



**City of Wilson**

**Fall 2022 CWSRF**

**Stormwater AIA Grant Application**

**NARRATIVE**

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City of Wilson

## Wilson Stormwater AIA Narrative

### Narrative

#### Section A: Stormwater Project Narrative

1. Narrative provided below.
2. City of Wilson (City) is located within the Neuse River basin within three watersheds: Contentnea, Hominy Swamp, and Toisnot. A majority of the downtown management area (DMA) is located within the Hominy watershed and partially within the Toisnot watershed. Due to the development of downtown prior to any stormwater management regulations taking affect, neither water quality or quantity issues were previously designed into the existing system. A majority of the water quality and quantity issues are directly attributed to rainfall in the area.
3. The DMA is approximately 485 acres located primarily bounded by Raleigh Road Pkwy, Hines St., Vance St., and Pender St.
4. See below:
  - a. **Attachment 1** shows a map of the proposed area for the asset inventory and assessment area.
  - b. Item is not applicable. The purpose of the AIA is to assess the existing stormwater structures and provide a full inventory for future planning purposes in and around the DMA.
  - c. Item is not applicable. No new stormwater structures are proposed.
  - d. **See attachment 1.** Major roads are included to provide greater geographical references.
5. The City has established a Stormwater Management Fund. The Stormwater Management Fund provides funding for the Neuse stormwater regulations for nitrogen control, the watershed supply protection regulations, and the upcoming NDPES Phase II regulations mandated by the USEPA; Local Erosion and Sediment Control Program; drainage channel cleaning initiatives set by the City Council; drainage studies; ongoing public information and education campaigns; and staff to manage, oversee, operate, and maintain the stormwater system all to maintain a viable, clean, and safe stormwater system to help provide a healthy water environment for our community. The first fees were collected on July 1, 2002.
  - a. The stormwater management fund was created in 2002.
  - b. As of August 2022, the number of single-family residential stormwater accounts was 20,761.
  - c. Non-single-family residential stormwater accounts are included in the single-family residential account number. The City does not separate the two types of accounts.
  - d. As of August 2022, the City has 1,701 commercial accounts, 29 industrial accounts, and 48 utility accounts (accounts that do not fall under residential, commercial or industrial).
  - e. The single-family residential charge for one equivalent residential unit (ERU), as of August 2022, is \$6.00. An ERU was calculated to be equivalent to 2,585 sq. ft. of impervious area.

- f. Non-single-family residential stormwater accounts are included in the single-family residential account number. The City does not separate the two types of accounts.
- g. The rate for commercial, industrial, and utility accounts is proportional to the amount of impervious area located onsite. For example, a 10,000 sq. ft. commercial building would be charged for four ERUs (10,000 sq. ft. divided by 2,585 sq. ft. rounded up). Thus, the charge would be \$24.00 (4 ERU multiplied by \$6.00 per ERU). As of August 2022, the average commercial fee was \$115.99, the average industrial fee was \$786.21, and the average utility fee was \$193.39.
6. Over the last 12 months (September 1, 2021 through August 31, 2022), the City billed for \$5,342,530.80 and received \$5,142,857.46 through the stormwater management fund.
7. Over the last 12 months, the City spent approximately \$5,165,399 to pay for stormwater projects from the stormwater management fund. The general fund does not contribute to the stormwater enterprise fund.
8. The City is currently **NOT** designated as an MS4 program. However, the City has begun preparations for when the notice from NCDEQ is received.
9. Not applicable. This funding request is for a planning grant.
10. The primary focus of the Stormwater Asset Inventory and Condition Assessment Grant (AIA) will go towards an asset and condition assessment of the stormwater structures in and around downtown Wilson in the area identified as the City's Downtown Management Area (DMA). There are approximately 780 known stormwater structures and 65,901 LF of stormwater pipe located within the DMA. The condition, size and inverts of each of the structures and pipes is not well known. Additionally, assets within approximately 1,000 LF of the DMA will also be inventoried and a condition assessment will be provided. There are approximately 1,526 known structures within the expanded DMA. A majority of the expanded DMA include areas identified as potentially underserved. Further, the expanded DMA is almost exclusively located in the Hominy Creek watershed. The Hominy Creek watershed is currently under a 4b plan with the state of North Carolina (NC) as it was previously 303(d) listed.

The stormwater AIA will allow the City to better understand the existing conditions of assets located in the expanded DMA. This will facilitate capital improvement projects to include the addition of stormwater features such as floodplain restoration and stormwater control measures (SCMs) which would assist with improving water quality and decreasing flood potential.

