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**AGENDA**  
**CUMBERLAND COUNTY BOARD OF COMMISSIONERS**  
**JUDGE E. MAURICE BRASWELL**  
**CUMBERLAND COUNTY COURTHOUSE- ROOM 118**  
**SEPTEMBER 15, 2025**  
**6:45 PM**

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INVOCATION - Commissioner Pavan Patel

PLEDGE OF ALLEGIANCE -

RECOGNITIONS

DSS for Social Work Simulation Training Program Awards

Cumberland County 4-H

**PUBLIC COMMENT PERIOD**

1. APPROVAL OF AGENDA
2. CONSENT AGENDA
  - A. Approval of a Proclamation Recognizing Pearce's Mill Fire Department
  - B. Approval of Proposed Lease for Communicare
  - C. Approval of the Health Departments' Delinquent Accounts to be turned over for Bad Debt Write Off
  - D. Approval to Waive the Vaccine and Administration Fee for COVID, Flu, and RSV
  - E. Approval of a Resolution Authorizing the Expenditure of Opioid Settlement Funds and Associated Budget Ordinance Amendment #B260581.
  - F. Approval of Budget Ordinance Amendment for the September 15, 2025 Board of Commissioners' Agenda
  - G. Approval of FY26 Farragut Systems Tax Software Contract Amendment
  - H. Approval of an Update to Policy No.3-3: Purchasing Policy
  - I. Approval of Crown Event Center Change Order #4
  - J. Approval of an Update to Personnel Policies 7.1, 7.2, and 7.3
  - K. Approval of an Update to Personnel Policies 7.10, 8.4, and 8.5
  - L. Approval to Pay Prior Year Invoices
  - M. Approval of Asset Management Plans for the Water and Sewer Districts
  - N. Approval of Memorandum of Understanding for Water Agreement with City of Dunn and Harnett County
  - O. Approval of Utility Service Agreement for the Kelly Hills/Slocomb Road Water and



Sewer District

- P. Approval of Request for Qualifications (RFQ) for Engineering Services for Rhodes Pond Parking and Restroom Improvements
- Q. Approval of Contract Amendment Items for Crown Coliseum Door Replacement
- R. Approval of Transfer of Governance of the FACVB to the TDA
- S. Approval of an Amendment to Rule 29 of the Board's Rules of Procedure
- T. Approval of a Policy Governing Meeting Attendance for Appointees to Boards and Commissions

3. PUBLIC HEARINGS

- A. Section 5311 Grant Application and Approval of Submission of the FY27 Applications for the Community Transportation Program (Sections: 5307, 5310, 5311, ROAP) Grant Funds

**Rezoning Cases**

- B. CASE # ZON-25-0030
- C. CASE # ZON-25-0031
- D. CASE # ZON-25-0032

4. ITEMS OF BUSINESS

- A. Consideration of Changes to the Health Department's Billing Manual for Out of County Residents
- B. Consideration of the First Amendment to the Agreement for Inmate Health Care Services by Wellpath, LLC

5. NOMINATIONS \*\*There are no Nominations for this Meeting\*\*

6. APPOINTMENTS \*\*There are no Appointments for this Meeting\*\*

**RECESS THE BOARD OF COMMISSIONERS' MEETING**

**CONVENE THE GRAY'S CREEK WATER AND SEWER DISTRICT GOVERNING BOARD MEETING**

- 7. GRAY'S CREEK WATER AND SEWER DISTRICT GOVERNING BOARD AND CONSENT AGENDA
  - A. Approval of Asset Management Plans for the Water and Sewer Districts

**ADJOURN THE GRAY'S CREEK WATER AND SEWER DISTRICT GOVERNING BOARD MEETING**

**CONVENE THE KELLY HILLS WATER AND SEWER DISTRICT GOVERNING BOARD MEETING**

- 8. KELLY HILLS WATER AND SEWER DISTRICT GOVERNING BOARD CONSENT AGENDA
  - A. Approval of Utility Service Agreement for the Kelly Hills/Slocomb Road Water and

Sewer District

- B. Approval of Asset Management Plans for the Water and Sewer Districts

**ADJOURN THE KELLY HILLS WATER AND SEWER DISTRICT GOVERNING BOARD MEETING**

**CONVENE THE NORCRESS WATER AND SEWER DISTRICT GOVERNING BOARD MEETING**

- 9. NORCRESS WATER AND SEWER DISTRICT GOVERNING BOARD CONSENT AGENDA

- A Approval of Asset Management Plans for the Water and Sewer Districts

**ADJOURN THE NORCRESS WATER AND SEWER DISTRICT GOVERNING BOARD MEETING**

**CONVENE THE OVERHILLS PARK WATER AND SEWER DISTRICT GOVERNING BOARD MEETING**

- 10. OVERHILLS PARK WATER AND SEWER DISTRICT GOVERNING BOARD CONSENT AGENDA

- A Approval of Asset Management Plans for the Water and Sewer Districts

**ADJOURN THE OVERHILLS PARK WATER AND SEWER DISTRICT GOVERNING BOARD MEETING**

**RECONVENE THE BOARD OF COMMISSIONERS MEETING**

- 11. CLOSED SESSION:

- A. Property Acquisition Pursuant to NCGS 143-318.11(a)(5)

**ADJOURN**

**REGULAR BOARD MEETINGS:**

**October 6, 2025 (Monday) 9:00 A.M.**  
**October 20, 2025 (Monday) 6:45 P.M.**

**WATCH THE MEETING LIVE**

**THIS MEETING WILL BE STREAMED LIVE THROUGH THE COUNTY'S WEBSITE, [www.cumberlandcountync.gov](http://www.cumberlandcountync.gov). LOOK FOR THE LINK AT THE TOP OF THE HOMEPAGE.**

**THE MEETING WILL ALSO BE BROADCAST LIVE ON CCNC-TV SPECTRUM CHANNEL 5**



**DEPARTMENT OF SOCIAL SERVICES**

**MEMORANDUM FOR BOARD OF COMMISSIONERS AGENDA OF SEPTEMBER 15, 2025**

**TO: BOARD OF COUNTY COMMISSIONERS**

**FROM: BRENDA REID JACKSON, SOCIAL SERVICES DIRECTOR**

**DATE: 9/15/2025**

**SUBJECT: DSS FOR SOCIAL WORK SIMULATION TRAINING PROGRAM AWARDS**

**BACKGROUND**

The North Carolina Association of County Directors of Social Services (NCACDSS) presented Cumberland County Department of Social Services the 22nd Annual Innovation Award for External and/or Non-Traditional Partnerships category for large-sized counties during the annual Social Services Institute Luncheon (SSI) held on August 7, 2025 in Hickory, N.C. Cumberland County DSS also received the North Carolina Association of County Commissioners (NCACC) Civic Excellence in Innovation Award. The award was presented at the NCACC 118th Annual Conference in Pitt County, NC on August 21, 2025

Both awards were presented to Cumberland County Department of Social Services for the Social Work Simulation Training Program. The awards recognize external and/or non-traditional partnerships that bring together organizations to solve complex problems that cannot be tackled solely by the local Social Services agency. The training program is a partnership with the University of Utah implementing cost effective, real-world virtual social work training to support staff for critical child and adult protective social work duties in the community.

Heike Hammer, DSS Performance Management Division Director, was recognized for her ability to research, seek out and form a partnership with the University of Utah. At the Social Services Institute (SSI), Heike in partnership with the University of Utah also conducted a workshop on the virtual training that was attended by 100 SSI participants. The theme of the SSI was "A Century of Lighting the Way," as the NCACDSS celebrated 100 years of the SSI.

**RECOMMENDATION / PROPOSED ACTION**

No action. Recognition of Cumberland County Department of Social Services and Heike Hammer,  
Performance Management Division Director



## COOPERATIVE EXTENSION

### MEMORANDUM FOR BOARD OF COMMISSIONERS AGENDA OF SEPTEMBER 15, 2025

**TO: BOARD OF COUNTY COMMISSIONERS**

**FROM: LISA B. CHILDERS**

**DATE: 9/15/2025**

**SUBJECT: CUMBERLAND COUNTY 4-H**

#### **BACKGROUND**

##### **Sarina Gautam – 2025 4-H YouthVoice Delegate**

Representing Cumberland County, Sarina Gautam attends Jack Britt High School and recently participated in the NC Association of County Commissioners' annual meeting in Pitt County as a 4-H YouthVoice delegate. Sarina would like to share a few remarks about her experience at YouthVoice.

##### **Eleanore Getz – Recipient of the Dr. Kim Ingold “Hands to Larger Service” 4-H Award**

We are proud to recognize Eleanore Getz, honored with the Dr. Kim Ingold Hands to Larger Service 4-H Award. Ms. Getz has dedicated more than 50 years of service to 4-H at the local, district, state, and national levels, leaving an extraordinary legacy of leadership and commitment.

##### **Alfreda Williams – 2024-2025 State 4-H Volunteer Leaders Association President**

Alfreda Williams brings more than 20 years of dedicated service as a 4-H volunteer. Over the years, she has served in many roles, and during her term as President of the State 4-H Volunteer Leaders Association, she provided training for leaders across North Carolina. She also played a vital role in planning and guiding the this year's statewide NC 4-H Volunteer Leaders Association Conference.

#### **RECOMMENDATION / PROPOSED ACTION**

Please recognize individuals for their accomplishments.



**CLERK TO THE BOARD OF COMMISSIONERS**

**MEMORANDUM FOR BOARD OF COMMISSIONERS AGENDA OF SEPTEMBER 15,  
2025**

**TO: BOARD OF COUNTY COMMISSIONERS**

**FROM: ANDREA TEBBE, CLERK TO THE BOARD**

**DATE: 7/7/2025**

**SUBJECT: APPROVAL OF A PROCLAMATION RECOGNIZING PEARCE'S MILL  
FIRE DEPARTMENT**

**BACKGROUND**

A request was received for a proclamation recognizing Pearce's Mill Fire Department.

**RECOMMENDATION / PROPOSED ACTION**

Respectfully request approval of the proclamation.

**ATTACHMENTS:**

Description

Pearce's Mill Proclamation

Type

Backup Material

 Proclamation

WHEREAS, chartered on October 6, 1955, Pearce’s Mill Fire Department was established to address a critical need for fire protection in Cumberland County; and

WHEREAS, under the leadership of Fire Chief Perlie A Reeves, the department first operated from a modest shed in Massey Hill with a 1946 American LaFrance Ford fire engine that had been donated; and

WHEREAS, over the years, Pearce’s Mill Fire Department has expanded services to include EMS calls, and currently handles 1600-1800 calls annually; and

WHEREAS, firefighters and emergency services personnel play an essential role in the protection of lives and property in our local community; and

WHEREAS, Pearce’s Mills Fire Department is a true representation of the mission statement “It shall be the drive of determination, knowledge, skills and professionalism that will help this department to protect its citizens and visitors from any fire, medical, and other disasters whether it is natural, created, or assisted by mankind”; and

WHEREAS, Pearce’s Mill has provided exemplary service to the Cumberland County Community for the past 70 years.

NOW, THEREFORE BE IT RESOLVED, We, the Cumberland County Board of Commissioners value the devotion of our firefighters and emergency services personnel and proclaim October 4, 2025 in honor of Pearce’s Mill Fire Department.

Adopted this 15<sup>th</sup> day of September 2025.

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Kirk J. deViere, Chairman  
Cumberland County Board of Commissioners



**ASSISTANT COUNTY MANAGER COMMUNITY SUPPORT SERVICES**

**MEMORANDUM FOR BOARD OF COMMISSIONERS AGENDA OF SEPTEMBER 15, 2025**

**TO: BOARD OF COUNTY COMMISSIONERS**

**FROM: HEATHER SKEENS, ASSISTANT COUNTY MANAGER**

**DATE: 9/15/2025**

**SUBJECT: APPROVAL OF PROPOSED LEASE FOR COMMUNICARE**

**BACKGROUND**

The lease agreement with Cumberland County Communicare, Inc., ("Communicare") expired June 30, 2024, and was extended through September 2024. Communicare has continued as a holdover tenant under the same terms. This item was presented at the May 6, 2025 Finance Committee meeting, the committee unanimously voted to move the item and the Resolution of Intent to Lease to the May 19, 2025 Consent Agenda with the following terms:

Premises: 14,494 square feet of office space and joint use of parking lot at 109 Bradford Avenue

Lessee: Cumberland County Communicare, Inc., a non-profit corporation

Use: office space for administering social services/juvenile prevention programs

Term: begin date not established, consensus by Board of Commissioners at the September 2, 2025 Board of Commissioners Meeting to begin October 1, 2025 - June 30, 2027

Rent: \$108,705 annually (\$7.50 per square foot)

Utilities: provided by Lessor

Janitorial: provided by Lessor

Early Termination Provision: none

Renewal Terms: none

G.S. 160A-272(a1) requires 30 days' public notice of intent be given before the board authorizes this lease at a regular meeting.

The Board of Commissioners adopted the Resolution of Intent to Lease at the May 19, 2025 Board of Commissioners meeting. Publication of the Intent to lease was completed.



**RECOMMENDATION / PROPOSED ACTION**

Staff request the Board of Commissioners approve the lease and authorize the County Manager to sign the lease.

**ATTACHMENTS:**

Description	Type
Proposed Lease - Communicare	Backup Material
Affidavit	Backup Material

STATE OF NORTH CAROLINA  
COUNTY OF CUMBERLAND

LEASE AGREEMENT

Publication of Notice of Intent: May 23, 2025

Approved by the Board of Commissioners \_\_\_\_\_

This Lease Agreement, made and entered to be effective October 1, 2025, by and between the County of Cumberland, a body politic and corporate of the State of North Carolina, hereinafter referred to as "LESSOR", and Cumberland County Communicare, Inc., a non-profit North Carolina corporation with a place of business at 109 Bradford Avenue, Fayetteville, North Carolina, hereinafter referred to as "LESSEE".

WITNESSETH:

THAT for and in consideration of the mutual promises contained herein and subject to the terms and conditions hereinafter set forth or referred to, LESSOR does hereby lease and demise to LESSEE that certain space consisting of 14,494 square feet of office space located at 109 Bradford Avenue, Fayetteville, NC, and being the same space already occupied by Lessee.

TO HAVE AND TO HOLD said property, together with all privileges and appurtenances thereto belonging including easements of ingress and egress, to the said LESSEE, under the terms and conditions hereinafter set forth:

1. TERM: The Lease shall commence October 1, 2025, and continue to June 30, 2027.
2. RENT: The rent shall be at an annual rate of ONE HUNDRED EIGHT THOUSAND, SEVEN HUNDRED FIVE DOLLARS (\$108,705), calculated at \$7.50 per square foot. The rent shall be payable in quarterly installments of TWENTY SEVEN THOUSAND ONE HUNDRED SEVENTY SIX DOLLARS and TWENTY-FIVE CENTS (\$27,176.25) beginning on October 1, 2025, and each quarter thereafter.
3. DEPOSIT: LESSOR shall not require a security deposit from LESSEE.
4. SERVICES: LESSOR covenants and agrees to furnish the leased premises with electrical service suitable for the intended use as general office space (including dedicated ground circuits for computer operation), including fluorescent tube and ballast replacements, heating and air conditioning for the comfortable use and occupancy of the leased premises, plus supplying and maintaining building common areas and restroom facilities, including hot and cold water, and sewage disposal in the building in which the leased premises are located. If the premises have a security system, Lessor will maintain it in good working order.
5. PARKING LOT: LESSEE shall have the right of shared use and enjoyment of the building's parking areas at no charge to the LESSEE.
6. ASSIGNMENT OR SUB-LEASE: LESSEE shall not assign this lease or sublet the leased premises or any part thereof, without the written consent of LESSOR. Such written consent will not be unreasonably withheld by LESSOR.

7. USE AND POSSESSION: It is understood that the leased premises are to be used for general office purposes and for no other purposes without prior written consent of LESSOR. LESSEE shall not use the leased premises for any unlawful purpose or so as to constitute a nuisance. LESSEE shall return the premises to LESSOR at the termination hereof in as good condition and state of repair as the same was at the commencement of the term hereof, except for loss, damage, or depreciation occasioned by reasonable wear and tear and damage by accidental fire or other casualty.
8. DESTRUCTION OF PREMISES: In the event that said building is damaged by fire, windstorm, or an act of God, so as to materially affect the use of the building and premises, this Lease shall automatically terminate as of the date of such damage or destruction, provided, however, that if such building and premises are repaired so as to be available for occupancy and use within sixty (60) days after said damage, then this lease shall not terminate, provided further that LESSEE shall pay no rent during the period of time that the premises are unfit for occupancy and use.
9. CONDEMNATION: If during the term of this lease, the whole of the leased premises, or such portion thereof as will make the leased premises unusable for the purpose leased, be condemned by public authority for public use, then in either event, the term hereby granted shall cease and come to an end as of the date of the vesting of title in such public authority, or when possession is given to such public authority, whichever event occurs last. Upon such occurrence the rent shall be apportioned as of such date and any rent paid in advance at the due date for any space condemned shall be returned to LESSEE. LESSOR shall be entitled to all compensation for such taking except for any statutory claim of LESSEE for injury, damage or destruction of LESSEE'S business accomplished by such taking. If a portion of the leased premises is taken or condemned by public authority for public use so as not to make the remaining portion of the leased premises unusable for the purposes leased, this lease will not be terminated but shall continue. In such case, the rent shall be equitably and fairly reduced or abated for the remainder of the term in proportion to the area of the leased premises taken. In no event shall LESSOR be liable to LESSEE for any interruption of business, diminution in use or for the value of any unexpired term of this lease.
10. INTERRUPTION OF SERVICE: LESSOR shall not be or become liable for damages to LESSEE alleged to be caused or occasioned by or in any way connected with or the result of any interruption in service, or defect or breakdown from any cause whatsoever in any of the electric, water, plumbing, heating, or air conditioning systems; however, upon receipt of actual notice of any such interruption, defect or breakdown, LESSOR will take such steps as are reasonable to cause such interrupted service to be restored as soon as possible.
11. LESSOR'S RIGHT TO INSPECT: LESSOR shall have the right, at reasonable times during the term of this lease, to enter the leased premises for the purposes of examining and inspecting same and of making such repairs or alterations therein as the LESSOR shall deem necessary.
12. INSURANCE: LESSOR will be responsible for insuring its interest in the building and LESSEE will be responsible for insuring its personal property within the leased premises. LESSEE shall at all times during the term hereof, at its own expense, maintain and keep in force a policy or policies of general and premises liability insurance against claims for bodily injury, death or property damage occurring in, on, or about the demised premises in a coverage amount of no less than \$500,000 per occurrence and naming LESSOR as an additional named insured.
13. MAINTENANCE OF STRUCTURE: LESSOR shall be responsible for the maintenance and good condition of the roof and supporting walls of the building leased hereunder and for maintenance in good working condition of all mechanical equipment (including but not limited to heating and air

conditioning equipment) installed and provided by the LESSOR. LESSEE shall be responsible for the maintenance in good condition of interior surfaces, floors, doors, ceilings, and similar items except that the LESSEE shall not be responsible for fair wear and tear or for major damage or destruction of such walls, grounds, surfaces, or any structural component of the premises.

14. HEATING AND AIR CONDITIONING; JANITORIAL SERVICES: LESSOR shall provide and maintain heating and air conditioning in good working condition. Temporary stoppages of heating services for the purposes of maintaining or repairing heating equipment and facilities shall not constitute a default by LESSOR in performance of this Lease, provided that LESSOR exercises due diligence and care to accomplish such maintenance and repair and such stoppages do not continue to an unreasonable length of time. LESSOR shall be responsible for commercially reasonable janitorial service and trash removal from leased premises.
  
15. PERSONAL PROPERTY AND IMPROVEMENTS: Any additions, fixtures, or improvements placed or made by LESSEE in or upon the leased premises, which are permanently affixed to the leased premises and which cannot be removed without unreasonable damage to said premises, shall become the property of LESSOR and remain upon the premises as a part thereof upon the termination of this lease. All other additions, fixtures, or improvements to include trade fixtures, office furniture and equipment, and similar items, which can be removed without irreparable damage to the leased premises, shall be and remain the property of LESSEE and may be removed from the leased premises by LESSEE upon the termination of this lease. LESSEE shall bear the expense of any repairs of the leased premises, other than fair wear and tear caused by such removal.
  
16. TAXES: LESSEE will list and pay all business personal property taxes, if any, on its personal property located within the demised premises.
  
17. NOTICE: Any notices to be given by either party to the other under the terms of this Agreement shall be in writing and shall be deemed to have been sufficiently given if delivered by hand, with written acknowledgement of receipt, or mailed by certified mail, return receipt requested, or delivered by receipt controlled express service, to the other party at the following addresses or to such other addresses as either party hereafter from time to time designates in writing to the other party for the receipt of notice:

LESSEE:  
Cumberland County, Communicare, Inc.  
Attn: Executive Director  
P.O. Box 87830  
Fayetteville, NC 28304-0030

LESSOR:  
Cumberland County  
Attn: County Manager  
P. O. Box 1829  
Fayetteville, NC 28302-1829

Such notice, if mailed, shall be deemed to have been received by the other party on the date contained in the receipt.

18. ORDINANCES AND REGULATIONS: LESSEE hereby covenants and agrees to comply with all the rules and regulations of the Board of Fire Underwriters, officers and boards of the city, county or state having jurisdiction over the leased premises, and with all ordinances and regulations or governmental authorities wherein the leased premises are located, at LESSEE'S sole cost and expense, but only insofar as any of such rules, ordinances, and regulations pertain to the manner in which LESSEE shall use the leased premises, the obligation to comply in every other case, and also all cases where such rules, regulations, and ordinances require repairs, alterations, changes or additions to

the building (including the leased premises) or building equipment, or any part of either, being hereby expressly assumed by LESSOR and LESSOR covenants and agrees promptly and duly to comply with all such rules, regulations and ordinances with which LESSEE has not herein expressly agreed to comply.

19. INDEMNIFICATION: LESSEE will indemnify LESSOR and save it harmless from and against any and all claims, actions, damages, liability and expense in connection with loss of life, personal injury or damage to property occurring in or about, or arising out of, the demised premises, and occasioned wholly or in part by any act or omission of LESSEE, its agents, licensees, concessionaires, customers or employees. In the event LESSOR shall be made a party to any litigation, commenced by or against LESSEE, its agents, licensees, concessionaires, customers or employees, then LESSEE shall protect and hold LESSOR harmless and shall pay all costs, expenses and reasonable attorneys' fees incurred or paid by LESSOR in connection with such litigation, unless such litigation arises out of an injury or injuries claimed as a result of some defective condition existing on the premises for which LESSOR has responsibility to maintain or repair under the terms of this lease and to which LESSOR has been put on notice by LESSEE.
20. REPAIR: The premises shall meet all requirements necessitated by the ADA and OSHA Inspection Guidelines. Should it be necessary during the term of this lease to repair the roof structure; exterior walls; or structural members or the building because of defect or failure, LESSOR shall make such repairs or replacements at its sole cost and expense, within a reasonable time after demand is made in writing to LESSOR to do so by LESSEE. LESSOR shall keep the premises, including all improvements, in good condition and repair and in a good, clean, and safe condition always during the term of this lease.
21. WARRANTY: LESSOR warrants that all plumbing, electrical, heating, and air conditioning units and facilities are in good working order at the commencement of this lease.
22. REMEDIES: If either party shall be in default with respect to any separate performance hereunder and shall have remained in default for ten (10) days after receipt of notice of default, there shall be a breach of this lease. The defaulting party shall remain fully liable for performing its remaining obligations under this lease. The defaulting party shall be liable for reasonable damages as provided by law and for all costs and expenses, including reasonable attorney's fees, incurred by the other party on account of such default, except as otherwise provided herein. Waiver by either party of any breach of the other's obligation shall not be deemed a waiver of any other or subsequent breach of the same obligation. No right or remedy of any party is exclusive of any other right or remedy provided or permitted by law or equity, but each shall be cumulative of every other right or remedy given hereunder or now or hereafter existing at law or in equity or by state or otherwise any may be enforced concurrently or from time to time.
23. SUCCESSORS AND ASSIGNS: This lease shall bind and inure to the benefit of the successors, assigns, heirs, executors, administrators, and legal representatives of the parties hereto.
24. ALTERATIONS AND PARTITIONS: LESSEE may make reasonable alterations and partitions to the interior of the premises to enhance their suitability for the uses contemplated in this lease agreement, provided prior written approval of the graphic plan for alterations and partitions shall be obtained from LESSOR, who shall not unreasonably withhold such approval.
25. UTILITIES: Electrical power, water, and sewer services to serve the leased premises shall be at LESSOR'S expense. LESSOR shall not be liable for any failure of any public utility to provide utility

services over such connections and such failure shall not constitute a default by LESSOR in performance of this Lease. LESSEE shall be prudent in its use of utilities and compliant with the LESSOR'S practices and policies related to utilities.

26. RISKS OF LOSS: As between LESSOR and LESSEE, any risk of loss of personal property placed by LESSEE in or upon the leased premises shall be upon, and a responsibility to, the LESSEE regardless of the cause of such loss.

27. DESTRUCTION OF PREMISES: If the leased premises should be completely destroyed or damaged so that more than fifty percent (50%) of the leased premises are rendered unusable, this lease shall immediately terminate as of the date of such destruction or damage.

28. TERMINATION: If LESSEE shall fail to pay any installment of rent when due and payable as heretofore provided or fail to perform any of the terms and conditions heretofore set forth and shall continue in such default for a period of fifteen (15) days after written notice of default, LESSOR, at its discretion, may terminate this lease and take possession

of the premises without prejudice to any other remedies allotted by law. If LESSOR shall fail to perform any of the terms and conditions heretofore set forth and shall continue in such default fifteen (15) days after written notice of such default, LESSEE, at its discretion may terminate this lease and vacate the leased premises without further obligation to pay rent as theretofore provided from date of said termination, without prejudice to any other remedies provided by law.

29. OCCUPANCY AND QUIET ENJOYMENT: LESSOR promises that LESSEE shall have quiet and peaceable possession and occupancy of the above leased premises in accordance with the terms set forth herein, and that LESSOR will defend and hold harmless LESSEE against any and all claims or demands of others arising from LESSEE'S occupancy of the premises or in any manner interfering with LESSEE'S use and enjoyment of said premises.

30. MODIFICATION: This Agreement may be modified only by an instrument duly executed by the parties or their respective successors.

31. MERGER CLAUSE: This instrument is intended by the parties as a final expression of their agreement and as a complete and exclusive statement of its terms. No course of prior dealings between the parties and no usage of trade shall be relevant or admissible to supplement, explain, or vary any of the terms of this agreement. Acceptance of, or acquiescence in, a course of performance rendered under this, or any prior agreement shall not be relevant or admissible to determine the meaning of this agreement even though the accepting or acquiescing party has knowledge of the nature of the performance and an opportunity to make objection. No representations, understandings or agreements have been made or relied upon in the making of this agreement other than those specifically set forth herein.

32. FURTHER CONSIDERATION: LESSOR acknowledges that LESSEE has continued occupancy of the premises as a holdover tenant since the expiration of the prior lease between the parties June 30, 2024, and any extensions thereof while determining whether to enter this lease at the new rental rate. LESSOR consented to this holdover tenancy and agrees that LESSEE'S occupancy during the holdover tenancy was to be in accordance with the rental rate and other applicable terms in the lease which expired June 30, 2024.

IN WITNESS WHEREOF, LESSOR and LESSEE have caused this lease agreement to be executed

in duplicate originals by their duly authorized officers, the date shown by each signature.

LESSOR: County of Cumberland

By:

\_\_\_\_\_  
Clarence Grier, County Manager

Date: \_\_\_\_\_

ATTEST:

\_\_\_\_\_  
Andrea Tebbe, Clerk to the Board

LESSEE: Cumberland County Communicare, Inc.

By:

Sarah Hallock

Sarah Hallock, Executive Director

Date: \_\_\_\_\_

9.3.25

ATTEST:

Myra Cant  
Corporate Secretary

APPROVED FOR LEGAL SUFFICIENCY  
UPON FORMAL EXECUTION BY ALL PARTIES

BY: \_\_\_\_\_

9/4/25  
County Attorney's Office

# LOCALIQ

StarNews | The Dispatch | Times-News  
Sun Journal | The Daily News | The Star  
The Free Press | Gaston Gazette  
The Fayetteville Observer

PO Box 631697 Cincinnati, OH 45263-1697

## AFFIDAVIT OF PUBLICATION

County Attorney's Office/Legal Dept.  
Cumb Co Attorney'S, Myra Brooks  
Po Box 1829

Fayetteville NC 28302-1829

STATE OF NORTH CAROLINA, COUNTY OF CUMBERLAND

The Fayetteville Observer, a newspaper distributed in the county of Cumberland, published in the City of Fayetteville, County of Cumberland, State of North Carolina printed and published and personal knowledge of the facts herein state and that the notice hereto annexed was Published in said newspapers in the issues dated on:

05/23/2025

and that the fees charged are legal. The Fayetteville Observer was a newspaper meeting all the requirements and qualifications prescribed by Sec. No. 1-597 G.S. of N.C.  
Sworn to and subscribed before on 05/23/2025



Legal Clerk



Notary, State of WI, County of Brown

10-25-26

My commission expires

Publication Cost:	\$119.45	
Tax Amount:	\$0.00	
Payment Cost:	\$119.45	
Order No:	11334508	# of Copies:
Customer No:	744407	0
PO #:	LWLM0301938	

**THIS IS NOT AN INVOICE!**

*Please do not use this form for payment remittance.*

... RYAN SPELLER  
Notary Public  
State of Wisconsin



PUBLIC NOTICE OF  
PROPOSED LEASE  
PURSUANT TO G.S. 160A-  
272

TAKE NOTICE that the Cumberland County Board of Commissioners has found that the real property described herein will not be needed for government purposes for the term of the lease described herein and that the Board intends to adopt a resolution at its meeting to be held on August 11, 2025, approving the lease of approximately 14,494 square feet of space located at 109 Bradford Avenue, Fayetteville, NC, to the Cumberland County Commu-nicare, Inc., for a term of three (3) years commenc-ing on October 1, 2024 at an annual rate of ONE HUNDRED EIGHT THOU-SAND SEVEN HUNDRED AND FIVE DOLLARS (108,705).

Heather Skeens  
Assistant County Manager  
for Community Support  
May 23 2025  
LWLM0301938



**DEPARTMENT OF PUBLIC HEALTH**

**MEMORANDUM FOR BOARD OF COMMISSIONERS AGENDA OF SEPTEMBER 15, 2025**

**TO: BOARD OF COUNTY COMMISSIONERS**

**FROM: DR. JENNIFER GREEN, PUBLIC HEALTH DIRECTOR**

**DATE: 8/21/2025**

**SUBJECT: APPROVAL OF THE HEALTH DEPARTMENTS' DELINQUENT ACCOUNTS TO BE TURNED OVER FOR BAD DEBT WRITE OFF**

**BACKGROUND**

At the Board of Health meeting on August 19, 2025, the Board approved writing off a total of \$10,877.98 as bad debts. The bad debt accounts with balances of \$50.00 or higher, are sent to the North Carolina Debt Setoff Clearinghouse. This program can attach to a debtors' North Carolina State Income Tax Refund and/or Education lottery winnings for payment of bad debts. The accounts with balances under \$50.00 will continue to be worked for collection through our in-house collection efforts. The accounts listed are 90 days or older as of 6/30/2025. This write-off of bad debts is compliant with the Cumberland County Health Department's Debt Collection Policy 02-03 to write off bad debts every quarter.

This item was presented at the Board of Commissioners Finance Committee on September 8, 2025 and approved to be moved as a Consent Agenda Item and placed on the September 15, 2025 Board of Commissioners meeting.

**RECOMMENDATION / PROPOSED ACTION**

Approve write-off of \$10,877.98 bad debts to the North Carolina Debt Set-Off Program.

**ATTACHMENTS:**

Description

Bad Debt Write Off # 76

Type

Backup Material

**CUMBERLAND COUNTY DEPARTMENT  
OF PUBLIC HEALTH  
DELINQUENT ACCOUNTS TO BE TURNED OVER FOR COLLECTION  
BAD DEBT WRITE OFF #76**

**July 28, 2025**

PROGRAM	AMOUNT
ADULT HEALTH	\$50.00
CHILD HEALTH CLINIC	\$921.34
FAMILY PLANNING CLINIC	\$4,714.02
IMMUNIZATIONS	\$4,495.02
MATERNAL HEALTH CLINIC	\$697.60
<b>TOTAL</b>	<b>\$10,877.98</b>

**All bad debt accounts with balances of \$50.00 or higher, will be sent to the North Carolina Debt Set-Off Program, which can attach a debtor's State Income Tax Refund for payment of bad debts.**

**The above accounts are 90 days old or older as of 6/30/2025**



**ASSISTANT COUNTY MANAGER COMMUNITY SUPPORT SERVICES**

**MEMORANDUM FOR BOARD OF COMMISSIONERS AGENDA OF SEPTEMBER 15, 2025**

**TO: BOARD OF COUNTY COMMISSIONERS**

**FROM: DR. JENNIFER GREEN, PUBLIC HEALTH DIRECTOR**

**DATE: 9/15/2025**

**SUBJECT: APPROVAL TO WAIVE THE VACCINE AND ADMINISTRATION FEE FOR COVID, FLU, AND RSV**

**BACKGROUND**

The Cumberland County Department of Public Health (CCDPH) provides flu, COVID, and RSV vaccines to the citizens of Cumberland County. Fees are recommended for each vaccine by considering the acquisition cost of the vaccine, the Medicaid rate, 3rd Party rates and the type of vaccine being administered. After a review of the flu, COVID, and RSV vaccines to be administered during the 2025-2026 season, it has been determined that the fees did not need to be changed this year. Historically, we have waived the administration fee for uninsured and underinsured adults for flu, COVID, and RSV. The proposed administration fee for 1 vaccination is \$24. For the 2025-2026 respiratory virus season, the Health Department is requesting to be able to provide flu, COVID, and RSV vaccines at no cost to them uninsured and underinsured.

Adults (19 and older) enrolled in the Be Smart Family Planning program and uninsured pregnant women served in our maternity clinic are already eligible to receive COVID, flu, and RSV vaccinations at no cost or on a sliding fee scale. Children aged 18 and under are also able to receive the vaccines at no cost through the Vaccines for Children program.

Waiving the vaccine and administration fees for uninsured and underinsured adults will reduce barriers to receiving these critical vaccines during respiratory virus season. The Board of Health recommended approval to waive the vaccine and administration fees during their meeting on August 18, 2025. We expect COVID, flu, and RSV vaccines to be available at the health department beginning October 2025.

This item was presented to the Finance Committee on September 8, 2025 and with the following motion: Item moved to September 11, 2025 Board of Commissioners Agenda Session as a Consideration of Item of Business. This item was heard at the September 11, 2025 Board of Commissioners Agenda session and

approved to move to the September 15, 2025 Board of Commissioners meeting as a Consent Agenda Item.

**RECOMMENDATION / PROPOSED ACTION**

Approve waiving the vaccine administration fee for COVID, flu, and RSV vaccine for uninsured or underinsured adults (RSV vaccines for adults 60 and older).



**ASSISTANT COUNTY MANAGER COMMUNITY SUPPORT SERVICES**

**MEMORANDUM FOR BOARD OF COMMISSIONERS AGENDA OF SEPTEMBER 15, 2025**

**TO: BOARD OF COUNTY COMMISSIONERS**

**FROM: DR. JENNIFER GREEN, PUBLIC HEALTH DIRECTOR**

**DATE: 9/15/2025**

**SUBJECT: APPROVAL OF A RESOLUTION AUTHORIZING THE EXPENDITURE OF OPIOID SETTLEMENT FUNDS AND ASSOCIATED BUDGET ORDINANCE AMENDMENT #B260581.**

**BACKGROUND**

The North Carolina Department of Justice helped negotiate more than \$50 billion in national settlements and bankruptcy resolutions with opioid companies, agreements that are helping to bring desperately needed resources to communities harmed by the opioid overdose epidemic. A Memorandum of Agreement (MOA) between the State and local government directs how opioid settlement funds are distributed and used in our state. Cumberland County is set to receive more than \$30,822,230 over 18 years.

In Fall 2024, the Cumberland County Commissioners approved a recommendation to approve funding for Family Drug Treatment Court to support Option A strategies to be determined at a future date based on the initial program implementation. The Justice Services Director has identified the following strategies that need support: Recovery Housing (\$19,200) and Criminal Justice Diversion (\$460,800). Funding supports a full time Court Coordinator. Cumberland County Department of Public Health in collaboration with the Cumberland-Fayetteville Opioid Response Team (C-FORT) completed Sequential Intercept Model (SIM) Mapping Workshop on January 30, 2025. In part, the purpose of a SIM Mapping Workshop was to plot resources and gaps across the SIM and to identify local substance use and behavioral health services to support diversion from the justice system. Among the identified gaps in services was training on Medication Assisted Treatment for health care providers and first responders and Crisis Intervention Training for first responders interacting with individuals with substance use disorder. This aligns with Option B Strategy, K,1 (provide funding for staff training or networking programs and services to improve the capability of government, community, and not-for-profit entities to abate the opioid crisis). The funding will be available pending approval of our Opioid Settlement Funds Strategic Planning Report (expected September 2025). These funds (\$98,420) were already approved in the adopted FY 25-26 budget process.

