

BASIN CAPITAL IMPROVEMENT PLAN
Payne Branch West
March 2023

Prepared for:

MetroConnects
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Basin Capital Improvement Plan: Payne Branch West

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BASIN CAPITAL IMPROVEMENT PLAN

MetroConnects is investigating the possibility of adding a new sanitary sewer line in the vicinity of Payne Branch, located near Fountain Inn, South Carolina. The area of the proposed sewer line has large tracts of land that are in consideration for development. MetroConnects and ReWa have some areas with gravity sewer mains, pump stations, and force mains in the vicinity of this proposed sewer line. The high level of development occurring in the area and the need for a collection and transmission system is the driving factor for a proposed sanitary sewer line in the vicinity of Payne Branch.

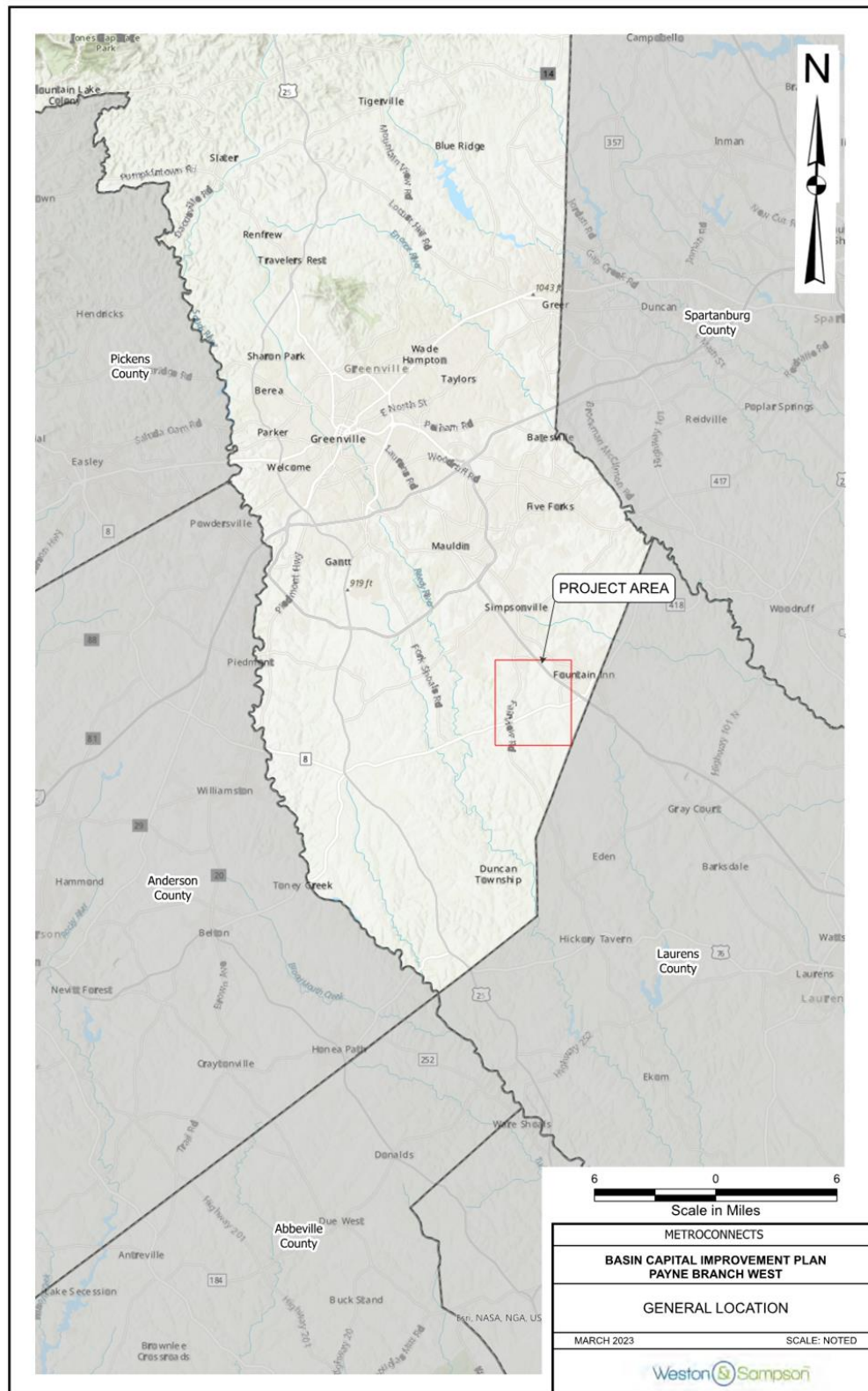
1A Description of Qualified Expansion Project

The area being studied is located along Payne Branch near Milacron Drive and Fairview Road. Refer to **Figure 1** for the general location of the project area. Within the study area, there are minimal utilities. Where the proposed sewer line crosses Milacron Drive, Fairview Road, there are expected to be water, electric, telecom, and gas mains. Approximately 85% of the proposed sewer line will be a cross-county sewer main, with little to no known utilities being impacted by the proposed project.