11. No public input sessions have been conducted for this study grant.

#### **Section D: Narrative and Documentation Required to Support Stormwater Planning Study Priority Rating System Points.**

##### **1. Challenges.**

The City has three major challenges impacting the successful management of stormwater within the City over the next five years:

## **Issue 1: Water Quality Issues**

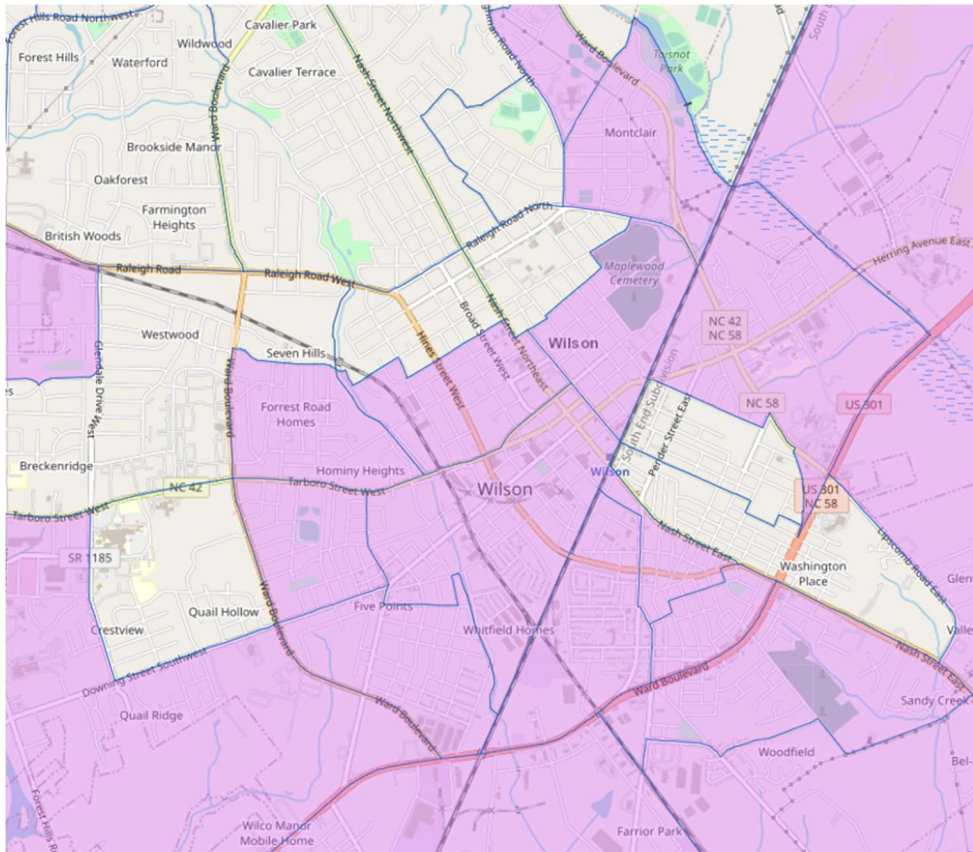
The majority of the DMA is located with the Hominy Swamp watershed. The Hominy Swamp watershed is impaired and listed as a category 4b requiring the City to move forward with pollution control strategies to improve the water quality.

**Attachment 2** is the City's Category 4b Plan for Hominy Swamp Restoration Plan dated November 7, 2018.

Upon a complete asset inventory and condition assessment of the DMA and surrounding area, the City will be able to determine areas for water quality improvement projects. These could include underground sand filters, permeable paver installation or other measures as appropriate. Additionally, the asset inventory and condition assessment may determine locations of illicit discharge including any direct sanitary sewer connections to the stormwater system.

## **Issue 2: Water Quantity Issues**

Localized flooding is an issue downstream of the DMA. The AIA will assist the City in determining areas where flood control measures (ex. below ground storage) could be possible. The conditions of the pipes and infrastructure may also be contributing to localized flooding downtown during wet weather events. Significant areas adjacent to the DMA are disadvantaged (see Figure 1).



**Figure 1 - Downtown Wilson as shown in DEQ Community Mapping Tool**

### **Issue 3: Aging Infrastructure**

The DMA has some of the oldest stormwater infrastructure within the City. Due to the age of the infrastructure, the City does not have an accurate understanding of the condition of much of the structures and pipes.

