Town of Forest City,
Sewer Force Main, Raw Water Intake, & Stream Bank Stabilization

Benefit-Cost Analysis Methods Summary

2022 FEMA BRIC Grant Application

Introduction

A benefit cost analysis (BCA) has been performed by McGill Associates as part of the FEMA Building Resilient Infrastructure and Communities (BRIC) Grant Application for the Town of Forest City. The purpose of the application is to obtain federal funds which will support the sewer force main, sewer pump station, gravity sewer line and raw water intake improvements. (The Project).

The Project includes improvements at 3 locations, approximately 1,000 linear feet of streambank restoration to improve the raw water intake area at coordinates (in decimal degrees): 35.379818, -81.862203, Flood proofing at the Bracket Creek sewer pump station, replacement of approximately 950 linear feet of existing 24-inch RCP sewer, slip lining another 850 linear feet of the sewer at Brackett Creek, at coordinates (in decimal degrees): 35.315720, -81.864054 and Sewer Force Main Repairs and streambank restoration at Second Broad River & US 74 Bridge at coordinates (in decimal degrees): 35.333571, -81.839593. BCA analysis have been completed for each of the project components.

The total project is estimated at $3,464,600

The FEMA BCA toolkit ver. 6.0 was used to estimate the present value stream of expected annual benefits and costs of The Project.

Benefits considered in the analysis include avoided loss of service, avoided repair and reconstruction costs, and ecosystem services.

The steps inputs to develop the BCA model are outlined below and are followed by a discussion of the findings.

Methodology

The following sections document the primary assumptions related to the level of protection, professional expected damages as a basis for the analysis, and key inputs into the analysis.

Project Useful Life

Stream Restoration components of the project are estimated to have a 30 year useful life in accordance with FEMA BCA Reference.

A 50-year useful life was used for sewer line improvements in accordance with Appendix D of the FEMA BCA reference guide, Major Infrastructure (minor localized flood reduction projects), standard value 50.

Level of Protection

Raw Water Intake

EXISTING

The Raw Water Intake utilizes a canal that allows water to flow off of the main channel of the Second Broad River to the raw water intake and pump station for the Town's water treatment facility. This canal is subject to flooding as the top of the bank is approximately 820 ft and 100 year flood elevation is approximately 830.9. Flood mapping does not include flood elevations for other storm events however it is assumed that 25 and 50 year events also overtop the bank. An event that overtops the bank could cause erosion of the canal area and restrict flow to the raw water intake. If this occurs the Town would be required to utilize a backup intake and it is estimated that service would be interrupted for up to 2 days in this event. The damages would require restoration of the canal area and take several weeks to complete to reinstate the existing intake. This facility services 10,500 customers including customers in Forest City, Ellenboro, Bostic and the Concord Community Water System and is estimated to include 27,405 persons using census data for persons per household.

PROPOSED

The project is proposed to provide protection to the river bank in the area of the raw water intake canal to prevent damage to the intake area. The system is designed to be inundated and therefore the improvements are only necessary to stabilize the area and armor it to prevent erosion filling in the canal and preventing water from reaching the existing intake. These improvements are anticipated to provide protection through the 100 year event.

Bracket Creek Sewer Line Replacement, Pump Station Flood Proofing

EXISTING

The existing Bracket Creek Pump Station has a finish flood elevation, top of slab of 892.5 ft per As Built drawings for the station. Floodwaters which exceed this level have potential to inundate the dry pit area of the pump station and damage the pumps. Flood elevations per FEMA model at 892.6 ft for 50 year storm, 893.0 for 100 year storm and 894.4 for 500 year storm and would each result in damage to the pumps. A 25 year storm has potential to damage the sewer interceptor and is assumed to cause a loss of service for 5 days. Storm events of 50 year and greater magnitude that damage the pumps will require bypass pump equipment to be placed which will require stormwater to recede prior to installation. Therefore the outage period for these events is 7 days. The 500 year storm would result in flooding of the electrical building of 1.9 ft and potentially damage electrical equipment in this location and an outage period of 9 days was utilized. The sewer line upstream of this pump station is located in the bank and erosion from storm events has exposed the line in some locations.

PROPOSED

The proposed project will replace 950 LF of the influent sewer, slip line 850 LF of sewer, rehabilitate 12 manholes and utilize streambank enhancement to stabilize approximately 2,000 LF of Bracket Creek and flood proof the Bracket Creek Pump Station to prevent flood water from entering the pump station. These improvements are anticipated to provide protection up to the 100 year storm event for the gravity sewers and the pump station locate along this flood hazard area.