Downstream of the proposed sanitary sewer line, ReWa is designing/constructing a pump station; at the time of this study, specific details of the proposed pump station are unknown. As part of the design phase of the sewer line, further investigation and research into this pump station will be needed.

Generally, the proposed corridor for the proposed sanitary sewer line is parallel to Payne Branch with some deviations to accommodate the existing lot and the new development on several parcels. Refer to **Figure 2** for the proposed sewer alignment. Along the proposed corridor, there are suspected wetlands and several stream crossings with Payne Branch and other various tributaries of Payne Branch. Refer to **Figure 3** for locations of wetlands per the National Fish and Wildlife Service's National Wetland Inventory. FEMA's flood insurance rate map shows a zone AE without a floodway along Payne Branch in the vicinity of the proposed corridor. See **Figure 4** for a map of the existing floodplain per FEMA data.

The proposed sewer alignment crosses 18 property parcels. Therefore, MetroConnects will need to obtain permanent and temporary easements.



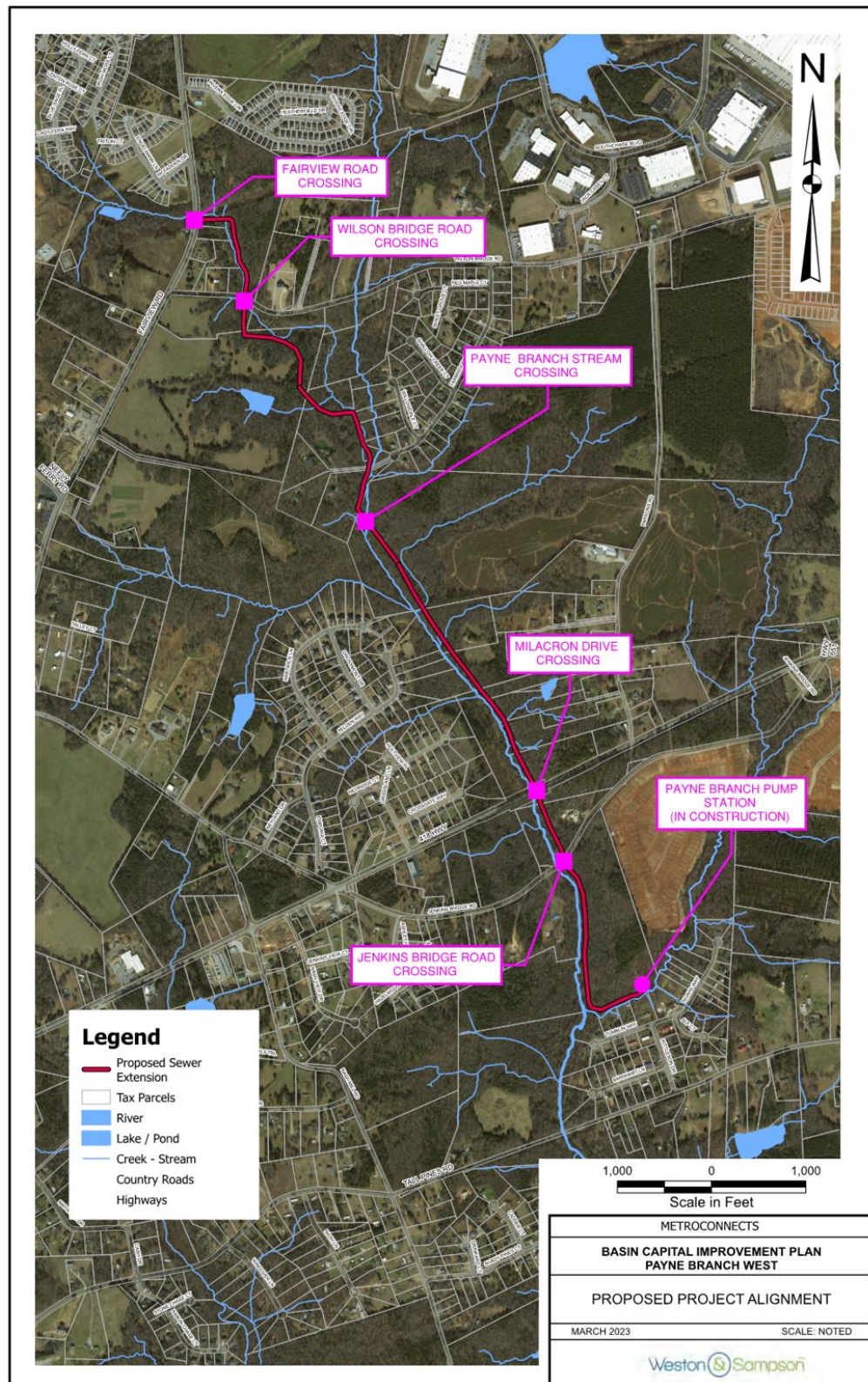


Figure 2 - Proposed Sewer Alignment

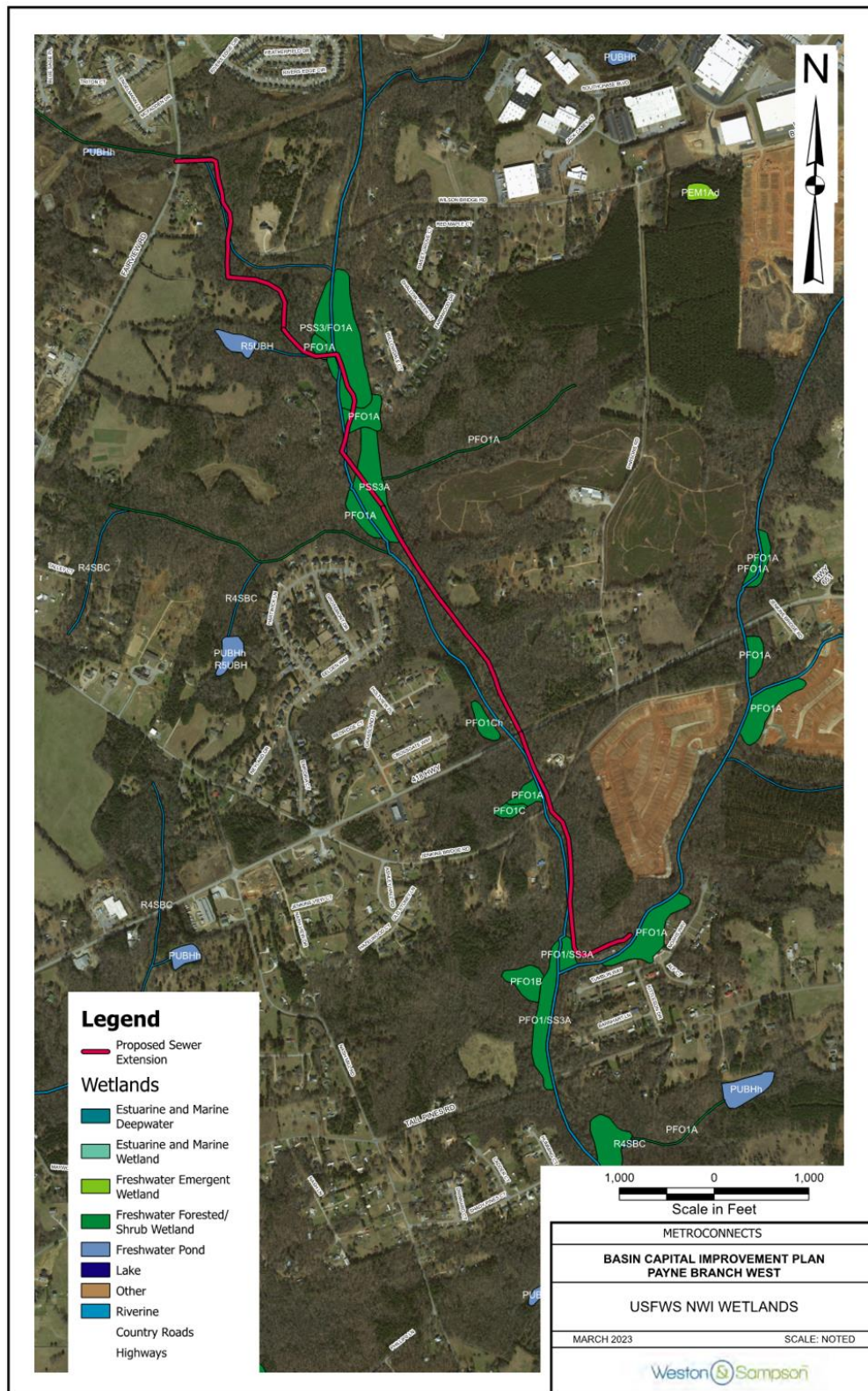


Figure 3 – Wetlands Map

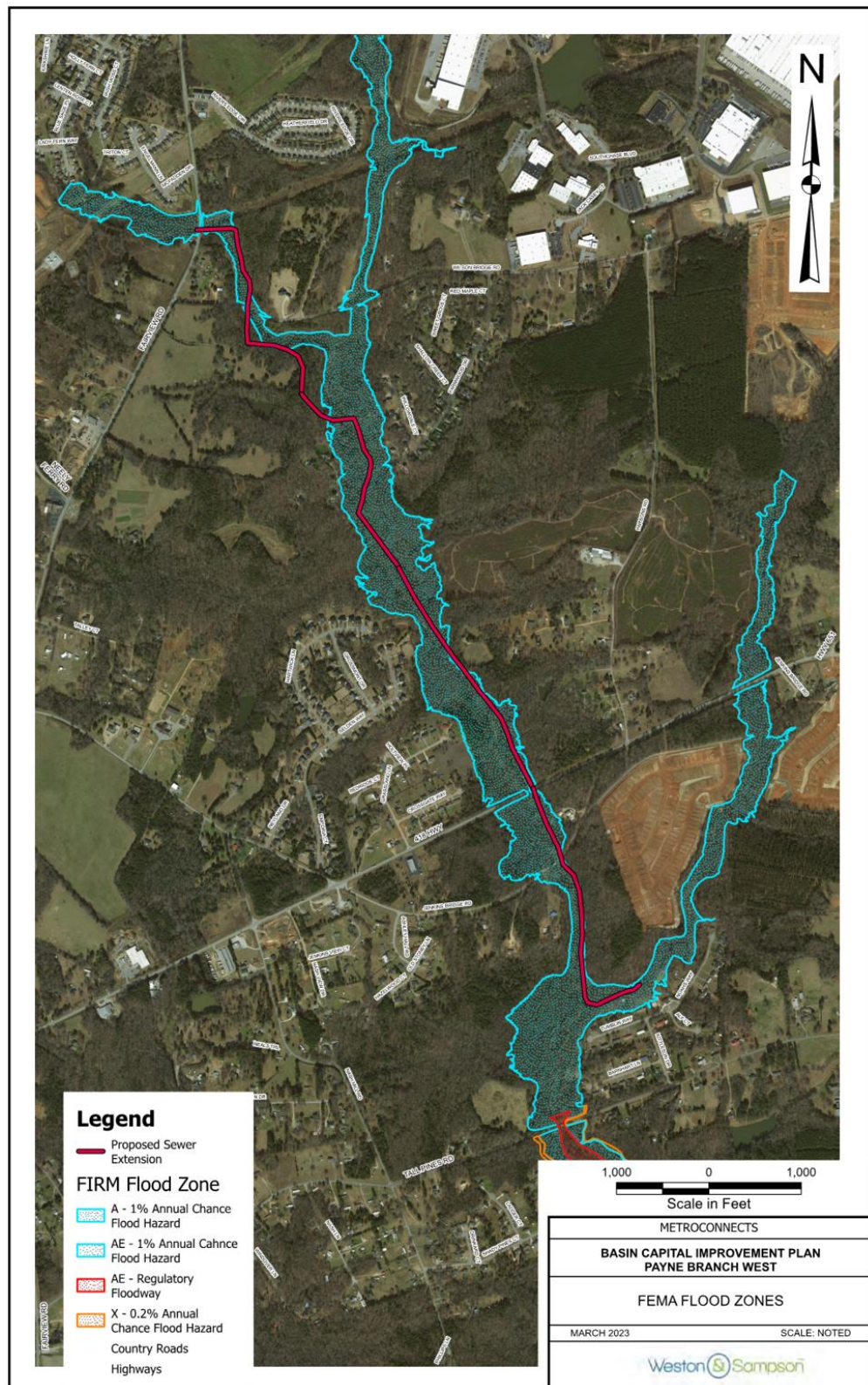


Figure 4 - FEMA Floodplain Map

1A-I *Project Need*