Cumberland Communicare is requesting funding to support for the following Option A Strategies: Early Intervention (\$17,346) and Re-Entry Services (\$42,654). Communicare will deploy a certified staff trainer to provide Mental Health First Aid (MHFA) to a broad range of community partners. The project aims to equip frontline individuals—teachers, juvenile justice staff, courts, Department of Social Services staff, Juvenile Crime Prevention Council (JCPC) funded programs, Managed Care Organizations (MC)) staff, churches, community providers, and parents/guardians—with the knowledge and skills to recognize early signs of substance use and mental health crises, and to respond effectively. Communicare will reduce relapse, recidivism, and overdose deaths by providing coordinated reentry services for justice involved individuals with Opioid Use Disorder, Substance Use Disorder, and mental illness through intensive care navigation and wraparound supports.

A Local Spending Authorization Resolution and a Budget Ordinance amendment are required to utilize opioid settlement funds. The Local Spending Authorization Resolution is organized by Option A as required by the NC MOA.

This item was presented to the Board of Commissioners Finance Committee on September 8, 2025 and unanimously approved to be placed on the September 15, 2025 Board of Commissioners meeting as a Consent Agenda Item.

**RECOMMENDATION / PROPOSED ACTION**

Approve Local Spending Authorization Resolution for \$638,420 in support of Option A and B projects and associated Budget Ordinance Amendment #BR260581.

**ATTACHMENTS:**

Description	Type
Resolution	Backup Material

**A RESOLUTION BY THE COUNTY OF CUMBERLAND  
TO DIRECT THE EXPENDITURE OF OPIOID SETTLEMENT FUNDS**

**WHEREAS** Cumberland County has joined national settlement agreements with companies engaged in the manufacturing, distribution, and dispensing of opioids.

**WHEREAS** the allocation, use, and reporting of funds stemming from these national settlement agreements and bankruptcy resolutions (“Opioid Settlement Funds”) are governed by the Memorandum of Agreement Between the State of North Carolina and Local Governments on Proceeds Relating to the Settlement of Opioid Litigation (“MOA”), the Supplemental Agreement for Additional Funds from Additional Settlements of Opioid Litigation (“SAAF”), and SAAF-2, and SAAF-3;

**WHEREAS** Cumberland County has received Opioid Settlement Funds pursuant to these national settlement agreements and deposited the Opioid Settlement Funds in a separate special revenue fund as required by section D of the MOA;

**WHEREAS** section E.6 of the MOA states that, before spending opioid settlement funds, the local government’s governing body must adopt a resolution that:

- (i) indicates that it is an authorization for expenditure of opioid settlement funds; and,
- (ii) states the specific strategy or strategies the county or municipality intends to fund pursuant to Option A or Option B, using the item letter and/or number in Exhibit A or Exhibit B to identify each funded strategy; and,
- (iii) states the amount dedicated to each strategy for a specific period of time.

**NOW, THEREFORE BE IT RESOLVED**, in alignment with the NC MOA, SAAF, and SAAF-2, and SAAF-3 Cumberland County authorizes the expenditure of opioid settlement funds as follows:

1. First strategy authorized
  - a. Name of strategy: Recovery Housing Support
  - b. Strategy is included in Exhibit: A
  - c. Item letter and/or number in Exhibit A or Exhibit B to the MOA: 4
  - d. Amount authorized for this strategy: \$19,200
  - e. Period of time during which expenditure may take place: Start date: October 1, 2025 through End date: December 31, 2029
  - f. Description of the program, project, or activity: To provide housing for individuals enrolled in Family Drug Treatment court
  - g. Provider: Cumberland County Justice Services
2. Second strategy authorized
  - a. Name of strategy: Criminal Justice Diversion
  - b. Strategy is included in Exhibit: A
  - c. Item letter and/or number in Exhibit: A or Exhibit B to the MOA: 10
  - d. Amount authorized for this strategy: \$460,800
  - e. Period of time during which expenditure may take place:



Start date: October 1, 2025 through End date: December 31, 2029

- f. Description of the program, project, or activity: Family Drug Treatment Court provides parents/guardians with an opportunity for sobriety and support to diversion from the criminal justice system.
        - g. Provider: Cumberland County Justice Services
3. Third authorized strategy
  - a. Name of strategy: Early Intervention
  - b. Strategy is included in Exhibit: 6
  - c. Item letter and/or number in Exhibit: A or Exhibit B to the MOA:
  - d. Amount authorized for this strategy: \$17,346
  - e. Period of time during which expenditure may take place:

Start date: January 1, 2026 through End date: December 31, 2026
  - f. Description of the program, project, or activity: Cumberland County Communicare Inc., will deploy a certified staff trainer to provide Mental Health First Aid (MHFA) to a broad range of community partners. The project aims to equip frontline individuals—teachers, juvenile justice staff, courts, Department of Social Services (DSS), Juvenile Crime Prevention Council-funded programs, Managed Care Organization staff, churches, community providers, and parents/guardians—with the knowledge and skills to recognize early signs of substance use and mental health crises, and to respond effectively.
  - g. Provider: Cumberland County Communicare
4. Fourth authorized strategy
  - a. Name of strategy: Re-Entry Services
  - b. Strategy is included in Exhibit: A
  - c. Item letter and/or number in Exhibit A or Exhibit B to the MOA: 12
  - d. Amount authorized for this strategy: \$42,654
  - e. Period of time during which expenditure may take place:

Start date: January 1, 2026 through End date: December 31, 2026
  - f. Description of the program, project, or activity: Cumberland County Communicare Inc., will provide coordinated reentry services for justice-involved individuals with OUD, SUD, and mental illness through intensive care navigation and wraparound supports
  - g. Provider: Cumberland County Communicare Inc.,
5. Fifth authorized strategy
  - a. Name of strategy: Provide funding for staff training or networking programs and services to improve the capability of government, community, and not-for-profit entities to abate the opioid crisis.
  - b. Strategy is included in Exhibit: B
  - c. Item letter and/or number in Exhibit A or Exhibit B to the MOA: K,1
  - d. Amount authorized for this strategy: \$98,420
  - e. Period of time during which expenditure may take place:

Start date: October 1, 2025, through End date: December 31, 2026
  - f. Description of the program, project, or activity: Cumberland County and Alliance Health will collaborate to support hiring of a Crisis Intervention Training (CIT) program that will support training law enforcement and other first responders in effectively engaging with individuals with Opioid Use Disorder (OUD) or any co-occurring Substance Use Disorder (SUD) or mental health condition
  - g. Provider: Cumberland County and Alliance Health

The total dollar amount of Opioid Settlement Funds appropriated across the above named and authorized strategies is \$638,420.00

Adopted this 15th day of September, 2025.

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Kirk DeViere

Cumberland County Board of Commissioners

ATTEST:

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Andrea Tebbe, Clerk to the Board

**COUNTY SEAL**



**BUDGET AND PERFORMANCE DEPARTMENT**

**MEMORANDUM FOR BOARD OF COMMISSIONERS AGENDA OF SEPTEMBER 15, 2025**

**TO: BOARD OF COUNTY COMMISSIONERS**

**FROM: DEBORAH W. SHAW, CHIEF BUDGET AND PERFORMANCE OFFICER**

**DATE: 9/15/2025**

**SUBJECT: APPROVAL OF BUDGET ORDINANCE AMENDMENT FOR THE SEPTEMBER 15, 2025 BOARD OF COMMISSIONERS' AGENDA**

**BACKGROUND**

**General Fund 101**

**1) Innovation and Technology Services – Budget Ordinance Amendment B260838 to decrease the funding for FY26 and increase fund balance in the amount of \$80,447**

The Board is requested to accept and approve Budget Ordinance Amendment B260838 to decrease the funding for FY26 and increase fund balance in the amount of \$80,447. These funds were originally reappropriated from FY25 to FY26 for the timekeeping project and will now be moved to FY27.

Please note this amendment requires no additional county funds.

**2) Detention Center – Budget Ordinance Amendment B260833 to recognize grant funds from the Tech Grant in the amount of \$15,809**

The Board is requested to accept and approve Budget Ordinance Amendment B260833 to recognize grant funds from the Tech grant in the amount of \$15,809. This funding will be used to purchase miscellaneous items that come up during the fiscal year.

Please note this amendment requires no additional county funds.

**3) Justice Services – Budget Ordinance Amendment B260043 to recognize grant funds from the**

**North Carolina Department of Adult Correction Intermediary Agency Services Re-entry Program in the amount of \$150,000**

The Board is requested to accept and approve Budget Ordinance Amendment B260043 to recognize grant funds from the North Carolina Department of Adult Correction Re-entry Program in the amount of \$150,000. These funds will be utilized for personnel costs. The grant period is for one year, with a start date of September 1, 2025, and end date of August 31, 2026.

Please note this amendment requires no additional county funds.

**4) Animal Services – Budget Ordinance Amendment B260141 to recognize the Best Friends Grant in the amount of \$1,000**

The Board is requested to accept and approve Budget Ordinance Amendment B260141 to recognize funds from the Best Friends Grant in the amount of \$1,000. This funding comes from Animal Services participating in the Partner Up Challenge. These funds will continue to provide life saving measures, to include Trap-Neuter-Vaccinate-Return (TNVR) and supplies needed within the shelter to help care for the animals within our community.

Please note that this amendment requires no additional county funds.

**5) Library Grants – Budget Ordinance Amendment B260851 to recognize endowment funds from the Cumberland County Foundation, Inc. in the amount of \$4,440**

The Board is requested to accept and approve Budget Ordinance Amendment B260851 to recognize endowment funds from Cumberland Community Foundation, Inc. in the amount of \$4,440. These funds will be used in accordance with specific funding guidelines as indicated by the endowment, which may include the purchase of books, supporting library programs, or specific library spaces.

Please note this amendment requires no additional county funds.

**Capital Investment Fund 107**

**6) Maintenance and Repairs – Budget Ordinance Amendment B260724 to decrease the funding for FY26 maintenance and repair projects in the amount of \$305,000**

The Board is requested to accept and approve Budget Ordinance Amendment B260724 to decrease the funding for FY26 maintenance and repair projects in the amount of \$305,000. These funds are no longer needed due to some of the projects moving to FY27. This was discussed at the August 14, 2025 Board of Commissioners' agenda session.

Please note this amendment requires no additional capital investment fund balance.

**7) Preliminary Capital CIF – Budget Ordinance Amendment B260035 to decrease the funding for FY26 in the amount of \$44,086 for capital outlay**

The Board is requested to accept and approve Budget Ordinance Amendment B260035 to reconcile the FY26 budget based on the actuals that was spent in FY25 in the amount of \$44,086 to complete the Mendoza Park project for the Spring Lake Recreation Center that was approved in FY25.

Please note this amendment requires no additional capital investment fund balance.

**8) Capital Investment – Technology – Budget Ordinance Amendment B260722 to decrease the reappropriation of FY25 funds in the amount of \$63,096**

The Board is requested to accept and approve Budget Ordinance Amendment B260722 to decrease the reappropriation of FY25 funds in the amount of \$63,096. These funds are for the public utilities billing project that will be moved to FY27.

Please note this amendment requires no additional capital investment fund balance.

**REGARDING THE FOLLOWING ITEMS #9-#40, PLEASE NOTE:**

Each fiscal year County departments may have projects that have been approved and initiated but were not complete by the fiscal year end (6/30/25) or items ordered that had not been received by fiscal year end. These projects or items were approved in the Fiscal Year 2025 budget; however, the money was not spent by June 30, 2025.

The following amendments seek to bring those funds forward from FY2025 into the current fiscal year, allowing departments to complete and pay for these projects and items. These revisions do not use new funds but are recognizing the use of FY25 funds in FY26.

**General Fund 101**

**9) Innovation and Technology Services – Budget Ordinance Amendment B260826 to reappropriate FY25 funds in the amount of \$175,447**

The Board is requested to accept and approve Budget Ordinance Amendment B260826 to reappropriate FY25 funds in the amount of \$175,477. These funds will be used to complete the timekeeping and the contract management software projects. These projects were started in FY25 and will not be completed until FY26.

**10) Detention Center – Budget Ordinance Amendment B260703 to reappropriate FY25 funds from a Tech grant in the amount of \$14,178**

The Board is requested to accept and approve Budget Ordinance Amendment B260703 to reappropriate FY25 funds from a Tech grant in the amount of \$14,178. This funding will be used to purchase miscellaneous items that come up during the fiscal year.

**11) Adult Drug Treatment Court – Budget Ordinance Amendment B260845 to reappropriate grant funds from the Office of Justice Programs Bureau of Justice Assistance for the Adult Drug Treatment Court Enhanced Project in the amount of \$458,900 and a county match of \$240,673 to align the budget to match the Bureau of Justice Assistance Program allocations**

The Board is requested to approve Budget Ordinance Amendment B260845 to reappropriate grant funds from the Office of Justice Programs Bureau of Justice Assistance for the Adult Drug Treatment Court Enhancement Project in the amount of \$458,900 and a county match of \$240,673. These funds will be utilized by the court system for personnel costs, counseling services, intense supervision, individualized treatment plans, and support services. The grant period is from October 1, 2023 through September 30, 2027. This grant award was approved at the October 16, 2023 Board of Commissioners' meeting.

**12) DWI Court – Budget Ordinance Amendment B260846 to reappropriate FY25 grant funds from**

**the Bureau of Justice Assistance DWI Court Discretionary Grant Program in the amount of \$101,272 with a county match of \$14,674**

The Board is requested to accept and approve Budget Ordinance Amendment B260846 to reappropriate FY25 grant funds from the Bureau of Justice Assistance Adult Drug Court Discretionary Grant Program in the amount of \$101,272 with a county match of \$14,674. These funds will be used for additional services, supplies, and training. The grant period is from October 1, 2022 through September 30, 2026. This grant was extended by one year, the end date is now September 30, 2027.

**13) Veterans Treatment Court – Budget Ordinance Amendment B260840 to reappropriate FY25 grant funds from the Office of Justice Programs Bureau of Justice Assistance for the District 12 Veterans Treatment Court Early Identification and Support Services Enhancement Project in the amount of \$731,155**

The Board is requested to accept and approve Budget Ordinance Amendment B260840 to reappropriate FY25 grant funds from the Office of Justice Programs Bureau of Justice Assistance for the District 12 Veterans Treatment Court Early Identification and Support Services Enhancement Project in the amount of \$731,155. These funds will continue to be used for multi-year grant activities. This grant was approved at the Board of Commissioners' meeting on April 15, 2024.

**14) Public Health – Budget Ordinance Amendment B260630 to reappropriate funds in the amount of \$102,137**

The Board is requested to accept and approve Budget Ordinance Amendment B260630 to reappropriate funds in the amount of \$102,137. These funds will be used to support Doula services and to purchase AED supplies for the Cumberland County Fire Department. Funds will be expended based on the current terms written in the Doula services contracts and as approved by the American Rescue Plan Committee.

**15) Department of Social Services– Budget Ordinance Amendment B260726 to reappropriate FY25 funds in the amount of \$64,000**

The Board is requested to accept and approve Budget Ordinance Amendment B260726 to reappropriate FY25 funds in the amount of \$64,000. These funds will be used to replace workers' worn desks and chairs, a cubicle workspace for the Energy program, and expansion of cubicle space on floor two.

**16) Department of Social Services – Budget Ordinance Amendment B260728 to reappropriate FY25 funds in the amount of \$192,119**

The Board is requested to accept and approve Budget Ordinance Amendment B260728 to reappropriate FY25 funds in the amount of \$192,119. These funds will be used to complete the following projects: self-serve kiosk project for economic services workload assistance, DSS security camera replacement and licensing, and door swipe-card hardware with accompanying software to enhance security and safety. These projects are planned to be completed in FY26.

**17) Department of Social Services – Budget Ordinance Amendment B260729 to reappropriate FY25 funds in the amount of \$79,817**

The Board is requested to accept and approve Budget Ordinance Amendment B260729 to reappropriate FY25 funds in the amount of \$79,817. These funds will be used for an ITS consultant and recruitment advertisements to attract experienced employees.

**18) Department of Social Services – Budget Ordinance Amendment B260730 to reappropriate funds in the amount of \$165,000**

The Board is requested to accept and approve Budget Ordinance Amendment B260730 to reappropriate funds in the amount of \$165,000. These funds will be used for the following projects: \$125,000 for replacement lighting, \$20,000 for floor cleaning, and \$20,000 for window cleaning. The floor and window cleaning will happen in FY26; lighting will progress according to the timeline.

**19) Department of Social Services – Budget Ordinance Amendment B260742 to reappropriate funds in the amount of \$500,000**

The Board is requested to accept and approve Budget Ordinance Amendment B260742 to reappropriate funds in the amount of \$500,000. These funds will be used for the sailboat timekeeping system project. This project was approved in FY25 and will be completed in FY26.

**20) Department of Social Services – Budget Ordinance Amendment B260744 to reappropriate funds in the amount of \$47,795**

The Board is requested to accept and approve Budget Ordinance Amendment B260744 to reappropriate funds in the amount of \$47,795. These funds will be used to complete the IT server room to include adequate storage for equipment and inventory management. This project was started in FY25 and will be completed in FY26.

**21) Department of Social Services – Budget Ordinance Amendment B260746 to reappropriate FY25 funds in the amount of \$97,833**

The Board is requested to accept and approve Budget Ordinance Amendment B260746 to reappropriate FY25 funds in the amount of \$97,833. These funds will be used to purchase the two budgeted vehicles not acquired in FY25 due to state contracting, vendor availability, pricing limitations, and submission restraints outside of DSS. This purchase was approved for FY25 but will not be completed until FY26.

**22) Department of Social Services – Budget Ordinance Amendment B260747 to reappropriate funds from the Department of Health and Human Services Adoption Promotion Program in the amount of \$700,224**

The Board is requested to accept and approve Budget Ordinance Amendment B260747 to reappropriate funds from the Department of Health and Human Services Adoption Promotion Program in the total amount of \$700,224. These funds will be used for the adoption promotion program.

**23) Department of Social Services – Budget Ordinance Amendment B260748 to reappropriate FY25 funds from the Women’s Giving Circle Grant from the Cumberland County Foundation, Inc. in the amount of \$12,992**

The Board is requested to accept and approve Budget Ordinance Amendment B260748 to reappropriate FY25 funds for the Women’s Giving Circle Grant from the Cumberland County Foundation, Inc. in the amount of \$12,992. This funding will be used to enhance domestic violence support to include safe temporary housing, legal fees, and access to DSS programming.

**24) Department of Social Services – Budget Ordinance Amendment B260830 to reappropriate funds in the amount of \$50,000**

The Board is requested to accept and approve Budget Ordinance Amendment B260830 to reappropriate funds

in the amount of \$50,000. These funds will be used for the DSS Transportation project. This project was started in FY25 but will not be completed until FY26.

**25) Library – Budget Ordinance Amendment B260508 to reappropriate FY25 funds in the amount of \$6,408**

The Board is requested to accept and approve Budget Ordinance Amendment B260508 to reappropriate FY25 funds in the amount of \$6,408. These funds will be used to purchase books for the library. These items were ordered in FY25 but will not be received until FY26.

**26) Library Grants – Budget Ordinance Amendment B260707 to reappropriate FY25 funds from Friends of the Cumberland County Public Library, Inc. in the amount of \$21,470**

The Board is requested to accept and approve Budget Ordinance Amendment B260707 to reappropriate FY25 funds from Friends of the Cumberland County Public Library, Inc. in the amount of \$21,470. These funds will be used for supplies and incentives for the children, teens, and adult programs. Program purchases began in FY25 but will not be completed until FY26.

**27) Library Grants – Budget Ordinance Amendment B260708 to reappropriate FY25 funds in the amount of \$9,643 for the E-Rate program**

The Board is requested to accept and approve Budget Ordinance Amendment B260708 to reappropriate FY25 funds in the amount of \$9,643 for the E-Rate program. These funds are from the Microelectronics Center of North Carolina and are used to support library services such as equipment and computer software.

**28) Library Grants - Budget Ordinance Amendment B260709 to reappropriate FY25 funds from Cumberland Community Foundation Grants in the amount of \$10,982**

The Board is requested to accept and approve Budget Ordinance Amendment B260709 to reappropriate \$3,773 in FY25 funds from the William F. Bethune Charitable Endowment for Children with Disabilities of Cumberland County and \$7,209 in FY25 funds from the Terri Union Endowment for Girls, both through the Cumberland Community Foundation. Funds from the William F. Bethune Charitable Endowment will be used to complete the installation of sensory spaces at library locations, and remaining funds from the Terri Union Endowment for Girls will be used for programmers and program supplies for the Girls Code @ The Library program.

**29) Library Grants – Budget Ordinance Amendment B260710 to reappropriate FY25 funds from the Public Library Association (PLA) Digital Literacy Grant in the amount of \$3,033**

The Board is requested to accept and approve Budget Ordinance Amendment B260710 to reappropriate FY25 funds from the Public Library Association (PLA) Digital Literacy Grant in the amount of \$3,033. These funds will continue to be used to provide various digital workshops to the community and to provide an incentive to the participants that complete all the workshops.

**30) Water and Sewer – Budget Ordinance Amendment B260785 to reappropriate FY25 funds in the amount of \$121,923**

The Board is requested to accept and approve Budget Ordinance Amendment B260785 to reappropriate FY25 funds in the amount of \$121,923. These funds will be used for water and sewer consulting services.

**Capital Investment Fund 107**



**31) Capital Improvement Plan – Budget Ordinance Amendment B260242 to reappropriate FY25 funds in the amount of \$377,009**

The Board is requested to accept and approve Budget Ordinance Amendment B260242 to reappropriate FY25 funds in the amount of \$377,009. These funds are needed to complete the Law Enforcement Center duct work project (\$106,000) and the Public Health Computer Room Air Conditioning unit replacement project (\$271,009) that were started in FY25 and are scheduled to be completed in FY26.

**32) Capital Investment – Technology – Budget Ordinance Amendment B260796 to reappropriate FY25 funds in the amount of \$606,596**

The Board is requested to accept and approve Budget Ordinance Amendment B260796 to reappropriate FY25 funds in the amount of \$606,596. These funds will be used for the following projects: \$368,500 for the BRA project for the Health Department, \$175,000 for the Wayfinding kiosk project, and \$63,096 for the public utilities upgrade.

**Federal Drug Forfeiture Fund 204**

**33) Federal Drug Forfeiture – Budget Ordinance Amendment B260809 to reappropriate funds in the amount of \$9,320**

The Board is requested to accept and approve Budget Ordinance Amendment B260809 to reappropriate funds in the amount of \$9,320. These funds will be used to purchase One Solution CA Brazos Technology software. This software allows information to be mirrored in the system, and they will not have to enter all the information over in the three different systems when they are writing warning tickets and citations.

**Juvenile Drug Treatment Court Fund 208**

**34) Juvenile Drug Treatment Court/General Government Other – Budget Ordinance Amendment B260844 to reappropriate FY25 grant funds from the Office of Justice Programs for the Juvenile Drug Treatment Court program in the amount of \$253,060 which includes the appropriation of General Fund balance in the amount of \$52,627**

The Board is requested to accept and approve Budget Ordinance Amendment B260844 to reappropriate FY25 grant funds from the Office of Justice Programs for the Juvenile Drug Treatment Court program in the amount of \$253,060 which includes the appropriation of General Fund balance in the amount of \$52,627. Funding will be used to support personnel costs, clinical counseling, substance treatment, occupational skills training and education, and housing support.

**Juvenile Crime Prevention Fund 245**

**35) Juvenile Crime Prevention Residential Group Home – Budget Ordinance Amendment B260750 to reappropriate FY25 funds in the amount of \$50,000**

The Board is requested to accept and approve Budget Ordinance Amendment B260750 to reappropriate FY25 funds in the amount of \$50,000. These funds will be used to repair safe landing group homes that were identified in the most recent DHHS health inspection; this includes new kitchen/pantry cabinets and plumbing fixtures to include tubs and sinks.

**Opioid Settlement Fund 249**

**36) Opioid Settlement – Budget Ordinance Amendment B260580 to reappropriate grant funds from the Opioid Settlement Funds in the amount of \$420,521**

The Board is requested to accept and approve Budget Ordinance Amendment B260580 to reappropriate grant funds from the Opioid Settlement Funds in the amount of \$420,521. These funds will be expended as previously approved in the Spending Resolutions adopted by the Board of County Commissioners.

**Development Supportive Housing Grant Fund 267**

**37) Supportive Housing Program Grants – Budget Ordinance Amendment B260356 to reappropriate FY25 funds and to align the budget with the NC511 Award Confirmations in the amount of \$134,960**

The Board is requested to accept and approve Budget Ordinance Amendment B260356 to reappropriate and align the following amounts: \$48,556 for Continuum of Care (CoC), \$1,808 for Robins Meadow, and \$84,596 for Community Housing Support Services. The amendment is needed to correct the use of prior year amounts as the base for FY26, incorporate actual carryforward balances, and align the County's FY26 budget with anticipated CoC awards.

**NC Elderly Fund 277**

**38) Rural Operation Assistance Program - Budget Ordinance Amendment B260764 to reappropriate FY25 funds in the amount of \$15,354**

The Board is requested to accept and approve Budget Ordinance Amendment B260764 to reappropriate FY25 funds in the amount of \$15,354. These funds will be used for eligible transportation expenses under Section 5311 of the CARES Act, the Elderly and Disabled Transportation Assistance Program (EDTAP) and the Rural General Public Program (RGP). These funds will be distributed into the following programs: \$6,509 for the Rural General Public Program (RGP), \$850 for the Employment and Transportation Assistance Program (EMPL), and \$7,995 for the Elderly and Disabled Transportation Assistance Program (EDTAP).

**Cemetery Trust Fund**

**39) Cemetery Trust – Budget Ordinance Amendment B260774 to reappropriate FY25 funds in the amount of \$26,500**

The Board is requested to accept and approve Budget Ordinance Amendment B260774 to reappropriate FY25 funds in the amount of \$26,500. These funds are needed to complete repaving for the County-owned cemetery. This was not completed in FY25 due to staff shortages.

**NORCRESS Water and Sewer Fund 605**

**40) NORCRESS Water and Sewer – Budget Ordinance Amendment B260032 to reappropriate FY25 funds in the amount of \$1,310,000**

The Board is requested to accept and approve Budget Ordinance Amendment B260032 to reappropriate FY25 funds in the amount of \$1,310,000. These funds will be dedicated to critical upgrades within the system aimed at enhancing efficiency, reliability, and operational control.

**RECOMMENDATION / PROPOSED ACTION**

Approve Budget Ordinance Amendments



**OFFICE OF THE TAX ADMINISTRATOR**

**MEMORANDUM FOR BOARD OF COMMISSIONERS AGENDA OF SEPTEMBER 15, 2025**

**TO: BOARD OF COUNTY COMMISSIONERS**

**FROM: JOSEPH R. UTLEY, JR.**

**DATE: 9/15/2025**

**SUBJECT: APPROVAL OF FY26 FARRAGUT SYSTEMS TAX SOFTWARE CONTRACT AMENDMENT**

**BACKGROUND**

The Tax Administration is requesting approval to proceed with a contract amendment for Contract #2019206 with Farragut Systems, Inc. Farragut Systems currently provides tax software used for maintaining real estate, personal property, and public service records, including support for the billing process.

The original contract included a provision that annual maintenance fees would not increase by more than 3% annually for the first six (6) years of the agreement. Fiscal Year 2025 (FY25) marked the conclusion of this initial six-year period.

Farragut Systems have submitted their proposed maintenance fees for Fiscal Year 2026 (FY26). The term of this contract amendment allows for a 9% increase, not to exceed \$239,714. Farragut is formulating a multi-year contract beginning Fiscal Year 2027 (FY27). With the initial term now completed, we are seeking approval to move forward with the amendment to incorporate the updated pricing.

**RECOMMENDATION / PROPOSED ACTION**

The Tax Administrator recommends approval of the amendment for Contract #2019206 Farragut Systems Tax Software for FY26.

**ATTACHMENTS:**

Description	Type
FY26 Farragut Systems Tax Software Contract Amendment	Backup Material

RECEIVED  
7/18/25 JN

Contract Amendment Check List (Eff. 6/21/21)

Contract Number: 2019206

Please ensure that each requirement below is completed before checking the boxes. Only check boxes that apply to the contract being processed. **Please Note: If the item does not apply to this contract, notate NA in the box.** All incomplete contracts will be returned to the submitting department. Packets must be organized.

Description	✓ or NA
1. <b>Only</b> the vendor's signatures have been obtained. Any position (Title) who signed the original contract must also sign the contract amendment per County Legal. <b>Note: Amendments to decrease only require the County (department head, Manager or Chairman) and vendor signatures. Legal and Finance signatures are not required. In this case, attach the executed contract (signed by the County and the vendor) in the Contract Agreement link and release the change order into workflow. The system will still route the change order in Munis to County Legal and Finance so it is helpful to send an email to all approvers that there will be no hard copies because it is a decrease, and the executed document is attached.</b>	✓
2. All attachments referenced in the contract language or applicable to the contract are included with the contract. If hyperlinks are included in the contract, the information included on the hyperlink must also be included as a hard copy.	NA
3. There are (3) signed originals. <b>One copy should be single-sided and paper-clipped together, the others stapled.</b>	✓
4. If the contract is Information Services related (computer hardware, software, etc.) the subtype <i>Computer Equipment</i> box in Munis has been selected. When this subtype is selected the IS Director will be an approver in Munis. Once you release the Contract Entry into workflow, contract hard copies should be sent to the IS Director and IS will forward to Finance after their approval. <b>This is applicable to all departments, including those with their own IS division.</b>	✓
5. There is either a Total Amount or Not to Exceed amount listed in the contract language or if the amount is not changing, whatever is being amended is clearly stated.	✓
<b>W9's &amp; LEGAL ENTITY NAME REQUIREMENTS</b> **If there is a discrepancy between the W9, Secretary of State page and contract hard copy, contact County Legal to reconcile before sending the contract forward. Contact County Legal for any questions regarding the legal name requirements. There are other special circumstances/legal requirements that may apply to certain contracts. We are unable to determine this in Finance or address all possible scenarios. We are listing below the basic requirements that should be followed.**	
6. The vendor has a W9 in Munis and the date is less than one calendar year old. Confirm the W9 date here: <u>5/6/25</u>	✓
7. If the W9 is more than one year old a new W9 has been emailed to County Finance (Accounts Payable) to be attached in Munis. <b>*Confirm (in Vendor Inquiry) the new W9 is attached before moving forward*</b>	✓
8. The vendor name listed on the W9 matches exactly to the Secretary of State page (See number 13 & 14 below), including "inc", "llc", etc. **If "incorporated" is not abbreviated on one document, it should not be abbreviated on any of the documents** If the W9 does not match the State page, the vendor will need to submit an updated W9.	✓
9. The name listed on all pages of the contract is the same as the Secretary of State page and W9. This includes "inc", "llc", etc.	✓
10. There is (1) <i>Contractor's Certification</i> form and (1) <i>Request for Finance &amp; Legal Review</i> form attached to the contract hard copies. Only one copy for the entire packet needed.	✓
11. <b>A copy of the screen page from the NC Secretary's (or the State they are registered in) website showing they have an active status. The screen page MUST be attached!</b>	✓
12. There is enough space for the pre-audit and Legal signatures, or a signature page is attached. <b>The "Signature Page" document is not needed if there is room for all signatures on the existing signature page that is signed by the vendor.</b>	✓
13. There are tabs identifying all signature pages.	✓
14. Purchase Order Change Order has been created, <b>but not released.</b> Purchase Order Number: <u>Reg # 139</u>	✓
15. Contract Change Order has been entered in Munis <b>and released into workflow.</b> Make sure any attachments in Contract Entry are PDF files. NO Excel/Word/etc. documents that show as a link to be downloaded.	✓

Lissa Jones

Contact Name Lauren Smith Certifying accuracy and completion: Department Head

*[Signature]*

Purchasing's Internal Notes (Contracts are not sent forward unless all questions have been resolved, these notes are for record purposes only.)

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



# REQUEST FOR LEGAL AND FINANCE REVIEW OF CONTRACT (EFF. 6/21/21)

The undersigned requests legal review of the contract between Cumberland County and Farragut Systems, Inc.

The undersigned certifies as follows:

**If legal review is not required, indicate the reason below.**

1. The only other party to this contract is a department or agency of the government of the United States or the State of North Carolina.

2. This contract requires the expenditure of not more than \$5,000 in any fiscal year.

3. The county and this contractor or vendor have had this same contract in place for the current and past fiscal years without any dispute and the only change to the existing contract is extending the term and/or increasing the contract amount.

**!!MUST RESPOND!!** Does this purchase qualify for federal reimbursement (ex. FEMA reimbursement or federal grant) Yes or No? NO, If Yes, have federal procurement guidelines been followed?    , a copy of the County's *FEMA Contract Clauses* is attached to each original hard copy    .  
 \*\*Completion of the Uniform Guidelines Checklist is advised\*\*

This contract was obtained through the following process  
**\*\*Only select an option if process was followed. Backup is required\*\*:**

**Service/Purchase/Construction**  
    Solicitation of quotes (5,000 – 29,999.99)

**Purchase (Items, Apparatus, Materials)**  
    Informal bids (30,000 – 89,999.99)  
 Formal bids (90,000 and above)

**Service** Formal IT RFP  
 Informal RFP (30,000 and above)

**Construction**  
    Informal bid (30,000 – 499,999.99) Attach Proof of General Contractors License or if not required, explain below.

    Formal bid (500,000 and above) Attach Proof of General Contractors License or if not required, explain below.

**Engineering/Consulting/Architect**  
    RFQ (Any amount)  
 - Does this contract with this vendor also include construction work?     If so, was an RFQ the only bid process followed?    ,  
 - Please Explain:

**If none of the above, provide justification/explanation:**  
RFP #18-10-IS

**Please complete and initial each item below.**

1. Date contract was approved by BOC (Put NA if Not Applicable) 8/6/18
- WMD 2. All statutory requirements applicable to the process were followed.
- WMD 3. All applicable Cumberland County purchasing and contracting requirements were followed.
- WMD 4. All applicable documentation required by the Cumberland County Finance Office has been submitted.

Certified by: Lauren Smith for the Tax Administration Department of Cumberland County.  
 Signature: Lauren Smith Date Submitted: 5/7/2025

**Boxes are for Purchasing Office Only**  
**Put NA or Cross Through Where Not Applicable**

Completed By (Initial): YS

SAM CHECKED:  IRAN LIST CHECKED:

DOA CHECKED:

- W9 requirements on checklist met  Name requirements met
- Requisition or PO checked  Budget code checked  Does the contract qualify as c.o.? NO, Is the Req. or POM coded to c.o.? NO, If yes, original budget or budget revision verified?
- Correct solicitation process followed  If \$30,000 or more, request posted on Vendor Self Service
- Quotes, bid tabulation or evaluation summary attached in Munis to Contract Entry or included with hard copies
- Board Agenda attached  If so, actual minutes reviewed  Does the minutes and agenda match the contract (vendor, amount, approvers, etc.)
- Required signatures verified  Effective date verified
- Contract includes indemnification language NO, If yes, there is a capped amount?  If yes, there is a separate requisition encumbering the capped amount?  If no capped amount, there is an email from vendor authorizing to strike out language included with hard copy
- Memo for approval of meal/food purchase attached 
  - Meal/Food amounts in line with GSA

**Construction Contracts Only:**  
 If required, is the general contractor's license attached?  Is it still valid?   
 Is bid bond required?  If yes, is a copy attached with hard copy?   
 Is performance payment bond required?  If yes, is a copy included with hard copy?

Notes:    

**Additional Check for Contract Amendments**

- Change in line with original bid process and work?

# CONTRACTOR'S CERTIFICATION FOR LEGAL REVIEW OF CONTRACT WITH CUMBERLAND COUNTY (Eff. 6/21/21)

The undersigned, on behalf of the contractor or vendor named below, certifies with respect to the attached contract between Cumberland County and Farragut Systems, Inc. as follows:

- The contractor is  
 an individual  
 a corporation  
 a limited liability company  
 a unit of local government  
 other: \_\_\_\_\_). (If the contractor is described as "other," a certified copy of the legal documents by which it is organized must be attached.)
- The contractor's business address is 2775 Meridian Parkway, Durham, NC 27713.  
(If this is an out-of-state address, the contract must be signed by the contractor before it is reviewed.)
- If the contractor is not an individual or a unit of local government, is it registered with the Secretary of State to do business in North Carolina?  
 Yes (Attach a copy of the screen page from NC Secretary of State Website showing active status.)  
 No (If it is not registered with the North Carolina Secretary of State, a certificate of good standing from the Secretary of State in the state in which it is organized must be attached.)
- The individual or individuals making this certification and signing the contract on behalf of the contractor are duly authorized to do so by action of the contractor.