If approved, the asset inventory and assessment grant will allow the City to begin addressing each of the major challenges. Specifically, the City focus on an asset inventory and condition assessment of the DMA and immediately surrounding area. The DMA has some of the oldest stormwater infrastructure within the City. The asset records within the DMA are not reliable and the condition of the infrastructure is largely unknown. Additionally, the DMA was developed prior to any stormwater regulations, thus there were no constraints on impervious area during development resulting in increased nutrient loading and an increase in peak flow resulting in localized flooding.

Additionally, the study will assist with the further refinement of City's stormwater capital improvement plan and inform the development of a stormwater infrastructure operation and maintenance plan. To the most practicable extent, this CIP refinement avoids wasteful construction by not replacing infrastructure too soon or too late. This is critical for the City since the City has significant areas mapped as potential underserved by the DEQ Community Mapping Tool and exceeds all five of the Division of Water Infrastructure's affordability parameters.

## **2. Scope and Deliverables**

The primary focus of the Stormwater Asset Inventory and Condition Assessment Grant (AIA) will go towards refining the asset inventory and completing a condition assessment of the stormwater structures in and around downtown Wilson in the area identified as the City's Downtown Management Area (DMA). There are approximately 780 known stormwater structures and 65,901 LF of stormwater pipe located within the DMA. The condition of each of the structures and pipes are unknown including the extent of any newly discovered illicit sanitary connections. Additionally, assets within approximately 1,000 LF of the DMA will also be inventoried and a condition assessment will be provided. There are approximately 1,526 known structures within the expanded DMA. A majority of the expanded DMA include areas identified as potentially underserved. Further, the expanded DMA is almost exclusively located in the Hominy Creek watershed. The Hominy Creek watershed is currently under a 4b plan with the state of NC as it was previously 303(d) listed.

The stormwater AIA will allow the City of Wilson to better understand the existing conditions of assets located in the expanded DMA. This will facilitate capital improvement projects to potentially include the addition of stormwater features which would assist with increasing water quality and decreasing flood potential.

The primary deliverables will be a full inventory of known and unknown (at this time) structures within and extended outward 1,000 LF of the DMA. A condition assessment of the structures will also be performed to assist with the development of a refined stormwater CIP. Additionally, a stormwater infrastructure operation and maintenance plan will be developed for the study

area based upon the condition of the infrastructure. The O&M plan will be used as a template for the remainder of the City's stormwater collection system.

#### **Line Item 1.A.**

The asset inventory and assessment will allow the City to begin addressing each of the major challenges. Specifically, the City will focus on an asset inventory and condition assessment of the DMA and immediately surrounding area. The DMA has some of the oldest stormwater infrastructure within the City. The asset records within the DMA are not reliable and the condition of the infrastructure is largely unknown. This project will provide critical data that will help the City make informed decisions about future stormwater initiatives. The City has an extensive GIS system and protocols in place that will allow information gathered in this project to be permanently maintained and updated as new projects are constructed. It will also allow the City to adjust to climate change by having this data readily available for future modeling efforts that may be needed.

Stormwater funding is very limited and the City must make informed decisions in this critical watershed on immediate capital projects that will be an outgrowth of the study. These projects will provide direct water quality benefits for an impaired watershed and will also have secondary (but direct) benefits to the larger Neuse River watershed that is nutrient sensitive. That is, an accurate assessment of the stormwater infrastructure will also allow a targeted approach combining the water quality needs with structural needs so that projects can be combined to further stretch limited stormwater funds. For example, the timing of SCM construction would be adjusted to correlate to critical stormwater conveyance structural issues so the area would only be disturbed once, local impacts would be minimized, and construction costs would be reduced which is critical for the City with five of five affordability parameters exceeded (see Line Item 3.B).

Other water quality aspects of this planning effort will include documentation of any unknown illegal discharges of sanitary connections to the storm sewer system. Staff have noted this issue in downtown areas. Illegal connections create public health issues since the storm system does not provide treatment for sanitary waste, contribute nutrients to a nutrient sensitive watershed, and create more oxygen demand in the biologically impaired Hominy Swamp.

#### **Line Item 1.B.**

The City currently has an approved 5-year stormwater CIP. A copy of the CIP is found in **Attachment 3**. However, the CIP was developed without knowledge of the current condition of downtown infrastructure. The CIP will be further developed to consider Water Quality, Quantity, and age and condition of existing infrastructure. As noted above, there are significant advantages to making well-informed decisions and potentially combining smaller projects into one overall project based on needs.

