and other nutrients of interest to DSD upstream of the sampling station at Chillicothe.
- (5) Produce a report comparing the Chillicothe and Piketon station from 2017-2018 to produce updated estimates of nonpoint source loads from the Scioto River and share with DSD and OEPA.

Work Plan

Our work plan for 2019 is as follows:

1. We will maintain one refrigerated automated ISCO sampler inside the monitoring building at Chillicothe. The sampler will collect one discrete sample every eight hours year-round. Samples will be shipped to us by our cooperator at the Ross County Soil and Water Conservation District weekly (except the last week in December). Heidelberg technicians will visit the site as needed, usually one to two times a year, to perform required maintenance and repairs. We have an excellent rapport with the Ross SWCD, and they occasionally volunteer in ensuring that the station is operational and has minimal “down time”.
2. As we have done since 1996, we will analyze 500 (\pm about 50) samples each year for the Chillicothe station, the exact number dependent on the number and duration of storm runoff events during the year. We analyzed 509 samples in WY 2018 and 519 samples in WY 2017. We will analyze daily samples and additional samples as needed to accurately characterize storm runoff loads of the analyzed compounds. All analyses conform to methods specified in our U.S. EPA-approved QAPP and are certified by Ohio EPA at level 3J. Several of our laboratory technicians (J. Kramer, E. Ewing, B. Merryfield) and research scientists (A. Roerdink, L. Johnson) are certified by Ohio EPA as Level 3 Qualified Data Collectors for chemical water quality assessment. We will analyze all water samples for specific conductance and the concentrations of total phosphorus, dissolved (soluble) reactive phosphorus, nitrate nitrogen, nitrite nitrogen, total Kjeldahl nitrogen, ammonia, chloride, sulfate, dissolved silica, and total suspended solids.
3. We will continue to upload our concentration data and the corresponding flow data (provided by USGS) for each analyzed sample on our tributary data download website on a quarterly basis following QA/QC analysis, and we will make the data available more frequently upon special request. After the end of the water year (30 September), we will calculate the annual loads, unit area loads, flow-weighted mean concentrations and time-weighted mean concentrations for each parameter.
4. We will continue to collaborate with Ohio EPA and DSD personnel in analyzing NPDES data and developing appropriate summaries and interpretive reports of the information.
5. In addition to the above tasks, the NCWQR will analyze a subset of samples collected at the Chillicothe station during 2018 for total dissolved solids, alkalinity and hardness. The number of samples, the timing of sample collections, and the specific analytical methods will be mutually agreed upon by NCWQR and DSD as before.
6. We will do a comparison of nonpoint source loads estimated from the Chillicothe station vs the Piketon station for WY 2017 and 2018. This data will be interpreted in a report to provide both to DSD and OEPA in case any corrections to the OEPA mass balance report are warranted.

Budget

The operational costs to monitor water quality at the Chillicothe station, the Piketon station, as well as the estimated costs for other chemical analyses including total dissolved solids, alkalinity, and hardness are shown below. The details are as follows:

Heidelberg Proposed Budget	
<i>Calendar Year 2019</i>	
Station Operation- Chillicothe	\$ 40,000
Optional services	
Other chemical analysis	\$ 5,000
NPS comparison report	\$ 2,000
Total Request to City of Columbus, not to exceed	\$ 47,000

Budget Notes

1. The costs quoted in station operation do not include any part of USGS program costs. The USGS operates and maintains the hydrological instrumentation that measures river stage and discharge. NCWQR does pay all electrical bills for the station, currently approximately \$100 per month.
2. For the total request, we have quoted a “not to exceed” total dollar amount, as the number of samples to be analyzed is not exactly known at this time.

We look forward to further collaboration with you as we continue to address important water quality issues in the Scioto River.



Laura T. Johnson
Director