If the contract was prepared or drafted by contractor or contractor's attorney, complete the following additional certifications:

- This contract is made subject to the laws of the State of North Carolina.
- This contract  does  does not contain a provision which may require the county to indemnify the contractor. If it does contain this indemnity provision, the maximum amount for which the county may liable under this indemnity is \$ \_\_\_\_\_ . (An indemnity provision that is not capped may result in the contract not being accepted by the county.)
- All obligations incurred by the county under the terms of this contract terminate on the following date:  
06/30/2026 . (Any contract provision which extends the obligations of the county beyond the date the contract terminates will not be accepted by the county.)

The contractor agrees that the county does not waive its rights as to any provisions of the contract which are against the public policy of the State of North Carolina, regardless of the choice of law stated in the contract.

Certified by Courtney Genthe for the contractor stated above.

Signature: Courtney Genthe

Date Submitted: 5/5/25



**Legal name:** Farragut Systems, Inc.

**Secretary of State Identification Number (SOSID):** 1093464

**Status:** Current-Active

**Citizenship:** Domestic

**Date formed:** 4/20/2009

**Fiscal month:** December

**Registered agent:** [Shailendra K. Jain](#)

**mailing address**

2775 Meridian Parkway  
Durham, NC 27713

**Principal office address**

2775 Meridian Parkway  
Durham, NC 27713

**Registered office address**

2775 Meridian Parkway  
Durham, NC 27713

**Registered mailing address**

2775 Meridian Parkway  
Durham, NC 27713

**Officers**

- **Chief Executive Officer**

[Shailendra K Jain](#)

2775 Meridian Parkway  
Durham NC 27713

- **President**

[Sucheta Jain](#)

2775 Meridian Parkway  
Durham NC 27713

**Stock:**

- **Class:** Common

**Shares:** 2000000

**No par value:** Yes



Form **W-9**  
 (Rev. October 2018)  
 Department of the Treasury  
 Internal Revenue Service

# Request for Taxpayer Identification Number and Certification

**Give Form to the requester. Do not send to the IRS.**

▶ Go to [www.irs.gov/FormW9](http://www.irs.gov/FormW9) for instructions and the latest information.

**1** Name (as shown on your income tax return). Name is required on this line; do not leave this line blank.  
**FARRAGUT SYSTEMS INC**

**2** Business name/disregarded entity name, if different from above

**3** Check appropriate box for federal tax classification of the person whose name is entered on line 1. Check only **one** of the following seven boxes.

Individual/sole proprietor or single-member LLC

Limited liability company. Enter the tax classification (C=C corporation, S=S corporation, P=Partnership) ▶ \_\_\_\_\_

Other (see instructions) ▶ \_\_\_\_\_

C Corporation

S Corporation

Partnership

Trust/estate

**4** Exemptions (codes apply only to certain entities, not individuals; see instructions on page 3):

Exempt payee code (if any) \_\_\_\_\_

Exemption from FATCA reporting code (if any) \_\_\_\_\_

(Applies to accounts maintained outside the U.S.)

**5** Address (number, street, and apt. or suite no.) See instructions.  
**2775 MERIDIAN PARKWAY**

**6** City, state, and ZIP code  
**DURHAM, NC 27713**

**7** List account number(s) here (optional)

Requester's name and address (optional)

Print or type. See Specific Instructions on page 3.

## Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on line 1 to avoid backup withholding. For individuals, this is generally your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the instructions for Part I, later. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN*, later.

**Note:** If the account is in more than one name, see the instructions for line 1. Also see *What Name and Number To Give the Requester* for guidelines on whose number to enter.

**Social security number**

			-			-				
--	--	--	---	--	--	---	--	--	--	--

**or**

**Employer identification number**

2	6	-	4	7	0	0	2	4	1
---	---	---	---	---	---	---	---	---	---

## Part II Certification

Under penalties of perjury, I certify that:

- The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me); and
- I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding; and
- I am a U.S. citizen or other U.S. person (defined below); and
- The FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct.

**Certification instructions.** You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions for Part II, later.

**Sign Here**

Signature of U.S. person ▶ *Sucheta Jain*

Date ▶ 5/6/2025

## General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

**Future developments.** For the latest information about developments related to Form W-9 and its instructions, such as legislation enacted after they were published, go to [www.irs.gov/FormW9](http://www.irs.gov/FormW9).

### Purpose of Form

An individual or entity (Form W-9 requester) who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) which may be your social security number (SSN), individual taxpayer identification number (ITIN), adoption taxpayer identification number (ATIN), or employer identification number (EIN), to report on an information return the amount paid to you, or other amount reportable on an information return. Examples of information returns include, but are not limited to, the following.

- Form 1099-INT (interest earned or paid)

- Form 1099-DIV (dividends, including those from stocks or mutual funds)
  - Form 1099-MISC (various types of income, prizes, awards, or gross proceeds)
  - Form 1099-B (stock or mutual fund sales and certain other transactions by brokers)
  - Form 1099-S (proceeds from real estate transactions)
  - Form 1099-K (merchant card and third party network transactions)
  - Form 1098 (home mortgage interest), 1098-E (student loan interest), 1098-T (tuition)
  - Form 1099-C (canceled debt)
  - Form 1099-A (acquisition or abandonment of secured property)
- Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN.

*If you do not return Form W-9 to the requester with a TIN, you might be subject to backup withholding. See What is backup withholding, later.*

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**ACTION AGENDA**  
**CUMBERLAND COUNTY BOARD OF COMMISSIONERS**  
**JUDGE E. MAURICE BRASWELL**  
**CUMBERLAND COUNTY COURTHOUSE - ROOM 118**  
**AUGUST 6, 2018**  
**9:00 AM**

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INVOCATION - Commissioner Jimmy Keefe

PLEDGE OF ALLEGIANCE -

Introduction of New Animal Control Director Elaine B. Smith

Recognition of Commissioner Glenn Adams For Receiving The N.C. Bar Association's 2018 Legal Legends of Color Award

1. APPROVAL OF AGENDA

2. CONSENT AGENDA

- Approved** A. Approval of June 11, 2018 Special Meeting Minutes Pursuant to NCGS 115C-431 and the June 18, 2018 Regular Meeting Minutes
- Approved** B. Approval of FY 2018-2019 Agreement of Conditions and Local Governmental Resolution for Continued Funding of the Governor's Highway Safety Program Grant for Cumberland County Sobriety Court (Funded at 100%)
- Approved** C. Approval of Request to Call a Public Hearing August 20, 2018 for the Edward Byrne Justice Grant Assistance Program
- Approved** D. Approval of Report on the Disposal of Surplus Property Pursuant to N.C.G.S.160A-226(a)
- Approved** E. Approval of Resolution Designating Various Financial Institutions as Official Depositories
- Approved** F. Approval of Induction of 2018 Agricultural Hall of Fame Nominee
- Approved** G. Approval of Resolution to Lease Certain Real Property to Cumberland County Communicare, Inc.



- Approved** H. Approval of Supplemental Agreement with County Tax Services Inc. for Auditing Services
- Approved** I. Approval of Tax Collector's Preliminary Report and Proposed Annual Settlement
- Approved** J. Approval of FY2018-2019 Tax Levy Charge to the Collector
- Approved** K. Approval of Offer to Purchase Surplus Properties Being Located at 4734 Hickory Ridge Road and 4612 Desert Ridge Road
- Approved** L. Approval of Offer to Purchase Surplus Property Located at 5404 Cardigon Court, Fayetteville
- Approved** M. Approval of Offer to Purchase Surplus Real Property Located at 6330 Beauchamp Drive
- Approved** N. Approval of Offer to Purchase Surplus Real Property Located at 1114 Morgan Street, Fayetteville
- Approved** O. Approval of Offer to Purchase Surplus Real Property Located at 4745 Camden Road, Fayetteville, NC
- Approved** P. Approval of Offer to Purchase Surplus Real Property Located at 4709 Star Rite Ln, Fayetteville, NC
- Approved** Q. Approval of Offer to Purchase Surplus Property Located at 803 Barnes St, Fayetteville
- Approved** R. Approval of Offer to Purchase Surplus Property Located at 508 Orlando Street, Fayetteville
- Approved** S. Approval of Offer to Purchase Surplus Property, Located at 810 Silk Lane, Fayetteville
- Approved** T. Approval of Sale of Surplus Real Property Located at 2224 Dixie Trail, Fayetteville
- Approved** U. Approval of Southeastern Workforce Strategies, LLC. Contract for the Department of Social Services
- Approved** V. Approval of Rejection of Bids for Office Supply Formal RFP #18-5-CTY
- Approved** W. Approval of Formal Bid Award for Splash Pad Installation

- Approved** X. Approval of Budget Ordinance Amendments for the August 6, 2018 Board of Commissioners' Agenda
- Y. Approval of Cumberland County Facilities Committee Report and Recommendation(s)
- Approved** 1. Memorial Parking Markers
- Approved** 2. Lease Agreement Renewal for the Jernigan Solid Waste Container Site
- Approved** 3. National Flood Insurance Program (NFIP) Community Rating System (CRS) Annual Recertification Progress Report
- Approved** 4. Contract for Exterior Building Repairs at Multiple County Facilities
- Approved** 5. Contract for Stream Debris Removal from Waterways Within the County
- Approved** 6. Approval of Grants of Easements to South River Electric Membership Corporation in Cedar Creek Industrial Park
- Z. Approval of Cumberland County Finance Committee Report and Recommendation(s)
- Approved** 1. Waive Permit Fees
- Approved** 2. Hazard Mitigation Grant Agreement (HMGP) for Two FEMA Approved Projects and Associated Budget Ordinance Amendment #B190017
- Approved** 3. Contract to Purchase Board of Elections Voting Equipment
- Approved** 4. Contract to Provide Tax Software and Associated Budget Ordinance Amendment #B190646
- Approved** 5. Engaging Outside Legal Counsel for DSS Independent Contractor for Children's Services - E. Gurnee and Budget Ordinance Amendment #B190042
- Approved** 6. Engaging Outside Legal Counsel for DSS Independent Contractor for Children's Services - M. Russ and Budget Ordinance Amendment #B190042
- Approved** 7. Request By United Developers, Inc. To Waive Landfill Disposal Fees



**CUMBERLAND  
★ COUNTY ★  
NORTH CAROLINA**

**INFORMATION SERVICES**

**MEMORANDUM FOR BOARD OF COMMISSIONERS AGENDA OF AUGUST 6, 2018**

**TO: BOARD OF COUNTY COMMISSIONERS**

**FROM: KEITH TODD, CHIEF INFORMATION SERVICES DIRECTOR**

**DATE: 8/2/2018**

**SUBJECT: CONTRACT TO PROVIDE TAX SOFTWARE AND ASSOCIATED BUDGET  
ORDINANCE AMENDMENT #B190646**

**BACKGROUND**

Cumberland County Tax Administration completed an extensive RFP process for acquiring a new software solution for the Tax software project. The new software system features flexibility of the software, ease of use, compliance with RFP requirements, mobile application, and cost.

Cumberland County Tax Administration Department is in the process of upgrading its processes and software. The organization is currently in need of a modern, comprehensive software package that encompasses a mobile companion that is compatible with the software. This will eliminate the need to use several different programs, streamline their processes, provide the ability to perform tasks while mobile, and provide enhanced automation. The upgrade of the tax software will increase the efficiency of the office by reducing the use of paper as well as the need to hand walk paperwork for one person or section to another within the same organization by creating electronic workflows. The new software will bring the organization from an outdated, green screen mainframe product to a modern easy to use program that can be accessed remotely. The product will also provide a central portal through which all citizens will have the ability to access status information of past and present tax actions as well as make online payments. It will offer citizens and Cumberland tax employees a unified and user-friendly approach to maneuver through the system.

As a result of the RFP process which included demos, site visits, and detailed functionality reviews, it was clear that one vendor demonstrated the ability to meet the functionality required by the Tax Department and within budget. Information Services Technology and Tax Administration Departments selected Farragut Systems Inc., as the vendor for the tax software project. Farragut has developed software and is working with the North Carolina Association of County Commissioners (NCACC) in a cooperative technology initiative to assist in streamlining and optimizing the property tax process for North Carolina through the identification and application of best business practices and standards. Please view the estimated cost listed below.

**RECOMMENDATION / PROPOSED ACTION**

1. Approval of contract by Finance Committee for Farragut Systems Inc., (contract has been reviewed and approved by the legal department for legal sufficiency) for the Tax Software as recommended by Information Services Technology and the Tax Department.
2. Approve Budget Ordinance Amendment B190646 in the amount of \$2,320,069 to be used towards the implementation costs for the tax software. This amendment requires the use of fund balance, which has been previously assigned specifically for this project.

**ATTACHMENTS:**

Description	Type
Vendor Comparison - Tax Software Project	Backup Material
Vendor Contract - Farragut	Backup Material



**18-10-IS Tax Bid Tab**

<b>Company</b>	<b>Bid</b>
Bi-Tek	\$1,067,050
Farragut	\$1,699,869
Tyler	\$4,232,528

\*The Farragut contract is \$1,517,880 with additional vendors on the project being paid \$181,989 to total \$1,699,869.

Tax Administration Evaluation Scoresheet - Date: 1/26/2018

		Vendor 1 - Bi-Tek	Vendor 2 - Farragut	Vendor 3 - Tyler	Comments
	The County reserves the right to select the Vendor which best meets the overall needs of Cumberland County, based primarily on				
1	Number of municipalities with a population of 60,000 or larger using suggested software package(s).	21	32	27	Bi-Tek's largest municipality was Cabarrus County-187,226. Tyler's largest municipality was New Hanover County-216,298. Farragut's largest municipality was Mecklenburg-1,032,620. All of the vendors are in a mixture of counties and do have some large counties that would be comparable to Cumberland - especially with Farragut in Forsyth and Guilford. Bi-Tek has 9 counties; however, none of those counties opted in to do the ad hoc reporting. Farragut has 8 counties and 5 of them are utilizing the entire software package. Tyler has 10 counties and 5 of them are utilizing the entire software package.
2	Amount and cost of Proposer support that will be available for conversion, implementation, assistance and on-going modifications.	15	32	18	Bi-Tek does not have many staff to put towards the project as a whole. Farragut has personnel devoted to be on the project. Tyler is waiting for additional personnel to be hired.
3	Proven, existing application systems the Proposer has available now for immediate implementation. The Proposer's capabilities in other systems areas will be treated as a positive factor.	13	28	25	Bi-Tek has current implementations going on that may take up the time of the 7 personnel that they have available. Bi-Tek: \$71,750 Farragut: \$925,980 Tyler: \$3,287,851.
4	Capability and costs to perform the required conversion of existing data files.	21	28	26	Bi-Tek may not have sufficient staffing due to the small amount of personnel they have in the organization. Farragut and Tyler should have sufficient personnel. Bi-Tek's Conversion: \$45,000 Farragut's Conversion: \$300,000 Tyler's Conversion: \$214,025
5	Quality of application software manuals, or other documentation and training aids.	14	32	32	Bi-Tek's documentation is not complete. Farragut and Tyler stated that they have current documentation.
6	Ease and ability to train user personnel.	16	26	24	Bi-Tek does not have many staff to supply to the project as a whole. Tyler is waiting for additional personnel to be hired.
7	Adherence to the requested proposal format. This includes the thoroughness of the proposal as well as the format of the presentation.	26	28	28	All vendors adhered to requested proposal format. Tyler's On Premises amount did not add up correctly.
8	Software and hardware maintenance, support and service capability.	23	30	27	None of the vendors provide hardware support. All have the software support. Bi-Tek: \$157,500 Farragut: \$287,105 Tyler: \$324,878 for maintenance.
9	Required experience and number of in-house data processing personnel necessary to operate and maintain the system.	19	29	28	Bi-Tek does not have many staff to put towards the project as a whole. Tyler is waiting for additional personnel to be hired.
10	The number, type and experience of local Proposer staff.	18	31	26	Bi-Tek: 7 Farragut: 58 Tyler: 15 Divisions. Must take into account that there will be specific staff devoted to Cumberland County.
11	Proposer's ability to support the total system solution, including installation, conversion, software, training, and hardware/software maintenance and support.	20	29	29	Bi-Tek may have difficulty due to the amount of personnel that they have available. Farragut stated 8 devoted to this project. Tyler did not specify how many were devoted to this project but mentioned that they are still hiring personnel.
12	Responsiveness to software requirements outlined in this RFP.	22	29	19	Bi-Tek - vendor provides a software system on a platform that is acceptable to the county with various modifications. Farragut - vendor provides a software system on a platform that is acceptable to the county; agrees to liquidated damages of \$500.00 per day for unexcused, missed deadlines due to fault of vendor; also application software will be licensed in perpetuity. Tyler - vendor proposed Oracle platform, cost would be a concern.
	<b>Total Scores</b>	<b>228</b>	<b>354</b>	<b>309</b>	
<b>Reviewers</b>	Joe Utley	33	47	41	
	Amy Kinlaw	31	47	40	
	Tami Botello	29	48	45	
	Keith Todd	36	54	50	
	Sabrina Patterson	29	50	39	
	Chartese Davis	30	53	43	
Jack Harris	40	55	51		



## Christopher Carr

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**From:** Christopher Carr  
**Sent:** Wednesday, August 20, 2025 9:54 AM  
**To:** Jessica Hullender; Gina Verton  
**Cc:** Joe Utley; Lissa Jones; Lauren M. Smith  
**Subject:** RE: Contract Amendment #2 for Contract #2019206-Farragut Systems Inc.

Thanks Jessica. I appreciate you spelling it out.

My issue is that this agreement was done in a single shot (not counting the first amendment which was apparently for consulting only). So, this single agreement looks like it had subparts.

I do see the section you highlighted in the Master agreement, but when I look at the NCPTS Software Maintenance and Support Agreement, on Page 3, part 6.1 says “this agreement will be in effect for an initial term of one (1) year.... and goes on to say that “after the initial term the agreement will continue for **up to five (5) successive annual renewal terms....”**

I gather that this subpart of the contract for NCPTS Software Maintenance and Support is no longer in effect, and that the general software license carries on in perpetuity. Correct?

Assuming that is correct, then as the software subparts are spelled out in the current amendment, I will move this one forward on that basis.

Thanks,  
Chris

**Christopher L. Carr**  
Asst. County Attorney  
Office of the County Attorney

**Cumberland County, NC**  
(910)-678-7760



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**From:** Jessica Hullender <jhullender@cumberlandcountync.gov>  
**Sent:** Tuesday, August 19, 2025 5:45 PM  
**To:** Christopher Carr <ccarr@cumberlandcountync.gov>; Gina Verton <gverton@cumberlandcountync.gov>  
**Cc:** Joe Utley <jutley@cumberlandcountync.gov>; Lissa Jones <ljones@cumberlandcountync.gov>; Lauren M. Smith <lmsmith@cumberlandcountync.gov>  
**Subject:** RE: Contract Amendment #2 for Contract #2019206-Farragut Systems Inc.

Good afternoon,

Lauren was checking in on this one and Gina mentioned something about a gap in dates. I wanted to take a look because I knew we wouldn't have provided a PO for FY25 if the contract had expired.

We provided the FY25 PO based on the attached contract pages, which include auto-renewal language. The Farragut ParcelSync and Farragut DeedSync pricing stayed the same every year. There is a statement about the maintenance fees not increasing by more than 3% per year for 6 years after the Effective Date and I can confirm that they did follow this. The FY25 amount stayed the same from FY24 to FY25 and did not increase the 3%, so maybe that was because they were considering that year 7? (if it was considered that because it seems some things were pushed back) I can confirm that a PO was re-appropriated from FY19 to FY20 and a PO was re-appropriated from FY20 to FY21, so I'm thinking this project was delayed.

Thanks,

**Jessica Hullender, CLGPO**

Finance Accountant Manager  
Financial Services

**Cumberland County**

O: 910-678-7730

[www.cumberlandcountync.gov](http://www.cumberlandcountync.gov)



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**From:** Lauren M. Smith <[lmsmith@cumberlandcountync.gov](mailto:lmsmith@cumberlandcountync.gov)>

**Sent:** Friday, August 1, 2025 4:52 PM

**To:** Christopher Carr <[ccarr@cumberlandcountync.gov](mailto:ccarr@cumberlandcountync.gov)>; Lissa Jones <[ljones@cumberlandcountync.gov](mailto:ljones@cumberlandcountync.gov)>

**Cc:** Joe Utley <[jutley@cumberlandcountync.gov](mailto:jutley@cumberlandcountync.gov)>; Gina Verton <[gverton@cumberlandcountync.gov](mailto:gverton@cumberlandcountync.gov)>; Jessica Hullender <[jhullender@cumberlandcountync.gov](mailto:jhullender@cumberlandcountync.gov)>

**Subject:** RE: Contract Amendment #2 for Contract #2019206-Farragut Systems Inc.

Chris, good afternoon,

We are not out of contract; the terms of the contract (to my understanding) are until either party terminates.

The 6-year agreement regarding the increase in annual support fees has come to an end and required a new agreement. A 1-year amendment was made with Farragut, because another amendment changing the annual support fees entirely due to moving the software to the cloud will come for FY27.

Tax paid the "first" year of annual support fees in February of 2021, I was not in this position then, but I do know there were delays in implementation. I've attached the invoices for the first year.

I also attached the email thread between myself and Finance last year when the PO order was submitted, they advised to get a contract amendment in place for FY26.

I've looped in Jessica as well; she has assisted me greatly with this amendment.

Thanks,

**Lauren Smith**

Tax Administrative Coordinator  
Tax Administration

**Cumberland County**

O: 910-321-6804  
cumberlandcountync.gov



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**From:** Christopher Carr <[ccarr@cumberlandcountync.gov](mailto:ccarr@cumberlandcountync.gov)>  
**Sent:** Friday, August 1, 2025 4:04 PM  
**To:** Lauren M. Smith <[lmsmith@cumberlandcountync.gov](mailto:lmsmith@cumberlandcountync.gov)>; Lissa Jones <[ljones@cumberlandcountync.gov](mailto:ljones@cumberlandcountync.gov)>  
**Cc:** Joe Utley <[jutley@cumberlandcountync.gov](mailto:jutley@cumberlandcountync.gov)>; Gina Verton <[gverton@cumberlandcountync.gov](mailto:gverton@cumberlandcountync.gov)>  
**Subject:** Contract Amendment #2 for Contract #2019206-Farragut Systems Inc.

Hello all,

I have been trying to figure this one out.

So, this looks like a second amendment. The contract had an effective date of 10/2018, and it clearly on its face calls for 6 years, with an initial annual term and 5 successive annual terms. So, a total of 6 years.

As I see it, the first term started in 2018, or during FY 2019.

Then if we take the next 5 years as having been automatic (which I believe we have done), they would have been for FY 2020, 2021, 2022, 2023 and 2024.

There was an amendment to add services in 2019, but I do not see it as extending the term.

So, if this one ended at the end of FY 2024, and we are now in FY 2026, it sure looks like a gap for FY 2025. I presume that the County just paid for those services for the past fiscal year, and I am speculating that the reason this new amendment is being sent is for a price increase, right?

My concern is that it sure looks like we are out of contract. Am I missing something?

Thanks,  
Chris

**Christopher L. Carr**  
Asst. County Attorney  
Office of the County Attorney

**Cumberland County, NC**

(910)-678-7760





# FARRAGUT™

## MASTER SERVICES AGREEMENT

This Master Services Agreement (this "Agreement") is made and entered into as of 9/26/18 (the "Effective Date") by and between Farragut Systems, Inc., a North Carolina corporation having a place of business at 2775 Meridian Parkway, Durham, North Carolina 27713 ("Farragut") and Cumberland County of North Carolina ("Customer"), a governmental agency with a mailing address of its executive offices at PO Box 1829, Fayetteville, NC 28302, and a physical address at 117 Dick Street, Suite 519, Fayetteville, NC 28301.

In consideration of the mutual promises and covenants contained herein and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the parties agree as follows:

### 1. Services

- 1.1. Farragut agrees to provide installation, implementation, configuration, consulting, development, training, support, and/or other services for the North Carolina Property Tax System ("NCPTS"), MapMetrics, ParcelSync, DeedSync, Apex Sketch, and Mobile Assessor, as set forth in one or more agreed Statements of Work (the "Services"). Statement of Work No. 1 are attached hereto and incorporated by reference. The parties may from time to time agree to additional Statements of Work, each of which, when signed by an authorized representative of each party, will be deemed a part of and incorporated into this Agreement. Each Statement of Work will identify responsibilities of each party, and the parties shall work together cooperatively to complete their respective responsibilities.
- 1.2. All changes to a Statement of Work will be made pursuant to a mutually agreed Change Order. The form of Change Order is attached hereto as Exhibit A. The Change Order will address as necessary changes to the requirements, Statement of Work or cost of the Services. No changes to a Statement of Work will be effective unless authorized in a written Change Order agreed by the parties.
- 1.3. Customer agrees to cooperate with Farragut and promptly perform Customer's responsibilities under this Agreement. Customer will provide timely access to its key personnel and will timely respond to Farragut's questions relating to this Agreement or Farragut's performance under this Agreement and the associated Statements of Work.
- 1.4. Unless otherwise agreed in writing by the parties, Customer shall have sole responsibility for acquiring and maintaining its own technology environment, including but not limited to client workstations, operating systems, database software, servers, internet access, local area networks, and wide area networks.

### 2. Fees and Expenses

- 2.1. Customer shall pay Farragut the fees set forth in the applicable Statement of Work in accordance with the terms and conditions therein. If the Services are provided on a time and materials basis, any estimates provided by Farragut are for planning purposes only. Unless otherwise set forth in the Statement of Work, Farragut shall invoice Customer on a milestone basis upon acceptance of deliverables, and payments are due within thirty (30) days of receipt of invoice. If payment is not made within thirty (30) days of receipt of invoice, then Customer agrees to pay 2/3% per month interest on unpaid amounts or the highest rate allowed by law, if lesser. In the event that



Information, and all copies thereof, at a secure location and limit access to those employees who must have access to enable Customer to use the Software. Each permitted copy of Confidential Information, including its storage media, must be marked by Customer to include all notices that appear on the original. Title, copyright and all other proprietary rights in and to the Confidential Information at all times remains vested exclusively in Farragut. If Customer is compelled by subpoena or court order to disclose Farragut Confidential Information, Customer shall promptly notify Farragut upon receipt of the subpoena or court order and shall reasonably cooperate with Farragut, at Farragut's election and expense, in contesting or limiting the subpoena or court order. Customer shall limit its disclosure to the extent and terms required by the subpoena or court order and related protective orders.

**6.2 Return of Confidential Information.** Upon termination or cancellation of this Agreement or, if earlier, upon termination of Customer's permitted access to or possession of Confidential Information, Customer shall return to Farragut and/or destroy (including, without limitation, deleting all electronic copies in a manner that cannot be recovered), at Farragut's option, all copies of the Confidential Information in Customer's possession, and provide certification to Farragut of such return and destruction.

**6.3 Intellectual Properties.** All ideas, concepts, know-how, data processing techniques, documentation, diagrams, schematics, firmware, equipment architecture, software, improvements, bug fixes, upgrades and trade secrets developed by Farragut personnel (alone or jointly with Customer) in connection with Confidential Information will be the exclusive property of Farragut. Client shall retain ownership of all documentation, training materials, and other work product related to the Software that Client solely develops.

**6.4 Support and Maintenance Materials.** Customer acknowledges that all support materials are the property of Farragut and include Confidential Information of Farragut. Customer agrees that it will not permit anyone other than Farragut installation and support personnel and authorized Customer employees to use such materials.

**6.5 Customer Employees.** Customer will inform its employees of their obligations under this

Section 6 to ensure that such obligations are met.

**6.6 Public Information Act.** Notwithstanding anything else to the contrary in this Agreement, the confidentiality terms and provisions of this Agreement are subject to the applicable requirements of the Public Information Act. If Customer is asked to disclose Farragut Confidential Information, Customer shall seek confidential treatment for such information in accordance with the applicable Public Information Act. Customer shall promptly notify Farragut in writing of all requests for Farragut Confidential Information and shall notify Farragut in writing before releasing any Farragut Confidential Information.

## **7. Term of Agreement; Termination.**

**7.1 Term.** This Agreement will commence on the Effective Date set forth above the parties' signatures and will continue in full force and effect, unless otherwise terminated as provided herein.

### **7.2 Termination.**

a) Either party may terminate this Agreement, by giving written notice of termination to the other party, if the other party is in default (as defined in Section 7.3). If default occurs, the parties will have all remedies provided in this Agreement and otherwise available by statute, law or equity, subject to the other terms of this Agreement.

b) Farragut may terminate its Software Support and other support obligations, if any, under this Agreement, by providing at least 30 days prior written notice of such termination to Customer, if Farragut determines that any modifications to the Software that are not made by Farragut or Customer's failure to install a Software Maintenance Release will materially interfere with the provision of Software Support or Farragut's other obligations.

**7.3 Defaults.** The following events will be deemed to be defaults:

a) A party committing a material breach of any term of this Agreement if such breach has not been cured within 30 days after written notice of such breach has been given by the non-defaulting party to the defaulting party;

b) A party failing to comply in any material respect with any federal, state or local laws applicable to the party's performance under

**SCHEDULE A**

**SOFTWARE DESCRIPTION, LICENSE LOCATION, AND FEES**

QUANTITY	SOFTWARE DESCRIPTION	LICENSE FEE	ANNUAL SUPPORT FEE
1	Farragut ParcelSync	\$30,000	\$12,500
1	Farragut DeedSync	\$20,000	\$7,500
1	Farragut MapMetrics	\$0	\$0

Licensed Location: \_\_\_\_\_.

License fees are due upon execution of this agreement.

Support services will begin and the annual support fees are due one year after the software is in production use by the Customer.



2.5. A "System Release" shall include Error corrections and may include functional, processing, and/or cosmetic enhancements. System Releases shall be delivered based upon a mutually agreed schedule.

2.6. "Acknowledgement Time" is the elapsed time from County's reporting of an Issue until Farragut's acknowledgement of receipt of the reported Issue.

2.7. "Resolution Time" is the elapsed time from County's submission of an Issue and delivery of associated information until either (1) Farragut delivers the a fix or reasonable workaround for the reported Error, or supplies the requested information for Issues not involving Errors, or (2) in the event such delivery is not reasonably feasible, Farragut delivers a plan/schedule for the support.

2.8. "Release Acceptability" is a quality measurement for a System Release, defined as the total number of Issues addressed in such System Release without a reported defect within 30 days of delivery, divided by the total number of Issues that are purported to be addressed by such System Release. For example, if 90 Issues are closed without defect (10 defects are reported) out of a total of 100 Issues delivered in a Support Release, the Release Acceptability is  $90/100 = 90\%$ .

3. **Services.** Farragut shall provide the support and maintenance services specified in Exhibit A hereto.

4. **Fees.**

4.1. The annual support and maintenance fee for the initial term is set out on Exhibit A, which fee shall be due and payable within thirty (30) days of the Effective Date. Fees for renewal terms shall be Farragut's then current standard annual fee for maintenance of the Software, which fee shall be payable in advance prior to the start of such one-year renewal term; provided that in no event shall the maintenance fee increase by more than 3% per year (multiply previous year's fee by 1.03) for 6 years after the Effective Date, (unless the County has acquired additional Software modules or has increased its number of real property parcels into a higher tier, as described in Exhibit A). Annual fees may be invoiced thirty (30) days prior to the expiration of the previous term. Farragut may impose interest on late payments in the amount of one percent (1 %) per month beginning on the date such payments became overdue.

4.2. Where on-site support is requested by County, a travel charge may be made by Farragut.

4.3. County understands that if County terminates this Agreement and then wishes at a later date to resume receiving services under this Agreement, County will be required to pay Farragut the entire maintenance fees for the period of discontinuance plus the maintenance fee for the period then commencing.

4.4. County shall be responsible for payment of all federal, state, local and other taxes (including, but not limited to, sales, use and property taxes) related to this Agreement, excluding any taxes based upon Farragut's income, unless County is tax exempt and provides a tax certificate of exemptions.

5. **Confidentiality**

5.1. "Confidential Information" means any information or data (including without limitation any formula, pattern, compilation, program, device, method, technique, or process) that is disclosed by one party (a disclosing party) to the other party (a receiving party) pursuant to this Agreement that is identified in writing as confidential or that would reasonably be recognized as confidential. Confidential Information does not include information that: (a) is or becomes publicly known or



9.8. On-site services (unless determined by Farragut to be necessary for addressing a Critical Severity Issue).

9.9. Change requests and enhancements.

9.10. Business and technical consulting.

9.11. Technology upgrades, other than those contained under section 6.3 Technology Upgrades.

10. **Reporting and Approvals.** The Support Coordinator for the County shall be \_\_\_\_\_ The Support Coordinator for Farragut shall be Renee Knight-Tate. The delivery and implementation of all Hot Fixes must be approved by both Support Coordinators.

**11. Fee Schedule.**

The Services will be provided by Farragut for an annual fee, based upon the Software modules in production and Client's total number of real property parcels as of the Effective Date and subsequently as of each annual renewal date, as follows.

Software Modules	Number of Real Property Parcels	Annual Fee
LRC	Tier 1: equal to or greater than 300,000 real property parcels	\$195,000
	Tier 2: greater than 120,000 and less than 300,000 real property parcels	\$95,000
	Tier 3: equal to or less than 120,000 real property parcels	\$50,000
B&C	Tier 1: equal to or greater than 300,000 real property parcels	\$195,000
	Tier 2: greater than 120,000 and less than 300,000 real property parcels	\$95,000
	Tier 3: equal to or less than 120,000 real property parcels	\$50,000

Farragut will invoice Client for four equal quarterly payments, beginning on one year after production of each software module above. Payment terms are net 30 days.

If, as of the beginning of any renewal term, the applicable number of real property parcels for either B&C or LRC, or both, has changed enough to move into a new tier, then the annual support fee will be changed on a graduated basis to the new tier amount, in that 1/2 of the change will apply in the renewal term and the remaining 1/2 of the change will apply in the following renewal term.

Client agrees to provide Farragut with access to Client's systems upon Farragut's request to audit and confirm Client's total number of real property parcels.



ANNUAL PRICING AMENDMENT TO ORIGINAL CONTRACT 2019206.

FOR: Cumberland County Tax Administration  
117 Dick Street 5<sup>th</sup> Floor  
Fayetteville NC 28301

CONTRACTOR: Farragut Systems, Inc.  
2775 Meridan Parkway  
Durham NC 27713

The term of this Annual Pricing Amendment shall be from **July 1, 2025, through June 30, 2026**, and shall not exceed **\$239,714**, which includes \$109,857 for B&C Support, \$109,857 for LRC Support, \$12,500 for ParcelSync Support, and \$7,500 for DeedSync Support.

Except as specifically amended herein, all other terms and provisions of the contract shall remain in full force and effect.

**Farragut Systems, Inc.**

Users, Neil  
Herding Digitally signed by Users, Neil Herding  
Date: 2025.03.27 15:46:49 -04'00'

Neil Herding Date  
VP Operations and Customer Experience

**County of Cumberland**

 7/8/25  
Keith Todd Date  
Chief IS Director

This instrument has been pre-audited in the manner required by the Local Government Budget and Fiscal Control Act.

 7/9/2025  
Robin Koonce Date  
County Finance Director

Approved for Legal Sufficiency:

 8/20/25  
County Attorney Date

upon formal execution by all parties<sup>2</sup>

\_\_\_\_\_  
Kirk DeViere Date  
Chairman, Board of Commissioners

\_\_\_\_\_  
Joseph R. Utley Jr. Date  
Tax Administrator



**FINANCE DEPARTMENT**

**MEMORANDUM FOR BOARD OF COMMISSIONERS AGENDA OF SEPTEMBER 15, 2025**

**TO: BOARD OF COUNTY COMMISSIONERS**

**FROM: ROBIN M KOONCE, FINANCE DIRECTOR / CFO**

**DATE: 9/2/2025**

**SUBJECT: APPROVAL OF AN UPDATE TO POLICY NO.3-3: PURCHASING POLICY**

**BACKGROUND**

Current policies do not explicitly state that tipping is permissible for pre-approved food bills or delivered catering. As a result, the Clerk to the Board has historically paid these gratuities from personal funds.

It was never the intention of current leadership for this practice to occur. A policy change is requested for future purchases.

**RECOMMENDATION / PROPOSED ACTION**

Recommend adding the following language to Policy No. 3-3: Purchasing Policy:

"Individuals authorized to use a procurement card for pre-approved food and meal purchases shall tip no more than 15% of the total food bill or delivered catering, unless the tip is mandatory based on party size."

**ATTACHMENTS:**

Description

Purchasing Policy No 3-3

Type

Backup Material

**Cumberland County**

**Section I – Board Approved Policies**

**Subsection 3: Cumberland County Financial / Audit**

**Policy No. 3-3: Purchasing Policy**

**The following policy was originally adopted on June 21, 1999 by the Board of Commissioners. This policy was amended on February 25, 2002, November 1, 2010, June 5, 2017, June 18, 2018, August 6, 2018, June 21, 2021, November 15, 2021, and June 17, 2024 by the Board of Commissioners.**

**1.0 PURPOSE**

This policy is established to ensure the fair and equitable treatment of all persons involved in public purchasing, to maximize the purchasing value of public funds in procurement, and to provide safeguards for maintaining a procurement system of quality and integrity, in accordance with North Carolina General Statutes (N.C.G.S) and federal law.