Second Broad Sewer Force Main and Streambank Stabilization

EXISTING

The existing force main serving this area is located in an unstable bank along the Second Broad River at a bridge crossing for US 74. The force main has been exposed during past storms and a nearby water line was washed out and required replacement. The force main is subject to potential damage in smaller storm events as it is located in the normal channel of the river and collapse of the streambank could damage the line. In the event of a collapse a temporary line would need to be installed until a few force main could be installed as a permanent repair. Damages include service loss until installation of the temporary main and repair cost for installation of a new sewer line.

PROPOSED

The proposed project includes replacement of the force main with a new line installed by directional drill. This line will be installed 10 to 15 feet below the stream bed providing additional protection from bank collapse. The project also includes streambank stabilization to repair the eroded areas and prevent potential damage to surrounding properties. These improvements are anticipated to provide protection for future storms including the 100 year event.

Table 1: Level of Protection and Project Useful Life

Input/Assumption	Value	Source
Project useful life	30 year -stream rehabilitation, 50 years utility	FEMA BCA reference guide Appendix D
Existing level of protection	<100-yr recurrence interval	All existing facilities proposed to be improved are located within 100 year flood zone.
Proposed level of protection (post mitigation)	100-yr recurrence interval	As noted in Scope of Work section, the selected project alternative will design for the 100-year recurrence interval.

Damages Estimates

The FEMA BCA toolkit ver. 6.0 was setup to estimate damages using Professional Expected Damages as historical information was not available. The BCA analysis was conducted using detailed information collected for the Project. Key inputs in the analysis are shown below in the following sections.

Tables 2, 3 and 4 provide a breakdown of general impacts to the three (3) infrastructure locations. The FEMA standard values for loss of water service and wastewater collection service was used in the analysis as well as damages for each storm event.

Table 2: Raw Water Intake Pump Station Impact Assumptions

Input/Assumption	Value	Source
Loss of Wastewater Service	$116	FEMA BCA toolkit 6.0, standard value
Number of Customers Served	27,405	As noted in Scope of Work section, the selected project alternative serves 5,938 people.
25-yr damages	$75,000	These damages include excavation and repair of the canal area of the raw water intake.
50-yr damages	$75,000	These damages include excavation and repair of the canal area of the raw water intake.
100-yr damages	$75,000	These damages include excavation and repair of the canal area of the raw water intake.

Table 3: Bracket Creek Sewer Line and Pump Station Flood Proofing Impact Assumptions

Input/Assumption	Value	Source
Loss of Wastewater Service	$60	FEMA BCA toolkit 6.0, standard value
Number of Customers Served	10,440	As noted in Scope of Work section, the selected project alternative serves 5,938 people.
25-yr damages	$50,000	Anticipated damages include sewer line repairs and bank stabilization.
50-yr damages	$150,000	These damages include pump replacement for 3-150 HP pumps.
100-yr damages	$200,000	These damages include electrical control panel, motor starter and sewage pump replacement.
500-yr damages	$275,000	These damages include electrical control panel, motor starter and sewage pump replacement and standby generator repairs

Table 4: Second Broad Sewer Force Main and Streambank Stabilization Impact Assumptions

Input/Assumption	Value	Source
Loss of Wastewater Service	$60	FEMA BCA toolkit 6.0, standard value
Number of Customers Served	2,182	As noted in Scope of Work section, the selected project alternative serves 5,938 people.
25-yr damages	$600,000	Damages include cost for installation of temporary force main and force main replacement.
50-yr damages	$600,000	Damages include cost for installation of temporary force main and force main replacement.
100-yr damages	$600,000	Damages include cost for installation of temporary force main and force main replacement.

Finally, environmental benefits were also included in the BCA framework. Table 5 below shows, key inputs for the ecosystem services benefits estimates in the toolkit at the Raw Water Intake Facility.

Table 5: Ecosystem Service Inputs

Input/Assumption	Value	Source
Project Area (Acres)	2.18	GIS parcel Data
Riparian Area (%)	7.37	Estimated area of streambank rehabilitation within riparian area.

