

Amendment to joint funding agreement 24NEJFA222 “HYDROLOGIC MONITORING OF MCBAINÉ BOTTOMS, INCLUDING EAGLE BLUFFS CONSERVATION AREA, 2024-2026”.

BACKGROUND AND PURPOSE: Bioaccumulation of microplastic particle has been observed in wildlife and human tissues. Study of the environmental exposures, pathways, and biological effects of microplastics has become a priority of Federal Government, U.S. Geological Survey (USGS) and stakeholders (Iwanowicz and others, 2024). The Missouri River alluvial aquifer near McBaine Bottoms serves as a municipal drinking water source and is exposed to several potential anthropogenic sources of microplastics, as well as natural pathways introducing microplastics like Missouri River surface water infiltration to the alluvial aquifer. Reconnaissance sampling for the presence of microplastic particles would provide water quality data for municipal water planning and research of microplastics presence in groundwater.

OBJECTIVE: The objective of this amendment is to include analysis of microplastics to the water quality sampling plan of the joint funding agreement “Hydrologic Monitoring of McBaine Bottoms, including Eagle Bluffs Conservation Area, 2024-2026”.

SCOPE: Discrete water quality sampling for screening of microplastic particles in groundwater in the Missouri River alluvial aquifer near McBaine Bottoms and Eagle Bluffs during autumn sampling in 2025.

APPROACH: USGS will collect one discrete sample for microplastic analysis from the 14 sites planned for water quality sampling during fiscal year 2025 (table 1). Microplastic samples will be collected and processed per sample collection protocol guidance supplied by the Northern Illinois University (NIU) Microplastics Laboratory protocol. Environmental and Quality assurance samples will be submitted to the Northern Illinois University Microplastics Laboratory for the detection, identification, and quantification of microplastic particles.

DELIVERABLES: The USGS will present the microplastics analysis data to cooperator and water science community. The results will be made available through data release or storage in NWIS. If stored in NWIS a Laboratory Evaluation Plan (LEP) will be generated for documentation of NIU methodology and quality of sample results.

QUALITY ASSURANCE PLAN: The following quality control samples for microplastics will be collected; one equipment blank, one field blank, and two field replicates. Northern Illinois University Microplastics Laboratory will conduct a laboratory blank to confirm method precision and accuracy.

TIMELINE: Microplastics samples will be collected by USGS and submitted to Northern Illinois University Microplastics Laboratory for analysis in 2025.

BUDGET:

USGS cooperator matching funds added \$24,100 for the collection and analysis of microplastics.

Funding	Original Agreement (FY¹ 2024-FY2026)	Proposed Amendment	Total
City of Columbia	\$429,600	\$0	\$429,600
USGS match ²	\$184,300	\$24,100	\$208,400
Total	\$613,900	\$24,100	\$638,000

¹FY = Federal fiscal year, October 1 – September 30.

²USGS Match funds are estimated, actual USGS contribution will depend on the availability of funding

REFERENCE:

Iwanowicz, D.D., Baldwin, A.K., Barber, L.B., Blazer, V.S., Corsi, S.R., Duris, J.W., Fisher, S.C., Focazio, M., Janssen, S.E., Jasmann, J.R., Kolpin, D.W., Kraus, J.M., Lane, R.F., Lee, M.E., McSwain, K.B., Oden, T.D., Reilly, T.J., and Spanjer, A.R., 2024, Integrated science for the study of microplastics in the environment—A strategic science vision for the U.S. Geological Survey: U.S. Geological Survey Circular 1521, 54 p., <https://doi.org/10.3133/cir1521>.