MetroConnects has identified thirteen (13) parcels for future development. Five (5) of the identified parcels are in the proposed development stage. MetroConnects has selected a possible route/alignment for the proposed sewer line along the Payne Branch. The goal is to provide a sewer solution to these twelve parcels. For undeveloped areas, sewer availability attracts developers because it decreases the minimum lot size and allows more dwellings to be built on the property. Additionally, sewer services benefit the health and welfare of the public and the environment and are generally preferred to private septic systems.

The construction of an appropriately sized gravity sewer system would also allow new developments in the basin to join in the growth and expansion of this portion of southern Greenville County.

1A-II *Proposed Sewer Line Route*

MetroConnects has already defined the approximate route for the proposed gravity sewer line. Weston & Sampson did not investigate alternative routes for the proposed sewer line as part of this report. The proposed sewer line is located along Payne Branch, beginning behind 1 Noah's Way, Fountain Inn, SC 29644; this location is also the location of a proposed ReWa Pump station that is under construction. The proposed sewer line will run along Payne Branch and a tributary of Payne Branch until it reaches Fairview Road, as shown in **Figure 2** above.

The proposed sewer line crosses approximately eight (8) streams including Payne Branch and also crosses multiple county and SCDOT roads; these road crossings are listed below:

- | County Roads | SCDOT Roads |
|-----------------------|------------------------------|
| • Wilson Bridge Road | • Fairview Road (Route 55) |
| • Jenkins Bridge Road | • Milacron Drive (Route 418) |

After a desktop review of available data, it is expected that there will be minimal conflicts with existing utilities. The areas with the most potential conflicts with utilities are located at the roadway crossings and when the sewer line runs along an existing roadway, which will involve coordination during design and construction with gas, telephone, water, storm sewer, and overhead electrical wires.

1A-III *Proposed Installation Methods*

Due to the cross-country nature of this proposed trunk line alignment, Weston & Sampson expects that typical open-cut methods can be used for most of the sewer line installation. It is anticipated that at the roadway crossings with Milacron Drive and Fairview Drive, SCDOT will require the sewer line to be installed utilizing a jack and bore installation method. For planning purposes, Weston & Sampson assumes a jack and bore length of 100 LF for each crossing. For a 15-inch sanitary sewer main, a 24-inch steel casing is expected. Steel casing is available in 12-, 16-, 20-, 24-, 30-inch nominal pipe sizes.

The open cut is a method of pipeline installation that consists of opening the ground surface to the designed depth for installation of the pipeline. The open-cut method is a traditional method that is widely used for the installation of different pipeline utilities.