FEMA Benefit-Cost Calculator

V.6.0 (Build 20230103.1822 | Release Notes)

Add Project | Import Projects | Export Projects | Batch Processing | Delete Projects

			Using 7% Discount Rate			Using 3% Discount Rate (For FY22 BRIC and FMA only)			
Select	Project Title	County, State	Benefits (B)	Costs (C)	BCR (B/C)	Benefits (B)	Costs (C)	BCR (B/C)	Copy
☑	Brackett Creek Sewer Line Replacement, Pump Station Flood Proofing	Rutherford, NC	$ 2,415,779	$ 2,041,907	1.18	$ 4,503,918	$ 2,161,198	2.08	
☑	Raw Water Intake	Rutherford, NC	$ 3,267,234	$ 986,071	3.31	$ 5,160,691	$ 1,201,813	4.29	
☑	Second Broad Sewer Force Main and Streambank Stabilization	Rutherford, NC	$ 692,577	$ 960,701	0.72	$ 1,291,222	$ 972,630	1.33	
TOTAL (SELECTED)			$ 6,375,590	$ 3,988,679	1.60	$ 10,955,831	$ 4,335,641	2.53	
TOTAL			$ 6,375,590	$ 3,988,679	1.60	$ 10,955,831	$ 4,335,641	2.53	

FEMA Benefit-Cost Calculator

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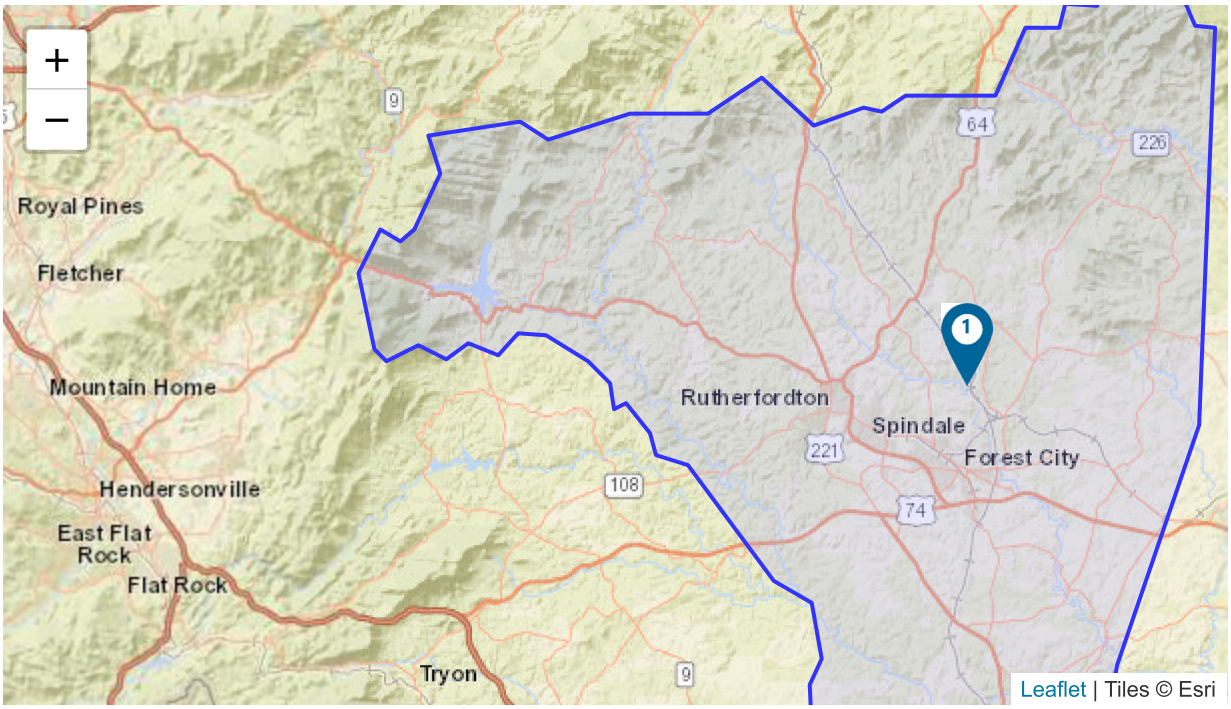
Benefit-Cost Analysis

