CITY OF DURHAM

Date: **July 30, 2019**

To: **Thomas J. Bonfield – City Manager**
Through: **W. Bowman Ferguson – Deputy City Manager**
From: **Marvin G. Williams – Director of Public Works**
Subject: **Intergovernmental Agreement with the U.S. Geological Survey for Operation and Maintenance of the City of Durham Rainfall and Streamflow Network**

Executive Summary
In 2008 the City entered into an intergovernmental agreement with the U.S. Geological Survey to purchase, install, operate and maintain a network of automated devices measuring rainfall and streamflow. These devices are needed to provide information necessary for the City of Durham's (City) annual report to the North Carolina Division of Water Resources regarding stormwater quality, including the response of local streams to rainfall. These devices are also used to evaluate the potential for flooding within the City. The intergovernmental agreement is negotiated and renewed regularly between the City and the U.S. Geological Survey. The cost to the City for the operation and maintenance of the rainfall and streamflow devices is $200,900.00 for the period from October 1, 2019 through September 30, 2021. The U.S. Geological Survey is providing $33,600.00 in matching funds for operation and maintenance.

Recommendation
To authorize the City Manager to execute an intergovernmental agreement with the U.S. Geological Survey for the continued operation and maintenance of the automated rainfall and streamflow monitoring network at an amount not to exceed $200,900.00 for the period covering October 1, 2019 through September 30, 2021.

Background
The federally issued National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit issued to the City (Permit #NCS000249) requires multiple annual reports that rely on manual and automated monitoring of the stream network. These include the following:

- NPDES Program annual report,
- Total Maximum Daily Load (TMDL) Response Plans, and
- the Water Quality Monitoring and Assessment Plan.

Additional reports for Falls of the Neuse Reservoir and Jordan Lake require information from the automated rainfall and streamflow monitoring network.

TMDL response plans require descriptions of the measures that the City has implemented and plan to be implemented, and the progress made toward meeting the TMDL targets. TMDL targets are dependent upon streamflow, which is dependent upon rainfall. TMDL response plans are currently required in the Third Fork Creek and Northeast Creek watersheds. The state has identified other City watersheds that need TMDLs, including Ellerbe, Little Lick, and New

Hope Creeks. The Water Quality Monitoring and Assessment Program is a requirement of the NPDES permit and includes a more comprehensive evaluation of water quality within the City, including progress toward meeting goals for water quality parameters and aquatic life (i.e., stream insects or benthic macroinvertebrates).

The U.S. Geological Survey conducts water resources monitoring throughout the nation through its Cooperative Water Program. Many municipalities participate in the program in order to monitor streamflow to and from reservoirs, to assess flooding, and to evaluate water quality impacts. The City uses streamflow measurements to estimate pollutant loading, particularly nitrogen and phosphorous, from large city watersheds. The City uses the simultaneous measurement of rainfall and streamflow or stream stage to evaluate potential illicit discharges to streams or to the stormwater drainage system. The City also has a flood warning system for the Eno River, Sandy Creek, and Third Fork Creek that utilizes the U.S. Geological Survey stream gauge data.

Per the agreement, the U.S. Geological Survey will maintain a total of seven rainfall and eight stage or streamflow gauges around the city. These are listed below in Table 1.

Table 1. U.S. Geological Survey Automated Monitoring Locations and Types

Stream	General location	Type of monitoring
Ellerbe Creek	Club Boulevard	Stage, Streamflow
Ellerbe Creek *(a)*	Glenn Road	Stage, Streamflow
Ellerbe Creek	Murray Ave	Rainfall
Eno River	Cole Mill Road	Stage, Rainfall
Eno River *(b)*	Roxboro Road	Rainfall
Little Lick Creek	Wake Forest Hwy	Stage, Rainfall
North Prong	Carpenter Fletcher Road	Stage
Sandy Creek	Cornwallis Road	Stage, Streamflow, Rainfall
Third Fork Creek	Woodcroft Pkwy	Stage, Streamflow, Rainfall
Third Fork Creek	Martin Luther King Jr Pkwy	Stage, Streamflow, Rainfall

(a) This agreement allows for stream stage and flow monitoring near Glenn Road to have cost-share funding between the cities of Durham and Raleigh.
(b) Stream stage and flow monitoring near Roxboro Road is performed in cooperation with the Triangle Area Water Supply Monitoring Program and the U.S. Army Corps of Engineers.

Further, this agreement would allow the cities of Durham and Raleigh to continue cost-share funding of a streamflow gauge in lower Ellerbe Creek near Glenn Road.

This agreement will be in place for two years and it will align with the U.S. Geological Survey's 2020 fiscal year (October 1, 2019 to September 30, 2020) and 2021 fiscal year (October 1, 2020 to September 30, 2021).

Stream stage and flow information is available to any interested party and can be accessed on the internet at the U.S. Geological Survey web site under Durham County: http://waterdata.usgs.gov/nc/nwis/current/?type=flow&group_key=county_cd.

Rainfall information is available on the internet at the following web address: http://waterdata.usgs.gov/nc/nwis/current/?type=precip&group_key=county_cd.

Issues and Analysis
Long-term operation of the precipitation and streamflow network will ensure that permitting, water quality, flood forecasting, and urban stream restoration needs can be served. Long-term measurements are needed to evaluate how streams respond to intense periods of rainfall, including the delivery of pollutants, stream bank collapse, and flooding potential.

Alternatives
The alternative is to deny authorization to negotiate and execute intergovernmental agreements for continued operation and maintenance of the network. Capital funds spent to purchase and install equipment would be unrecoverable. The ability to complete the annual NPDES report to the state would be compromised, as would the annual reports regarding status and progress towards meeting the Falls of the Neuse Reservoir and Jordan Lakes rules. The ability to evaluate flood warning would be limited to weather forecasts and visual observations. City assets and infrastructure would be at greater risk.

Financial Impact
The operation and maintenance costs for the 24-month period (October 1, 2019 through September 30, 2021) of $200,900.00 will be paid from the Public Works Operating Budget from the following accounts in the City fiscal years below:

CITY FISCAL YEAR	ACCOUNT	AMOUNT
2020	5500L041-728600	$75,337.50
2021	5500L041-728600	$100,450.00
2022	5500L041-728600	$25,112.50
TOTAL		**$200,900.00**

The U.S. Geological Survey is providing $33,600.00 in matching funds for operation and maintenance costs in the City fiscal years below:

CITY FISCAL YEAR	AMOUNT
2020	$12,600.00
2021	$16,800.00
2022	$4,200.00
TOTAL	**$33,600.00**

Equal Business Opportunity Summary
This is an interlocal agreement that was not reviewed by the Equity & Inclusion Department for compliance with the Ordinance to Promote Equal Business Opportunities in City Contracting.

Attachments
U.S. Geological Survey Cover Letter
U.S. Geological Survey and City of Durham Joint Funding Agreement and Price Quote Table