Alternative trenchless methods will be investigated at the stream crossings if deemed necessary after consulting with the wetland consultants during the design and coordination with USACE.

1A-IV Potential Project Challenges

The potential challenges faced by this project include stream crossing, stream diversion, working in and around wetlands and the permitting process involved with this, and construction access. There will also be the challenges of excavation and haul (relocation) of native material, backfilling project trenches, and jacking and boring under roadways.

1A-V Permit considerations

The major permitting considerations that may need to be accounted for are as follows:

Wetlands and Stream Crossings

It is expected that wetlands exist near and along Payne Branch, and it is known that there will be several stream crossings. Impacts on the wetlands and existing streams will need to be considered; therefore, a delineation of existing wetlands and impacts on existing streams will need to be evaluated. Due to the likelihood of impacts to the wetlands and existing streams permitting with the US Army Corp of Engineers will be needed. It is expected that a 401 Certification will be required, and the USACOE will require either a Nationwide permit or an Individual permit. Based on a desktop review of available data, it is assumed that a Nationwide permit may be applicable for the Payne Branch sewer line project. However, an individual permit may be required depending on the impact of the existing wetlands and streams. Additionally, depending on the level of impact, wetland and stream credits may need to be purchased.

Wetland restoration and preservation credit costs can range from \$20,000 to \$25,000, and stream restoration and preservation credit costs are typically \$200 each, per the Arrowhead Farms Mitigation Bank.

It is expected that the permitting with the USACOE will be the longest lead time for the project. The Nationwide permit should take approximately 6-12 months to receive approval from the USACOE. If it is determined that an Individual permit is required, the project schedule should plan for approximately 15-24 months to receive approval from the USACOE. Any wetland and stream credits must be purchased before receiving a permit from the USACOE.

Wastewater Construction

The project shall adhere to the design and construction guidelines described in MetroConnects regulations and SCDHEC R61-67. All proposed sewer line construction will require a SCDHEC Wastewater Construction Permit. For this permit, an O&M letter will be required by SCDHEC. To close out the permit and to allow sanitary sewer flow on the sewer main, SCDHEC will require a permit to operate. To obtain the permit to operate, the engineer and owner will need to submit record drawings, testing data, and various certifications. Once a permit to operate has been received, wastewater flow can be applied to the sewer line.

It is assumed that a standard submittal will need to be made to SCDHEC for this project due to the MS4 performing the work. It is expected that approval of the Wastewater Construction Permit will take approximately 2-3 months once SCDHEC receives the complete submittal package and permit fees. For SCDHEC to provide the permit to operate, it is expected to take 2-4 weeks once SCDHEC has received all the information they need for the permit.

Land Disturbance

The project is located within Greenville County and will require a land disturbance permit. Greenville County is expected to require a Stormwater Pollution Prevention Plan (SWPPP) in addition to country-specific applications. In addition, SCDHEC NPDES coverage will be required due to the acreage of construction activities. For this coverage, a SCDHEC Notice of Intent application will be filled out and provided to Greenville County and ultimately to SCDHEC for their approval.

Greenville County's land disturbance permit is expected to take approximately 2-3 months to receive approval. However, typically counties will only issue land disturbance approvals once the county has received all permit approvals from all permitting agencies.

Roadway Encroachments

The project includes multiple roadway encroachments involving South Carolina Department of Transportation (SCDOT) and Greenville County. The proposed sewer is proposed to cross under Fairview Road (Route 55) and Milacron Drive (Route 418), Wilson Bridge Road, and Jenkins Bridge Road. It is expected that SCDOT will require these crossings to be jack and bored and to have a steel casing. At the time of this report, it is assumed that Greenville County will allow an open cut to cross any crossing within a county road. It is recommended that the engineer reach out to Greenville County early in the design process to confirm this assumption. A utility encroachment application must be filled out and submitted to both SCDOT and Greenville County.

Is expected that permitting with SCDOT could take between 3-4 months from the time SCDOT has received the Utility Encroachment submittal. For Greenville County it is expected to take between 2-3 months from the time they receive the Utility Encroachment submittal.

FEMA Floodplain

The proposed alignment along Payne Branch is also within a FEMA Floodplain zone AE without a designated floodway. According to section 44 CFR 60.3(d) of the National Flood Insurance Program (NFIP), encroachment by fill, new construction, substantial improvements, and other development is prohibited unless it is proven that no impact to the BFE would occur. Therefore, it is not anticipated that this project will impact the BFE, but considerations will be evaluated during the design phase.

There are no permits associated with evaluating the FEMA floodplain. However, a courtesy submittal should be made to the County Floodplain manager if necessary.

1A-VI Other Considerations

Public Outreach

Communication with all property owners directly impacted during construction is required to access the property. This communication can be done in multiple ways: through community meetings, project signage during construction, and electronically through websites and social media.

Traffic Impacts

Traffic impact for this project is anticipated to be minimal as 85 percent of the work is within the wooded areas. Mitigation of noise and disturbance to the abutters during construction will be addressed during the design phase.

Single-lane closures are anticipated within the roadways. One-way traffic will be allowed for local and emergency vehicles within the neighborhood.