Project Name: Raw Water Intake



				Using 7% Discount Rate			Using 3% Discount Rate (For FY22 BRIC and FMA only)			
Map Marker ▲	Mitigation Title	Property Type	Hazard	Benefits (B)	Costs (C)	BCR (B/C)	Benefits (B)	Costs (C)	BCR (B/C)	
1	Floodplain and Stream Restoration @ 35.3798178; -81.8622029		DFA - Riverine Flood	$ 3,267,234	$ 986,071	3.31	$ 5,160,691	$ 1,201,813	4.29	
TOTAL (SELECTED)				**$ 3,267,234**	**$ 986,071**	**3.31**	**$ 5,160,691**	**$ 1,201,813**	**4.29**	
TOTAL				**$ 3,267,234**	**$ 986,071**	**3.31**	**$ 5,160,691**	**$ 1,201,813**	**4.29**	

Property Configuration

Property Title:	Floodplain and Stream Restoration @ 35.3798178; -81.8622029
Property Location:	28043, Rutherford, North Carolina
Property Coordinates:	35.3798178, -81.8622029
Hazard Type:	Riverine Flood
Mitigation Action Type:	Floodplain and Stream Restoration
Property Type:	Utilities
Analysis Method Type:	Professional Expected Damages

Cost Estimation
Floodplain and Stream Restoration @ 35.3798178; -81.8622029

Project Useful Life (years):	30
Project Cost:	$613,800
Number of Maintenance Years:	30 Use Default:Yes
Annual Maintenance Cost:	$30,000

Comments

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Annual Maintenance Cost:

The raw water intake settling canal/opening is dredged annually.

Damage Analysis Parameters - Damage Frequency Assessment
Floodplain and Stream Restoration @ 35.3798178; -81.8622029

Year of Analysis was Conducted:	2022
Year Property was Built:	1989
Analysis Duration:	34 Use Default:Yes

Comments

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Year Built:

The original raw water intake for the Town was constructed in 1948 with significant rehabilitation in the 1970s. The settling canal was added in 1989.

Utilities Properties

Floodplain and Stream Restoration @ 35.3798178; -81.8622029

Type of Service:	Potable Water
Number of Customers Served:	27,405
Value of Unit of Service ($/person/day):	$116 Use Default:Yes
Total Value of Service Per Day ($/day):	$3,178,980

Comments

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Type of Service:

The Town of Forest City owns and operates an 8.0 MGD water treatment plant (WTP) that provides water to customers in the Town and surrounding areas of Rutherford County. Additionally, the system supplies water to the Towns of Ellenboro and Bostic and the Concord Community Water System. Raw water is obtained from the Second Broad River. A raw water intake and pump station which includes two low head dams or weirs, settling canal and pump station are located at the sites and pump water to the WTP.

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Number of Customers Served:

The water system serves more than residential connections, three high schools and other educational institutions, and major employers impacting more than 5,000 jobs. The system population is estimated as 27,405 based on the number of customers and persons per household from US Census data. The system also provides water to the Towns of Ellenboro and Bostic and the Community Water System.

Professional Expected Damages Before Mitigation

Floodplain and Stream Restoration @ 35.3798178; -81.8622029

	POTABLE WATER	OPTIONAL DAMAGES			VOLUNTEER COSTS		TOTAL
Recurrence Interval (years)	Impact (days)	Category 1 ($)	Category 2 ($)	Category 3 ($)	Number of Volunteers	Number of Days	Damages ($)
50	2	75,000	0	0	0	0	6,432,960
25	2	75,000	0	0	0	0	6,432,960
100	2	75,000	0	0	0	0	6,432,960

Comments

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Damages Before Mitigation:

The raw water intake continues to be negatively impacted by the changing weather patterns associated with global climate change and the frequency and intensity of storms. Low water associated with drought conditions limits the amount of water available to meet system demands. Then flood events and high water create excessive erosion of the riverbanks in the vicinity of the raw water intake, including the settling canal. Continued erosion has the potential to breach the embankment which could result in a potential disruption of the ability to withdraw and treat water to meet the system demands. Current storage would meet only 1.5 days demand.