**2.0 SCOPE**

This policy applies to all County employees conducting purchases on behalf of Cumberland County. Any reference of “department head” throughout this policy is inclusive of the elected offices of the Register of Deeds and the Sheriff, as well as any interim assignments of department head responsibilities. Any reference to approval authority of the County Manager shall also apply to the County Manager’s designee as authorized in writing by the County Manager in their absence.

**3.0 POLICY**

**3.1 Local Preference Policy**

Contracts for the provision of services in any amount and all contracts for the purchase of apparatus, materials, supplies and equipment in which the aggregate purchase price in any single contract is less than \$30,000 shall be awarded to local vendors or suppliers, to the greatest extent possible, in accordance with the further conditions set out herein.

Local vendors or suppliers shall be those who demonstrate that they pay business personal or real property taxes and are either self-employed residents of Cumberland County or employ at least one resident of Cumberland County as an employee or officer of the contracting business entity.

### **3.2 Purchase Orders**

All services and purchases in amounts of \$5,000 and more must have a purchase order prior to the purchase being made or the services being rendered. All purchases require a written (electronic or printed) document (invoice, quote, proposal, etc.) with sale details prior to payment being made.

### **3.3 Purchases & Services**

#### Less than \$5,000

Department heads shall authorize services or purchases of apparatus, supplies, materials or equipment up to \$4,999.99 without a purchase order if sufficient funds are budgeted and available within the department budget. Prior to the purchase, departments must ensure there is an appropriation authorizing the obligation and that sufficient funds will remain in the appropriation to pay the amounts that are expected to come due in the fiscal year in which the obligation is incurred.

#### \$5,000 – \$29,999.99

Department heads shall solicit proposals for services or purchases of apparatus, supplies, materials or equipment when the estimated cost is between \$5,000 - \$29,999.99. County Purchasing will review the purchase upon receipt of requisition to ensure compliance with County policies. County Purchasing may solicit additional proposals as determined necessary and appropriate by the Finance Director.

### **3.4 Purchases of apparatus, supplies, materials, or equipment**

#### \$30,000 – \$89,999.99

**Informal bids** are required for any purchase of apparatus, supplies, materials, or equipment that requires an expenditure of \$30,000 - \$89,999.99. Departments shall submit specifications to County Purchasing for purchases in this category. Exemptions: purchases that qualify under the Competitive Bidding Exceptions as per N.C.G.S 143-129(e).

#### \$90,000 and Above

**Formal bids** are required for any purchase of apparatus, supplies, materials, or equipment in amounts of \$90,000 or more. Departments shall submit specifications to County Purchasing for purchases in this category. The County Manager must approve bid awards in amounts between \$90,000 - \$99,999.99. The Board of Commissioners must approve bid awards in amounts of \$100,000 or greater. Bids for engineering and construction must comply with North Carolina General Statutes. Exemptions: purchases that qualify under the Competitive Bidding Exceptions as per N.C.G.S 143-129(e).

Bid award is not a substitution for receiving contract approval in accordance with the dollar thresholds established within this policy or as further delegated by the Board of Commissioners.

### **3.5 Purchase of Services**

### \$30,000 and Above

**An Informal RFP** process is required for services estimated to cost \$30,000 or more. County Purchasing will review the proposal upon receipt of requisition to ensure compliance with county policies. County Purchasing may solicit additional proposals as determined necessary and appropriate by the Finance Director.

### **3.6 Procurement Cards**

The procurement card program was established to provide a more rapid turnaround of requisitions for low dollar value goods, and to reduce paperwork and handling costs. Procurement cardholders may initiate transactions in person, or by telephone, within the established limits of these procedures. Department heads may designate individuals to receive procurement cards. Individuals authorized to use a procurement card for pre-approved food and meal purchases shall tip no more than 15% of the total food bill or delivered catering, unless the tip is mandatory based on party size. Prior to signing for a procurement card and annually thereafter, procurement cardholders must attend a class conducted by County Purchasing addressing the guidelines involved in the responsibility associated with the card. To ensure pre-audit requirement compliance, funds for each department's estimated procurement card charges shall be encumbered at the beginning of each fiscal year.

### **3.7 Contracts**

A contract is an agreement stating the obligations and benefits arising out of a transaction between the County and at least one other party. A contract must be signed by the County and all other parties to the contract. The contract, in its final form, requires review for legal sufficiency approval **prior to** consideration for approval/signature. All contracts for expenditures, in amounts of \$50,000 or more require County Manager signature. Contracts **resulting from a formal bid process** for expenditures in amounts of \$100,000 or more require the Chair to the Board of Commissioners signature, after Board approval. Contracts with a total amount less than \$50,000 may be signed by the Department head.

These signature requirements pertain to all contracts in which the county is obligated to expend funds of \$5,000 and above, even if the funds have been approved by the Board of Commissioners in the original budget. Digital signatures by vendors or non-County personnel are permitted on contracts when there is legal authentication attached to the signatures and when the digital signature system being utilized provides system integrity in the process to ensure the signed document has not been altered in transit. Digital signatures by County personnel will be permitted pursuant to a system and/or process approved by the County Manager.

The Board of Commissioners must approve all interlocal agreements, regardless of the dollar amount. The action approving the agreement must be recorded within the minutes of the Board of Commissioners' meeting.

If an amendment to the original contract occurs, an equivalent position to the original contract signor must also sign the amendment, regardless of the original contract dollar amount or method of award.

Contracts funded with federal grant or loan funds must be procured in a manner that conforms with all applicable Federal laws, policies, and standards, including those under the Uniform Guidance (2 C.F.R. Part 200). See the Addendum following section 4.0 of this policy for the Uniform Guidance Procurement Policy.

### **3.8 Federal and State Law Compliance**

Federal law and North Carolina general statutes allow local policy to be more restrictive. When comparing federal, state, and local procurement requirements to implement federal programs or grants, the most restrictive requirement shall be applied. This policy is more restrictive regarding bid requirements of services and dollar thresholds for contractual signatures in comparison to state statute requirements. Periodically, legislation results in changes to law and/or general statutes. The General Statutes referenced in this policy are incorporated by reference, and changes in the referenced General Statutes are also incorporated herein as if set out in full.

## **4.0 IMPLEMENTATION**

The Finance Director is responsible for implementing and enforcing this Policy and to interpret it consistent with its spirit and intent, fiscal prudence and accountability. The Finance Director is authorized to prescribe additional administrative instructions for implementing the above policy.

## **ADDENDUM**

### **Uniform Guidance Procurement Policy for North Carolina Local Governments**

#### **I. Purpose**

The purpose of this Policy is to establish guidelines that meet or exceed the procurement requirements for purchases of goods (apparatus, supplies, materials, and equipment), services, and construction or repair projects when federal funds are being used in whole or in part to pay for the cost of the contract.

#### **II. Policy**

A. **Application of Policy.** This policy applies to contracts for purchases, services, and construction or repair work funded with federal financial assistance (direct or reimbursed). The requirements of this Policy also apply to any subrecipient of the funds.



All federally funded projects, loans, grants, and sub-grants, whether funded in part or wholly, are subject to the Uniform Administrative Requirements, Cost Principles, and Audit Requirements for federal awards (Uniform Guidance) codified at 2 C.F.R. Part 200 unless otherwise directed in writing by the federal agency or state pass-through agency that awarded the funds.

- B. **Compliance with Federal Law.** All procurement activities involving the expenditure of federal funds must be conducted in compliance with the Procurement Standards codified in 2 C.F.R. § 200.317 through § 200.326 unless otherwise directed in writing by the federal agency or state pass-through agency that awarded the funds. Cumberland County will follow all applicable local, state, and federal procurement requirements when expending federal funds. Should the County have more stringent requirements, the most restrictive requirement shall apply so long as it is consistent with state and federal law.
- C. **Contract Award.** All contracts shall be awarded only to the lowest responsive responsible bidder possessing the ability to perform successfully under the terms and conditions of the contract.
- D. **No Evasion.** No contract may be divided to bring the cost under bid thresholds or to evade any requirements under this Policy or state and federal law.
- E. **Contract Requirements.** All contracts paid for in whole or in part with federal funds shall be in writing. The written contract must include or incorporate by reference the provisions required under 2 C.F.R § 200.326 and as provided for under 2 C.F.R. Part 200, Appendix II.
- F. **Contractors' Conflict of Interest.** Designers, suppliers, and contractors that assist in the development or drafting of specifications, requirements, statements of work, invitation for bids or requests for proposals shall be excluded from competing for such requirements.
- G. **Approval and Modification.** The administrative procedures contained in this Policy are administrative and may be changed as necessary at the staff level to comply with state and federal law.

### III. **General Procurement Standards and Procedures:**

Either the Purchasing Department or the Requesting Department shall procure all contracts in accordance with the requirements of this Section of the Policy.

- A. **Necessity.** Purchases must be necessary to perform the scope of work and must avoid acquisition of unnecessary or duplicative items. The Purchasing Department and/or the Requesting Department should check with the federal surplus property agency prior to buying new items when feasible and less expensive. Strategic sourcing should be considered with other departments and/or agencies who have similar needs to consolidate procurements and services to obtain better pricing.



- B. Clear Specifications.** All solicitations must incorporate a clear and accurate description of the technical requirements for the materials, products, or services to be procured, and shall include all other requirements which bidders must fulfill and all other factors to be used in evaluating bids or proposals. Technical requirements must not contain features that restrict competition.
- C. Notice of Federal Funding.** All bid solicitations must acknowledge the use of federal funding for the contract. In addition, all prospective bidders or offerors must acknowledge that funding is contingent upon compliance with all terms and conditions of the funding award.
- D. Compliance by Contractors.** All solicitations shall inform prospective contractors that they must comply with all applicable federal laws, regulations, executive orders, and terms and conditions of the funding award.
- E. Fixed Price.** Solicitations must state that bidders shall submit bids on a fixed price basis and that the contract shall be awarded on this basis unless otherwise provided for in this Policy. Cost plus percentage of cost contracts are prohibited. Time and materials contracts are prohibited in most circumstances. Time and materials contracts will not be used unless no other form of contract is suitable and the contract includes a “Not to Exceed” amount. A time and materials contract shall not be awarded without express written permission of the federal agency or state pass-through agency that awarded the funds.
- F. Use of Brand Names.** When possible, performance or functional specifications are preferred to allow for more competition leaving the determination of how to reach the required result to the contractor. Brand names may be used only when it is impractical or uneconomical to write a clear and accurate description of the requirement(s). When a brand name is listed, it is used as reference only and “or equal” must be included in the description.
- G. Lease versus Purchase.** Under certain circumstances, it may be necessary to perform an analysis of lease versus purchase alternatives to determine the most economical approach.
- H. Dividing Contract for Minority/Women Business Enterprises (M/WBE) Participation.** If economically feasible, procurements may be divided into smaller components to allow maximum participation of small and minority businesses and women business enterprises. The procurement cannot be divided to bring the cost under bid thresholds or to evade any requirements under this Policy.
- I. Documentation.** Documentation must be maintained by the Purchasing Department and/or the Requesting Department detailing the history of all procurements. The documentation should include the procurement method used, contract type, basis for contractor selection, price, sources solicited, public notices, cost analysis, bid documents, addenda, amendments, contractor’s responsiveness, notice of award, copies of notices to unsuccessful bidders or offerors, record of protests or disputes, bond documents, notice to proceed, purchase order, and contract. All documentation

relating to the award of any contract must be made available to the granting agency upon request.

- J. Cost Estimate.** For all procurements costing \$250,000 or more, the Purchasing Department and/or Requesting Department shall develop an estimate of the cost of the procurement prior to soliciting bids. Cost estimates may be developed by reviewing prior contract costs, online review of similar products or services, or other means by which a good faith cost estimate may be obtained. Cost estimates for construction and repair contracts may be developed by the project designer.
- K. Contract Requirements.** The Requesting Department must prepare a written contract incorporating the provisions referenced in Section II.C of this Policy.
- L. Debarment.** No contract shall be awarded to a contractor included on the federally debarred bidder's list.
- M. Contractor Oversight.** The Requesting Department receiving the federal funding must maintain oversight of the contract to ensure that contractor is performing in accordance with the contract terms, conditions, and specifications.
- N. Open Competition.** Solicitations shall be prepared in a way to be fair and provide open competition. The procurement process shall not restrict competition by imposing unreasonable requirements on bidders, including but not limited to unnecessary supplier experience, excessive or unnecessary bonding, specifying a brand name without allowing for "or equal" products, or other unnecessary requirements that have the effect of restricting competition.
- O. Geographic Preference.** No contract shall be awarded on the basis of a geographic preference.

#### **IV. Specific Procurement Procedures**

Either the Purchasing Department or the Requesting Department shall solicit bids in accordance with the requirements under this Section of the Policy based on the type and cost of the contract.

- A. Service Contracts** except for Architectural/Engineering (A/E) professional services and **Purchase Contracts** costing less than \$30,000 shall be procured using the Uniform Guidance "micro-purchase" procedure (2 C.F.R. § 200.320(a)) as follows:
  1. The contract may be awarded without soliciting pricing or bids if the price of the goods or services is considered to be fair and reasonable.
  2. To the extent practicable, purchases must be distributed among qualified suppliers.
  3. The \$30,000 threshold for "micro-purchase" is allowed as long as the County qualifies as a low-risk auditee, in accordance with the criteria in §200.520 according to the most recent audit, self-certifies annually, and maintains documentation to be made available to the Federal awarding agency and auditors upon request.

- B. Service Contracts** (except for A/E professional services) and **Purchase Contracts costing \$30,000 up to \$90,000** shall be procured using the Uniform Guidance “small purchase” procedure (2 C.F.R. § 200.320(b)) as follows:
1. Obtain price or rate quotes from an “adequate number” of qualified sources (a federal grantor agency might issue guidance interpreting “adequate number,” so the Requesting Department should review the terms and conditions of the grant award documents to confirm whether specific guidance has been issued).
  2. Take affirmative steps to solicit price quotes from M/WBE vendors and suppliers as required under 2 C.F.R. § 200.321.
  3. Cost or price analysis is not required prior to soliciting bids.
  4. Award the contract on a fixed-price basis (a not-to-exceed basis is permissible for service contracts where obtaining a fixed price is not feasible).
  5. Award the contract to the lowest responsive, responsible bidder.
- C. Service Contracts** (except for A/E professional services) and **Purchase Contracts costing \$90,000 and above** shall be procured using a combination of the most restrictive requirements of the Uniform Guidance “sealed bid” procedure (2 C.F.R. § 200.320(c)) and state formal bidding procedures (G.S. 143-129) as follows:
1. Cost or price analysis is required prior to soliciting bids.
  2. Complete specifications or purchase description must be made available to all bidders.
  3. The bid must be formally advertised in a newspaper of general circulation for at least seven full days between the date of the advertisement and the date of the public bid opening. Electronic-only advertising must be authorized by the governing board. The advertisement must state the date, time, and location of the public bid opening, indicate where specifications may be obtained, and reserve to the governing board the right to reject any or all bids only for “sound documented reasons.”
  4. Take affirmative steps to solicit price quotes from M/WBE vendors and suppliers as required under 2 C.F.R. § 200.321.
  5. Open bids at the public bid opening on the date, time, and at the location noticed in the public advertisement. All bids must be submitted sealed. A minimum of 2 bids must be received in order to open all bids.
  6. Award the contract to the lowest responsive, responsible bidder on a fixed-price basis. Governing board approval is required for purchase contracts unless the governing board has delegated award authority to an individual official or employee. Any and all bids may be rejected only for “sound documented reasons.”
- D. Service Contracts** (except for A/E professional services) **costing \$250,000 and above** may be procured using the Uniform Guidance “competitive proposal” procedure (2 C.F.R. § 200.320(d)) when the “sealed bid” procedure is not appropriate for the particular type of service being sought. The procedures are as follows:
1. A Request for Proposals (RFP) must be publicly advertised. Formal advertisement in a newspaper is not required so long as the method of advertisement will solicit proposals from an “adequate number” of qualified firms.
  2. Take affirmative steps to solicit price quotes from M/WBE vendors and suppliers as provided under 2 C.F.R. § 200.321.
  3. Identify evaluation criteria and relative importance of each criteria (criteria weight) in the RFP.

4. Consider all responses to the publicized RFP to the maximum extent practical.
5. Must have a written method for conducting technical evaluations of proposals and selecting the winning firm.
6. Award the contract to the responsible firm with most advantageous proposal taking into account price and other factors identified in the RFP. Governing board approval is not required.
7. Award the contract on a fixed-price or cost-reimbursement basis.

**E. Construction and repair contracts costing less than \$30,000** shall be procured using the Uniform Guidance “micro-purchase” procedure (2 C.F.R. § 200.320(a)) as follows:

1. The contract may be awarded without soliciting pricing or bids if the price of the goods or services is considered to be fair and reasonable.
2. To the extent practicable, contracts must be distributed among qualified suppliers.
3. The \$30,000 threshold for “micro-purchase” is allowed as long as the County qualifies as a low-risk auditee, in accordance with the criteria in §200.520 according to the most recent audit, self-certifies annually, and maintains documentation to be made available to the Federal awarding agency and auditors upon request.

**F. Construction and repair contracts costing \$30,000 up to \$250,000** shall be procured using the Uniform Guidance “small purchase” procedure (2 C.F.R. § 200.320(b)) as follows:

1. Obtain price or rate quotes from an “adequate number” of qualified sources (a federal grantor agency might issue guidance interpreting “adequate number,” so the requesting department should review the terms and conditions of the grant award documents to confirm whether specific guidance has been issued).
2. Take affirmative steps to solicit price quotes from M/WBE vendors and suppliers as required under 2 C.F.R. § 200.321.
3. Cost or price analysis is not required prior to soliciting bids, although price estimates may be provided by the project designer.
4. Award the contract on a fixed-price or not-to-exceed basis.
5. Award the contract to the lowest responsive, responsible bidder. Governing board approval is not required.

**G. Construction and repair contracts costing \$250,000 up to \$500,000** shall be procured using the Uniform Guidance “sealed bid” procedure (2 C.F.R. § 200.320(c)) as follows:

1. Cost or price analysis is required prior to soliciting bids (this cost estimate may be provided by the project designer).
2. Complete specifications must be made available to all bidders.
3. Publicly advertise the bid solicitation for a period of time sufficient to give bidders notice of opportunity to submit bids (formal advertisement in a newspaper is not required so long as other means of advertising will provide sufficient notice of the opportunity to bid). The advertisement must state the date, time, and location of the public bid opening, and indicate where specifications may be obtained.
4. Take affirmative steps to solicit price quotes from M/WBE vendors and suppliers as provided under 2 C.F.R. § 200.321.

5. Open the bids at the public bid opening on the date, time, and at the location noticed in the public advertisement. All bids must be submitted sealed. A minimum of 2 bids must be received in order to open all bids.
6. A 5% bid bond is required of all bidders. Performance and payment bonds of 100% of the contract price is required of the winning bidder.
7. Award the contract on a firm fixed-price basis.
8. Award the contract to the lowest responsive, responsible bidder. Governing board approval is not required. Any and all bids may be rejected only for “sound documented reasons.”

**H. Construction and repair contracts costing \$500,000 and above** shall be procured using a combination of the most restrictive requirements of the Uniform Guidance “sealed bid” procedure (2 C.F.R. § 200.320(c)) and state formal bidding procedures (G.S. 143-129) as follows:

1. Cost or price analysis is required prior to soliciting bids (this cost estimate should be provided by the project designer).
2. Complete specifications must be made available to all bidders.
3. Formally advertise the bid in a newspaper of general circulation for at least seven full days between the date of the advertisement and the date of the public bid opening. Electronic-only advertising must be authorized by the governing board. The advertisement must state the date, time, and location of the public bid opening, indicate where specifications may be obtained, and reserve to the governing board the right to reject any or all bids only for “sound documented reasons.”
4. Take affirmative steps to solicit price quotes from M/WBE vendors and suppliers as provided under 2 C.F.R. § 200.321.
5. Open the bids at the public bid opening on the date, time, and at the location noticed in the public advertisement. All bids must be submitted sealed and in paper form. A minimum of 3 bids must be received in order to open all bids.
6. A 5% bid bond is required of all bidders (a bid that does not include a bid bond cannot be counted toward the 3-bid minimum requirement). Performance and payment bonds of 100% of the contract price is required of the winning bidder.
7. Award the contract on a firm fixed-price basis.
8. Award the contract to the lowest responsive, responsible bidder. Governing board approval is required and cannot be delegated. The governing board may reject and all bids only for “sound documented reasons.”

**I. Construction or repair contracts involving a building costing \$300,000 and above** must comply with the following additional requirements under state law:

1. Formal HUB (historically underutilized business) participation required under G.S. 143-128.2, including local government outreach efforts and bidder good faith efforts, shall apply.
2. Separate specifications shall be drawn for the HVAC, electrical, plumbing, and general construction work as required under G.S. 143-128(a).
3. The project shall be bid using a statutorily authorized bidding method (separate-prime, single-prime, or dual bidding) as required under G.S. 143-129(a1).

**J. Contracts for Architectural and Engineering Services costing less than \$50,000** shall be procured using the Uniform Guidance “micro-purchase” procedure (2 C.F.R.

§ 200.320(a)) when contracting for the purchase of services subject to the qualifications-based selection process in the Mini-Brooks Act; provided that such threshold shall apply to a contract only if the County has exercised an exemption to the Mini-Brooks Act, in writing, for a particular project pursuant to G.S. 143-64.32. If the exemption is not authorized, the micro-purchase threshold shall be \$0.

The threshold for “micro-purchase” is allowed as long as the County qualifies as a low-risk auditee, in accordance with the criteria in §200.520 according to the most recent audit, self-certifies annually, and maintains documentation to be made available to the Federal awarding agency and auditors upon request.

**K. Contracts for Architectural and Engineering Services costing \$50,000 up to \$250,000** shall be procured using the state “Mini-Brooks Act” requirements (G.S. 143-64.31) as follows:

1. Issue a Request for Qualifications (RFQ) to solicit qualifications from qualified firms (formal advertisement in a newspaper is not required). Price (other than unit cost) shall not be solicited in the RFQ.
2. Take affirmative steps to solicit price quotes from M/WBE vendors and suppliers as provided for under 2 C.F.R. § 200.321.
3. Evaluate the qualifications of respondents based on the evaluation criteria developed by the Purchasing Department and/or Requesting Department.
4. Rank respondents based on qualifications and select the best qualified firm. Price cannot be a factor in the evaluation. Preference may be given to in-state (but not local) firms.
5. Negotiate fair and reasonable compensation with the best qualified firm. If negotiations are not successful, repeat negotiations with the second-best qualified firm.
6. Award the contract to best qualified firm with whom fair and reasonable compensation has been successfully negotiated. Governing board approval is not required.

**L. Contracts for Architectural and Engineering Services costing \$250,000 or more** shall be procured using the Uniform Guidance “competitive proposal” procedure (2 C.F.R. § 200.320(d)(5)) as follows:

1. Publicly advertise a Request for Qualifications (RFQ) to solicit qualifications from qualified firms (formal advertisement in a newspaper is not required). Price (other than unit cost) shall not be solicited in the RFQ.
2. Take affirmative steps to solicit price quotes from M/WBE vendors and suppliers as provided under 2 C.F.R. § 200.321.
3. Identify the evaluation criteria and relative importance of each criteria (the criteria weight) in the RFQ.
4. Proposals must be solicited from an “adequate number of qualified sources” (an individual federal grantor agency may issue guidance interpreting “adequate number”).
5. Must have a written method for conducting technical evaluations of proposals and selecting the best qualified firm.
6. Consider all responses to the publicized RFQ to the maximum extent practical.
7. Evaluate qualifications of respondents to rank respondents and select the most qualified firm. Preference may be given to in-state (but not local) firms provided

that granting the preference leaves an appropriate number of qualified firms to compete for the contract given the nature and size of the project.

8. Price cannot be a factor in the initial selection of the most qualified firm.
9. Once the most qualified firm is selected, negotiate fair and reasonable compensation. If negotiations are not successful, repeat negotiations with the second-best qualified firm.
10. Award the contract to best qualified firm with whom fair and reasonable compensation has been successfully negotiated. Governing board approval is not required.

**M. The following **Bid Protest Procedures** will apply to procurement processes **when FTA (Federal Transit Administration) funds are to be used:****

1. Bid documents must include written procedures that allow bidders or proposers to protest a procurement action. Notice of protest procedures must be available to all potential bidders or proposers, either by inclusion in the solicitation documents or available to the public.
2. Any party which is a prospective bidder, offeror, or contractor that is aggrieved by the solicitation must submit a written protest within five (5) calendar days prior to the opening of the Request for Bid, Request for Proposal.
3. Any party which is an actual bidder, offeror, or contractor that is aggrieved by the award of a contract must submit a written protest within five (5) calendar days of the County awarding the contract.
4. The protest must be submitted via email to the Cumberland County Purchasing Division at [CumberlandPurchasing@cumberlandcountync.gov](mailto:CumberlandPurchasing@cumberlandcountync.gov) and must include all of the following information:
  - i. Name, address, telephone number, and email address of the protester.
  - ii. Signature of the protester or authorized agent.
  - iii. The bid name and number.
  - iv. A detailed statement of the legal and factual grounds of protest including copies of relevant documents.
  - v. Any supporting exhibits, evidence, or documents to substantiate any claims.
  - vi. All information establishing that the protester is an interested party for the purpose of filing a protest.
  - vii. The form of relief requested.
5. The Purchasing Director will notify NCDOT if a protest involves an FTA compliance issue within two (2) business days of receiving the protest.
6. After careful consideration of all relevant information, and consultation with the County Attorney, the Finance Director shall make a written decision.
7. A decision of the Finance Director may be appealed to the County Manager or appropriate Governing Board, depending on the type of bid. An appeal must be in writing and be delivered to the County Manager's Office, 117 Dick Street, Fayetteville, NC 28301, within seven (7) calendar days of the date of the Finance Director emailed decision.
8. Any and all costs incurred by a protesting party in connection with a protest shall be the sole responsibility of the protesting party.

**V. Exceptions**

Non-competitive contracts are allowed *only* under the following conditions and with the written approval of the federal agency or state pass-through agency that awarded the federal funds:

- A. Sole Source.** A contract may be awarded without competitive bidding when the item is available from only one source. The Purchasing Department and/or Requesting Department shall document the justification for and lack of available competition for the item. A sole source contract must be approved by the governing board.
- B. Public Exigency.** A contract may be awarded without competitive bidding when there is a public exigency. A public exigency exists when there is an imminent or actual threat to public health, safety, and welfare, and the need for the item will not permit the delay resulting from a competitive bidding.
- C. Inadequate Competition.** A contract may be awarded without competitive bidding when competition is determined to be inadequate after attempts to solicit bids from a number of sources as required under this Policy does not result in a qualified winning bidder.
- D. Federal Contract.** A contract may be awarded without competitive bidding when the purchase is made from a federal contract available on the U.S. General Services Administration schedules of contracts.
- E. Awarding Agency Approval.** A contract may be awarded without competitive bidding with the express written authorization of the federal agency or state pass-through agency that awarded the federal funds so long as awarding the contract without competition is consistent with state law.

<END>





**FINANCE DEPARTMENT**

**MEMORANDUM FOR BOARD OF COMMISSIONERS AGENDA OF SEPTEMBER 15, 2025**

**TO: BOARD OF COUNTY COMMISSIONERS**

**FROM: ROBIN M KOONCE, FINANCE DIRECTOR / CFO**

**DATE: 9/9/2025**

**SUBJECT: APPROVAL OF CROWN EVENT CENTER CHANGE ORDER #4**

**BACKGROUND**

TA Loving/Metcon, Construction Manager at Risk (CMAR) for the former downtown Crown Event Center project, has submitted a final Change Order #4 for Owner's Termination for Convenience. The contract sum prior to the Change Order is \$29,226,326.42.

Change order #4 decreases the contract sum by \$19,165,696.59. The new contract sum after this Change Order is \$10,060,629.83. Previous payments to the CMAR total \$6,249,297.92, leaving a final balance of \$3,811,331.91 to be paid after authorization of Change Order #4.

Change Order #4 has been vetted by the County Owner's Agent and Legal Department.

**RECOMMENDATION / PROPOSED ACTION**

Recommend approval of Change Order #4, which enables final payment and closure of this capital project with CMAR.

**ATTACHMENTS:**

Description	Type
Change Order #4	Backup Material



T.A. Loving-Metcon, a Joint Venture  
 400 Patetown Rd  
 Goldsboro, North Carolina 27530  
 Phone: (919) 734-8400

**Project:** 24901 - Crown Event Center  
 113 Gillespie Street  
 Fayetteville, North Carolina 28301

## Prime Contract Change Order #004: Owner Change Order #04 Owner Termination For Convenience

<b>TO:</b>	Cumberland County 226 Bradford Avenue Fayetteville, North Carolina 28301	<b>FROM:</b>	T.A. Loving-Metcon, A Joint Venture 400 Patetown Road Goldsboro, North Carolina 27530
<b>DATE CREATED:</b>	7/21/2025	<b>CREATED BY:</b>	Noah McDonald (T. A. Loving Company)
<b>CONTRACT STATUS:</b>	Approved	<b>REVISION:</b>	0
<b>DESIGNATED REVIEWER:</b>	Noah McDonald (T. A. Loving Company)	<b>REVIEWED BY:</b>	
<b>DUE DATE:</b>		<b>REVIEW DATE:</b>	07/21/2025
<b>INVOICED DATE:</b>		<b>PAID DATE:</b>	
<b>SCHEDULE IMPACT:</b>	0 days	<b>EXECUTED:</b>	No
		<b>SIGNED CHANGE ORDER RECEIVED DATE:</b>	
<b>CONTRACT FOR:</b>	1:Crown Event Center	<b>TOTAL AMOUNT:</b>	(\$19,165,696.59)

**DESCRIPTION:**  
 CE #011 - Owner Termination For Convenience  
 Termination cost and final deduction change order due to the Owner's decision to terminate the project for convenience, per 13.2.3 of the AIA A133-2019 standard form agreement for the Crown Event Center Project and section 14.3 of the AIA A201-2017 General Conditions to The Contract for Construction. The cost includes final termination costs for TA Loving-Metcon and their subcontractors within the scope of work for GMP1 and GMP2.

**ATTACHMENTS:**

**POTENTIAL CHANGE ORDERS IN THIS CHANGE ORDER:**

PCO #	Title	Schedule Impact	Amount
007	CE #011 - Owner Termination For Convenience	0 days	(\$19,165,696.59)
<b>Total:</b>			(\$19,165,696.59)

**CHANGE ORDER LINE ITEMS:**

**PCO # 007: CE #011 - Owner Termination For Convenience**

#	Budget Code	Description	Amount
1	005-12000.6 Structural Steel Framing.6 - Vista Subcontract	GMP2 Steel	\$ (10,928,898.81)
2	003-30000.6 Cast-in-Place Concrete.6 - Vista Subcontract	GMP2 Concrete	\$(4,448,126.00)
3	031-00500.S Earthwork.S - Subcontract	GMP1 Sitework	\$(1,276,289.64)
4	031-66000.6 Special Foundations.6 - Vista Subcontract	GMP2 Deep Foundations	\$(259,833.00)
5	001-40000.O Quality Requirements.O - Other	General Requirements GMP2	\$(100,000.00)
6	003-30500.7 Heavy Duty Concrete Allowance.7 - Vista Other	Heavy Duty Concrete GMP2	\$(140,000.00)
7	001-21160.O Contingency Allowances.O - Other	Construction Contingency GMP2	\$(417,818.00)
8	002-41130.S Selective Site Demolition.S - Subcontract	Site Demo GMP1	\$(33,500.00)
9	001-21160.O Contingency Allowances.O - Other	Construction Contingency GMP1	\$(44,809.00)
10	001-99999.P Profit.P - Profit	GMP1 remaining profit	\$(62,164.51)
11	001-40000.O Quality Requirements.O - Other	GMP1 General Requirements	\$(81,261.00)
12	001-99999.P Profit.P - Profit	GMP2 remaining profit	\$(605,231.63)



#	Budget Code	Description	Amount
13	001-00001.O General Conditions.O - Other	GMP2 remaining general conditions	\$(767,765.00)
<b>Grand Total:</b>			<b>\$ (19,165,696.59)</b>

The original (Contract Sum)	\$733,215.14
Net change by previously authorized Change Orders	\$28,493,111.28
The contract sum prior to this Change Order was	\$29,226,326.42
The contract sum will be decreased by this Change Order in the amount of	(\$19,165,696.59)
The new contract sum including this Change Order will be	\$10,060,629.83
The contract time will not be changed by this Change Order.	

**Cumberland County**  
 226 Bradford Avenue  
 Fayetteville, North Carolina 28301

**T.A. Loving-Metcon, A Joint Venture**  
 400 Patetown Road  
 Goldsboro, North Carolina 27530

\_\_\_\_\_  
 SIGNATURE DATE

\_\_\_\_\_  
 SIGNATURE DATE

TA Loving-Metcon Cancellation Cost Breakdown  
8/28/2025

Trade Partner	Description	Value	Notes
North State Steel	PA #04, Termination, and Storage Costs	\$ 2,044,707.67	NSS Termination Cost and NSS PA#4
Estrello Concrete	Rebar Mill Order/Detailing/Termination	\$ 232,474.00	Estrello Concrete Termination Cost
Hines Sitework	Demobilization	\$ 89,013.11	Hine Sitework PA #4
TA Loving Metcon	Site Personnel Downtime	\$ 1,074,871.00	Monthly GC's from June 2025- April 2026/End of GMP2
	Subtotal Termination Costs	\$ 3,441,065.78	
	CMAR Fee on Sub Costs	\$ 137,642.63	
	<b>Total Termination Costs</b>	<b>\$ 3,578,708.41</b>	
	BTF including retention through PA#11	\$ 22,744,405.00	
	<b>Final Contract Value</b>	<b>\$ 10,060,629.83</b>	
	Final Deductive CO	\$ (19,165,696.59)	
	PA#12	\$ 3,811,331.91	Total Termination and final \$232,623.50 JV Retention through PA#11

CHECK	
Current Contract	\$ 29,226,326.42
Completed & Stored TD	\$ (6,481,921.42)
Remaining Cost	\$ 22,744,405.00
Deduct Change Order	\$ (19,165,696.59)
Termination Cost	\$ 3,578,708.41
CHECK	
NSS	\$ (2,044,707.67)
Estrello	\$ (232,474.00)
Hine	\$ (89,013.11)
TAL-Metcon Downtime	\$ (1,074,871.00)
CMAR Fee	\$ (137,642.63)
Total	\$ -

North State Steel, Inc.  
 PO Box 5003  
 Greenville, NC 27835  
 (252)830-8884

TA Loving/Barnhill/Metcon

INVOICE ID: 286148  
 DRAW ID: #00004  
 DATE: June 20, 2025

SALESPERSON:

CONTRACT ID: G-24-082  
 Crown Event Center  
 LOCATION: Crown Event Center  
 131 Gillespie Street  
 Fayetteville, NC 28301

CUSTOMER ID: 10-200177  
 PO #:

Bid Date 11/20/24  
 Tax Rate 7.0% 4.75 state 2.25 Cumberland

Item Id	Description	Contract Amount	Completed To Date	Retainage	Less Previous Billings	Total This Invoice Less Retainage
001	Submittals					
002	Steel Detailing & Engineering	509,000.00	305,400.00	15,270.00	305,400.00	
003	Miscellaneous Steel Det & Eng	65,000.00	65,000.00	3,250.00	65,000.00	
004	Ornamental Det & Eng	65,000.00				
005	Deck Detailing	15,000.00	15,000.00	750.00	15,000.00	
006	Grating Detailing	15,000.00	15,000.00	750.00	15,000.00	
007	Louver Detailing	6,000.00				
008	Buyouts					
009	Joist & Deck	600,000.00				
010	Miscellaneous Metals Material	1,100,000.00				
011	Miscellaneous Metals Install	360,000.00				
012	Ornamental Metals Material	1,075,000.00				
013	Ornamental Metals Install	450,000.00				
014	Steel Bar Grating	170,000.00				
015	Louvers	220,000.00				
016	Louver Erection	25,000.00				
017	Surveys	25,000.00				
018	Crane Pad/Access	100,000.00				
019	Base Bid					
020	Structural Steel Fabrication	7,100,000.00	2,926,503.51	146,325.18	2,325,993.52	570,484.49
021	Structural Steel Erection	3,800,000.00	9,145.00	457.25		8,687.75
P01	NSS CO #1 12/20/2024					
P02	NSS CO #2 1/3/2025					

TA Lovina/Barnhill/Metcon  
 G-24-082/Crown Event Center

Invoice ID: 286148  
 Date: 6/20/25

Item Id	Description	Contract Amount	Completed To Date	Retainage	Less Previous Billings	Total This Invoice Less Retainage
	P03 NSS CO #3 2/21/2025					
	P04 NSS CO #4 2/28/2025					
<b>Total</b>		15,700,000.00	3,336,048.51	166,802.43	2,726,393.52	579,172.24

Invoice Sub-total 609,654.99  
 Retainage Held 30,482.75

Amount due this Invoice \$579,172.24

Billed to date: 3,336,048.51  
 Paid to date: 1,902,891.37  
 Retainage 166,802.43  
 Total amount due: \$1,266,354.71

TO: TA Loving/Metcon JV  
400 Patetown Road  
Goldsboro, NC 27530

Project: Crown Event Center

APPLICATION NO:

4 Distribution to:

OWNER

ARCHITECT

PERIOD TO:  
6/30/2025

CONTRACTOR

FROM: North State Steel, Inc  
PO Box 5003  
Greenville, NC 27835

PROJECT NOS: 24901 24-082

CONTRACT FOR: Crown Event Center

CONTRACT DATE: 01/02/25

**CONTRACTOR'S APPLICATION FOR PAYMENT**

Application is made for payment, as shown below, in connection with the Contract. Continuation Sheet, AIA Document G703, is attached.