1B Estimated Overall Cost of Qualified Expansion Project

A preliminary opinion of probable construction and engineering services cost was prepared for the proposed gravity sewer extension.

The opinion of probable construction cost (OPCC) was developed based on unit cost from a recent bid that MetroConnects provided the bid to Weston & Sampson. The Payne Branch project cost estimate assumes standard opened-cut installation and pipe bedding materials. A detail of actual pipe bedding will be evaluated during the detailed design.

Weston & Sampson developed OPCCs for the construction of the Payne Branch Basin sewer expansion, approximately 10,750 linear feet of 8-, 12- & 15-inch PVC SDR26 sewer main from Fairview Road to Noah's Way. See **Table 1** below. For a detail OPCC see **Appendix A**.

Table 1 – Opinion Of Probable Cost (Payne Branch Basin Sewer Extension)	
Item Description	Total Cost
Mobilization/Bond/Insurance (5%):	\$133,550.00
Construction Cost:	\$4,451,510.00
Construction Subtotal:	\$4,585,060.00
Engineering Services Design, Bid (10%):	\$ 458,506.00
Engineering Services Construction Admin, and full-time oversight (8%):	\$366,805.00
ROWs Legal, ROW Agent, Property Value	\$100,000.00
*TOTAL OPINION OF PROJECT COST:	\$5,510,371.00

**Cost calculation assumes standard pipe bedding. Improved pipe bedding may be required once geotechnical exploration is completed during the design phase. No easements and permit fees were included in the OPCC. Construction contingency was removed, per MetroConnects' request.*

1C Estimated Capacity of Qualified Expansion Project

Weston & Sampson followed the MetroConnects Sanitary Sewer Standards and Procedures Design Requirements Revision 6 – January 1, 2023, and SCDHEC R.61-67 to size the proposed sewer main. A peaking factor of 3.25 (based on Babbitt's formula) was used to calculate the build out conditions for the thirteen (13) parcels. The combined peaking flow to be used to size the sewer main is 1,005,493 GPD.

Weston & Sampson determined the following criteria to be appropriate:

- Buildout Conditions for the thirteen (13) parcels: 309,383 GPD (ADF)
- Peaking Factor: 3.25 (based on Babbitt's formula)
- Manning's Formula: $Q = VA = (1.49/n)(A)(r_H)^{2/3}(S)^{1/2}$

Q = Flow rate (cfs)

V = Velocity (ft/sec)

n = roughness coefficient

A = cross section area (ft²)

S = Slope (ft/ft)

r_H = hydraulic radius = A/P

P = wetted perimeter

The results indicate that an 8- 12- and 15-inch sewer line may be adequate for the projected flow during peak flow condition from the Fairview Road station to the proposed new ReWa pump station for approximately 10,750 linear feet.

At these conditions, at a minimum slope, the maximum average daily flow (ADF) pipe capacity for a 15-inch pipe flowing at 70% full is 1,486,068 GPD. Per SCDHEC R61-67, one single-family home accounts for 300 GPD in contributory loading, which is also equal to a single equivalent residential unit (ERU). Therefore, the capacity of the system is equivalent to approximately 4,953 ERUs (ADF).

PVC SDR26 is available in 4-, 6-, 8-, 10-, 12-, 15-, and 18-inch nominal pipe sizes.

A hydraulic model of the proposed sewer system has yet to be developed. Weston & Sampson recommends that a hydraulic model be developed during the project's design phase to confirm the pipe size for the proposed gravity sewer.

1D Description of Land Use Assumptions

Approximately thirteen (13) parcels are located within this natural drainage basin and would benefit from public sewer availability as they develop. **Figure 5** illustrates this delineated basin and reflects feasibility of parcel connection to the system. The drainage basins along the proposed sewer alignment are 82% zoned for residential development and 18% unzoned and are not served by public sewer. The current zoning classifications are summarized in **Table 2** below.

Table 2– Zoning Classifications	
TM# ID	Zoning
0562020101102	UNZONED
0562020100603	UNZONED
0562020101101	UNZONED
0562020100713	UNZONED
562020100201	R-12
562020100307	R-S
0562020100200	R-S
0562020100101	R-S
0567010102705	R-20
0567010102705	R-20
0567010102700	R-S
0567010102600	R-S
0566010102900	R-10

1E Estimated Number of Equivalent Residential Units (ERUs)

To estimate the total number of units of development that are reasonably expected to utilize the Qualified Expansion Project, Weston & Sampson determined the following criteria to be appropriate:

- Assumption of 1,000 GPD/acre.
- Assumption that 75% of each acre is developable.
- Calculate total flow in ERUs, where 300 GPD = 1 ERU

Using this criterion, the basin was estimated to have approximately 1,026 ERUs (309,383 GPD). The calculated parcel ERU was rounded down to the nearest whole number with a minimum of 1 ERU.

1F Allocation of ERUs to Developable Parcels

Using the same criterion as above, each Developable Parcel was assigned a total flow based on developable acreage within the drainage basin. **Figure 5** below assigns each Developable Parcel an ID label, which can then be referenced to find total ERU flow projections in **Table 3**.