Annualized Damages Before Mitigation

Floodplain and Stream Restoration @ 35.3798178; -81.8622029

Annualized Recurrence Interval (years)	Damages and Losses ($)	Annualized Damages and Losses ($)
25	6,432,960	128,659
50	6,432,960	64,330
100	6,432,960	64,329
	Sum Damages and Losses ($)	Sum Annualized Damages and Losses ($)
	19,298,880	257,318

Professional Expected Damages After Mitigation

Floodplain and Stream Restoration @ 35.3798178; -81.8622029

	POTABLE WATER	OPTIONAL DAMAGES			VOLUNTEER COSTS		TOTAL
Recurrence Interval (years)	Impact (days)	Category 1 ($)	Category 2 ($)	Category 3 ($)	Number of Volunteers	Number of Days	Damages ($)
25	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0

Annualized Damages After Mitigation

Floodplain and Stream Restoration @ 35.3798178; -81.8622029

Annualized Recurrence Interval (years)	Damages and Losses ($)	Annualized Damages and Losses ($)
25	0	0
50	0	0
100	0	0
	Sum Damages and Losses ($)	Sum Annualized Damages and Losses ($)
	0	0

Standard Benefits - Ecosystem Services

Floodplain and Stream Restoration @ 35.3798178; -81.8622029

Total Project Area (acres):	2.18
Percentage of Urban Green Open Space:	0.00%
Percentage of Rural Green Open Space:	0.00%
Percentage of Riparian:	7.37%
Percentage of Coastal Wetlands:	0.00%
Percentage of Inland Wetlands:	0.00%
Percentage of Forests:	0.00%
Percentage of Coral Reefs:	0.00%
Percentage of Shellfish Reefs:	0.00%
Percentage of Beaches and Dunes:	0.00%
Expected Annual Ecosystem Services Benefits:	$5,977

Benefits-Costs Summary

Floodplain and Stream Restoration @ 35.3798178; -81.8622029

Total Standard Mitigation Benefits:	$3,267,234
Total Social Benefits:	$0
Total Mitigation Project Benefits:	$3,267,234
Total Mitigation Project Cost:	$986,071
Benefit Cost Ratio - Standard:	3.31
Benefit Cost Ratio - Standard + Social:	3.31

FEMA Benefit-Cost Calculator

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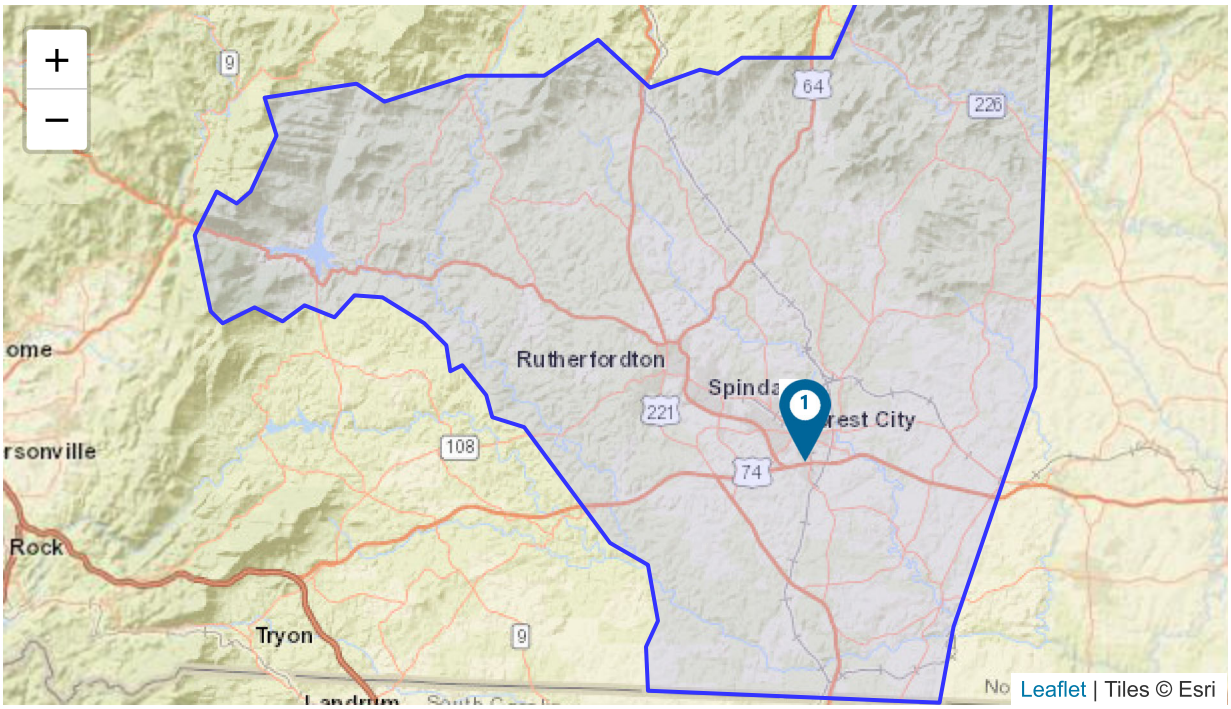
Benefit-Cost Analysis