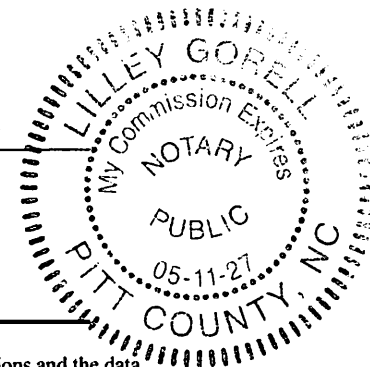
1. ORIGINAL CONTRACT SUM	\$	<u>15,700,000.00</u>
2. Net change by Change Orders	\$	<u>                    </u>
3. CONTRACT SUM TO DATE (Line 1 ± 2)	\$	<u>15,700,000.00</u>
4. TOTAL COMPLETED & STORED TO DATE (Column G on G703)	\$	<u>3,336,048.51</u>
5. RETAINAGE:		
a. <u>5.00%</u> % of Completed Work (Column D + E on G703)	\$	<u>166,802.43</u>
b. _____ % of Stored Material (Column F on G703)	\$	<u>                    </u>
Total Retainage (Lines 5a + 5b or Total in Column I of G703)	\$	<u>166,802.43</u>
6. TOTAL EARNED LESS RETAINAGE (Line 4 Less Line 5 Total)	\$	<u>3,169,246.08</u>
7. LESS PREVIOUS CERTIFICATES FOR PAYMENT (Line 6 from prior Certificate)	\$	<u>2,590,073.84</u>
8. CURRENT PAYMENT DUE	\$	<u>579,172.24</u>
9. BALANCE TO FINISH, INCLUDING RETAINAGE (Line 3 less Line 6)		<u>12,530,753.92</u>

The undersigned Contractor certifies that to the best of the Contractor's knowledge, information and belief the Work covered by this Application for Payment has been completed in accordance with the Contract Documents, that all amounts have been paid by the Contractor for Work for which previous Certificates for Payment were issued and payments received from the Owner, and that current payment shown herein is now due.

CONTRACTOR:

By: Cathy E. Allshouse Date: 06/20/25

State of: NC County of: Pitt  
Subscribed and sworn to before 20 day of June 2025  
Notary Public: Lilley Gorell  
My Commission Expires: May 11, 2027



**ARCHITECT'S CERTIFICATE FOR PAYMENT**

In accordance with the Contract Documents, based on on-site observations and the data comprising the application, the Architect certifies to the Owner that to the best of the Architect's knowledge, information and belief the Work has progressed as indicated, the quality of the Work is in accordance with the Contract Documents, and the Contractor is entitled to payment of the AMOUNT CERTIFIED.

AMOUNT CERTIFIED . . . . . \$

(Attach explanation if amount certified differs from the amount applied. Initial all figures on this Application and on the Continuation Sheet that are changed to conform with the amount certified.)  
ARCHITECT:

By: \_\_\_\_\_ Date: \_\_\_\_\_

This Certificate is not negotiable. The AMOUNT CERTIFIED is payable only to the Contractor named herein. Issuance, payment and acceptance of payment are without prejudice to any rights of the Owner or Contractor under this Contract.

CHANGE ORDER SUMMARY	ADDITIONS	DEDUCTIONS
Total changes approved in previous months by Owner		
Total approved this Month		
<b>TOTALS</b>	<b>\$0.00</b>	<b>\$0.00</b>
<b>NET CHANGES by Change Order</b>	<b>\$0.00</b>	

CONTINUATION SHEET

AIA DOCUMENT G703

AIA Document G702, APPLICATION AND CERTIFICATION FOR PAYMENT, containing Contractor's signed certification is attached.

APPLICATION NO: 4  
APPLICATION DATE: 06/20/25

In tabulations below, amounts are stated to the nearest dollar. Use Column I on Contracts where variable retainage for line items may apply.

North State Steel, Inc.

PERIOD TO: 06/30/25  
ARCHITECT'S PROJECT NO:

A ITEM NO.	B DESCRIPTION OF WORK	C SCHEDULED VALUE	D WORK COMPLETED		F MATERIALS PRESENTLY STORED (NOT IN D OR E)	G		H BALANCE TO FINISH (C - G)	I RETAINAGE (IF VARIABLE RATE)
			FROM PREVIOUS APPLICATION (D + E)	THIS PERIOD		TOTAL COMPLETED AND STORED TO DATE (D+E+F)	% (G ÷ C)		
	<i>North State Steel, Inc</i> G-24-082 Crown Event Center Page 1								
1	<b>Submittals</b>								\$ -
2	Steel Detailing & Engineering	\$ 509,000.00	\$ 305,400.00			\$ 305,400.00	60.00%	\$ 203,600.00	\$ 15,270.00
3	Miscellaneous Steel Detailing & Engineering	\$ 65,000.00	\$ 65,000.00			\$ 65,000.00	100.00%		\$ 3,250.00
4	Ornamental Detailing & Engineering	\$ 65,000.00						\$ 65,000.00	\$ -
5	Deck Detailing	\$ 15,000.00	\$ 15,000.00			\$ 15,000.00	100.00%		\$ 750.00
6	Grating Detailing	\$ 15,000.00	\$ 15,000.00			\$ 15,000.00	100.00%		\$ 750.00
7	Louver Detailing	\$ 6,000.00						\$ 6,000.00	\$ -
8	<b>Buyouts</b>								\$ -
9	Joist & Deck	\$ 600,000.00						\$ 600,000.00	\$ -
10	Miscellaneous Metals Material	\$ 1,100,000.00						\$ 1,100,000.00	\$ -
11	Miscellaneous Metals Install	\$ 360,000.00						\$ 360,000.00	\$ -
12	Ornamental Metals Material	\$ 1,075,000.00						\$ 1,075,000.00	\$ -
13	Ornamental Metals Install	\$ 450,000.00						\$ 450,000.00	\$ -
14	Steel Bar Grating	\$ 170,000.00						\$ 170,000.00	\$ -
15	Louvers	\$ 220,000.00						\$ 220,000.00	\$ -
16	Louver Erection	\$ 25,000.00						\$ 25,000.00	\$ -
17	Surveys	\$ 25,000.00						\$ 25,000.00	\$ -
18	Crane Pad/Access	\$ 100,000.00						\$ 100,000.00	\$ -
19	<b>Base Bid</b>								\$ -
20	Structural Steel Fabrication	\$ 7,100,000.00	\$ 2,325,993.52	\$ 5,700.00	\$ 594,809.99	\$ 2,926,503.51	41.22%	\$ 4,173,496.49	\$ 146,325.18
21	Structural Steel Erection	\$ 3,800,000.00		\$ 9,145.00		\$ 9,145.00	0.24%	\$ 3,790,855.00	\$ 457.25
22									\$ -
23									\$ -
24									\$ -
25									\$ -
26									\$ -
27									\$ -
28									\$ -
29									\$ -
30									\$ -
31									\$ -
32									\$ -
33									\$ -
34									\$ -
35									\$ -
36									\$ -
37									\$ -
38									\$ -
39									\$ -
	<b>Page Total</b>	\$ 15,700,000.00	\$ 2,726,393.52	\$ 14,845.00	\$ 594,809.99	\$ 3,336,048.51		\$ 12,363,951.49	\$ 166,802.43





## NORTH STATE STEEL

North State Steel, Inc.  
PO Box 5003  
Greenville, NC 27835

June 27, 2025

Attention: Noah McDonald & Ryan Parker  
Project Executives  
TA Loving Company/Metcon Joint Venture  
**Project: NSS JOB #24-082 Crown Event Center**  
**Subject: NSS Response for Termination Costs**

Dear Noah & Ryan,

North State Steel ("NSS") has received TA Loving-Metcon's letter dated June 10, 2025 Re: Crown Event Center Project Termination and your request to itemize termination costs since this Project has been cancelled.

### **1. North State Steel Costs**

#### **a. Base Scope of Work Completed and Partially Paid**

i. Costs Billed to Date thru North State Steel Pay App #4 dated 6-20-2025 = \$3,336,048.51

ii. North State Steel Committed but Not Yet Invoiced as of 6-20-2025

1. Steel Detailing & Engineering = \$101,800

a. This value will be increased to 80% to bill for the work completed after NSS was directed to restart submittals when the construction pause was lifted, email dated 4-29-2025 from TALCO/Metcon to NSS.

2. Mill & Warehouse Material Sub-Total = \$387,151.34 \*\*This is material that was committed and rolled but not shipped to NSS Greenville yet. Invoice will be provided after shipment.\*\*

#### **b. Change Orders Completed and Unpaid = \$110,549.01**

i. See below change order log and costs that remain open.

1010 West Gum Road  
Greenville, NC 27384

Phone: 252-830-8884  
Fax: 252-830-9451

[www.northstatesteel.com](http://www.northstatesteel.com)



**NORTH STATE STEEL**

NSS CO Date	NSS CO		NSS Pending AMOUNT	GC Approved Amount	WORK COMPLETED thru 3-30-2025
		<b>Change order totals</b>	<b>\$332,479.35</b>	<b>\$0.00</b>	<b>\$110,549.01</b>
12/20/2024	1	Addendum #1 Contract Drawings	\$132,554.46		\$55,162.17
1/3/2025	2	Addendum #2 Contract Drawings	\$84,037.46		\$23,142.27
2/21/2025	3	ASI #1	\$69,562.92		\$22,290.84
2/28/2025	4	ASI #2	\$46,324.51		\$9,953.73

**c. Termination Costs**

**i. Idle Time/Unabsorbed Shop Overhead**

Steel fabrication is an industry which requires high levels of automation, large physical plant facilities, extensive planning and qualified support personnel. As a result, a large percentage of a fabricator's total cost are fixed costs. Those fixed costs include depreciation, fabrication equipment, salaries, insurance, rent, property tax, electricity, and maintenance.

Further, NSS must maintain a skilled workforce to ensure compliance with our AISC certifications, as well as to ensure adequate skilled labor is available to perform the fabrication activities needed on this Project and others. NSS cannot simply lay off our workforce and hope that we can re-hire them at a later date. NSS must keep our skilled workforce employed and paid during any period of idle time; otherwise, skilled labor will no longer be available.

NSS' shop labor rate is \$75 per hour with fixed costs of \$37.50 per shop hour for 2025. These fixed costs must be absorbed, or paid for, by the work performed in the fabrication plant. Most, if not all, structural fabrication shops recover the cost through the shop man-hours charged to the project.

Due to the long lead times, which are necessary prior to the start of any actual fabrication on a project, a fabricator cannot procure work in a reactionary manner. It cannot for instance discover the need for additional work to fill a void which has opened in its shop, as a result of a suspension or termination of a project. There are many precedent activities, such as procurement of materials, producing, submitting and obtaining shop drawing approvals for example.



This process literally takes weeks, or months to accomplish. This makes it nearly impossible for a fabricator to replace projects in the fabrication shop schedule, which incur substantial delays between the time a Notice to Proceed is received, and fabrication is scheduled to commence. The fabricator typically has several projects in various stages of progress and must schedule its fabrication needs for one project in conjunction with those of the other projects.

The lead-time involved in fabricating a project must be a consideration for the fabricator. When the fabricator is bidding or negotiating projects, it must consider its shop's ability to fabricate the project within the time constraints imposed by the contract requirements. In addition, it must coordinate with the



## NORTH STATE STEEL

constraints imposed by other projects in its shop. This is due to the fact that a fabrication shop has only a certain level of production which can be achieved. This level of production is the maximum output, which management determines can be fabricated.

When NSS was awarded this Project, the Contract Schedule required that NSS validate it had available shop capacity and ability to fabricate the project to meet the erection deadlines. NSS therefore, booked the following shop hours for the Crown Event Center in order to meet the Contract Schedule after multiple contract drawing revisions stated above in change orders.

<b>Calendar Month</b>	<b>Planned Shop Hours</b>
Apr-25	2200
May-25	3960
Jun-25	3780
Jul-25	4140
Aug-25	3360
Sep-25	3520
Oct-25	2300
Nov-25	1724
<b>Totals</b>	<b>24984</b>

The hours scheduled would allow NSS to achieve its required shop capacity to cover its fixed costs.

When this project was suspended, NSS immediately began looking for replacement work to fill the shop hours it had planned to work on this Project. As discussed above, when a project is suspended or terminated, the fabricator loses its planned shop hours and cannot immediately replace those hours in its fabrication shop.

During this time of postponement, NSS was not able to fill all planned shop hours, and was not able to mitigate all lost shop hours.

The following calculation will show the actual losses in absorption which FABRICATOR will experience:

$$\text{Lost Hours} \quad \times \quad \text{Shop Labor Rate} = \text{Idle Time}$$



NORTH STATE STEEL

Calendar Month	Planned Shop Hours	Actually - Hours Used	Other Projects Hours	Lost Hours from Plan	Shop Capacity	Fixed Overhead
Apr-25	2200	0	2200	2200	4400	\$165,000
May-25	3960	0	440	3960	4400	\$165,000
Jun-25	3780	0	420	3780	4200	\$157,500
Jul-25	4140	0	460	4140	4600	\$172,500
Aug-25	3360	0	840	3360	4200	\$157,500
Sep-25	3520	0	880	3520	4400	\$165,000
Oct-25	2300	0	2300	2300	4600	\$172,500
Nov-25	1724	0	2276	1724	4000	\$150,000
<b>Totals</b>	<b>24984</b>	<b>0</b>	<b>9816</b>	<b>24984</b>	<b>34800</b>	<b>\$1,305,000</b>

Suspension Mitigation Efforts

Planned Hours	24,984
Mitigated Shop Hours	12,874
<b>Net Lost Hours</b>	<b>12,110</b>

12,110 Lost Hours x \$75 Shop Labor Rate = \$908,250.00 Idle Time

The above costs were calculated as of April 4, 2025 in a previous request for termination costs. On June 10, 2025, NSS received T.A. Loving-Metcon’s letter providing notice of termination. When a termination occurs, NSS must still pay all the fixed costs that would have been absorbed through performance on the Project. NSS reserved 24,984 hours in its fabrication shop for the fabrication of the Project. NSS has taken the initiative to proactively try to mitigate the lost Shop Hours on the project.

Even if new work can be found, the lead time for NSS to begin fabrication would be at least 4-6 weeks after termination (considering the time necessary for drawings before fabrication can begin), putting the soonest that a hypothetical, replacement job could have been inserted into these fabrication “holes” would be August or September, 2025.

Fortunately, NSS has been able to further mitigate Shop Hours during this time, thereby reducing its anticipated lost Shop Hours from 24,984 to 1,301.20 Lost Shop Hours. This savings has reduced the charges for Lost Shop Hours to \$97,590.

1301.20 Lost Hours @ \$75 Shop Labor Rate = \$97,590

1010 West Gum Road  
Greenville, NC 27384

Phone: 252-830-8884  
Fax: 252-830-9451

www.northstatesteel.com



## NORTH STATE STEEL

### ii. Material Storage & Disposition

1. Storage Costs – As pointed out in NSS March 18, 2025 letter, the cost for storing raw materials until disposition was stated to be \$2.50/SF. This projects raw material has been taking up approximately 68,800 sf of space since the project was postponed for the months of March, April, May, and June 2025.  $68,800 \text{ SF} \times \$2.50/\text{SF} \times 4 \text{ months} = \$688,000$ .

*\*\*NORTH STATE STEEL RESERVES THE RIGHT TO CHARGE ADDITIONAL STORAGE FOR AS LONG AS IT TAKES TO REACH A RESOLUTION.\*\**

2. Material Disposition & Scrap Costs = <\$393,337.67>
  - a. All 4,563,846 lbs. of this material was purchased specifically for the design of the Crown Event Center. There is not a definitive timeline of NSS being able to utilize this material on future work, it would take years to consume. Especially the grade 65 ksi material designed in some of the column shafts and truss framing, that material is likely never to get used as it is so rarely put in a design.
  - b. For this reason, North State Steel is offering scrap value for all material at \$.1580/lb. plus material handling, labor to process (cut up in lengths suitable for scrap container), and freight to dispose of all material. This is the average scrap value NSS has received in the year 2025.
    - i. Scrap 4,563,846 lbs. @ <\$.1580/lb.> = <\$721,087.67>
    - ii. Material Handling, Labor to Process, & Freight to Scrap = \$327,750

### 2. Subcontractor Termination Costs

- a. Detailing – Included in Costs to Date
- b. Engineering – Included in Costs to Date
- c. Joists and Deck – Included in Costs to Date
- d. Architectural Louvers – Included in Costs to Date
- e. Grating – Included in Costs to Date
- f. Misc. Metals – Stairs and Railings – Included in Costs to Date
- g. Erection
  - i. Barnett Steel Erection = \$403,000 + 10% NSS Mark Up = \$443,300.00
    1. Lost revenue for three cranes scheduled for the project.
      - a. LR1200SX (Main Truss Crane) - \$41,500 x 6 months = \$249,000
      - b. RTC8090II (Assist to truss crane) - \$16,000/month x 6 months = \$96,000
      - c. CCH700 (Perimeter steel crane) - \$14,500 x 4 months = \$58,000



NORTH STATE STEEL

To summarize all the above-mentioned costs:

1. TOTAL COSTS COMPLETED & STORED TO DATE Thru Pay App #4	\$	3,336,048.51
2. COMMITTED COSTS but NOT YET INVOICED as of 6-25-2025	\$	488,951.34
3. TOTAL CHANGE ORDER WORK COMPLETED TO DATE	\$	110,549.01
4. IDLE TIME/UNABSORBED SHOP OVERHEAD	\$	97,590.00
5. MATERIAL STORAGE AND DISPOSITION COSTS	\$	294,662.33
6. SUBCONTRACTOR TERMINATION COSTS	\$	443,300.00
	\$	
SUB-TOTAL OF ALL COSTS ABOVE (#1 thru #6)	\$	4,771,101.19
7. ORIGINAL CONTRACT SUM for NORTH STATE STEEL, INC.	\$	15,700,000.00
8. <DEDUCT> AMOUNT OWED TO CLOSE NSS CONTRACT	\$	(10,928,898.81)

Please let us know if you have any further questions regarding the cancellation of this project and the costs associated with it.

PA #04 = 609,654.99

Respectfully submitted,

Jon D. Morgan  
President – North State Steel, Inc.

Cc: Cathy Allsbrook – CFO  
Kari Ann Bell – Vice President  
Shawn Galloway – Project Manager



# APPLICATION AND CERTIFICATION FOR PAYMENT

TO OWNER:  
T.A. LOVING CO.  
400 PATETOWN ROAD  
GOLDSBORO, NC 27530

PROJECT: CROWN EVENT CENTER  
131 GILLESPIE STREET  
FAYETTEVILLE, NC 28301

APPLICATION NO: 4-REV  
PERIOD TO: 06/30/2025  
PROJECT NO: 24901  
INVOICE NO: 24128-4

Distribution to:  
 OWNER  
 ARCHITECT  
 CONTRACTOR

FROM CONTRACTOR:  
HINE SITEWORK, INC.  
PO BOX 1275  
GOLDSBORO, NC 27533

VIA ARCHITECT:  
EWINGCOLE  
8208 BROWNLEIGH DR #200  
RALEIGH, NC 27617

CONTRACT FOR:

## CONTRACTOR'S APPLICATION FOR PAYMENT

Application is made for payment, as shown below, in connection with the Contract.  
Continuation Sheet is attached.

1. ORIGINAL CONTRACT SUM	\$	<u>\$2,096,440.00</u>
2. NET CHANGE BY CHANGE ORDERS	\$	<u>133,938.00</u>
3. CONTRACT SUM TO DATE (Line 1 ± 2)	\$	<u>2,230,378.00</u>
4. TOTAL COMPLETED & STORED TO DATE (Column G on Continuation Sheet)	\$	<u>954,088.36</u>
5. RETAINAGE:		
a. 5% of Completed Work	\$	<u>47,704.42</u>
(Column D + E on Continuation Sheet)		
b. 5% of Stored Material	\$	<u>                    </u>
(Column F on Continuation Sheet)		
Total Retainage (Lines 5a + 5b or Total in Column I of Continuation Sheet)		
	\$	<u>47,704.42</u>
6. TOTAL EARNED LESS RETAINAGE (Line 4 Less Line 5 Total)	\$	<u>906,383.94</u>
7. LESS PREVIOUS CERTIFICATES FOR PAYMENT (Line 6 from prior Certificate)	\$	<u>821,821.49</u>
8. CURRENT PAYMENT DUE	\$	<u>84,562.45</u>
9. BALANCE TO FINISH, INCLUDING RETAINAGE (Line 3 less Line 6)	\$	<u>1,323,994.06</u>

CHANGE ORDER SUMMARY	ADDITIONS	DEDUCTIONS
Total changes approved in previous months by Owner	\$133,938.00	\$0.00
Total approved this Month	\$0.00	\$0.00
TOTALS	\$133,938.00	\$0.00
NET CHANGES by Change Order	\$133,938.00	

The undersigned Contractor certifies that to the best of the Contractor's knowledge, information and belief the Work covered by this Application for Payment has been completed in accordance with the Contract Documents, that all amounts have been paid by the Contractor for Work for which previous Certificates for Payment were issued and payments received from the Owner, and that current payment shown herein is now due.

CONTRACTOR: Hine Sitework, Inc.

By: [Signature] Date: 7/21/25

State of: North Carolina County of: Wayne  
Subscribed and sworn to before me this 21 day of July 2025

Notary Public:  
X [Signature]  
My Commission expires: 9-23-29



## ARCHITECT'S CERTIFICATE FOR PAYMENT

In accordance with the Contract Documents, based on on-site observations and the data comprising the application, the Architect certifies to the Owner that to the best of the Architect's knowledge, information and belief the Work has progressed as indicated, the quality of the Work is in accordance with the Contract Documents, and the Contractor is entitled to payment of the AMOUNT CERTIFIED.

AMOUNT CERTIFIED ..... \$                     

(Attach explanation if amount certified differs from the amount applied. Initial all figures on this application and on the Continuation Sheet that are changed to conform with the amount certified.)

Little Diversified Architectural Consulting PA

By: \_\_\_\_\_ Date: \_\_\_\_\_

This Certificate is not negotiable. The AMOUNT CERTIFIED is payable only to the Contractor named herein. Issuance, payment and acceptance of payment are without prejudice to any rights of the Owner or Contractor under this Contract.

# CONTINUATION SHEET

APPLICATION AND CERTIFICATION FOR PAYMENT, containing

Contractor's signed certification is attached.

In tabulations below, amounts are stated to the nearest cent.

Use Column I on Contracts where variable retainage for line items may apply.

APPLICATION NO: 4

PERIOD TO: 06/30/2025

PROJECT NO: 24901

INVOICE NO: 24128-4

A ITEM NO.	B DESCRIPTION OF WORK	C SCHEDULED VALUE	D WORK COMPLETED		F MATERIALS PRESENTLY STORED (NOT IN D OR E)	G		H BALANCE TO FINISH (C - G)	I RETAINAGE (IF VARIABLE RATE)
			FROM PREVIOUS APPLICATION (D + E)	THIS PERIOD		TOTAL COMPLETED AND STORED TO DATE (D+E+F)	% (G ÷ C)		
1	SUBMITTALS	\$10,000.00	\$10,000.00	\$0.00	\$0.00	\$10,000.00	100%	\$0.00	
2	LOCATE	\$15,000.00	\$15,000.00	\$0.00	\$0.00	\$15,000.00	100%	\$0.00	
3	POT HOLE	\$15,000.00	\$3,750.00	\$1,200.00	\$0.00	\$4,950.00	33%	\$10,050.00	
4	LAYOUT	\$30,000.00	\$7,500.00	\$2,400.00	\$0.00	\$9,900.00	33%	\$20,100.00	
5	MOBILIZATION	\$30,000.00	\$30,000.00	\$0.00	\$0.00	\$30,000.00	100%	\$0.00	
6	TEMPORARY MEASURES	\$25,000.00	\$0.00	\$25,000.00	\$0.00	\$25,000.00	100%	\$0.00	
7	EROSION CONTROL - STAGE 1	\$51,552.00	\$51,552.00	\$0.00	\$0.00	\$51,552.00	100%	\$0.00	
8	EROSION CONTROL - STAGE 2	\$33,010.00	\$33,010.00	\$0.00	\$0.00	\$33,010.00	100%	\$0.00	
9	EROSION CONTROL - STAGE 3	\$3,800.00	\$0.00	\$0.00	\$0.00	\$0.00	0%	\$3,800.00	
10	STREET SWEEPING	\$25,000.00	\$0.00	\$0.00	\$0.00	\$0.00	0%	\$25,000.00	
11	CONCRETE WASHOUT	\$3,200.00	\$0.00	\$0.00	\$0.00	\$0.00	0%	\$3,200.00	
12	CLEARING & GRUBBING	\$15,000.00	\$15,000.00	\$0.00	\$0.00	\$15,000.00	100%	\$0.00	
13	DEMOLITION - BUILDING	\$71,160.00	\$71,160.00	\$0.00	\$0.00	\$71,160.00	100%	\$0.00	
14	DEMOLITION - ABOVE GROUND	\$175,470.00	\$131,602.50	\$10,273.50	\$0.00	\$141,876.00	81%	\$33,594.00	
15	DEMOLITION - BELOW GROUND	\$49,880.00	\$29,928.00	\$0.00	\$0.00	\$29,928.00	60%	\$19,952.00	
16	GRADING	\$443,513.00	\$332,634.75	\$22,175.65	\$0.00	\$354,810.40	80%	\$88,702.60	
17	STORM DRAINAGE	\$206,770.00	\$0.00	\$22,963.96	\$0.00	\$22,963.96	11%	\$183,806.04	
18	TRENCH DRAINAGE	\$47,500.00	\$0.00	\$0.00	\$0.00	\$0.00	0%	\$47,500.00	
19	SEWER - MAIN	\$174,545.00	\$0.00	\$0.00	\$0.00	\$0.00	0%	\$174,545.00	
20	SEWER - SERVICES	\$203,160.00	\$0.00	\$0.00	\$0.00	\$0.00	0%	\$203,160.00	
21	WATER - MAIN	\$185,800.00	\$0.00	\$0.00	\$0.00	\$0.00	0%	\$185,800.00	
22	WATER - FIRE	\$58,750.00	\$0.00	\$0.00	\$0.00	\$0.00	0%	\$58,750.00	
23	WATER - FIRE HYDRANTS	\$89,580.00	\$0.00	\$0.00	\$0.00	\$0.00	0%	\$89,580.00	
24	WATER - SERVICE	\$79,000.00	\$0.00	\$0.00	\$0.00	\$0.00	0%	\$79,000.00	
25	WATER - IRRIGATION	\$29,750.00	\$0.00	\$0.00	\$0.00	\$0.00	0%	\$29,750.00	
<b>PAGE TOTALS</b>		<b>\$2,071,440.00</b>	<b>\$731,137.25</b>	<b>\$84,013.11</b>	<b>\$0.00</b>	<b>\$815,150.36</b>	<b>39%</b>	<b>\$1,256,289.64</b>	<b>\$40,757.52</b>

# CONTINUATION SHEET

APPLICATION AND CERTIFICATION FOR PAYMENT, containing

Contractor's signed certification is attached.

In tabulations below, amounts are stated to the nearest cent.

Use Column I on Contracts where variable retainage for line items may apply.

APPLICATION NO: 4

PERIOD TO: 06/30/2025

PROJECT NO: 24901

INVOICE NO: 24128-4

A ITEM NO.	B DESCRIPTION OF WORK	C SCHEDULED VALUE	D WORK COMPLETED		F MATERIALS PRESENTLY STORED (NOT IN D OR E)	G		H BALANCE TO FINISH (C - G)	I RETAINAGE (IF VARIABLE RATE)
			FROM PREVIOUS APPLICATION (D + E)	THIS PERIOD		TOTAL COMPLETED AND STORED TO DATE (D+E+F)	% (G + C)		
26	ASBUILTS	\$15,000.00	\$0.00	\$0.00	\$0.00	\$0.00	0%	\$15,000.00	
27	CLEANUP	\$5,000.00	\$0.00	\$0.00	\$0.00	\$0.00	0%	\$5,000.00	
28	CLOSEOUT	\$5,000.00	\$0.00	\$5,000.00	\$0.00	\$5,000.00	100%	\$0.00	
29	COR- UNDERCUT & REP. THRU 12/6/2024	\$133,938.00	\$133,938.00	\$0.00	\$0.00	\$133,938.00	100%	\$0.00	
<b>PAGE TOTALS</b>		\$158,938.00	\$133,938.00	\$5,000.00	\$0.00	\$138,938.00	87%	\$20,000.00	\$6,946.90
<b>GRAND TOTALS</b>		\$2,230,378.00	\$865,075.25	\$89,013.11	\$0.00	\$954,088.36	43%	\$1,276,289.64	\$47,704.42

# INVOICE

**Estrello Construction Group**  
106 N. Lombard St. #104  
Clayton, NC 27520

terrie@estrelloconstructiongroup  
+1 (919) 879-8086  
www.estrelloconstructiongroup.com



**Bill to**  
TA Loving  
400 Patetown Rd.  
Goldsboro, NC 27530

**Ship to**  
TA Loving  
400 Patetown Rd.  
Goldsboro, NC 27530

## Invoice details

Invoice no.: 1360  
Terms: Net 30  
Invoice date: 06/30/2025  
Due date: 07/30/2025

#	Date	Product or service	Description	Qty	Rate	Amount
1.		<b>Project Manager / Accounting Fee</b>	Crown PM & Accounting Fee	1	\$15,000.00	\$15,000.00
2.		<b>Rebar</b>	Steel Manufacturing Cochrane Steel Inv#255219 / Crown	1	\$29,104.00	\$29,104.00
3.		<b>Labor</b>	Labor Expenses incurred due project being idle/ on hold/ then cancelled Week of 4/29/25 We were able to allocate 30% of costs to other projects	1	\$20,930.00	\$20,930.00
4.		<b>Labor</b>	Labor Expenses incurred due project being idle/ on hold/ then cancelled Week of 5/5/25 We were able to allocate 30% of costs to other projects	1	\$20,930.00	\$20,930.00
5.		<b>Labor</b>	Labor Expenses incurred due project being idle/ on hold/ then cancelled Week of 5/12/25 We were able to allocate 30% of costs to other projects	1	\$20,930.00	\$20,930.00
6.		<b>Labor</b>	Labor Expenses incurred due project being idle/ on hold/ then cancelled Week of 5/19/25 We were able to allocate 30% of costs to other projects	1	\$20,930.00	\$20,930.00
7.						