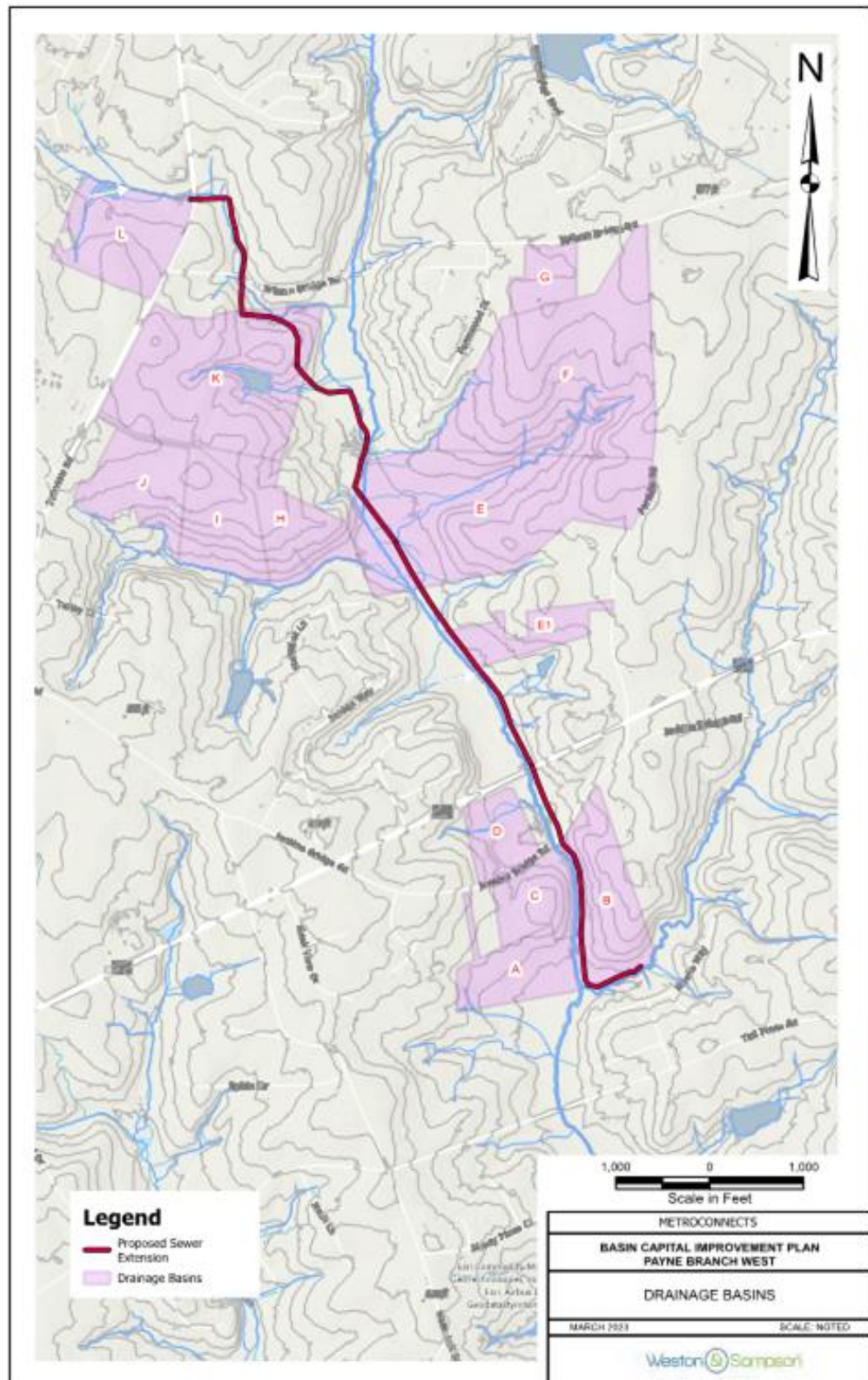


Figure 5 – Drainage Basin/Parcel ID

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Table 3 – Allocation of ERUs per Developable Parcel					
ID	TM# ID	Total Acreage	Developable Acreage	GPD	*ERU
A	0562020101102	18.83	14.12	14,123	47
B	0562020100603	28.06	21.05	21,045	70
C	0562020101101	14.87	11.15	11,153	37
D	0562020100713	12.46	9.35	9,345	31
E	0562020100201	80.86	60.65	60,645	202
E1	0562020100307	12.75	9.56	9,563	31
F	0562020100200	78.59	58.94	58,943	196
G	0562020100101	9.44	7.08	7,080	23
H	0567010102705	22.34	16.76	16,755	55
I	0567010102705	22.18	16.64	16,635	55
J	0567010102700	20.86	15.65	15,645	52
K	0567010102600	63.41	47.56	47,558	158
L	0566010102900	27.86	20.90	20,895	69
TOTAL		412.51	309.38	309,383	1,026

*The calculated parcel ERU was rounded down to the nearest whole number with a minimum of 1 ERU.