Project Name: Brackett Creek Sewer Line Replacement, Pump Station Flood Proofing



				Using 7% Discount Rate			Using 3% Discount Rate (For FY22 BRIC and FMA only)			
Map Marker ▲	Mitigation Title	Property Type	Hazard	Benefits (B)	Costs (C)	BCR (B/C)	Benefits (B)	Costs (C)	BCR (B/C)	
1	Floodproofing Measures @ 35.3157198; -81.8605430_copy		DFA - Riverine Flood	$ 2,415,779	$ 2,041,907	1.18	$ 4,503,918	$ 2,161,198	2.08	
TOTAL (SELECTED)				**$ 2,415,779**	**$ 2,041,907**	**1.18**	**$ 4,503,918**	**$ 2,161,198**	**2.08**	
TOTAL				**$ 2,415,779**	**$ 2,041,907**	**1.18**	**$ 4,503,918**	**$ 2,161,198**	**2.08**	

Property Configuration

Property Title:	Floodproofing Measures @ 35.3157198; -81.8605430_copy
Property Location:	28043, Rutherford, North Carolina
Property Coordinates:	35.3157198, -81.8605430
Hazard Type:	Riverine Flood
Mitigation Action Type:	Floodproofing Measures
Property Type:	Utilities
Analysis Method Type:	Professional Expected Damages

Cost Estimation

Floodproofing Measures @ 35.3157198; -81.8605430_copy

Project Useful Life (years):	50
Project Cost:	$1,903,900
Number of Maintenance Years:	50 Use Default:Yes
Annual Maintenance Cost:	$10,000

Damage Analysis Parameters - Damage Frequency Assessment

Floodproofing Measures @ 35.3157198; -81.8605430_copy

Year of Analysis was Conducted:	2022
Year Property was Built:	1988
Analysis Duration:	35 Use Default:Yes

Utilities Properties

Floodproofing Measures @ 35.3157198; -81.8605430_copy

Type of Service:	Wastewater
Number of Customers Served:	10,440
Value of Unit of Service ($/person/day):	$60 Use Default:Yes
Total Value of Service Per Day ($/day):	$626,400

Professional Expected Damages Before Mitigation

Floodproofing Measures @ 35.3157198; -81.8605430_copy

	WASTEWATER	OPTIONAL DAMAGES			VOLUNTEER COSTS		TOTAL
Recurrence Interval (years)	Impact (days)	Category 1 ($)	Category 2 ($)	Category 3 ($)	Number of Volunteers	Number of Days	Damages ($)
50	7	150,000	0	0	0	0	4,534,800
100	7	200,000	0	0	0	0	4,584,800
25	5	50,000	0	0	0	0	3,182,000
500	9	275,000	0	0	0	0	5,912,600

Comments

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Damages Before Mitigation:

Change in the frequency and intensity of storms continues to have a negative effect on the Brackett Creek sewer collection and pumping system. The stream continues to experience higher stream flows which result in erosion and damage to the relatively sandy soils located along the stream and the gravity sewer line. Recent flood events have caused concern that the pump station would be flooded requiring closure of two major industries until flood waters receded and a rental pump installed.

Annualized Damages Before Mitigation

Floodproofing Measures @ 35.3157198; -81.8605430_copy

Annualized Recurrence Interval (years)	Damages and Losses ($)	Annualized Damages and Losses ($)
25	3,182,000	75,973
50	4,534,800	45,597
100	4,584,800	41,652
500	5,912,600	11,825
	Sum Damages and Losses ($)	Sum Annualized Damages and Losses ($)
	18,214,200	175,047

Professional Expected Damages After Mitigation

Floodproofing Measures @ 35.3157198; -81.8605430_copy

	WASTEWATER	OPTIONAL DAMAGES			VOLUNTEER COSTS		TOTAL
Recurrence Interval (years)	Impact (days)	Category 1 ($)	Category 2 ($)	Category 3 ($)	Number of Volunteers	Number of Days	Damages ($)
25	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0
500	0	0	0	0	0	0	0

Comments

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Damages After Mitigation:

The improvements proposed for this project are anticipated to extend the service life of the gravity sewer, to restore the creek bank, and to move the location of Brackett Creek to its original flow pattern and flood proof the sewer pump station. It is expected that these improvements would present sewer overflows and protect the environment, eliminating damage through 100 year flooding events.