#### **Line Item 1.C.**

The study will allow the City to address the Illicit Discharge Detection and Elimination component of the six minimum control measures as defined in the NPDES MS4 permit. Specifically, during the asset inventory and condition assessment, illicit discharge locations

will be identified. The City will then move forward with removing them. Additionally, the study will allow for staff to more efficiently track future discharges by having an accurate inventory of assets and understanding their interconnectivity.

**Line Item 1D.**

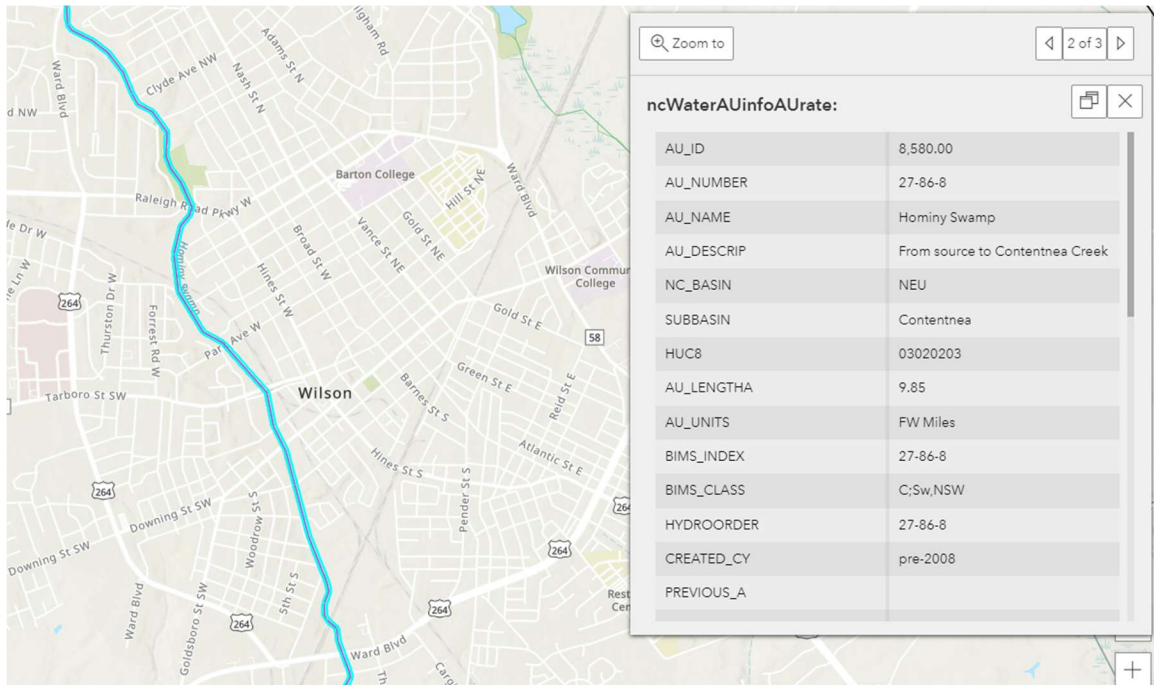
Not applicable.

**Line Item 1.E.**

As noted above, most of the DMA drainage area is tributary to Hominy Swamp. Hominy Swamp is impaired as shown in the 2022 Integrated Report which is included in **Attachment 4** and as shown in Figure 2A and 2B.

<b>Hominy Swamp</b>	<b>27-86-8</b>	<b>C;Sw,NSW</b>	<b>9.9</b>	<b>FW Miles</b>
8580	From source to Contentnea Creek			
2022 Water Quality Assessments				
PARAMETER	IR CATEGORY	CRITERIA STATUS		
Benthos (Nar, AL, FW)	4b	Exceeding Criteria		
Fish Community (Nar, AL, FW)	3b	Data Inconclusive		

**Figure 2A - Excerpt from Page 709 of the 2022 Integrated Report**



**Figure 2B - Hominy Swamp highlighted in [DWR Map Locator - Public \(arcgis.com\)](https://arcgis.com)**

As stated in Line Item 1.A., these projects will provide direct water quality benefits for an impaired watershed and will also have secondary (but direct) benefits to the larger Neuse River watershed that is nutrient sensitive. That is, an accurate assessment of the stormwater



infrastructure will also allow a targeted approach combining the water quality needs with structural needs so that projects can be combined to further stretch limited stormwater funds.