	<b>Labor</b>	Labor Expenses incurred due project being idle/ on hold/ then cancelled Week of 5/26/25 We were able to allocate 30% of costs to other projects	1	\$20,930.00	\$20,930.00
8.	<b>Labor</b>	Labor Expenses incurred due project being idle/ on hold/ then cancelled Week of 6/2/25 We were able to allocate 30% of costs to other projects	1	\$20,930.00	\$20,930.00
9.	<b>Labor</b>	Labor Expenses incurred due project being idle/ on hold/ then cancelled Week of 6/9/25 We were able to allocate 30% of costs to other projects	1	\$20,930.00	\$20,930.00
10.	<b>Labor</b>	Labor Expenses incurred due project being idle/ on hold/ then cancelled Week of 6/16/25 We were able to allocate 30% of costs to other projects	1	\$20,930.00	\$20,930.00
11.	<b>Labor</b>	Labor Expenses incurred due project being idle/ on hold/ then cancelled Week of 6/23/25 We were able to allocate 30% of costs to other projects	1	\$20,930.00	\$20,930.00

**Total** **\$232,474.00**

### Ways to pay



[View and pay](#)

# Estrello Concrete Labor Breakdown

## April

Wk 1			4/28/2025	4/29/2025	4/30/2025	5/1/2025	5/2/2025		
4-28-25 to 5-2-25		Rate	Monday	Tuesday	Wednesday	Thursday	Friday	Total Hours	Total Hours Cost
1	Mario Ceras	\$57.50	8	8	8	8	8	40	\$ 2,300.00
2	Lorenzo Franciso Cortez	\$57.50	8	8	8	8	8	40	\$ 2,300.00
3	Florencio Dominguez	\$57.50	8	8	8	8	8	40	\$ 2,300.00
4	Humberto Dominguez	\$57.50	8	8	8	8	8	40	\$ 2,300.00
5	Marcos Gaona Santiago	\$57.50	8	8	8	8	8	40	\$ 2,300.00
6	Gabriel Garcia-Avalos	\$57.50	8	8	8	8	8	40	\$ 2,300.00
7	Sergio Garcia Tejada	\$57.50	8	8	8	8	8	40	\$ 2,300.00
8	Soit Gonzalez Hernandez	\$57.50	8	8	8	8	8	40	\$ 2,300.00
9	Macario Hernandez Jimenez	\$57.50	8	8	8	8	8	40	\$ 2,300.00
10	Isidro Piedra	\$57.50	8	8	8	8	8	40	\$ 2,300.00
11	Angel Quirino Dominguez	\$57.50	8	8	8	8	8	40	\$ 2,300.00
12	Leonardo Santiago Garcia	\$57.50	8	8	8	8	8	40	\$ 2,300.00
13	Noe Santiago Romero	\$57.50	8	8	8	8	8	40	\$ 2,300.00
TOTALS			104	104	104	104	104	520	\$ 29,900.00

## May

Wk 2			5/5/2025	5/6/2025	5/7/2025	5/8/2025	5/9/2025		
5-5-25 to 5-9-25		Rate	Monday	Tuesday	Wednesday	Thursday	Friday	Total Hours	Total Hours Cost
1	Mario Ceras	\$57.50	8	8	8	8	8	40	\$ 2,300.00
2	Lorenzo Franciso Cortez	\$57.50	8	8	8	8	8	40	\$ 2,300.00
3	Florencio Dominguez	\$57.50	8	8	8	8	8	40	\$ 2,300.00
4	Humberto Dominguez	\$57.50	8	8	8	8	8	40	\$ 2,300.00
5	Marcos Gaona Santiago	\$57.50	8	8	8	8	8	40	\$ 2,300.00
6	Gabriel Garcia-Avalos	\$57.50	8	8	8	8	8	40	\$ 2,300.00
7	Sergio Garcia Tejada	\$57.50	8	8	8	8	8	40	\$ 2,300.00
8	Soit Gonzalez Hernandez	\$57.50	8	8	8	8	8	40	\$ 2,300.00
9	Macario Hernandez Jimenez	\$57.50	8	8	8	8	8	40	\$ 2,300.00
10	Isidro Piedra	\$57.50	8	8	8	8	8	40	\$ 2,300.00
11	Angel Quirino Dominguez	\$57.50	8	8	8	8	8	40	\$ 2,300.00
12	Leonardo Santiago Garcia	\$57.50	8	8	8	8	8	40	\$ 2,300.00
13	Noe Santiago Romero	\$57.50	8	8	8	8	8	40	\$ 2,300.00
TOTALS			104	104	104	104	104	520	\$ 29,900.00

## May

Wk 3			5/12/2025	5/13/2025	5/14/2025	5/15/2025	5/16/2025		
5-12-25 to 5-16-25		Rate	Monday	Tuesday	Wednesday	Thursday	Friday	Total Hours	Total Hours Cost
1	Mario Ceras	\$57.50	8	8	8	8	8	40	\$ 2,300.00
2	Lorenzo Franciso Cortez	\$57.50	8	8	8	8	8	40	\$ 2,300.00
3	Florencio Dominguez	\$57.50	8	8	8	8	8	40	\$ 2,300.00
4	Humberto Dominguez	\$57.50	8	8	8	8	8	40	\$ 2,300.00
5	Marcos Gaona Santiago	\$57.50	8	8	8	8	8	40	\$ 2,300.00
6	Gabriel Garcia-Avalos	\$57.50	8	8	8	8	8	40	\$ 2,300.00
7	Sergio Garcia Tejada	\$57.50	8	8	8	8	8	40	\$ 2,300.00
8	Soit Gonzalez Hernandez	\$57.50	8	8	8	8	8	40	\$ 2,300.00
9	Macario Hernandez Jimenez	\$57.50	8	8	8	8	8	40	\$ 2,300.00
10	Isidro Piedra	\$57.50	8	8	8	8	8	40	\$ 2,300.00
11	Angel Quirino Dominguez	\$57.50	8	8	8	8	8	40	\$ 2,300.00
12	Leonardo Santiago Garcia	\$57.50	8	8	8	8	8	40	\$ 2,300.00
13	Noe Santiago Romero	\$57.50	8	8	8	8	8	40	\$ 2,300.00
TOTALS			104	104	104	104	104	520	\$ 29,900.00

## May

Wk 4			5/19/2025	5/20/2025	5/21/2025	5/22/2025	5/23/2025		
5-19-25 to 5-23-25		Rate	Monday	Tuesday	Wednesday	Thursday	Friday	Total Hours	Total Hours Cost
1	Mario Ceras	\$57.50	8	8	8	8	8	40	\$ 2,300.00
2	Lorenzo Franciso Cortez	\$57.50	8	8	8	8	8	40	\$ 2,300.00
3	Florencio Dominguez	\$57.50	8	8	8	8	8	40	\$ 2,300.00



4	Humberto Dominguez	\$57.50	8	8	8	8	8	40	\$ 2,300.00
5	Marcos Gaona Santiago	\$57.50	8	8	8	8	8	40	\$ 2,300.00
6	Gabriel Garcia-Avalos	\$57.50	8	8	8	8	8	40	\$ 2,300.00
7	Sergio Garcia Tejada	\$57.50	8	8	8	8	8	40	\$ 2,300.00
8	Soit Gonzalez Hernandez	\$57.50	8	8	8	8	8	40	\$ 2,300.00
9	Macario Hernandez Jimenez	\$57.50	8	8	8	8	8	40	\$ 2,300.00
10	Isidro Piedra	\$57.50	8	8	8	8	8	40	\$ 2,300.00
11	Angel Quirino Dominguez	\$57.50	8	8	8	8	8	40	\$ 2,300.00
12	Leonardo Santiago Garcia	\$57.50	8	8	8	8	8	40	\$ 2,300.00
13	Noe Santiago Romero	\$57.50	8	8	8	8	8	40	\$ 2,300.00
TOTALS			104	104	104	104	104	520	\$ 29,900.00

May

Wk 5			5/26/2025	5/27/2025	5/28/2025	5/29/2025	5/30/2025		
5-26-25 to 5-30-25		Rate	Monday	Tuesday	Wednesday	Thursday	Friday	Total Hours	Total Hours Cost
1	Mario Ceras	\$57.50	8	8	8	8	8	40	\$ 2,300.00
2	Lorenzo Franciso Cortez	\$57.50	8	8	8	8	8	40	\$ 2,300.00
3	Florencio Dominguez	\$57.50	8	8	8	8	8	40	\$ 2,300.00
4	Humberto Dominguez	\$57.50	8	8	8	8	8	40	\$ 2,300.00
5	Marcos Gaona Santiago	\$57.50	8	8	8	8	8	40	\$ 2,300.00
6	Gabriel Garcia-Avalos	\$57.50	8	8	8	8	8	40	\$ 2,300.00
7	Sergio Garcia Tejada	\$57.50	8	8	8	8	8	40	\$ 2,300.00
8	Soit Gonzalez Hernandez	\$57.50	8	8	8	8	8	40	\$ 2,300.00
9	Macario Hernandez Jimenez	\$57.50	8	8	8	8	8	40	\$ 2,300.00
10	Isidro Piedra	\$57.50	8	8	8	8	8	40	\$ 2,300.00
11	Angel Quirino Dominguez	\$57.50	8	8	8	8	8	40	\$ 2,300.00
12	Leonardo Santiago Garcia	\$57.50	8	8	8	8	8	40	\$ 2,300.00
13	Noe Santiago Romero	\$57.50	8	8	8	8	8	40	\$ 2,300.00
TOTALS			104	104	104	104	104	520	\$ 29,900.00

June

Wk 6			6/2/2025	6/3/2025	6/4/2025	6/5/2025	6/6/2025		
6-2-25 to 6-6-25		Rate	Monday	Tuesday	Wednesday	Thursday	Friday	Total Hours	Total Hours Cost
1	Mario Ceras	\$57.50	8	8	8	8	8	40	\$ 2,300.00
2	Lorenzo Franciso Cortez	\$57.50	8	8	8	8	8	40	\$ 2,300.00
3	Florencio Dominguez	\$57.50	8	8	8	8	8	40	\$ 2,300.00
4	Humberto Dominguez	\$57.50	8	8	8	8	8	40	\$ 2,300.00
5	Marcos Gaona Santiago	\$57.50	8	8	8	8	8	40	\$ 2,300.00
6	Gabriel Garcia-Avalos	\$57.50	8	8	8	8	8	40	\$ 2,300.00
7	Sergio Garcia Tejada	\$57.50	8	8	8	8	8	40	\$ 2,300.00
8	Soit Gonzalez Hernandez	\$57.50	8	8	8	8	8	40	\$ 2,300.00
9	Macario Hernandez Jimenez	\$57.50	8	8	8	8	8	40	\$ 2,300.00
10	Isidro Piedra	\$57.50	8	8	8	8	8	40	\$ 2,300.00
11	Angel Quirino Dominguez	\$57.50	8	8	8	8	8	40	\$ 2,300.00
12	Leonardo Santiago Garcia	\$57.50	8	8	8	8	8	40	\$ 2,300.00
13	Noe Santiago Romero	\$57.50	8	8	8	8	8	40	\$ 2,300.00
TOTALS			104	104	104	104	104	520	\$ 29,900.00

June

Wk 7			6/9/2025	6/10/2025	6/11/2025	6/12/2025	6/13/2025		
6-9-25 to 6-13-25		Rate	Monday	Tuesday	Wednesday	Thursday	Friday	Total Hours	Total Hours Cost
1	Mario Ceras	\$57.50	8	8	8	8	8	40	\$ 2,300.00
2	Lorenzo Franciso Cortez	\$57.50	8	8	8	8	8	40	\$ 2,300.00
3	Florencio Dominguez	\$57.50	8	8	8	8	8	40	\$ 2,300.00
4	Humberto Dominguez	\$57.50	8	8	8	8	8	40	\$ 2,300.00
5	Marcos Gaona Santiago	\$57.50	8	8	8	8	8	40	\$ 2,300.00
6	Gabriel Garcia-Avalos	\$57.50	8	8	8	8	8	40	\$ 2,300.00
7	Sergio Garcia Tejada	\$57.50	8	8	8	8	8	40	\$ 2,300.00
8	Soit Gonzalez Hernandez	\$57.50	8	8	8	8	8	40	\$ 2,300.00

9	Macario Hernandez Jimenez	\$57.50	8	8	8	8	8	40	\$ 2,300.00
10	Isidro Piedra	\$57.50	8	8	8	8	8	40	\$ 2,300.00
11	Angel Quirino Dominguez	\$57.50	8	8	8	8	8	40	\$ 2,300.00
12	Leonardo Santiago Garcia	\$57.50	8	8	8	8	8	40	\$ 2,300.00
13	Noe Santiago Romero	\$57.50	8	8	8	8	8	40	\$ 2,300.00
TOTALS			104	104	104	104	104	520	\$ 29,900.00

June

Wk 8			6/16/2025	6/17/2025	6/18/2025	6/19/2025	6/20/2025		
6-16-25 to 6-20-25		Rate	Monday	Tuesday	Wednesday	Thursday	Friday	Total Hours	Total Hours Cost
1	Mario Ceras	\$57.50	8	8	8	8	8	40	\$ 2,300.00
2	Lorenzo Franciso Cortez	\$57.50	8	8	8	8	8	40	\$ 2,300.00
3	Florencio Dominguez	\$57.50	8	8	8	8	8	40	\$ 2,300.00
4	Humberto Dominguez	\$57.50	8	8	8	8	8	40	\$ 2,300.00
5	Marcos Gaona Santiago	\$57.50	8	8	8	8	8	40	\$ 2,300.00
6	Gabriel Garcia-Avalos	\$57.50	8	8	8	8	8	40	\$ 2,300.00
7	Sergio Garcia Tejada	\$57.50	8	8	8	8	8	40	\$ 2,300.00
8	Soit Gonzalez Hernandez	\$57.50	8	8	8	8	8	40	\$ 2,300.00
9	Macario Hernandez Jimenez	\$57.50	8	8	8	8	8	40	\$ 2,300.00
10	Isidro Piedra	\$57.50	8	8	8	8	8	40	\$ 2,300.00
11	Angel Quirino Dominguez	\$57.50	8	8	8	8	8	40	\$ 2,300.00
12	Leonardo Santiago Garcia	\$57.50	8	8	8	8	8	40	\$ 2,300.00
13	Noe Santiago Romero	\$57.50	8	8	8	8	8	40	\$ 2,300.00
TOTALS			104	104	104	104	104	520	\$ 29,900.00

June

Wk 9			6/23/2025	6/24/2025	6/25/2025	6/26/2025	6/27/2025		
6-23-25 to 6-27-25		Rate	Monday	Tuesday	Wednesday	Thursday	Friday	Total Hours	Total Hours Cost
1	Mario Ceras	\$57.50	8	8	8	8	8	40	\$ 2,300.00
2	Lorenzo Franciso Cortez	\$57.50	8	8	8	8	8	40	\$ 2,300.00
3	Florencio Dominguez	\$57.50	8	8	8	8	8	40	\$ 2,300.00
4	Humberto Dominguez	\$57.50	8	8	8	8	8	40	\$ 2,300.00
5	Marcos Gaona Santiago	\$57.50	8	8	8	8	8	40	\$ 2,300.00
6	Gabriel Garcia-Avalos	\$57.50	8	8	8	8	8	40	\$ 2,300.00
7	Sergio Garcia Tejada	\$57.50	8	8	8	8	8	40	\$ 2,300.00
8	Soit Gonzalez Hernandez	\$57.50	8	8	8	8	8	40	\$ 2,300.00
9	Macario Hernandez Jimenez	\$57.50	8	8	8	8	8	40	\$ 2,300.00
10	Isidro Piedra	\$57.50	8	8	8	8	8	40	\$ 2,300.00
11	Angel Quirino Dominguez	\$57.50	8	8	8	8	8	40	\$ 2,300.00
12	Leonardo Santiago Garcia	\$57.50	8	8	8	8	8	40	\$ 2,300.00
13	Noe Santiago Romero	\$57.50	8	8	8	8	8	40	\$ 2,300.00
TOTALS			104	104	104	104	104	520	\$ 29,900.00



**FINANCE DEPARTMENT**

**MEMORANDUM FOR BOARD OF COMMISSIONERS AGENDA OF SEPTEMBER 15, 2025**

**TO: BOARD OF COUNTY COMMISSIONERS**

**FROM: ROBIN M KOONCE, FINANCE DIRECTOR / CFO**

**DATE: 9/3/2025**

**SUBJECT: APPROVAL OF AN UPDATE TO PERSONNEL POLICIES 7.1, 7.2, AND 7.3**

**BACKGROUND**

Cumberland County Finance is implementing Governmental Accounting Standards Board (GASB) Statement No. 101, Compensated Absences. Part of the implementation requires review of current Personnel Policies to ensure key language that is part of GASB 101 is included in County policies in order to reduce risk of errors and/or misinterpretation of the new standard.

Finance is working directly with Cherry Bekaert, LLP (CBH), consultants. The following changes were reviewed and approved by Finance, Human Resources, and Legal.

**Policy 7.1 - Holidays:**

The following language will be added: "No unused Floating Holiday leave is paid out upon separation of employment."

**Policy 7.2 - Annual Leave:**

The following language will be added: "Annual leave is settled through cash payments when used for time off during employment."

**Policy 7.3: - Sick Leave:**

The following language will be added: "Sick leave is settled through cash payments when used for time off during employment."

For information, CBH also recommended changing language in Policy 7.10, School Participation Leave. Part of the current policy refers to a fiscal year and a later part refers to a calendar year. The Human Resources Department has already made this change through a revision they completed for this policy to include other

volunteer leave.

**RECOMMENDATION / PROPOSED ACTION**

Recommend updates listed to Personnel Policies 7.1, 7.2, and 7.3 to complete implementation of GASB 101, Compensated Absences.

**ATTACHMENTS:**

Description

Type

Personnel Policies 7.1, 7.2 and 7.3

Backup Material

## Section 7: Leave Policies

### 7.0 Policy Statement

Paid leave policies apply to all employees working 20 hours or more weekly.

All leave shall be authorized in minimum increments of one-quarter hour periods (15 minutes) but only with appropriate notice and the approval of the department head or other appropriate appointed authority in order to ensure the business operations of the department run effectively.

When in paid leave status an employee continues to accumulate leave, is entitled holiday leave and is eligible for any salary increases during that period.

Employees on Worker's Compensation shall be credited with annual and sick leave accrued during time lost due to on-the-job injuries but cannot use leave to supplement the remaining salary not paid through Worker's Compensation.

Strict adherence to the terms and conditions of these policies are required. Failure to do so could result in the loss of benefits.

### 7.1 Holidays

*Revised June 1, 2021*

All full-time and part-time employees working twenty (20) or more hours per week shall be eligible for holidays, as outlined in section 3.10. Cumberland County will observe the following 12 holidays in accordance with North Carolina Office of State Human Resources, in addition to one Floating Holiday as a part of the County's Holiday Schedule:

New Year's Day	Labor Day
MLK Birthday	Veterans Day
Easter (Good Friday)	Thanksgiving (2)
Memorial Day	Christmas (3)
Fourth of July	Floating Holiday*

#### **\*Floating Holiday**

One Floating Holiday per calendar year is provided to support diversity and offer flexibility by giving employees discretion to choose a holiday, event or paid day off that is significant to them.

The Floating Holiday must be requested and approved in advance based on the business needs and operations of the department as follows:

- Eligible employees must submit Floating Holiday requests in full day increments.
- During 2021, which is the initial year of implementation, eligible employees will submit a Floating Holiday request during the month of May for consideration for a day between June – December. Department Heads shall review and communicate a determination to the employee by June 15<sup>th</sup>.
- During 2021, eligible new employees hired after June 1 must identify and submit a Floating Holiday request within five business days of the hire date for the remaining calendar year.
- Beginning in December 2021, eligible current employees will submit an annual Floating Holiday request during the month of December for the following calendar year. Department Heads shall review and communicate a determination to the employee in January.
- Beginning in January 2022, eligible new employees hired after a new calendar year has started (January) must identify and submit a Floating Holiday request within five business days of the hire date for the remaining calendar year.
- Eligible employees who transfer between County departments will submit a Floating Holiday request within five business days of their transfer unless the day has already been taken.
- Department Heads will make every effort to approve the requested holiday as work demands allow as long as approval of the requested holiday does not adversely affect County services.
- Department Head may rescind approval of an employee's floating holiday in the event of emergency/unforeseen situations that may arise, in order to meet work demands. In that situation, the impacted employee shall be allowed to submit a request for a different day to be utilized before the end of the calendar year which would be subject to the department's approval process.
- Employees may not substitute their Floating Holiday for other forms of leave such as annual leave or sick leave.
- No Floating Holiday leave balance will be carried over to subsequent years.

A yearly schedule will be distributed that shows the actual dates of the above holidays distributed by the office of the County Manager.

*(Ref. CC Personnel Ordinance, Article VI, Section 605)*



## 7.2 Annual Leave

### Covered Employees and Annual Leave Credits

All employees working at least 20 hours or more per week will accrue annual leave per pay period at a prorated accrual based upon years of Cumberland County service and hours worked per week. Employees on leave without pay at the end of the pay period, do not accrue leave credits for the pay period.

The following table indicates the amount of annual leave accrued per pay period based on years of *Cumberland County* service:

Leave Code	Years of Completed Aggregate Service	Hours Earned Each Pay Period	Days Earned Annually
1	0-2	3.7000	12.0250
2	2	4.6167	15.0043
3	5	5.5500	18.0375
4	10	6.4667	21.0168
5	15	7.4000	24.0500
6	20	8.3167	27.0293

The following table indicates the amount of annual leave accrued per pay period based on years of *Cumberland County* service for *Law Enforcement Officers Only*.

Leave Code	Years of Completed Aggregate Service	Hours Earned Each Pay Period	Days Earned Annually
A	0-2	3.9500	12.0117
B	2	4.9333	15.0018
C	5	5.9333	18.0428
D	10	6.9167	21.0234
E	15	7.9000	24.0234
F	20	8.8833	27.0135

Annual leave may be used for an absence from work as approved by supervisor including, but not limited to:

1. Vacation
2. Other periods of absence for personal reasons
3. Absences due to adverse weather conditions when the office is open
4. Personal illness (in lieu of sick leave)
5. Illness in the immediate family
6. Time lost for late reporting
7. Donations to an employee who is an approved voluntary shared leave recipient

8. To attend the funeral of anyone with whom the employee had a close relationship for a maximum of three days

Annual leave is settled through cash payments when used for time off during employment.  
In accordance with the Uniform Services Employment and Reemployment Rights Act (USERRA) an employee may choose to use annual leave to supplement guard and reserve duty pay but cannot be required to do so.

#### Accumulation

Leave may be accumulated without any applicable maximum until June 30 of each calendar year. Leave accumulations over two hundred forty (240) hours will be transferred to sick leave on the first pay period in July. Employees separating from service will be paid for no more than 240 hours in accumulated annual leave. Law enforcement officers are paid out max of 257 hrs.

#### Reemployment

Former employees who are reemployed will be credited with their total years of completed cumulative service in determining their annual leave accrual rate.

(Ref. CC Personnel Ordinance, Article VI, Section 606)

### 7.3 Sick Leave

#### Policy

Sick leave is to be used for reasons as outlined below. Sick leave cannot be substituted for other types of leave.

For the purposes of sick leave, immediate family shall be defined as child, spouse or parent as stated in the *Family and Medical Leave Act*.

#### Uses of Sick Leave

Sick leave may be used for:

1. Personal illness or injury;
2. Medical appointments; and
3. Illness, injury, or care for a member of employee's immediate family.

Sick leave is settled through cash payments when used for time off during employment.

#### Accumulation

All employees subject to the Local Government Employees' and Law Enforcement Officers' Retirement Systems who are in a pay status for ten or more workdays, 80 hours, in a pay period earn sick leave at the rate of 3.7000 hours per pay period or 12.0117 days per year. Employees whose normal work week is less than or more than 40 hours per week shall earn sick leave proportionally. There is no maximum accumulation for sick leave.

Annual leave in excess of 240 hours on June 30<sup>th</sup> each calendar year shall be converted to sick leave.

#### Verification

A statement from a medical provider or other acceptable proof may be required for an employee out on leave for three or more consecutive days or if abuse of leave is suspected.

**Acceptance of Sick Leave**

Cumberland County accepts transferrable sick leave earned from an employer under the North Carolina Retirement System, with the following conditions:

1. From the most recent qualifying employer where the employee was employed within the past three years
2. Documented on official letterhead from the transferring employer which includes the employee's name, social security number and unused sick leave balance, and dates of service
3. Requested from the previous employer by the employee and received by Cumberland County Payroll within six months of hire.

**Separation**

The county shall not pay for any unused sick leave upon the employee's separation from employment. Unused sick leave may be used for service credit upon retirement under the rules of the applicable retirement system.

**Reinstatement**

Sick leave may be reinstated when an employee returns to work within three years of a resignation from the last workday. Sick leave may be transferred out within this same three-year period.

*(Ref. CC Personnel Ordinance, Article VI, Section 607)*

**7.4 Voluntary Shared Leave**

**Policy Statement**

Cumberland County allows employees to donate annual leave to other employees appointed to regular full-time, part-time, and time-limited positions who have exhausted all of their accumulated leave.

Temporary employees do not earn leave and therefore, are not eligible to donate or receive shared leave.

Probationary employees who are not eligible for Family Medical leave coverage until one year of service may receive Voluntary Shared Leave during their first year of employment if they have a medical condition that meets Family Medical Leave guidelines.

**Eligibility**

An employee in an approved Leave-Without-Pay Status may be eligible to receive shared leave if:



**OFFICE OF THE COUNTY MANAGER**

**MEMORANDUM FOR BOARD OF COMMISSIONERS AGENDA OF SEPTEMBER 15, 2025**

**TO: BOARD OF COUNTY COMMISSIONERS**

**FROM: CLARENCE GRIER, COUNTY MANAGER**

**DATE: 9/4/2025**

**SUBJECT: APPROVAL OF AN UPDATE TO PERSONNEL POLICIES 7.10, 8.4, AND 8.5**

**BACKGROUND**

As part of the adopted FY26 Budget, the Board of County Commissioners approved two personnel policy changes that emphasized investments in workforce development and employee engagement, highlighting two specific areas:

- School Participation Leave Policy (Section 7.10) - would expand school participation leave to allow employees to participate in community involvement leave to serve their communities.
- Tuition Assistance Policy (Section 8.4) – would raise the tuition reimbursement limit to encourage greater participation of employees in professional development. Additionally, an amendment to the Tuition Reimbursement Policy (Section 8.5) would provide employees greater flexibility in financing their educational goals while maintaining safeguards to protect the County’s investment.

These personnel policy changes were approved at the September 5, 2025, Policy Committee Meeting and are to be brought forward for Commissioners’ approval at the September 15, 2025, Commissioner Meeting.

**RECOMMENDATION / PROPOSED ACTION**

Staff recommends approval of the updated personnel policies.

**ATTACHMENTS:**

Description

Personnel Policy Updates

Type

Backup Material



**MEMORANDUM**

**TO:** Policy Review Committee  
**FROM:** Dominique Hall, Human Resources Director  
**DATE:** Wednesday, August 27, 2025  
**SUBJECT:** Policy Updates – Community Engagement & School Participation Leave, Tuition Reimbursement, and Optional Tuition Assistance

**Background**

As part of the FY26 Budget adopted in June, the Board emphasized investments in workforce development and employee engagement highlighting two specific areas:

- Expanding School Participation Leave into Community Involvement Leave to allow all employees to serve their communities.
- Raising the tuition reimbursement cap to encourage greater participation in professional development.

To implement the approvals, updates to the Cumberland County Personnel Policy Manual have been drafted as well as one additional optional policy for the committee’s consideration.

**Policy Changes**

1. Section 7.10 – Community Engagement & School Participation Leave (formerly School Participation Leave)

- Retains the four (4) hours of annual leave allocation.
- Expanded eligibility from parents/guardians to all employees.
- May now be used for:
  - School participation activities (per NCGS §95-28.3).
  - Community service/volunteer activities with eligible nonprofit or civic organizations.

Directly reflects the budget directive to provide Community Involvement Leave and promotes employee engagement and civic participation.

2. Section 8.4 – Tuition Reimbursement (formerly Tuition Assistance)

- Corrected the title to Tuition Reimbursement to reflect the existing reimbursement process.

- Increased annual reimbursement limits:
  - Undergraduate: from \$500 to \$2,500.
  - Graduate: from \$500 to \$1,500.
- Clarified eligible and ineligible expenses, grade requirements, and reimbursement process.
- Supports professional development and employee retention by removing financial barriers.

**Additional Optional Policy for Consideration**

Proposed Section 8.5 – Tuition Assistance (Upfront Payment)

- Provides an upfront payment option for approved tuition costs.
- Employees would be able to choose between:
  - Reimbursement model (8.4) – payment after course completion.
  - Assistance model (8.5) – upfront payment prior to course, with repayment required if grade or service requirements are not met.
- Includes safeguards such as a signed repayment agreement and minimum grade requirement.
- Intended to further increase utilization by supporting employees who cannot afford to pay tuition costs in advance.

**Recommendation**

- Human Resources recommends approval of the updated Community Engagement & School Participation Leave Policy (Section 7.10) and the Tuition Reimbursement Policy (Section 8.4) as presented.
- Additionally, Human Resources recommends that the Policy Committee consider adoption of the optional Tuition Assistance (Upfront Payment) Policy (Section 8.5) to provide employees with greater flexibility in financing their educational goals while maintaining safeguards to protect the County’s investment.



While serving as witnesses or for court appearances in connection with their official duties, the County compensates employees for travel, room, board, and special expenses incurred and employees must turn over to the County any fees or travel allowances awarded by the court.

While on civil leave, benefits and leave will accrue as though on regular duty.

This policy shall not apply in private court actions unrelated to the County, involving the employee directly as a plaintiff or defendant.

*(Ref. CC Personnel Ordinance, Article VI, Section 611)*

## 7.9 Administrative Leave

Administrative leave is used to temporarily remove an employee from the job site in order to conduct a fact-finding investigation. The department head has the authority to place an employee on administrative leave only after consultation with County Human Resources. This action does not constitute a disciplinary action or a loss of pay or property rights and therefore cannot be grieved.

Management must notify an employee, in writing, of the reasons and instructions for placement on administrative leave not later than the second scheduled workday after the being placed on leave. Administrative leave shall last no longer than 30 calendar days without written notice of extension by the department head and only after consultation with the Human Resources Director and SHRA as applicable.

When an extension beyond the 30-day period is required, the employee must be notified in writing of the extension, the length of the extension and the specific reasons for the extension. If no action has been taken by the end of the 30-day period and no further extension has been granted, management must either take appropriate disciplinary action on the basis of the findings upon investigation or return the employee to active work status.

Under no circumstances is it permissible to use administrative leave for the purpose of extending an employee's absence from work pending the resolution of a civil or criminal court matter involving the employee. It is permissible to place an employee on administrative leave only under the following circumstances:

1. To investigate allegations of performance or conduct deficiencies that would constitute just cause for disciplinary action
2. To provide time within which to schedule and conduct a pre-disciplinary conference
3. To avoid disruption of the workplace and/or to protect the safety of persons or property

*(Ref. CC Personnel Ordinance, Article VI, Section 617)*

## 7.10 School Participation Leave

**Policy**

Based on NC GS95-28.3, Cumberland County will grant four hours of leave per year so that employees may become involved in their children’s school activities. School Participation Leave, within the parameters outlined below, may be granted to:

1. Parents for child involvement in the schools (as defined below)
2. Any employee for tutoring and mentoring in the schools

**DEFINITIONS**

**School:** Authorized to operate under the laws of the State of North Carolina and is:

1. Elementary school
2. Middle school
3. High school
4. Childcare program

For the purpose of this policy, school means any public school, private church school, church of religious charter, or non-public school as described in parts 1 and 2 of Article XXXIX of Chapter 115C of the NC General Statutes, that regularly provides a course of grade school instruction, a preschool, and child day care facilities, as defined in NC Statute 110-86(c).

**Child:** A son or daughter who is:

1. A biological child
2. An adopted child
3. A foster child
4. A stepchild
5. A legal ward
6. A child of an employee standing in loco parentis

**Covered Employees and Credits**

Any employee who is a parent, guardian, or person standing in loco parentis of a school age child shall be granted four hours of paid leave per fiscal year (July 1 through June 30) so that the employee may attend or otherwise be involved in school activities.

**Approval of Leave**

Leave approval is subject to the following:

1. Employees must receive advance approval from their supervisor to use this leave

2. Leave shall be at a mutually agreed upon time between the supervisor and the employee
3. The employee may be asked to provide a written request for the leave at least 48 hours before the time desired for the leave
4. The employee may be asked to furnish written verification from the child's school that the employee attended or was otherwise involved at that school during the time of the leave

**Noncumulative**

Leave not taken is forfeited and shall not be carried into the next calendar year.

**Separation**

Employees shall not be paid for this leave upon separation.

*(Ref. CC Personnel Ordinance, Article VI, Section 612)*

## 7.11 Family and Medical Leave Act

**Purpose**

The purpose of this policy is to ensure Family and Medical Leave is provided in compliance with the Family and Medical Leave Act (FMLA), which entitles eligible employees to take up to 12 workweeks of job-protected leave in a 12-month period for specified family and medical reasons, or for any qualifying exigency arising out of the fact that a covered military member is on active duty or has been notified of an impending call or order to active duty, in support of a contingency operation. The FMLA also allows eligible employees to take up to 26 workweeks of a job-protected leave in a single 12-month period to care for a covered service member or veteran with a serious injury or illness.

**Scope**

This policy applies to all employees who have been employed with the County for at least 12 months and who have worked a minimum of 1,250 hours during the 12-month period immediately preceding the start of the leave. Employees with any questions about their eligibility for FMLA leave should contact the Human Resources Department for more information.

**Policy**

Cumberland County shall administer FMLA leave in compliance with the FMLA of 1993, as amended, the rules and regulations of the U.S. DOL concerning FMLA as published at 29 C.F.R. Part 825, and the Cumberland County Personnel Ordinance.

**Determining the 12-Month Period**

The method used in determining the 12-month period in which the employee is entitled to the 12 workweeks for all FMLA leave except for care for a covered service member begins when an employee first takes FMLA leave and ends 12 months later.

**Care of a Covered Service Member or Veteran**

normal supervisory assistance, the employee's Department Head (or designee) may make a supervisory referral to the Employee Assistance Program.

Reports of the employee's participation in the program will be provided to the Department Head. The employee will be required to sign a release of information form to enable the EAP provider to release attendance information only.

When an EAP supervisory referral is made, supervisors should follow these steps:

1. Document all specific instances in which an employee's work performance or behavior fails to meet established standards (i.e., lateness, chronic absenteeism, decreased efficiency and/or production, friction with co-workers, violation of Center policies, etc.).
2. During the disciplinary process if the employee voluntarily admits or if the supervisor suspects that a personal problem is contributing to declining work performance or conduct, he/she shall be referred to the Employee Assistance Program, who will make arrangements for employee counseling. The EAP liaison will report to the supervisor that arrangements have been made. Appropriate disciplinary actions may be taken whether the employee accepts or declines participation in the Employee Assistance Program. Participation in the program does not negate the employee's responsibility to perform or conduct himself/herself in a satisfactory and appropriate manner.
3. If the employee chooses to utilize EAP services, the supervisor shall remind the employee that choosing to utilize the EAP services does not jeopardize the employee's job nor entitle the employee to special privileges.

## 8.4 Tuition Assistance

*Revised July 1, 2020*

### **Policy Statement**

Tuition assistance is to aide employees to obtain job related skills to enhance their career with the county. Continuing education is a benefit that directly impacts job satisfaction, improves employee retention, and enhances the County's professionalism and service delivery to our citizens. It is expected that employees approved for tuition assistance will utilize this opportunity for career development within the County.

Department Heads may approve tuition assistance in the form of reimbursement to any regular full-time employee who has completed their probationary period. Employees pay costs associated with coursework upon class enrollment and approval. An employee can be reimbursed up to the annual limit for successfully completing coursework that is directly related to an employee's current position, or for classes that prepare employees for promotions or transfers to other positions within the County. Funds are limited and provided on a first-come, first-serve basis up to \$500 per eligible employee per fiscal year.

Tuition assistance funding is contingent upon Board of County Commissioners appropriation of funds in the annual budget ordinance.

**Program Requirements:**

- **Eligible Employees:** All regular full-time employees who have successfully completed their probationary period of one full year of county service and who do not have any active disciplinary action in their personnel file. Employees must be actively employed at the time of course completion. Employees approved for tuition assistance who leave county employment prior to course completion are not eligible for tuition reimbursement.
- **Prior Approval:** Employees must submit Employee Tuition Assistance Approval Request **prior to** taking classes to be eligible for reimbursement.
- **Assistance Subject to Availability of Funds:** Tuition reimbursement is subject to availability of budgeted funds. Employees are encouraged to apply early as funds are limited each budget year.
- **Eligible Courses:** An eligible course is one which gives credit toward a related degree or certification that will either improve the employee's ability to perform the present job or help prepare them for a job within the county which requires a higher level of skills or responsibilities.
- **Eligible Institutions:** Courses must be offered by a college, university, community college or other school or training academy accredited through recognized agencies.
- **Reimbursement Amounts:** Up to \$500.00 per eligible employee per fiscal year for course(s) completed during that fiscal year. For classes that span more than one fiscal year the reimbursement will be made during the fiscal year in which the course completed.
- **Eligible Expenses:**
  - Tuition
  - Registration fees
  - Lab fees
  - Student fees
  - Books
- **Non-Eligible Expenses:**
  - Special equipment
  - Tools
  - Supplies

- Travel
- Meals
- Any expenses that were paid for by grants or scholarships
- **Grade Requirement:** Employees must complete and pass the course with a grade C or higher. For courses with non-traditional grading employees must show proof of successful pass or credit by examination.
- **Leave Time:** Employees may use pre-approved annual leave to cover educational absences during regularly scheduled work hours. (Ref. Section 7.2 Annual Leave)
- **Work Rules:**

**Employee Responsibilities:**

- Complete Employee Tuition Assistance Approval Request and submit to Department Head for approval prior to the course beginning.
- Successfully complete course with grade of C or higher or as described in Grade Requirements above.
- Complete Employee Tuition Assistance Reimbursement Request within thirty days of successful completion of course according to criteria stated above and submit to Department Head along with supporting documentation.

**Department Head Responsibilities:**

- Review Employee Tuition Assistance Approval Request for approval/denial and submit to Human Resources.
- Submit Employee Tuition Assistance Reimbursement Request and supporting documentation to Human Resources upon receipt of request from employee.

**Human Resources Responsibilities:**

- Receive Employee Tuition Assistance Approval Request from Department Head and review for policy compliance.
- Notify employee of approval/denial of Tuition Assistance Approval Request in writing.
- Receive Tuition Assistance Reimbursement Request from Department Head and submit for payment to employee through accounts payable.

## **7.10 Community Engagement and School Participation Leave**

### **Policy Statement**

Cumberland County encourages employee engagement in schools and the broader community by providing a maximum of four hours leave for school-related activities and/or volunteer service. This policy complies with **North Carolina General Statute §95-28.3**, which mandates leave for school involvement, while expanding the benefit to include other community service opportunities that align with the County's commitment to civic responsibility.

### **Eligibility and Leave Credit**

All full-time and part-time employees are eligible to receive up to four (4) hours of paid leave per fiscal year (July 1 – June 30) to participate in eligible school or community engagement activities.

This leave may be used for either of the following purposes:

1. **School Participation Leave** (as required by NCGS §95-28.3)
2. **Volunteer Community Service Leave**

### **1. School Participation Leave**

In compliance with NCGS §95-28.3, employees who are parents, guardians, or persons standing in loco parentis of a school-age child may use leave to attend or otherwise be involved in their child's school activities.

#### **Eligible School Activities Include:**

- Attending parent-teacher conferences
- Participating in classroom activities or field trips
- Volunteering at school events
- Tutoring or mentoring at the child's school

#### **Eligible Schools Include:**

- Public, private, or charter elementary, middle, or high schools
- Licensed preschools or childcare programs
- Any educational institution as defined by Article 39 of Chapter 115C or NC Statute §110-86(c)

#### **Child Definition:**

A biological, adopted, foster, stepchild, legal ward, or a child for whom the employee stands in loco parentis.



## **2. Volunteer Community Service Leave (County-Supported)**

Employees may also use their leave to volunteer with eligible nonprofit or civic organizations that support the well-being of the community.

### **Examples of Eligible Activities:**

- Volunteering at a local food bank or shelter
- Participating in community clean-up events
- Tutoring or mentoring youth not related to the employee
- Assisting in nonpartisan election support roles
- Supporting public libraries, senior centers, or other public service agencies

### **Eligible Organizations:**

- 501(c)(3) nonprofit organizations
- Public schools and universities
- Governmental and civic agencies
- Faith-based organizations providing non-religious community services

### **Leave Approval Guidelines**

- Leave must be approved in advance by the employee's supervisor.
- Leave should be taken at a mutually agreeable time that does not disrupt operations.
- At least 48 hours' notice is encouraged.
- Supervisors may request written verification from the school or organization confirming participation.

### **Additional Provisions**

- **Noncumulative:** Unused leave does not roll over into the next fiscal year.
- **Separation:** Employees will not be paid for unused leave upon separation.
- Employees may use other accrued leave if additional time is needed beyond the four-hour allowance.

### **Reference**

- Cumberland County Personnel Ordinance, Article VI, Section 612
- North Carolina General Statute §95-28.3

## **8.4 Tuition Reimbursement**

### **Policy Statement**

Cumberland County supports continuous learning and professional growth by offering tuition reimbursement to full-time employees pursuing courses that enhance their job-related skills and career potential within the County. This benefit promotes workforce development, employee engagement, and improved service delivery.

### **Eligibility**

- Regular full-time employees with at least one year of continuous service.
- No active disciplinary actions on file.
- Employee must be employed at course completion.

### **Funding Limits**

- Up to \$2,500 per fiscal year for undergraduate courses.
- Up to \$1,500 per fiscal year for graduate courses.
- Funding is contingent upon Board of County Commissioners' budget appropriation and is available on a first-come, first-served basis.

### **Eligible Expenses**

- Tuition
- Registration fees
- Lab and student fees
- Required textbooks

### **Non-Eligible Expenses**

- Special equipment or tools
- Supplies
- Travel or meals
- Expenses covered by grants, scholarships, or other assistance

### **Eligible Courses**

- Courses must be job-related or part of a degree or certification that supports promotional or transfer opportunities within the County.
- Offered by an accredited college, university, community college, or recognized training academy.