Annualized Damages After Mitigation

Floodproofing Measures @ 35.3157198; -81.8605430_copy

Annualized Recurrence Interval (years)	Damages and Losses ($)	Annualized Damages and Losses ($)
25	0	0
50	0	0
100	0	0
500	0	0
	Sum Damages and Losses ($)	Sum Annualized Damages and Losses ($)
	0	0

Benefits-Costs Summary

Floodproofing Measures @ 35.3157198; -81.8605430_copy

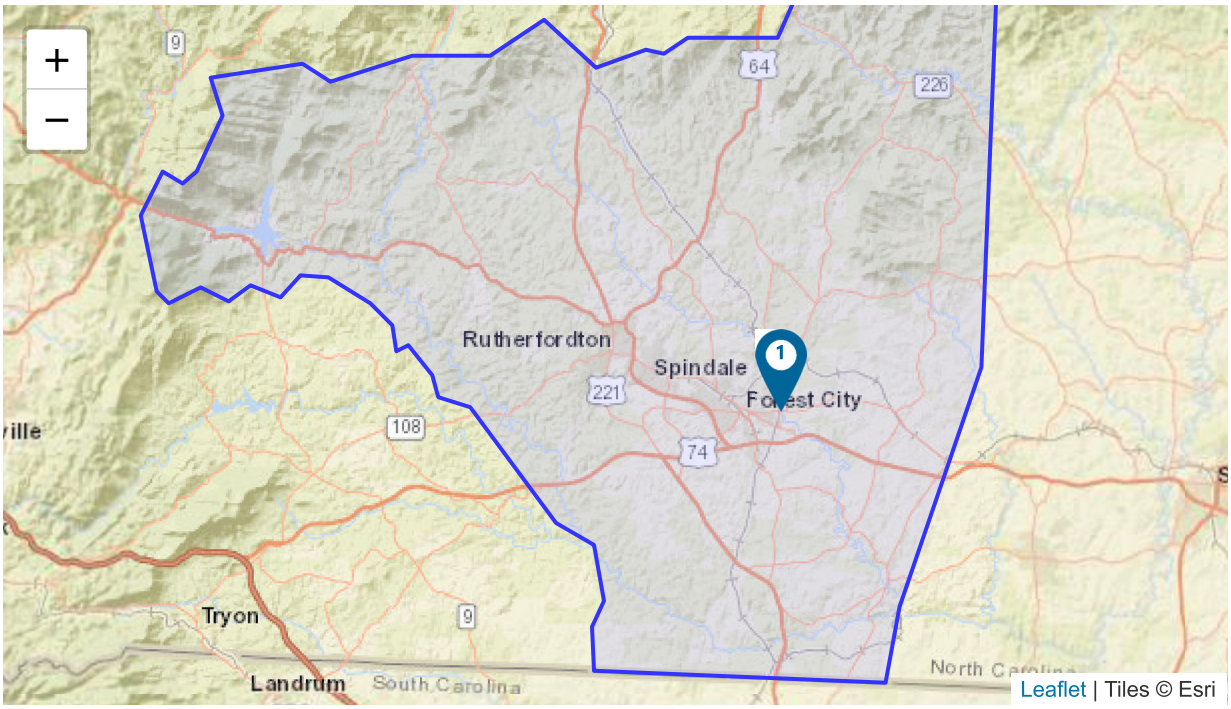
Total Standard Mitigation Benefits:	$2,415,779
Total Social Benefits:	$0
Total Mitigation Project Benefits:	$2,415,779
Total Mitigation Project Cost:	$2,041,907
Benefit Cost Ratio - Standard:	1.18
Benefit Cost Ratio - Standard + Social:	1.18

FEMA Benefit-Cost Calculator

V.6.0 (Build 20230103.1822 | Release Notes)