Note that due to the impairment including benthic impacts, water quantity is also a water quality issue. That is, higher stormwater flows increase flow velocity, which results in bed scour that is known to degrade the aquatic habitat. This is expressed in the Hominy Swamp Creek Watershed Assessment and Restoration Plan discussion of water quality (see **Figure 3** below) that peak flows contribute to erosion (i.e., bed scour). The City has completed several projects to address either stormwater quality or quantity in the Hominy Swamp watershed. In addition, the City is applying for LASII grants for three additional measures in this watershed. This study will allow these SCM-type projects to be coordinated with the storm sewer replacement projects to provide targeted approaches to stormwater management.

#### **4 Existing Water Quality:**

Hominy Swamp Creek is classified by the NC Division of Water Quality (DWQ) as Class C Nutrient Sensitive Waters (NSW) Swamp Waters (SW). Most of the waters in the larger subbasin of Contentnea Creek (Neuse 07, 700 sq. mi.) are similarly classified, barring those designated as public water supply watersheds. The mainstem of Hominy Swamp Creek becomes perennial at the confluence of two intermittent tributaries north of Forest Hills Road; most others waters within the watershed are intermittent according to USGS maps. At base flow, Hominy Swamp Creek is a slow moving swamp waters system, impacted by channelization over time that has caused it to function in many segments primarily as drainage and stormwater conveyance. Precipitation averages 48" a year in the area, and common rainfall events can cause high peak, erosive storm flow.

**Figure 3 - Excerpt from Page 24 Hominy Swamp Creek Watershed Assessment and Restoration Plan**

This planning effort will also include a survey of illegal discharges of sanitary connections to the storm sewer system. Staff have noted this issue in downtown areas. These illegal connections create public health issues since the storm sewer system does not provide treatment for sanitary waste, contribute nutrients to a nutrient sensitive watershed, and create more oxygen demand in the biologically impaired Hominy Swamp.

#### **Line Item 1.F.**

Not applicable.

#### **Line Item 1.G.**

Not applicable.

#### **Line Item 1.H.**

Study will evaluate potential projects that will address flooding, sea level rise, or other environmental changes with the goal to decrease vulnerability to future conditions. This asset inventory and assessment project will address flooding and other environmental changes with the goal to address both water quantity and quality issues in the watershed. In the Hominy Swamp Creek Watershed Assessment and Restoration Plan, flooding is an ongoing issue (see **Figure 4**). As rainfall intensity and quantity increase, the flooding issues in this



watershed will also increase. Evaluating the storm sewer system allows the City to plan for adequate pipe sizing as well as coordinating the placement of SCMs with the storm sewer CIP that will be an outcome of this study. In managing the storm water utility, this knowledge is critical when adjusting to changes made by federal agencies such as revised floodplain mapping (FEMA) and precipitation intensity changes (NOAA) that directly result from climatic changes.

The stream system that makes up Hominy Swamp Creek has been extensively channelized over the past 50 years, and now serves mainly as storm water conveyance through the urbanized mid-portion of the watershed. Most headwater streams of the system are relatively undisturbed at present, but there is additional development pressure in the city as new residential and commercial developments encroach from the east and west. The mid and upper portions of the watershed have been largely built-out over the past fifty years, and there are many complaints of residential flooding as the creek attempts to access its historical floodplain.

**Figure 4 - Excerpt from Page 3 Hominy Swamp Creek Watershed Assessment and Restoration Plan**

#### **Line Item 2.A.**

The City employs multiple FTEs towards the goal of stormwater management. These include a Stormwater Compliance Specialist, a Stormwater Compliance Technician, a Civil Engineer, and GIS Technician. Additionally, multiple individuals are involved with the day-to-day operation of the stormwater collection system.

Stormwater Compliance Specialist (1 FTE) – Position is primarily responsible for the management of various permits including NPDES permits for the operations center, compost facility, and airport, wastewater collection system permit, and overseeing the day-to-day operations of the stormwater compliance technician. Tiffanie Garner has been with the City less than a year however, she has several years of experience focusing on NPDES permit compliance for wastewater treatment facilities and assisting with their pretreatment programs.

Stormwater Compliance Technician (1 FTE) – Position is primarily responsible for overseeing the illicit discharge program, educational outreach, and post construction stormwater control measure inspections. Jose Valdavinis has been with the City several years working at the compost facility ensuring compliance with the City's compost permit. Within the last year he has moved into the stormwater compliance technician position.