### **Grade Requirement**

- A final grade of **“C” or better** is required for reimbursement.
- For non-letter grade systems, proof of course completion or “pass” status must be submitted.

## **DRAFT**

### **Leave Usage**

Employees must use pre-approved annual leave for coursework during work hours. (See Section 7.2 Annual Leave.)

### **Reimbursement Process**

#### **1. Prior Approval**

- Submit the *Tuition Assistance Approval Request* to your Department Head at least 30 days before the course begins.
- HR will confirm eligibility and issue approval in writing.

#### **2. Reimbursement Request**

- Within 30 days of course completion, submit the *Tuition Assistance Reimbursement Request*, final grade report, and receipts to your Department Head.
- The Department will forward to HR for processing through Accounts Payable.

## **8.5 Tuition Assistance (Upfront Payment)**

### **Policy Statement**

To expand access to continued education, Cumberland County offers an optional **Tuition Assistance (Upfront Payment)** model. This program removes financial barriers by covering approved education costs at the start of a course, subject to successful course completion.

### **Eligibility**

- Regular full-time employees with at least one year of continuous service.
- No active disciplinary actions on file.
- Employee must remain employed through course completion.

### **Funding Limits**

- Up to \$2,500 per fiscal year for undergraduate courses
- Up to \$1,500 per fiscal year for graduate courses
- Funds are available on a first-come, first-served basis and subject to annual budget appropriation.

### **Eligible Courses and Institutions**

- Must meet the same criteria outlined in policy 8.4 Tuition Reimbursement.

### **Grade Requirement**

- A final grade of “C” or better is required

### **Application and Disbursement Process**

- 1. Pre-Approval and Agreement**
  - Submit a *Tuition Assistance Approval Request* and a signed *Tuition Assistance Agreement Form* at least 30 days prior to the course.
  - The Agreement will outline repayment terms should the employee not meet grade or service requirements.
  - HR and the Department Head must approve.
- 2. Upfront Payment**
  - Upon approval, HR will issue payment directly to the institution or employee (as appropriate), processed through Accounts Payable.
- 3. Post-Course Requirements**
  - Employee must submit official grade report within 30 days of course completion.

### **Repayment Terms**

- Employees who fail to meet the grade requirement, or do not submit grades, or separate employment before course ends will be required to repay the assistance in full.
- Repayment will be made through:

**DRAFT**

- Payroll deductions
- Direct payment
- If necessary, collections for unresolved balances



**FINANCE DEPARTMENT**

**MEMORANDUM FOR BOARD OF COMMISSIONERS AGENDA OF SEPTEMBER 15, 2025**

**TO: BOARD OF COUNTY COMMISSIONERS**

**FROM: ROBIN M KOONCE, FINANCE DIRECTOR / CFO**

**DATE: 9/9/2025**

**SUBJECT: APPROVAL TO PAY PRIOR YEAR INVOICES**

**BACKGROUND**

There is a period of time after June 30th of fiscal year-end in which transactions of the prior fiscal year will continue to be processed (typically until the third week in August). After that cutoff date has passed, a department may still receive a vendor invoice that is payable for services rendered or goods received in the prior fiscal year. When that occurs, approval by the Board of Commissioners is required prior to payment. The following departmental invoices meet those criteria.

**Department:** Social Services

**Vendor:** McCarter

**Date:** April 2, 2025

**Amount:** \$507.00

**Department:** American Rescue Plan

**Vendor:** Fire Chief's Association

**Date:** December 10, 2024, February 27, 2025, April 3, 2025

**Amount:** \$23,412.28

**Department:** Library

**Vendor:** InfoUSA Marketing, Inc

**Dates:** April 15, 2024

**Amount:** \$716.91

**Department:** Solid Waste

**Vendor:** Bell's Seed Store  
**Dates:** June 25, 2025  
**Amount:** \$53.08

**Department:** Solid Waste  
**Vendor:** Colonial Chemical Solutions, Inc.  
**Dates:** June 17, 2025  
**Amount:** \$3,477.68

**Department:** Solid Waste  
**Vendor:** Cumberland Septic Solutions, Inc.  
**Dates:** November 30, 2024, December 31, 2024, May 31, 2025  
**Amount:** \$2,600.10

**Department:** Solid Waste  
**Vendor:** Red Wing Shoes  
**Dates:** June 19, 2025  
**Amount:** \$100.00

**Department:** Solid Waste  
**Vendor:** Fayetteville Steel  
**Dates:** June 11, 2025  
**Amount:** \$149.80

**Department:** Human Resources  
**Vendor:** Wolfe & Associates, Inc  
**Dates:** June 30, 2025  
**Amount:** \$54.50

**Department:** Human Resources  
**Vendor:** Maryam Lafi  
**Dates:** April 2025 - June 2025  
**Amount:** \$500.00

**Department:** Human Resources  
**Vendor:** Tawheed McCray  
**Dates:** June 2025  
**Amount:** \$229.19

**Department:** Engineering  
**Vendor:** Parks Building Solutions  
**Dates:** June 30, 2025  
**Amount:** \$69,263.47

**Department:** Internal Services  
**Vendor:** Fayetteville Footwear  
**Dates:** June 2025  
**Amount:** \$400.00

**Department:** Internal Services



**Vendor:** Napa Auto Parts  
**Dates:** June 24,2025  
**Amount:** \$356.89

**Department:** Internal Services  
**Vendor:** Cintas  
**Dates:** May 2025, June 2025  
**Amount:** \$160.10

**Department:** FCEDC  
**Vendor:** Community Development Foundation  
**Dates:** June 2025  
**Amount:** \$23,812.50

**Department:** FCEDC  
**Vendor:** Lafayette Society  
**Dates:** March 2025  
**Amount:** \$2,500.00

### **RECOMMENDATION / PROPOSED ACTION**

Recommend approval to pay prior year invoices for Social Services totaling \$507.00, American Rescue Plan for \$23,412.28, Library for \$716.91, Solid Waste for \$6,380.66, Human Resources for \$783.69, Engineering for \$69,263.47, Internal Services for \$916.99 and FCEDC for \$26,312.50.

### **ATTACHMENTS:**

Description	Type
Prior Yr Invoices - Social Services	Backup Material
Prior Yr Invoices - American Rescue Plan	Backup Material
Prior Yr Invoices - Library	Backup Material
Prior Yr Invoices - Solid Waste (Bells, Colonial, Cumberland Septic, Red Wing)	Backup Material
Prior Yr Invoices - Solid Waste (Fayetteville Steel)	Backup Material
Prior Yr Invoices - Human Resources (Wolfe)	Backup Material
Prior Yr Invoices - Human Resources (L Maryam)	Backup Material
Prior Yr Invoices - Human Resources (T McCray)	Backup Material
Prior Yr Invoices - Engineering	Backup Material
Prior Yr Invoices - Internal Services	Backup Material
Prior Yr Invoices - FCEDC	Backup Material
Prior Yr Invoices - FCEDC (Lafayette Society)	Backup Material

Brenda Reid Jackson  
Director

Dawn Oxendine  
Assistant Director  
Legal Services

Donnie Perry  
Division Director  
Business Operations



**CUMBERLAND**  
COUNTY  
NORTH CAROLINA

**Department of Social Services**

Kristin Bonoyer  
Assistant Director  
Social Work Services

Vivian Tookes  
Assistant Director  
Economic Services

Heike Hammer  
Division Chief  
Performance Management

**MEMORANDUM**

**TO:** ROBIN DEEVER, FINANCE DIRECTOR

**THROUGH:** BRENDA JACKSON, DIRECTOR *[Signature]*

**THROUGH:** DONNIE PERRY, BUSINESS OPERATIONS DIVISION DIRECTOR *[Signature]*  
ELTON HINES, OPERATIONS MANAGER *[Signature]*

**FROM:** ABU-BAKR FARRAKHAN, FACILITIES MANAGER *[Signature]*

**DATE:** August 18, 2025

**SUBJECT:** REQUEST TO PAY PRIOR YEAR (FY 25) INVOICES  
Please approve the attached prior year invoices which were presented for payment after the deadline to pay Fiscal Year 2025 invoices.

**Validation Statement:** We have validated service delivery for each of the invoices attached.

**Verification Statement:** We have verified for each of the invoices attached that none are duplicates and have not been previously paid.

**Measures of Prevention:** Vendors have been counseled on the importance of submitting invoices timely and to the appropriate department. We have also strengthened additional tracking measures to easily identify when recurring vendor invoices have not been submitted.

Attachments

**CUMBERLAND COUNTY DEPARTMENT of SOCIAL SERVICES**

*We stand united to strengthen individuals and families and to protect children and vulnerable adults...*

P.O. Box 2429 | Fayetteville, North Carolina 28302-2429 | Phone: 910-677-2589 | Fax: 910-677-2886

www.ccdssnc.com

*[Handwritten signature]*

Prior Fiscal Year Invoices Presented for Payment

VENDOR NAME	INVOICE NUMBER	DOLLAR AMOUNT	REASON INVOICE IS LATE	IMPACT TO CURRENT FISCAL YEAR BUDGET
McCarter Electric Vendor #7275	3276	\$507.00	The vendor sent the invoice electronically to an incorrect email address. The vendor did not send a physical invoice or statement until August 13, 2025.	CAN BE ASBORBED INTO THE BUDGET

**TOTAL:     \$507.00**



# Invoice

## Fayetteville Branch

Date: 4/2/2025  
Invoice No.: 3276

409 Chicago Drive  
Unit 116  
Fayetteville, NC 28306

Bill to: CUMBERLAND COUNTY ENGINEERING  
130 GILLESPIE STREET  
ROOM 214  
FAYETTEVILLE, NC 28301

Service at: CUMBERLAND COUNTY DSS  
1225 RAMSEY ST.  
FAYETTEVILLE, NC 28301

Customer ID: CU024

Description: Relocate copier outlet.

Reference: Work Order 4096

Terms:

PO Number:

Item	Description	Quantity	Unit Price	Amount
Quoted Job				
	Final Billing	1.00	507.00	507.00
			<b>Subtotal</b>	<b>507.00</b>

Price Breakdown:

Labor \$455.64  
Materials \$48.00  
Material Sales Tax \$3.36

*Al Tom*  
8-18-25

*08/18/25*

Remit To:  
P.O. Box 868  
Laurinburg, NC 28353

\*A finance charge of 1.5% monthly (18% annually) will be charged on all past due balances over 30 days.

Subtotal:	507.00
<b>Total Due:</b>	<b>507.00</b>



Tye Vaught  
Chief of Staff



## American Rescue Plan

**TO:** Robin M. Koonce, Finance Director/ Chief Financial Officer  
**FROM:** Tye B. Vaught, Chief of Staff *TBV*  
**DATE:** August 12, 2025  
**SUBJECT:** Payment of Prior Year Invoice – Fire Chief’s Association

I am requesting approval to process payment for a prior year invoice from the Fire Chief’s Association. I have been in communication with the Association’s President, Chief Freddy Johnson, regarding outstanding invoices; however, I did not receive the formal request for payment until August 6, 2025, despite the memo accompanying the invoice being dated April 4, 2025.

The request includes reimbursement for three payments, supported by checks dated as follows:

- **December 10, 2024:** \$9,672.20
- **February 27, 2025:** \$11,450.07
- **April 3, 2025:** \$2,290.01

These payments total **\$23,412.28**.

There is currently an available balance of \$97,260 in budget line **1014301-522320-ARPRS MEDICAL SUPPLIES** for FY2026, with a total balance of \$156,898 available after reappropriation. This line item was approved and established in FY2023 specifically for the purchase of AED machines and pad replacements for Cumberland County Volunteer Fire Departments.

Given that the purpose of this expenditure aligns directly with the original intent of the budgeted funds, I recommend that we proceed with payment of the invoice using the available FY2026 budget in the above-referenced account.

Please let me know if you require any additional documentation to move forward with this request.

Attachment: Prior Year Invoice – Fire Chief’s Association





**Cumberland County  
Fire Chiefs' Association**  
7221 Stoney Point Road  
Fayetteville, North Carolina 28306  
Phone # (910) 424-0694  
Fax # (910) 425-2795  
Email: [spfd1301@nc.rr.com](mailto:spfd1301@nc.rr.com)



**Freddy L. Johnson Sr.**  
President  
**Gary Brock**  
Vice President  
**Freddy L. Johnson Jr.**  
Treasurer  
**Joshua Hopkins**  
Secretary  
**Henry Tyson**  
Fire Commissioner  
**Kenneth Tatum**  
Chaplain

April 4, 2025

**TO:** Mr. Tye B. Vaught, Chief of Staff  
Cumberland County Government  
P. O. Box 1829  
Fayetteville, North Carolina 28302-1829

**FROM:** Freddy L. Johnson Sr., President  
Cumberland County Fire Chiefs' Association  
7221 Stoney Point Road  
Fayetteville, North Carolina 28306-8005

**REF:** Reimbursement for Replacement Batteries for Power Heart–G-5 AEDs

Dear Mr. Vaught:

Tye, I'm hoping you are well and enjoying our summer-like weather. I am writing to provide a justification for the reimbursement of the Cumberland County Fire Chiefs Association (CCFCA) for the recent purchases consisting of three (3) separate purchases of Power Heart G5 Automated External Defibrillators (AED's) IntelliSense Batteries, totaling \$23,412.28 including applicable taxes.

With the CCFCA's transitioning from the Cardiac Science Power Heart G-5 AEDs to the new PHYSIO CONTROL LIFEPAK DEFIBRILLATOR Stryker 1000 AEDs which are compatible with Cape Fear Valley EMS, thus allowing for direct AED pad exchanges in the field.

After the transition 120 Cardiac Science Powerheart AEDs were returned to the Cumberland County Emergency Services Department, for redistribution throughout Cumberland County Departments. Since that time 51 of the 120 Powerheart AED Batteries have reached the end of their lifespan, requiring replacement due to expiration and subsequent failure.

The EMS funding allocated to the CCFCA by the Health Department specifically designated for addressing critical related medical emergencies, currently holds a fund balance of \$156,899.00. Attached invoices and copies of checks made out to Bound Tree, the sole provider of Cardiac Science AED products, further validate the necessity and legitimacy of the procurement of AED replacement batteries.



The expenditures on these batteries are justified by the essential need to maintain operational AEDs in optimal condition, ensuring effective emergency response capabilities and ultimately safeguarding the well-being of our citizens and visitors conducting business in county-owned properties.

We kindly request that the CCFCA be reimbursed for these special purchases from the fund established for the Fire Departments and this purpose.

12/10/2024 Check # 2982 Bound Tree Medical LLC = \$9,672.20  
02/27/2025 Check # 3001 Bound Tree Medical LLC = \$11,450.07  
04/03/2025 Check # 3011 Bound Tree Medical LLC. = \$2,290.01  
**Total = \$23,412.28**

Thank you for your prompt attention and approval of this matter. Should you require any additional information or clarification, please do not hesitate to reach out. We are more than willing to provide any necessary documentation or evidence to support the reimbursement claim. I am including a copy of all applicable checks and invoices. All ordered AED Batteries / PAD have been received and re-installed to all units requiring a new battery for immediate use.

Thanks again for your much needed assistance.



FREDDY L. JOHNSON SR.  
President / Fire Chief

**3 Enclosures**

- 1 - Bound Tree Invoice # 85563809 dated 11/18/2024 – Check # 2982 = \$9,672.20
- 2 - Bound Tree Invoice # 85662864 dated 02/13/2025 – Check # 3001 = \$11,450.07
- 3 – Bound Tree Invoice # 85710674 dated 03/25/2025 – Check # 3011 = \$2,290.01





# STATEMENT

5000 Tuttle Crossing Blvd  
 Dublin, OH 43016  
 Phone (800) 533-0523 Fax (800) 257-5713  
 www.boundtree.com

Date	12/01/24
Page	1
Account	240242

TIN# 31-1739487



6 / 1498 00001498 1 MB 0.622  
 CUMBERLAND CO FIRE CHIEFS ASSOC  
 7221 STONEY POINT RD  
 FAYETTEVILLE, NC 28306-8005

Remit To: BOUND TREE MEDICAL, LLC.  
 23537 NETWORK PLACE  
 CHICAGO, IL 60673-1235

Doc. Date	Due Date	Document Number Applied Item(s)	Reference / PO	Code	Original Amount	Applied Amount	Current Amount
11/18/24	12/18/24	85563809		SLS	\$ 9,698.45		\$ 9,698.45
11/12/24	11/12/24	2976		PMT	\$(26.25)		\$(26.25)
<p><i>AD# 2982 - 21 BATTERIES - 1 Adult PAK</i></p> <p><i>AD# 2976 - 25 BATTERIES</i></p> <p><i>\$ 11,476.32</i></p>							
THANK YOU FOR YOUR BUSINESS!						Account Balance	\$ 9,672.20

Please contact us to apply your unapplied payments and credits.

Current	01-30 Days	31 - 60 Days	61 - 90 Days	91 - 120 Days	Over 120 Days
9,672.20	0.00	0.00	0.00	0.00	0.00

If you require invoice copies, send your request by FAX to (866) 284-7504 or by email to [invoices@boundtree.com](mailto:invoices@boundtree.com)  
 Please include your Account Number, Invoice Number, Fax Number and Contact Name/Number.

SLS = Sales / Invoices  
 FIN = Finance Charges  
 CR = Credit Memos  
 RTN = Returns  
 PMT = Payments  
 DR = Debit Memos





Correspondence Address:  
 5000 Tuttle Crossing Blvd  
 Dublin, OH 43016  
 PHONE: (800) 533-0523  
 FAX: (800) 257-5713  
 www.boundtree.com

Please Remit to:  
**BOUND TREE MEDICAL, LLC**  
 23537 Network Place  
 Chicago, IL 60673-1235

# Invoice

Invoice	85563809
Date	11/18/2024
Page	1 of 1
Account #	240242

TIN# 31-1739487



2 / 329 00000329 1 MB 0.622  
 CUMBERLAND CO FIRE CHIEFS ASSOC  
 7221 STONEY POINT RD  
 FAYETTEVILLE, NC 28306-8005

Ship To: SHIP001  
 CUMBERLAND CO FIRE CHIEFS ASSOC  
 7221 STONEY POINT RD  
 FAYETTEVILLE, NC 28306-8005

Purchase Order #	Sales Order #	Sales Person	Ship Via	Ship Date	Payment Terms		
	105735524	R CAMPBELL	>\$150 NO FRT	11/18/2024	NET 30		
Item #	Description	Ordered	Shipped	B/O	Unit Price	UOM	Ext. Price
***** THE FOLLOWING ITEMS SHIPPED FROM: 08 *****							
2619 IGNITION DRIVE							
STE. 2							
JACKSONVILLE, FL 32218							
BTM Distributor License No: 1832							
2742-40002	Cardiac Science G5 Adult Electrodes Intellisense	1	1	0	\$75.13	EA	\$75.13
2750-40001	G5 AED IntelliSense Battery Lithium, non-rechargeable battery with 4 year operational guarantee	21	21	0	\$428.04	EA	\$8,988.84
Tracking Numbers: 422933794690							
Note: * Indicates taxable item							

Correspondence and inquiries  
 can be sent to:  
 5000 Tuttle Crossing Blvd  
 Dublin, OH 43016

Merchandise	9,063.97
Misc	0.00
Tax	634.48
Freight	0.00
Trade Discount	0.00
Payment Recv'd	0.00
<b>Total</b>	<b>9,698.45</b>











Correspondence Address:  
 5000 Tuttle Crossing Blvd  
 Dublin, OH 43016  
 PHONE: (800) 533-0523  
 FAX: (800) 257-5713  
 www.boundtree.com

Please Remit to:  
**BOUND TREE MEDICAL, LLC**  
 23537 Network Place  
 Chicago, IL 60673-1235

Check # 3001 2/23/25 Invoice

Invoice	85662864
Date	2/13/2025
Page	1 of 1
Account #	240242

TIN# 31-1739487



2 / 183 00000183 1 MB 0.622  
 CUMBERLAND CO FIRE CHIEFS ASSOC  
 7221 STONEY POINT RD  
 FAYETTEVILLE, NC 28306-8005

Ship To: SHIP001  
 CUMBERLAND CO FIRE CHIEFS ASSOC  
 7221 STONEY POINT RD  
 FAYETTEVILLE, NC 28306-8005

Purchase Order #	Sales Order #	Sales Person	Ship Via	Ship Date	Payment Terms		
PER FREDDY JOHNSON	105939130	R CAMPBELL	>\$150 NO FRT	02/12/2025	NET 30		
Item #	Description	Ordered	Shipped	B/D	Unit Price	UOM	Ext. Price
*****							
	THE FOLLOWING ITEMS SHIPPED FROM: 08 2619 IGNITION DRIVE STE. 2 JACKSONVILLE, FL 32218 BTM Distributor License No: 1832						
2750-40001	G5 AED IntelliSense Battery Lithium, non-rechargeable battery with 4 year operational guarantee	25	25	0	\$428.04	EA	\$10,701.00
2742-26002	Intellisense CPR Feedback Adult Defibrillation Pads, Powerheart G5 AED	0	0	1	\$292.99	EA	\$0.00
Tracking Numbers: 436603568291 Note: * Indicates taxable item							

Correspondence and inquiries  
 can be sent to:  
 5000 Tuttle Crossing Blvd  
 Dublin, OH 43016

Merchandise	10,701.00
Misc	0.00
Tax	749.07
Freight	0.00
Trade Discount	0.00
Payment Recv'd	0.00
<b>Total</b>	<b>11,450.07</b>











# Bound Tree

Correspondence Address:  
 5000 Tuttle Crossing Blvd  
 Dublin, OH 43016  
 PHONE: (800) 533-0523  
 FAX: (800) 257-5713  
 www.boundtree.com

Please Remit to:  
**BOUND TREE MEDICAL, LLC**  
 23537 Network Place  
 Chicago, IL 60673-1235

## Invoice

Invoice	85710674
Date	3/25/2025
Page	1 of 1
Account #	240242

TIN# 31-1739487



305D0101



2 / 173 00000173 1 MB 0.622  
 CUMBERLAND CO FIRE CHIEFS ASSOC  
 7221 STONEY POINT RD  
 FAYETTEVILLE, NC 28306-8005

Ship To: SHIP001  
 CUMBERLAND CO FIRE CHIEFS ASSOC  
 7221 STONEY POINT RD  
 FAYETTEVILLE, NC 28306-8005

Purchase Order #	Sales Order #	Sales Person	Ship Via	Ship Date	Payment Terms		
	106041564	R CAMPBELL	>\$150 NO FRT	03/25/2025	NET 30		
Item #	Description	Ordered	Shipped	B/O	Unit Price	UOM	Ext. Price
2750-40001	THE FOLLOWING ITEMS SHIPPED FROM: 08 2619 IGNITION DRIVE STE. 2 JACKSONVILLE, FL 32218 BTM Distributor License No: 1832  G5 AED IntelliSense Battery Lithium, non-rechargeable battery with 4 year operational guarantee	5	5	0	\$428.04	EA	\$2,140.20
Tracking Numbers: 444660220216 Note: * Indicates taxable item							

COPY

Correspondence and inquiries  
 can be sent to:  
 5000 Tuttle Crossing Blvd  
 Dublin, OH 43016

Merchandise	2,140.20
Misc	0.00
Tax	149.81
Freight	0.00
Trade Discount	0.00
Payment Recv'd	0.00
Total	2,290.01



CASH ONLY IF ALL CheckLock™ SECURITY FEATURES LISTED ON BACK INDICATE NO TAMPERING OR COPYING

CUMBERLAND COUNTY FIRE CHIEFS ASSOCIATION  
7221 Stoney Point Road  
Fayetteville, North Carolina 28306-8005  
Phone: 910-424-0694

TRUIST FINANCIAL  
66-112/531

3011

4/3/2025

PAY TO THE ORDER OF Bound Tree Medical, LLC.

**COPY**

\$\*\*2,290.01

Two Thousand Two Hundred Ninety and 01/100\*\*\*\*\* DOLLARS

PROTECTED AGAINST FRAUD

Bound Tree Medical, LLC.  
23537 Network Place  
Chicago, Illinois 60673-1235



*[Handwritten Signature]*

MEMO 5 Replacement Batteries for G-5 AEDs

⑈00301⑈ ⑆053101121⑆0001351086099⑈

Cumberland County Fire Chiefs Association  
Bound Tree Medical, LLC.

4/3/2025

3011

5 Replacement Batteries for old G-5 AEDs turned in t

2,290.01

INV# 85910674

Checking Account 609 5 Replacement Batteries for G-5 AEDs

2,290.01






HEATHER HALL  
DIRECTOR



VACANT  
DEPUTY DIRECTOR

MEMORANDUM

TO: Robin Koonce, Finance Director  
THRU: Faith Phillips, Assistant County Manager.   
FROM: Heather Hall, Library Director *HH 07.30.2025*  
DATE: July 30, 2025  
SUBJECT: Prior Year Invoice for InfoUSA Marketing

The library is requesting approval to process a prior-year invoice totaling \$716.91 from InfoUSA Marketing, Inc., dated April 15, 2024. This invoice was first brought to our attention on July 24, 2025, via email from a collection agency. No prior notification or correspondence was received directly from InfoUSA Marketing, Inc., which may have been due to an incorrect zip code associated with our account.

We've confirmed that the reference directories listed on the invoice were received, and that no payment has been processed to date. For reference, the invoice and item records from our library catalog are attached.

To help prevent this from happening in the future, we contacted the vendor to request an update to our zip code and to confirm they have the correct email addresses on file.

Funds to pay for this invoice will come from the FY26 book budget.

Thank you for your time and attention to this request.

Attachments: InfoUSA Marketing, Inc (DataAxle) Invoice  
Record of from library catalog





www.data-axle.com

# INVOICE

Page 1 of 1

10004204457	15-APR-24	
-------------	-----------	--

**BILL TO:**

ATTN: PATRICIA HOSMER  
 COUNTY OF CUMBERLAND PUBLIC L  
 300 MAIDEN LANE  
 FAYETTEVILLE NC 28801

**SHIP TO:**

ATTN: PATRICIA HOSMER  
 COUNTY OF CUMBERLAND PUBLIC L  
 300 MAIDEN LANE  
 FAYETTEVILLE NC 28801

954140	023000	7874618TNK00101	UPS GROUND
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Reference Solutions - Use Package Data Axle LICENSE AGREEMENT 15-Apr-2024 - 15-Apr-2024		0	
City Directories - N. Carolina State Business Directory Book - Edition 202404 @645.00/EACH Data Axle ORDER - ORDER#: 7874618	645.00	1	645.00
Freight Amount			25.00

SALES REP: BEN BRIGHAM	TERMS: UPON RECEIPT	SUBTOTAL	670.00
Special Instructions:		TAX Federal ID # 47-0794710	46.91
		ADJUSTMENTS	0.00
		PAYMENTS	-0.00
		<b>BALANCE DUE</b>	<b>716.91 USD</b>

For Billing Inquiries/Contact Changes Phone: 866-872-0053 Fax: 402-836-3951 Email: arhelp@data-axle.com

This invoice is governed by the terms of the Master Product Suite Agreement available at <https://www.data-axle.com/master-product-suite-agreement> (the "MPSA"). If a separate, fully executed agreement exists between you and Data Axle (or any of its affiliates or subsidiaries) for the products and/or services under this invoice, this invoice will be governed by the terms of that agreement and the terms of the MPSA will not apply to this invoice. By accessing and using the product or services provided in this invoice, you agree to the Terms and Conditions for Use found at <https://www.data-axle.com/terms-and-conditions/>

Remittance Form: Please return this portion with your payment to ensure proper posting to your account. If you have any questions regarding this invoice, contact Accounts Receivable at 866-872-0053. Thank you.

COUNTY OF CUMBERLAND PUBLIC L	954140	10004204457	716.91 USD	AMOUNT PAID
-------------------------------	--------	-------------	------------	-------------

ATTN: PATRICIA HOSMER  
 COUNTY OF CUMBERLAND PUBLIC L  
 300 MAIDEN LANE  
 FAYETTEVILLE NC 28801

Please make checks payable and remit to: InfoUSA Marketing, Inc.  
 (A subsidiary of Data Axle, Inc.)  
 PO BOX 957742  
 ST. LOUIS MO 63195-7742

000010004204457600000716915





Record Summary [Serials and magazines](#)

Title: North Carolina [Business Directory](#)

Author: 338.0029/4756

Bib Call #: 338.0029/4756

Edition:

Pubdate: 2003

Record Owner:

TCN: 10179798

Created By: admin

Database ID: 10179798

Last Edited By: jeffon

Last Edited On: 10/21/23, 12:24 PM

Created On: 1/10/17, 2:09 PM

Last Edited On: 10/21/23, 12:24 PM

Start: Previous Next End Back to Results (1 / 40)

Patron View Place Hold Add Holdings Serials Mark For... Other Actions

Staff View Item Table MARC Edit MARC View Record Notes View Holds Monograph Parts Holdings View Compaired Items Shelf Browse

Navigation buttons: Home, Back, Forward, Refresh, Rows 100, Settings

#	Location	Call Number / Item Notes	Part	Barcode	Shipping Location	Circulation Modifier	Status	Active/Create Date	Due Date
1	CUMBERLAND_HQ	RNC 338.0029 N 2024 Edit	Vol. 1	31781057089050 View   Edit	Local History Reference	BOOK	Available	06/06/2024	
2	CUMBERLAND_HQ	RNC 338.0029 N 2024 Edit	Vol. 2	31781057089058 View   Edit	Local History Reference	BOOK	Available	06/06/2024	
3	CUMBERLAND_HQ	RNC 338.0029 N 2024 Edit	Vol. 3	31781057089076 View   Edit	Local History Reference	BOOK	Available	06/06/2024	
4	CUMBERLAND_HQ	RNC 338.0029 N 2024 Edit	Vol. 4	31781057089084 View   Edit	Local History Reference	BOOK	Available	06/06/2024	



Amanda Lee, PE  
General Manager  
for Natural Resources



**Solid Waste Management &  
Public Utilities Department**

**MEMORANDUM**


TO: ROBIN KOONCE, FINANCE DIRECTOR  
FROM: AMANDA LEE, GENERAL MANAGER FOR NATURAL RESOURCES  
DATE: AUGUST 14, 2025  
SUBJECT: REQUEST TO PAY PRIOR YEAR (FY25) INVOICES

A handwritten signature in blue ink that reads "Amanda Lee".

Please approve the attached prior year invoices which were presented for payment after the deadline to pay Fiscal Year 2025 invoices.

**Validation:** We have validated service delivery for the invoices attached.

- Bell's Seed Store – The Solid Waste Department received a request for payment on August 11, 2025 for prior year invoice with Invoice #2076/1 dated 06/25/2025 in the amount of \$53.08.
- Colonial Chemical Solutions Inc. – The Solid Waste Department received a request for payment on August 6, 2025 for prior year invoice with Invoice #24030989-A dated 06/17/2025 in the amount of \$3,477.68.
- Cumberland Septic Services Inc. – The Solid Waste Department received a request for payment on August 13, 2025 for prior year invoices with Invoice #128471 dated 11/30/2024 in the amount of \$877.40, Invoice #130623 dated 12/31/2024 in the amount of \$845.30, and Invoice #140663 dated 05/31/2025 in the amount of \$877.40.
- Red Wing Shoes – The Public Utilities Department received a request for payment on August 4, 2025 for prior year invoice with Invoice #0236383 dated ~~7/18/2025~~ *6/19/2025 ER* in the amount of \$100.

  
**Verification Statement:** We have verified the invoices attached are not a duplicate and have not been previously paid. (ATTACHED)

**Measure of prevention:** We have strengthened additional tracking measures to easier identify when recurring vendor invoices have not been submitted.

The cost of the invoices can be absorbed in this year's budget:

**Solid Waste Department**

Invoice	Budget Org – Obj	Amount
2076/1	6254608 – 522210	\$53.08
24030989-A	6254606 – 522210	\$3,477.68
128471	6254602 – 533802	\$30
	6254606 – 533802	\$60
	6254607 – 533802	\$30
	6254608 – 533802	\$605
	6254611 – 533802	\$95
130623	6254602 – 533802	\$30

698 Ann Street | Fayetteville, North Carolina 28301

Solid Waste Customer Service Phone: 910-321-6920 | Public Utilities Customer Service Phone: 910-678-7682 | Fax: 910-321-6840

[cumberlandcountync.gov](http://cumberlandcountync.gov)



Amanda Lee, PE  
 General Manager  
 for Natural Resources



**Solid Waste Management &  
 Public Utilities Department**

	6254606 – 533802	\$60
	6254607 – 533802	\$30
	6254608 – 533802	\$575
	6254611 – 533802	\$95
I40663	6254602 – 533802	\$30
	6254606 – 533802	\$60
	6254607 – 533802	\$30
	6254608 – 533802	\$605
	6254611 – 533802	\$95

**Public Utilities Department**

Invoice	Budget Org – Obj	Amount
0236383	101451A – 533671	\$100





**Bell's Seed Store**  
**230 E. Russell Street**  
**Fayetteville, NC 28301**

PAGE NO 1

**PHONE: (910) 483-8400**

CUST NO: 88	JOB NO: 000	PURCHASE ORDER: 4608	REFERENCE: Dave	TERMS: NET 15TH	CLERK: LISA	DATE / TIME: 6/25/25 9:54
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DUE DATE: 7/15/25      TERMINAL: 551

SOLD TO:  
 CUMB. CO. SOLID WASTE / LANDFI  
 698 ANN ST.  
 FAYETTEVILLE NC 28301

SHIP TO:

TAX: 001 FAYETTEVILL NC

**INVOICE: 2076 /1**

LINE	SHIPPED	ORDERED	UM	SKU	DESCRIPTION	SUGG	UNITS	PRICE/ PER	EXTENSION
1	1	1	EA	6329650	SPRAY WASP/HORNET 18.5OZ		1	4.95 /EA	4.95
2	1	1	EA	6329650	SPRAY WASP/HORNET 18.5OZ		1	4.95 /EA	4.95
3	1	1	EA	6329650	SPRAY WASP/HORNET 18.5OZ		1	4.95 /EA	4.95
4	1	1	EA	6329650	SPRAY WASP/HORNET 18.5OZ		1	4.95 /EA	4.95
5	1	1	EA	6329650	SPRAY WASP/HORNET 18.5OZ		1	4.95 /EA	4.95
6	1	1	EA	6329650	SPRAY WASP/HORNET 18.5OZ		1	4.95 /EA	4.95
7	1	1	EA	8879942	TOOL PICK UP/REACH 36IN		1	9.95 /EA	9.95
8	1	1	EA	8879942	TOOL PICK UP/REACH 36IN		1	9.95 /EA	9.95

6254608  
522210

ORIGINAL  
 Certified By:  
 AC  
 RECEIVED  
 8/8/25

TAXABLE	49.60
NON-TAXABLE	0.00
<b>SUBTOTAL</b>	<b>49.60</b>

(DAVE)  
**\*\* AMOUNT CHARGED TO STORE ACCOUNT \*\*      53.08**

TAX AMOUNT	3.48
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<b>TOTAL</b>	<b>53.08</b>
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TOT WT: 9.66

X  
 Received By





Original Invoice  
**COLONIAL CHEMICAL SOLUTIONS, INC.**  
 (800) 285-8593

Invoice	
Date	Number
6/17/2025	24030989-A
Sales Order Number	
24031049 SF	

<b>SOLD TO:</b> 1331621
CUMBERLAND COUNTY SOLID WASTE 698 ANN STREET FAYETTEVILLE, NC 28301

<b>SHIP TO:</b> 1331622
CUMBERLAND COUNTY SOLID WASTE 698 ANN STREET FAYETTEVILLE NC 28301

Cust Order No.	Shipped Via	Ship/Frt Terms	Branch	Sales Rep
Wes Wrenn	CCS INTERNAL FREIGHT	PREPAID/DELIVERED	189970	9430

Shipped Date.	Railcar No.	Release No.	Shipment No.
6/17/2025			649308

Units/Pkg	Item/Product Description	Total Quantity	Price	Amount
8.00000 50 LB PAIL	CHLORINE, TABLET CHLO002	400.00000 LB	\$7.970000	\$3188.00
1.00000	DELIVERY FEE DEL FEE	1.00000 EA	\$65.000000	\$65.00

6254606  
522210

ORIGINAL  
Certified By:

AC

RECEIVED  
8-5-25

**NOTES:**

<b>Sales Tax:</b> NC CUMBERLAND COUNTY	N026	Tax Rate: 7.000%	\$224.68
<b>Due Date:</b> 7/17/2025	<b>TOTAL DUE</b>	USD	\$3,477.68

We may impose late charges, the lesser of 1.5% per month or the maximum lawful rate, 30 days after due date and computed from due date.  
 Unless otherwise agreed in a writing signed by CCS, the General Terms and Conditions located at  
<http://colonialchemicals.com/resources/terms-and-conditions/> or provided upon request shall apply to all Customer's purchases.