CAPITAL CONTRIBUTION BASIN REPORT

In consideration of the Basin-Specific Capital-Expansion Expenditure to fund the Qualifying Expansion Project, MetroConnects is within their authority to assess a Basin-Specific Capital Contribution to each Developable Parcel within the associated drainage basin. This section outlines the approach to allocate a Basin-Specific Capital Contribution based on a prorated percentage of related construction costs.

1G Per-ERU Capital Contribution

MetroConnects' Basin-Specific Capital-Expansion Expenditure is estimated to be \$5,510,371.00. When allocating this cost over a total of 1,026 ERUs for all remaining Developable Parcels, Staff recommends that the Basin-Specific Capital Contributions are to be assessed at \$5,370.00/ERU.

1H Allocation of Qualified Expansion Project Costs

Each parcel has been allocated a total Basin-Specific Capital Contribution by multiplying the Per-ERU Capital Contribution by the number of ERUs allocated to each Developable Parcel. A summary of these Basin-Specific Capital Contributions calculations can be found in **Table 4** below.

Table 4 – Basin-Specific Capital Contribution Calculation			
ID	ERU	Cost (\$)/ERU	Basin-Specific Capital Contribution (\$)
A	47	\$5,370.00	\$ 252,390.00
B	70	\$5,370.00	\$ 375,900.00
C	37	\$5,370.00	\$ 198,690.00
D	31	\$5,370.00	\$ 166,470.00
E	202	\$5,370.00	\$ 1,084,740.00
E1	31	\$5,370.00	\$ 166,470.00
F	196	\$5,370.00	\$ 1,052,520.00
G	23	\$5,370.00	\$ 123,510.00
H	55	\$5,370.00	\$ 295,350.00
I	55	\$5,370.00	\$ 295,350.00
J	52	\$5,370.00	\$ 279,240.00
K	158	\$5,370.00	\$ 848,460.00
L	69	\$5,370.00	\$ 370,530.00
TOTAL			\$ 5,509,620.00

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1I Statement for Allocation of Qualified Expansion Project Costs

To summarize, the Allocation of Qualified Expansion Project Costs are based on the following total cost and flows estimations:

- Total Estimated Project Cost: \$5,510,371.00
- Total Estimated Basin Flow: 1,026 ERUs
- Cost per ERU: \$5,370.00/ERU

The Basin-Specific Capital Contribution Summary can be found in **Table 5** below.

ID	TM# ID	Basin-Specific Capital Contribution (\$)
A	0562020101102	\$ 252,390.00
B	0562020100603	\$ 375,900.00
C	0562020101101	\$ 198,690.00
D	0562020100713	\$ 166,470.00
E	0562020100201	\$ 1,084,740.00
E1	0562020100307	\$ 166,470.00
F	0562020100200	\$ 1,052,520.00
G	0562020100101	\$ 123,510.00
H	0567010102705	\$ 295,350.00
I	0567010102705	\$ 295,350.00
J	0567010102700	\$ 279,240.00
K	0567010102600	\$ 848,460.00
L	0566010102900	\$ 370,530.00
TOTAL		\$ 5,509,620.00

1J Statement for Collection of Basin-Specific Capital Contribution

MetroConnects shall move forward with the collection of Basin-Specific Capital Contributions (BSCC) in any method as approved by the Commission, in accordance with the Policy for the Recoupment of Basin-Specific Capital-Expansion Expenditures. The BSCC shall be collected by MetroConnects prior to issuing the Plan Approval Letter or Connection Permit, whichever occurs first.

APPENDIX A

OPINION OR PROBABLE CONSTRUCTION COST

OPINION OF PROBABLE CONSTRUCTION COST				
Construction				
Item	Quantity	Unit	Cost/Unit	Total
Clearing and Grubbing (35' wide easement)	8.64	AC	\$10,000.00	\$86,375.11
Grassing	8.64	AC	\$6,000.00	\$51,825.07
Silt Fence	21,500	LF	\$4.00	\$86,000.00
Road & Creek Crossings	400	LF	\$2,300.00	\$920,000.00
Staking	1	LS	\$50,000.00	\$50,000.00
Erosion and Sediment Control	1	LS	\$100,000.00	\$100,000.00
8" PVC Gravity SDR-26	3,200	LF	\$160.00	\$512,000.00
12" PVC Gravity SDR-26	950	LF	\$215.00	\$204,250.00
15" PVC Gravity SDR-26	6,600	LF	\$276.00	\$1,821,600.00
4' dia MHs	17	EA	\$6,500.00	\$107,900.00
5' dia MHs	28	EA	\$8,500.00	\$238,000.00
Stone Bedding (top of pipe)	1,194	CY	\$150.00	\$179,166.67
Rock Removal	510	CY	\$175.00	\$89,185.19
Traffic Control	1	LS	\$5,200.00	\$5,200.00
Mobilization, Demobilization & Bonding (5%)	1	LS	\$133,545.06	\$133,550.00
			Total	\$4,585,060.00
Engineering				
18% of Construction				\$825,311.00
ROWs Legal, ROW Agent, Property Value)				\$100,000.00
Total Project Cost				\$5,510,371.00

Total Proposed Sewer (LF)	10,750.00
Overall Cost /Ft	\$512.59