Benefit-Cost Analysis

Project Name: Second Broad Sewer Force Main and Streambank Stabilization



				Using 7% Discount Rate			Using 3% Discount Rate (For FY22 BRIC and FMA only)			
Map Marker ▲	Mitigation Title	Property Type	Hazard	Benefits (B)	Costs (C)	BCR (B/C)	Benefits (B)	Costs (C)	BCR (B/C)	
1	Floodproofing Measures @ 35.3335710; -81.8395933_copy		DFA - Riverine Flood	$ 692,577	$ 960,701	0.72	$ 1,291,222	$ 972,630	1.33	
TOTAL (SELECTED)				**$ 692,577**	**$ 960,701**	**0.72**	**$ 1,291,222**	**$ 972,630**	**1.33**	
TOTAL				**$ 692,577**	**$ 960,701**	**0.72**	**$ 1,291,222**	**$ 972,630**	**1.33**	

Property Configuration

Property Title:	Floodproofing Measures @ 35.3335710; -81.8395933_copy
Property Location:	28043, Rutherford, North Carolina
Property Coordinates:	35.3335710, -81.8395933
Hazard Type:	Riverine Flood
Mitigation Action Type:	Floodproofing Measures
Property Type:	Utilities
Analysis Method Type:	Professional Expected Damages

Cost Estimation

Floodproofing Measures @ 35.3335710; -81.8395933_copy

Project Useful Life (years):	50
Project Cost:	$946,900
Number of Maintenance Years:	50 Use Default:Yes
Annual Maintenance Cost:	$1,000

Damage Analysis Parameters - Damage Frequency Assessment

Floodproofing Measures @ 35.3335710; -81.8395933_copy

Year of Analysis was Conducted:	2022
Year Property was Built:	1995
Analysis Duration:	28 Use Default:Yes

Utilities Properties

Floodproofing Measures @ 35.3335710; -81.8395933_copy

Type of Service:	Wastewater
Number of Customers Served:	2,182
Value of Unit of Service ($/person/day):	$60 Use Default:Yes
Total Value of Service Per Day ($/day):	$130,920

Professional Expected Damages Before Mitigation

Floodproofing Measures @ 35.3335710; -81.8395933_copy

	WASTEWATER	OPTIONAL DAMAGES			VOLUNTEER COSTS		TOTAL
Recurrence Interval (years)	Impact (days)	Category 1 ($)	Category 2 ($)	Category 3 ($)	Number of Volunteers	Number of Days	Damages ($)
50	5	600,000	0	0	0	0	1,254,600
25	5	600,000	0	0	0	0	1,254,600
100	5	600,000	0	0	0	0	1,254,600

Annualized Damages Before Mitigation

Floodproofing Measures @ 35.3335710; -81.8395933_copy

Annualized Recurrence Interval (years)	Damages and Losses ($)	Annualized Damages and Losses ($)
25	1,254,600	25,092
50	1,254,600	12,546
100	1,254,600	12,546
	Sum Damages and Losses ($)	Sum Annualized Damages and Losses ($)
	3,763,800	50,184

Professional Expected Damages After Mitigation

Floodproofing Measures @ 35.3335710; -81.8395933_copy

	WASTEWATER	OPTIONAL DAMAGES			VOLUNTEER COSTS		TOTAL
Recurrence Interval (years)	Impact (days)	Category 1 ($)	Category 2 ($)	Category 3 ($)	Number of Volunteers	Number of Days	Damages ($)
25	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0

Annualized Damages After Mitigation

Floodproofing Measures @ 35.3335710; -81.8395933_copy

Annualized Recurrence Interval (years)	Damages and Losses ($)	Annualized Damages and Losses ($)
25	0	0
50	0	0
100	0	0
	Sum Damages and Losses ($)	Sum Annualized Damages and Losses ($)
	0	0

Benefits-Costs Summary

Floodproofing Measures @ 35.3335710; -81.8395933_copy

Total Standard Mitigation Benefits:	$692,577
Total Social Benefits:	$0
Total Mitigation Project Benefits:	$692,577
Total Mitigation Project Cost:	$960,701
Benefit Cost Ratio - Standard:	0.72
Benefit Cost Ratio - Standard + Social:	0.72

United States Census Bureau

QuickFacts

Forest City town, North Carolina

QuickFacts provides statistics for all states and counties, and for cities and towns with a ***population of 5,000 or more***.

Table

Families & Living Arrang…	Forest City town, North Carolina
Population, Census, April 1, 2020	**7,377**
PEOPLE	
Families & Living Arrangements	
Households, 2017-2021	2,767
Persons per household, 2017-2021	2.61
Living in same house 1 year ago, percent of persons age 1 year+, 2017-2021	84.1%
Language other than English spoken at home, percent of persons age 5 years+, 2017-2021	7.7%