Civil Engineer (0.5 FTE) – Approximately half of the Civil Engineer's position involves the review and approval of erosion control plans and stormwater control measures prior to construction. Additionally, the Civil Engineer tracks Neuse Nitrogen numbers for new development within the City. Dustin Eldreth is a recent graduate with less than a year of experience.

GIS Technician (1 FTE) – Stormwater has a dedicated GIS Technician who updates all stormwater repairs within the City’s GIS system and adds any new infrastructure as required. Additionally, the GIS Technician provides impervious numbers to billing to determine ERUs to be billed for non-residential developments. Beverly Baily has been in the position for over 10 years.

Additionally, the Public Works Director (Bill Bass), Water Infrastructure Division Manager (Noah Parsons), the Assistant Directors of Public Works (Scott Hedgepeth), and the City Engineer (Kyle Manning) are heavily involved with planning/providing direction to the stormwater group on a daily basis.

#### **Line Item 2.B.**

In 2004, the Hominy Swamp Creek Watershed Assessment and Restoration Plan was submitted to EPA (**Attachment 5**). Based upon the submission, the entire Hominy Swamp was listed as a Category 5 (i.e. 303(d) list). The City then drafted a Hominy Creek Greenway and Water Quality Park Master Plan in 2016 (**Attachment 6**). The City submitted and was approved to have the Hominy Swamp relisted as a Category 4b Plan in 2018 (**Attachment 2**). The City has worked with the NC Department of Public Safety on flooding issues including the buyout of several structure that were flood prone in the Hominy Swamp watershed. The City has several projects to address both SW quantity and quality in the Hominy Swamp watershed. Note that due to the impairment including benthic impacts, water quantity is also a water quality issue. That is, higher flows increase flow velocity, which results in bed scour degrading the aquatic habitat. This is expressed in the Hominy Swamp Creek Watershed Assessment and Restoration Plan discussion of water quality – see **Figure 3** under Line Item 1.E. The City has completed several projects to address either stormwater quality or quantity in the Hominy Swamp watershed. In addition, the City is applying for LASII grants for three additional measures in this watershed. These actions were a direct result on the Hominy Swamp Creek Watershed Assessment and Restoration Plan efforts.

Other water quality aspects of this planning effort will include a survey of illegal discharges of sanitary connections to the storm sewer system. Staff have noted this issue in downtown areas. These illegal connections create public health issues since the storm system does not provide treatment for sanitary waste, contribute nutrients to a nutrient sensitive watershed, and create more oxygen demand in the biologically impaired Hominy Swamp.

#### **Line Item 2.C.**

City staff were heavily involved in the development of the Hominy Creek Greenway and Water Quality Master Plan and the 4b Plan in 2018. As shown in Figure 4, two planners and the City Engineer were key staff on the development of the plans.



Figure 4 - Excerpt from Page 3 Hominy Creek Greenway and Water Quality Park Master Plan.

**Line Item 2.D.**

The existing CIP (**Attachment 3**) would be revised based upon this planning effort. The AIA work will also lead to placement of future SCMs and that construction will be coordinated between SCMs and pipe replacement.

The City has already adopted the Hominy Swamp Creek Watershed Assessment and Restoration Plan (2004) and the Hominy Creek Greenway and Water Quality Master Plan (2016) for this planning study area (i.e., the DMA and surrounding area). The City has completed several projects to address either stormwater quality or quantity in the Hominy Swamp watershed as a result of these plans.

**Line Item 2.E.**

Resolution creating the stormwater enterprise fund can be found in **Attachment 7**.

**Line Item 3.A**

Not Applicable

**Line Item 3.B**

The City of Wilson has five out of five LGU indicators worse than the state benchmark. **Attachment 8** is the Fall 2022 LGU Indicator Calculator for Stormwater Funding Eligibility that documents the values in **Table 1** below.

Local Government Unit Indicator		State Benchmarks for Fall 2022 Applications	Enter Value of Local Government Unit Indicator of Applicant
1. Population Change	< =	4.5%	-0.50%
2. Poverty Rate	> =	14.0%	23.2%
3. Median Household Income	< =	\$56,642	\$43,126
4. Unemployment Rate	> =	7.1%	8.6%
5. Per Capita Appraised Value of Property	< =	\$125,015	\$88,067

**Table 1 - Fall 2022 LGU Indicators**

**Line Item 3.C**

Figure 1 above shows the potentially underserved areas using the NC DEQ's Community Mapping System in and around the DMA.