**\*\*\* PLEASE INCLUDE ACCOUNT NUMBER AND INVOICE NUMBER WITH REMITTANCE \*\*\***

<b>MAIL REMITTANCE TO:</b>
COLONIAL CHEMICAL SOLUTIONS INC. PO BOX 743239 ATLANTA GA 30374-3239

<b>ELECTRONIC REMITTANCE TO:</b>
COLONIAL CHEMICAL SOLUTIONS INC. Payment by ACH transfer in USD to Bank of America, NA ABA#: 061000052 Acct#: 003253917555

For more information visit [www.colonialchemicals.com](http://www.colonialchemicals.com)  
 We appreciate your business!





CUMBERLAND SEPTIC SERVICES INC  
 PO BOX 35192  
 FAYETTEVILLE, NC 28303  
 (910) 868-3830  
 CUMBERLANDSEPTIC@GMAIL.COM  
 Tax ID: 561922838



**Invoice To:**

CUMBERLAND COUNTY SOLID WASTE  
 638 Ann St  
 Fayetteville, NC 28301

Invoice # I28471  
 Invoice Date Nov 30, 2024  
 Due Date Dec 30, 2024

Invoice Amount **\$877.40**

Customer ID C915	PO # ---	Pay Online ID ---	Clerk RR
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ANN ST, 698 Ann St, Fayetteville, NC 28301 \$128.40

Invoice Date Nov 30, 2024	Terms NET 30	Invoice # I28472	P.O. # ---	Rental # R1694
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Service	Tax Code	Rate	Qty.	Amount
1 MONTHLY (11/1/2024 - 11/30/2024) PORTABLE TOILET - 1X WEEKLY SERVICE	01	\$30.00	4	\$120.00

Subtotal \$120.00 CUMBERLAND - 7% (01) \$8.40  
 Discounts (\$0.00)

ANN ST \$128.40

ANN ST, 698 Ann St, Fayetteville, NC 28301 \$128.40

JERNIGAN, 9221 Giles Rd, Linden, NC 28356 \$64.20

Invoice Date Nov 30, 2024	Terms NET 30	Invoice # I28484	P.O. # ---	Rental # R2280
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Service	Tax Code	Rate	Qty.	Amount
1 MONTHLY (11/1/2024 - 11/30/2024) PORTABLE TOILET - 1X WEEKLY SERVICE	01	\$30.00	1	\$30.00

Subtotal \$30.00 CUMBERLAND - 7% (01) \$2.10  
 Discounts (\$0.00)

JERNIGAN \$32.10

Invoice Date Nov 30, 2024	Terms NET 30	Invoice # I28486	P.O. # ---	Rental # R2283
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Service	Tax Code	Rate	Qty.	Amount
1 MONTHLY (11/1/2024 - 11/30/2024) PORTABLE TOILET - 1X WEEKLY SERVICE	01	\$30.00	1	\$30.00

Subtotal \$30.00 CUMBERLAND - 7% (01) \$2.10  
 Discounts (\$0.00)

JERNIGAN \$32.10

JERNIGAN, 9221 Giles Rd, Linden, NC 28356 \$64.20

WARREN, 5488 Leitha Ln, Godwin, NC 28344 \$32.10

Invoice Date Nov 30, 2024	Terms NET 30	Invoice # I28490	P.O. # ---	Rental # R2292
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Service	Tax Code	Rate	Qty.	Amount
1 MONTHLY (11/1/2024 - 11/30/2024) PORTABLE TOILET - 1X WEEKLY SERVICE	01	\$30.00	1	\$30.00
Subtotal \$30.00 CUMBERLAND - 7% (01) \$2.10 Discounts (\$0.00)				
WARREN				\$32.10
WARREN, 5488 Leitha Ln, Godwin, NC 28344				\$32.10

PEARSALL, 2331 Polly Island Rd, Autryville, NC 28318 \$32.10

Invoice Date	Terms	Invoice #	P.O. #	Rental #
Nov 30, 2024	NET 30	I28489	---	R2291

Service	Tax Code	Rate	Qty.	Amount
1 MONTHLY (11/1/2024 - 11/30/2024) PORTABLE TOILET - 1X WEEKLY SERVICE	01	\$30.00	1	\$30.00
Subtotal \$30.00 CUMBERLAND - 7% (01) \$2.10 Discounts (\$0.00)				
PEARSALL				\$32.10
PEARSALL, 2331 Polly Island Rd, Autryville, NC 28318				\$32.10

PARKER, 4759 Black Bridge Rd, Parkton, NC 28371 \$32.10

Invoice Date	Terms	Invoice #	P.O. #	Rental #
Nov 30, 2024	NET 30	I28488	---	R2290

Service	Tax Code	Rate	Qty.	Amount
1 MONTHLY (11/1/2024 - 11/30/2024) PORTABLE TOILET - 1X WEEKLY SERVICE	01	\$30.00	1	\$30.00
Subtotal \$30.00 CUMBERLAND - 7% (01) \$2.10 Discounts (\$0.00)				
PARKER				\$32.10
PARKER, 4759 Black Bridge Rd, Parkton, NC 28371				\$32.10

MCCAULEY, 4674 Research Dr, Fayetteville, NC 28306 \$32.10

Invoice Date	Terms	Invoice #	P.O. #	Rental #
Nov 30, 2024	NET 30	I28487	---	R2286

Service	Tax Code	Rate	Qty.	Amount
1 MONTHLY (11/1/2024 - 11/30/2024) PORTABLE TOILET - 1X WEEKLY SERVICE	01	\$30.00	1	\$30.00
Subtotal \$30.00 CUMBERLAND - 7% (01) \$2.10 Discounts (\$0.00)				
MCCAULEY				\$32.10
MCCAULEY, 4674 Research Dr, Fayetteville, NC 28306				\$32.10

MANCHESTER, 1000 Little River Rd, Spring Lake, NC 28390 \$32.10

Invoice Date	Terms	Invoice #	P.O. #	Rental #
Nov 30, 2024	NET 30	I28485	---	R2282

Service	Tax Code	Rate	Qty.	Amount
1 MONTHLY (11/1/2024 - 11/30/2024) PORTABLE TOILET - 1X WEEKLY SERVICE	01	\$30.00	1	\$30.00
Subtotal \$30.00 CUMBERLAND - 7% (01) \$2.10 Discounts (\$0.00)				
MANCHESTER				\$32.10





MANCHESTER, 1000 Little River Rd, Spring Lake, NC 28390

\$32.10

JE CARTER, 4465 Macedonia Church Rd, Fayetteville, NC 28312

\$32.10

Invoice Date Nov 30, 2024	Terms NET 30	Invoice # I28483	P.O. # ---	Rental # R2279
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Service	Tax Code	Rate	Qty.	Amount
1 MONTHLY (11/1/2024 - 11/30/2024) PORTABLE TOILET - 1X WEEKLY SERVICE	01	\$30.00	1	\$30.00

Subtotal \$30.00 CUMBERLAND - 7% (01) \$2.10  
Discounts (\$0.00)

JE CARTER \$32.10

JE CARTER, 4465 Macedonia Church Rd, Fayetteville, NC 28312

\$32.10

WILLIAMS, 5746 Kennel Rd, Wade, NC 28395

\$32.10

Invoice Date Nov 30, 2024	Terms NET 30	Invoice # I28473	P.O. # ---	Rental # R2228
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Service	Tax Code	Rate	Qty.	Amount
1 MONTHLY (11/1/2024 - 11/30/2024) PORTABLE TOILET - 1X WEEKLY SERVICE	01	\$30.00	1	\$30.00

Subtotal \$30.00 CUMBERLAND - 7% (01) \$2.10  
Discounts (\$0.00)

WILLIAMS \$32.10

WILLIAMS, 5746 Kennel Rd, Wade, NC 28395

\$32.10

IN CARTER, 3961 Hummingbird Pl, Fayetteville, NC 28312

\$32.10

Invoice Date Nov 30, 2024	Terms NET 30	Invoice # I28482	P.O. # ---	Rental # R2278
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Service	Tax Code	Rate	Qty.	Amount
1 MONTHLY (11/1/2024 - 11/30/2024) PORTABLE TOILET - 1X WEEKLY SERVICE	01	\$30.00	1	\$30.00

Subtotal \$30.00 CUMBERLAND - 7% (01) \$2.10  
Discounts (\$0.00)

IN CARTER \$32.10

IN CARTER, 3961 Hummingbird Pl, Fayetteville, NC 28312

\$32.10

HUBBARD, 1066 Wade-Stedman Rd, Stedman, NC 28391

\$133.75

Invoice Date Nov 30, 2024	Terms NET 30	Invoice # I28481	P.O. # ---	Rental # R2277
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Service	Tax Code	Rate	Qty.	Amount
1 MONTHLY (11/1/2024 - 11/30/2024) PORTABLE TOILET - 1X WEEKLY SERVICE	01	\$30.00	1	\$30.00
2 MONTHLY (11/1/2024 - 11/30/2024) HANDWASH UNIT - 1X WEEKLY SERVICE	01	\$95.00	1	\$95.00

Subtotal \$125.00 CUMBERLAND - 7% (01) \$8.75  
Discounts (\$0.00)

HUBBARD \$133.75

HUBBARD, 1066 Wade-Stedman Rd, Stedman, NC 28391

\$133.75

FISHER, 7931 Turnbull Rd, Fayetteville, NC 28312

\$32.10



Invoice Date Nov 30, 2024	Terms NET 30	Invoice # I28480	P.O. # ---	Rental # R2276
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Service	Tax Code	Rate	Qty.	Amount
1 MONTHLY (11/1/2024 - 11/30/2024) PORTABLE TOILET - 1X WEEKLY SERVICE	01	\$30.00	1	\$30.00

Subtotal \$30.00 CUMBERLAND - 7% (01) \$2.10  
Discounts (\$0.00)

FISHER \$32.10

FISHER, 7931 Turnbull Rd, Fayetteville, NC 28312

\$32.10

COOPER, 2210 Rich Walker Rd, Wade, NC 28395

\$32.10

Invoice Date Nov 30, 2024	Terms NET 30	Invoice # I28479	P.O. # ---	Rental # R2275
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Service	Tax Code	Rate	Qty.	Amount
1 MONTHLY (11/1/2024 - 11/30/2024) PORTABLE TOILET - 1X WEEKLY SERVICE	01	\$30.00	1	\$30.00

Subtotal \$30.00 CUMBERLAND - 7% (01) \$2.10  
Discounts (\$0.00)

COOPER \$32.10

COOPER, 2210 Rich Walker Rd, Wade, NC 28395

\$32.10

ODOM, 2281 Odom Rd, Hope Mills, NC 28348

\$133.75

Invoice Date Nov 30, 2024	Terms NET 30	Invoice # I28478	P.O. # ---	Rental # R2274
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Service	Tax Code	Rate	Qty.	Amount
1 MONTHLY (11/1/2024 - 11/30/2024) PORTABLE TOILET - 1X WEEKLY SERVICE	01	\$30.00	1	\$30.00
2 MONTHLY (11/1/2024 - 11/30/2024) HANDWASH UNIT - 1X WEEKLY SERVICE	01	\$95.00	1	\$95.00

Subtotal \$125.00 CUMBERLAND - 7% (01) \$8.75  
Discounts (\$0.00)

ODOM \$133.75

ODOM, 2281 Odom Rd, Hope Mills, NC 28348

\$133.75

Cliffdale, 7581 Lowell Harris Rd, Fayetteville, NC 28314

\$32.10

Invoice Date Nov 30, 2024	Terms NET 30	Invoice # I28477	P.O. # ---	Rental # R2273
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Service	Tax Code	Rate	Qty.	Amount
1 MONTHLY (11/1/2024 - 11/30/2024) PORTABLE TOILET - 1X WEEKLY SERVICE	01	\$30.00	1	\$30.00

Subtotal \$30.00 CUMBERLAND - 7% (01) \$2.10  
Discounts (\$0.00)

Cliffdale \$32.10

Cliffdale, 7581 Lowell Harris Rd, Fayetteville, NC 28314

\$32.10

CAMDEN, 7427 Camden Rd, Fayetteville, NC 28306

\$32.10

Invoice Date Nov 30, 2024	Terms NET 30	Invoice # I28474	P.O. # ---	Rental # R2243
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Service	Tax Code	Rate	Qty.	Amount
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Service	Tax Code	Rate	Qty.	Amount
1 MONTHLY (11/1/2024 - 11/30/2024) PORTABLE TOILET - 1X WEEKLY SERVICE	01	\$30.00	1	\$30.00
Subtotal \$30.00 CUMBERLAND - 7% (01) \$2.10 Discounts (\$0.00)				
CAMDEN				\$32.10
CAMDEN, 7427 Camden Rd, Fayetteville, NC 28306				\$32.10

MELVIN, 3811 Dudley Rd, Fayetteville, NC 28312 \$32.10

Invoice Date	Terms	Invoice #	P.O. #	Rental #
Nov 30, 2024	NET 30	I28525	---	R2289

Service	Tax Code	Rate	Qty.	Amount
1 MONTHLY (11/1/2024 - 11/30/2024) PORTABLE TOILET - 1X WEEKLY SERVICE	01	\$30.00	1	\$30.00
Subtotal \$30.00 CUMBERLAND - 7% (01) \$2.10 Discounts (\$0.00)				
MELVIN				\$32.10
MELVIN, 3811 Dudley Rd, Fayetteville, NC 28312				\$32.10

Invoice Summary

Invoice Subtotal	\$820.00
Tax (01) - CUMBERLAND - 7%	\$57.40
<b>Invoice Total</b>	<b>\$877.40</b>

**Thank you!**

Detach and return (#9 envelope)

CUMBERLAND COUNTY SOLID WASTE  
638 Ann St  
Fayetteville, NC 28301

Customer ID # C915  
Invoice # I28471  
Invoice Date Nov 30, 2024  
Due Date Dec 30, 2024  
Invoice Total \$877.40  
Payments (\$0.00)

**Remit To:**

CUMBERLAND SEPTIC SERVICES INC  
PO BOX 35192  
FAYETTEVILLE, NC 28303

**Invoice Due \$877.40**

6254602 533802  
4606  
4607  
4608  
4611

30  
60  
30  
605  
\$95





CUMBERLAND SEPTIC SERVICES INC  
 PO BOX 35192  
 FAYETTEVILLE, NC 28303  
 (910) 868-3830  
 CUMBERLANDSEPTIC@GMAIL.COM  
 Tax ID: 561922838



Invoice # I30623  
 Invoice Date Dec 31, 2024  
 Due Date Jan 30, 2025

**Invoice To:**

CUMBERLAND COUNTY SOLID WASTE  
 638 Ann St  
 Fayetteville, NC 28301

Invoice Amount **\$845.30**

Customer ID C915	PO # ---	Pay Online ID ---	Clerk RR
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ANN ST, 698 Ann St, Fayetteville, NC 28301 \$128.40

Invoice Date Dec 31, 2024	Terms NET 30	Invoice # I30624	P.O. # ---	Rental # R1694
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Service	Tax Code	Rate	Qty.	Amount
1 MONTHLY Dec 1, 2024 - Dec 31, 2024   (12/1/2024 - 12/31/2024) PORTABLE TOILET - 1X WEEKLY SERVICE	01	\$30.00	4	\$120.00

Subtotal \$120.00 CUMBERLAND - 7% (01) \$8.40  
 Discounts (\$0.00)

ANN ST \$128.40

ANN ST, 698 Ann St, Fayetteville, NC 28301 \$128.40

JE CARTER, 4465 Macedonia Church Rd, Fayetteville, NC 28312 \$32.10

Invoice Date Dec 31, 2024	Terms NET 30	Invoice # I30635	P.O. # ---	Rental # R2279
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Service	Tax Code	Rate	Qty.	Amount
1 MONTHLY Dec 1, 2024 - Dec 31, 2024   (12/1/2024 - 12/31/2024) PORTABLE TOILET - 1X WEEKLY SERVICE	01	\$30.00	1	\$30.00

Subtotal \$30.00 CUMBERLAND - 7% (01) \$2.10  
 Discounts (\$0.00)

JE CARTER \$32.10

JE CARTER, 4465 Macedonia Church Rd, Fayetteville, NC 28312 \$32.10

PEARSALL, 2331 Polly Island Rd, Autryville, NC 28318 \$32.10

Invoice Date Dec 31, 2024	Terms NET 30	Invoice # I30641	P.O. # ---	Rental # R2291
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Service	Tax Code	Rate	Qty.	Amount
1 MONTHLY Dec 1, 2024 - Dec 31, 2024   (12/1/2024 - 12/31/2024) PORTABLE TOILET - 1X WEEKLY SERVICE	01	\$30.00	1	\$30.00

Subtotal \$30.00 CUMBERLAND - 7% (01) \$2.10  
 Discounts (\$0.00)

PEARSALL \$32.10

PEARSALL, 2331 Polly Island Rd, Autryville, NC 28318 \$32.10



PARKER, 4759 Black Bridge Rd, Parkton, NC 28371

\$32.10

Invoice Date Dec 31, 2024	Terms NET 30	Invoice # I30640	P.O. # ---	Rental # R2290
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Service	Tax Code	Rate	Qty.	Amount
1 MONTHLY Dec 1, 2024 - Dec 31, 2024   (12/1/2024 - 12/31/2024) PORTABLE TOILET - 1X WEEKLY SERVICE	01	\$30.00	1	\$30.00

Subtotal \$30.00 CUMBERLAND - 7% (01) \$2.10  
Discounts (\$0.00)

PARKER \$32.10

PARKER, 4759 Black Bridge Rd, Parkton, NC 28371

\$32.10

MCCAULEY, 4674 Research Dr, Fayetteville, NC 28306

\$32.10

Invoice Date Dec 31, 2024	Terms NET 30	Invoice # I30639	P.O. # ---	Rental # R2286
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Service	Tax Code	Rate	Qty.	Amount
1 MONTHLY Dec 1, 2024 - Dec 31, 2024   (12/1/2024 - 12/31/2024) PORTABLE TOILET - 1X WEEKLY SERVICE	01	\$30.00	1	\$30.00

Subtotal \$30.00 CUMBERLAND - 7% (01) \$2.10  
Discounts (\$0.00)

MCCAULEY \$32.10

MCCAULEY, 4674 Research Dr, Fayetteville, NC 28306

\$32.10

JERNIGAN, 9221 Giles Rd, Linden, NC 28356

\$64.20

Invoice Date Dec 31, 2024	Terms NET 30	Invoice # I30638	P.O. # ---	Rental # R2283
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Service	Tax Code	Rate	Qty.	Amount
1 MONTHLY Dec 1, 2024 - Dec 31, 2024   (12/1/2024 - 12/31/2024) PORTABLE TOILET - 1X WEEKLY SERVICE	01	\$30.00	1	\$30.00

Subtotal \$30.00 CUMBERLAND - 7% (01) \$2.10  
Discounts (\$0.00)

JERNIGAN \$32.10

Invoice Date Dec 31, 2024	Terms NET 30	Invoice # I30636	P.O. # ---	Rental # R2280
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Service	Tax Code	Rate	Qty.	Amount
1 MONTHLY Dec 1, 2024 - Dec 31, 2024   (12/1/2024 - 12/31/2024) PORTABLE TOILET - 1X WEEKLY SERVICE	01	\$30.00	1	\$30.00

Subtotal \$30.00 CUMBERLAND - 7% (01) \$2.10  
Discounts (\$0.00)

JERNIGAN \$32.10

JERNIGAN, 9221 Giles Rd, Linden, NC 28356

\$64.20

MANCHESTER, 1000 Little River Rd, Spring Lake, NC 28390

\$32.10

Invoice Date Dec 31, 2024	Terms NET 30	Invoice # I30637	P.O. # ---	Rental # R2282
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Service	Tax Code	Rate	Qty.	Amount
1 MONTHLY Dec 1, 2024 - Dec 31, 2024   (12/1/2024 - 12/31/2024) PORTABLE TOILET - 1X WEEKLY SERVICE	01	\$30.00	1	\$30.00

Subtotal \$30.00 CUMBERLAND - 7% (01) \$2.10  
Discounts (\$0.00)





MANCHESTER \$32.10

MANCHESTER, 1000 Little River Rd, Spring Lake, NC 28390 \$32.10

IN CARTER, 3961 Hummingbird Pl, Fayetteville, NC 28312 \$32.10

Invoice Date Dec 31, 2024	Terms NET 30	Invoice # I30634	P.O. # ---	Rental # R2278
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Service	Tax Code	Rate	Qty.	Amount
1 MONTHLY Dec 1, 2024 - Dec 31, 2024   (12/1/2024 - 12/31/2024) PORTABLE TOILET - 1X WEEKLY SERVICE	01	\$30.00	1	\$30.00

Subtotal \$30.00 CUMBERLAND - 7% (01) \$2.10  
Discounts (\$0.00)

IN CARTER \$32.10

IN CARTER, 3961 Hummingbird Pl, Fayetteville, NC 28312 \$32.10

WILLIAMS, 5746 Kennel Rd, Wade, NC 28395 \$32.10

Invoice Date Dec 31, 2024	Terms NET 30	Invoice # I30625	P.O. # ---	Rental # R2228
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Service	Tax Code	Rate	Qty.	Amount
1 MONTHLY Dec 1, 2024 - Dec 31, 2024   (12/1/2024 - 12/31/2024) PORTABLE TOILET - 1X WEEKLY SERVICE	01	\$30.00	1	\$30.00

Subtotal \$30.00 CUMBERLAND - 7% (01) \$2.10  
Discounts (\$0.00)

WILLIAMS \$32.10

WILLIAMS, 5746 Kennel Rd, Wade, NC 28395 \$32.10

HUBBARD, 1066 Wade-Stedman Rd, Stedman, NC 28391 \$133.75

Invoice Date Dec 31, 2024	Terms NET 30	Invoice # I30633	P.O. # ---	Rental # R2277
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Service	Tax Code	Rate	Qty.	Amount
1 MONTHLY Dec 1, 2024 - Dec 31, 2024   (12/1/2024 - 12/31/2024) PORTABLE TOILET - 1X WEEKLY SERVICE	01	\$30.00	1	\$30.00
2 MONTHLY Dec 1, 2024 - Dec 31, 2024   (12/1/2024 - 12/31/2024) HANDWASH UNIT - 1X WEEKLY SERVICE	01	\$95.00	1	\$95.00

Subtotal \$125.00 CUMBERLAND - 7% (01) \$8.75  
Discounts (\$0.00)

HUBBARD \$133.75

HUBBARD, 1066 Wade-Stedman Rd, Stedman, NC 28391 \$133.75

FISHER, 7931 Turnbull Rd, Fayetteville, NC 28312 \$32.10

Invoice Date Dec 31, 2024	Terms NET 30	Invoice # I30632	P.O. # ---	Rental # R2276
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Service	Tax Code	Rate	Qty.	Amount
1 MONTHLY Dec 1, 2024 - Dec 31, 2024   (12/1/2024 - 12/31/2024) PORTABLE TOILET - 1X WEEKLY SERVICE	01	\$30.00	1	\$30.00

Subtotal \$30.00 CUMBERLAND - 7% (01) \$2.10  
Discounts (\$0.00)

FISHER \$32.10

FISHER, 7931 Turnbull Rd, Fayetteville, NC 28312 \$32.10

COOPER, 2210 Rich Walker Rd, Wade, NC 28395 \$32.10



Invoice Date Dec 31, 2024	Terms NET 30	Invoice # I30631	P.O. # ---	Rental # R2275
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Service	Tax Code	Rate	Qty.	Amount
1 MONTHLY Dec 1, 2024 - Dec 31, 2024   (12/1/2024 - 12/31/2024) PORTABLE TOILET - 1X WEEKLY SERVICE	01	\$30.00	1	\$30.00

Subtotal \$30.00 CUMBERLAND - 7% (01) \$2.10  
Discounts (\$0.00)

COOPER \$32.10

COOPER, 2210 Rich Walker Rd, Wade, NC 28395

\$32.10

ODOM, 2281 Odom Rd, Hope Mills, NC 28348

\$133.75

Invoice Date Dec 31, 2024	Terms NET 30	Invoice # I30630	P.O. # ---	Rental # R2274
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Service	Tax Code	Rate	Qty.	Amount
1 MONTHLY Dec 1, 2024 - Dec 31, 2024   (12/1/2024 - 12/31/2024) PORTABLE TOILET - 1X WEEKLY SERVICE	01	\$30.00	1	\$30.00
2 MONTHLY Dec 1, 2024 - Dec 31, 2024   (12/1/2024 - 12/31/2024) HANDWASH UNIT - 1X WEEKLY SERVICE	01	\$95.00	1	\$95.00

Subtotal \$125.00 CUMBERLAND - 7% (01) \$8.75  
Discounts (\$0.00)

ODOM \$133.75

ODOM, 2281 Odom Rd, Hope Mills, NC 28348

\$133.75

Cliffdale, 7581 Lowell Harris Rd, Fayetteville, NC 28314

\$32.10

Invoice Date Dec 31, 2024	Terms NET 30	Invoice # I30629	P.O. # ---	Rental # R2273
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Service	Tax Code	Rate	Qty.	Amount
1 MONTHLY Dec 1, 2024 - Dec 31, 2024   (12/1/2024 - 12/31/2024) PORTABLE TOILET - 1X WEEKLY SERVICE	01	\$30.00	1	\$30.00

Subtotal \$30.00 CUMBERLAND - 7% (01) \$2.10  
Discounts (\$0.00)

Cliffdale \$32.10

Cliffdale, 7581 Lowell Harris Rd, Fayetteville, NC 28314

\$32.10

CAMDEN, 7427 Camden Rd, Fayetteville, NC 28306

\$32.10

Invoice Date Dec 31, 2024	Terms NET 30	Invoice # I30626	P.O. # ---	Rental # R2243
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Service	Tax Code	Rate	Qty.	Amount
1 MONTHLY Dec 1, 2024 - Dec 31, 2024   (12/1/2024 - 12/31/2024) PORTABLE TOILET - 1X WEEKLY SERVICE	01	\$30.00	1	\$30.00

Subtotal \$30.00 CUMBERLAND - 7% (01) \$2.10  
Discounts (\$0.00)

CAMDEN \$32.10

CAMDEN, 7427 Camden Rd, Fayetteville, NC 28306

\$32.10

WARREN, 5488 Leitha Ln, Godwin, NC 28344

\$32.10

Invoice Date Dec 31, 2024	Terms NET 30	Invoice # I30642	P.O. # ---	Rental # R2292
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Service	Tax Code	Rate	Qty.	Amount
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Service	Tax Code	Rate	Qty.	Amount
1 MONTHLY Dec 1, 2024 - Dec 31, 2024   (12/1/2024 - 12/31/2024) PORTABLE TOILET - 1X WEEKLY SERVICE	01	\$30.00	1	\$30.00
Subtotal \$30.00 CUMBERLAND - 7% (01) \$2.10 Discounts (\$0.00)				
WARREN				\$32.10
WARREN, 5488 Leitha Ln, Godwin, NC 28344				\$32.10

Invoice Summary

Invoice Subtotal	\$790.00
Tax (01) - CUMBERLAND - 7%	\$55.30
Invoice Total	\$845.30

Thank you!

Detach and return (#9 envelope)

CUMBERLAND COUNTY SOLID WASTE  
638 Ann St  
Fayetteville, NC 28301

Customer ID # C915  
Invoice # I30623  
Invoice Date Dec 31, 2024  
Due Date Jan 30, 2025  
Invoice Total \$845.30  
Payments (\$0.00)

Remit To:

CUMBERLAND SEPTIC SERVICES INC  
PO BOX 35192  
FAYETTEVILLE, NC 28303

Invoice Due \$845.30

6254602 533802 30  
4606 60  
4607 30  
4608 575  
4611 95



CUMBERLAND SEPTIC SERVICES INC  
 PO BOX 35192  
 FAYETTEVILLE, NC 28303  
 (910) 868-3830  
 CUMBERLANDSEPTIC@GMAIL.COM  
 Tax ID: 561922838



Invoice # I40663  
 Invoice Date May 31, 2025  
 Due Date Jun 30, 2025

**Invoice To:**

CUMBERLAND COUNTY SOLID WASTE  
 638 Ann St  
 Fayetteville, NC 28301

Invoice Amount **\$877.40**

Customer ID C915	PO # ---	Pay Online ID ---	Clerk CS
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ANN ST, 698 Ann St, Fayetteville, NC 28301 \$128.40

Invoice Date May 31, 2025	Terms NET 30	Invoice # I40872	P.O. # ---	Rental # R1694
------------------------------	-----------------	---------------------	---------------	-------------------

Service	Tax Code	Rate	Qty.	Amount
1 MONTHLY May 1, 2025 - May 31, 2025   (5/1/2025 - 5/31/2025) PORTABLE TOILET - 1X WEEKLY SERVICE	01	\$30.00	4	\$120.00

Subtotal \$120.00 CUMBERLAND - 7% (01) \$8.40  
 Discounts (\$0.00)

ANN ST \$128.40

ANN ST, 698 Ann St, Fayetteville, NC 28301 \$128.40

JERNIGAN, 9221 Giles Rd, Linden, NC 28356 \$64.20

Invoice Date May 31, 2025	Terms NET 30	Invoice # I40882	P.O. # ---	Rental # R2280
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Service	Tax Code	Rate	Qty.	Amount
1 MONTHLY May 1, 2025 - May 31, 2025   (5/1/2025 - 5/31/2025) PORTABLE TOILET - 1X WEEKLY SERVICE	01	\$30.00	1	\$30.00

Subtotal \$30.00 CUMBERLAND - 7% (01) \$2.10  
 Discounts (\$0.00)

JERNIGAN \$32.10

Invoice Date May 31, 2025	Terms NET 30	Invoice # I40884	P.O. # ---	Rental # R2283
------------------------------	-----------------	---------------------	---------------	-------------------

Service	Tax Code	Rate	Qty.	Amount
1 MONTHLY May 1, 2025 - May 31, 2025   (5/1/2025 - 5/31/2025) PORTABLE TOILET - 1X WEEKLY SERVICE	01	\$30.00	1	\$30.00

Subtotal \$30.00 CUMBERLAND - 7% (01) \$2.10  
 Discounts (\$0.00)

JERNIGAN \$32.10

JERNIGAN, 9221 Giles Rd, Linden, NC 28356 \$64.20

WARREN, 5488 Leitha Ln, Godwin, NC 28344 \$32.10

Invoice Date May 31, 2025	Terms NET 30	Invoice # I40888	P.O. # ---	Rental # R2292
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Service	Tax Code	Rate	Qty.	Amount
1 MONTHLY May 1, 2025 - May 31, 2025   (5/1/2025 - 5/31/2025) PORTABLE TOILET - 1X WEEKLY SERVICE	01	\$30.00	1	\$30.00
Subtotal \$30.00 CUMBERLAND - 7% (01) Discounts (\$0.00)				
WARREN				\$32.10
WARREN, 5488 Leitha Ln, Godwin, NC 28344				\$32.10

PEARSALL, 2331 Polly Island Rd, Autryville, NC 28318 \$32.10

Invoice Date	Terms	Invoice #	P.O. #	Rental #
May 31, 2025	NET 30	I40887	---	R2291

Service	Tax Code	Rate	Qty.	Amount
1 MONTHLY May 1, 2025 - May 31, 2025   (5/1/2025 - 5/31/2025) PORTABLE TOILET - 1X WEEKLY SERVICE	01	\$30.00	1	\$30.00
Subtotal \$30.00 CUMBERLAND - 7% (01) Discounts (\$0.00)				
PEARSALL				\$32.10
PEARSALL, 2331 Polly Island Rd, Autryville, NC 28318				\$32.10

PARKER, 4759 Black Bridge Rd, Parkton, NC 28371 \$32.10

Invoice Date	Terms	Invoice #	P.O. #	Rental #
May 31, 2025	NET 30	I40886	---	R2290

Service	Tax Code	Rate	Qty.	Amount
1 MONTHLY May 1, 2025 - May 31, 2025   (5/1/2025 - 5/31/2025) PORTABLE TOILET - 1X WEEKLY SERVICE	01	\$30.00	1	\$30.00
Subtotal \$30.00 CUMBERLAND - 7% (01) Discounts (\$0.00)				
PARKER				\$32.10
PARKER, 4759 Black Bridge Rd, Parkton, NC 28371				\$32.10

MCCAULEY, 4674 Research Dr, Fayetteville, NC 28306 \$32.10

Invoice Date	Terms	Invoice #	P.O. #	Rental #
May 31, 2025	NET 30	I40885	---	R2286

Service	Tax Code	Rate	Qty.	Amount
1 MONTHLY May 1, 2025 - May 31, 2025   (5/1/2025 - 5/31/2025) PORTABLE TOILET - 1X WEEKLY SERVICE	01	\$30.00	1	\$30.00
Subtotal \$30.00 CUMBERLAND - 7% (01) Discounts (\$0.00)				
MCCAULEY				\$32.10
MCCAULEY, 4674 Research Dr, Fayetteville, NC 28306				\$32.10

MANCHESTER, 1000 Little River Rd, Spring Lake, NC 28390 \$32.10

Invoice Date	Terms	Invoice #	P.O. #	Rental #
May 31, 2025	NET 30	I40883	---	R2282

Service	Tax Code	Rate	Qty.	Amount
1 MONTHLY May 1, 2025 - May 31, 2025   (5/1/2025 - 5/31/2025) PORTABLE TOILET - 1X WEEKLY SERVICE	01	\$30.00	1	\$30.00
Subtotal \$30.00 CUMBERLAND - 7% (01) Discounts (\$0.00)				
MANCHESTER				\$32.10





MANCHESTER, 1000 Little River Rd, Spring Lake, NC 28390

\$32.10

JE CARTER, 4465 Macedonia Church Rd, Fayetteville, NC 28312

\$32.10

Invoice Date May 31, 2025	Terms NET 30	Invoice # I40881	P.O. # ---	Rental # R2279
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Service	Tax Code	Rate	Qty.	Amount
1 MONTHLY May 1, 2025 - May 31, 2025   (5/1/2025 - 5/31/2025) PORTABLE TOILET - 1X WEEKLY SERVICE	01	\$30.00	1	\$30.00

Subtotal \$30.00 CUMBERLAND - 7% (01) \$2.10  
Discounts (\$0.00)

JE CARTER \$32.10

JE CARTER, 4465 Macedonia Church Rd, Fayetteville, NC 28312

\$32.10

WILLIAMS, 5746 Kennel Rd, Wade, NC 28395

\$32.10

Invoice Date May 31, 2025	Terms NET 30	Invoice # I40873	P.O. # ---	Rental # R2228
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Service	Tax Code	Rate	Qty.	Amount
1 MONTHLY May 1, 2025 - May 31, 2025   (5/1/2025 - 5/31/2025) PORTABLE TOILET - 1X WEEKLY SERVICE	01	\$30.00	1	\$30.00

Subtotal \$30.00 CUMBERLAND - 7% (01) \$2.10  
Discounts (\$0.00)

WILLIAMS \$32.10

WILLIAMS, 5746 Kennel Rd, Wade, NC 28395

\$32.10

IN CARTER, 3961 Hummingbird Pl, Fayetteville, NC 28312

\$32.10

Invoice Date May 31, 2025	Terms NET 30	Invoice # I40880	P.O. # ---	Rental # R2278
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Service	Tax Code	Rate	Qty.	Amount
1 MONTHLY May 1, 2025 - May 31, 2025   (5/1/2025 - 5/31/2025) PORTABLE TOILET - 1X WEEKLY SERVICE	01	\$30.00	1	\$30.00

Subtotal \$30.00 CUMBERLAND - 7% (01) \$2.10  
Discounts (\$0.00)

IN CARTER \$32.10

IN CARTER, 3961 Hummingbird Pl, Fayetteville, NC 28312

\$32.10

HUBBARD, 1066 Wade-Stedman Rd, Stedman, NC 28391

\$133.75

Invoice Date May 31, 2025	Terms NET 30	Invoice # I40879	P.O. # ---	Rental # R2277
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Service	Tax Code	Rate	Qty.	Amount
1 MONTHLY May 1, 2025 - May 31, 2025   (5/1/2025 - 5/31/2025) PORTABLE TOILET - 1X WEEKLY SERVICE	01	\$30.00	1	\$30.00
2 MONTHLY May 1, 2025 - May 31, 2025   (5/1/2025 - 5/31/2025) HANDWASH UNIT - 1X WEEKLY SERVICE	01	\$95.00	1	\$95.00

Subtotal \$125.00 CUMBERLAND - 7% (01) \$8.75  
Discounts (\$0.00)

HUBBARD \$133.75

HUBBARD, 1066 Wade-Stedman Rd, Stedman, NC 28391

\$133.75

FISHER, 7931 Turnbull Rd, Fayetteville, NC 28312

\$32.10



Invoice Date May 31, 2025	Terms NET 30	Invoice # I40878	P.O. # ---	Rental # R2276
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Service	Tax Code	Rate	Qty.	Amount
1 MONTHLY May 1, 2025 - May 31, 2025   (5/1/2025 - 5/31/2025) PORTABLE TOILET - 1X WEEKLY SERVICE	01	\$30.00	1	\$30.00

Subtotal \$30.00 CUMBERLAND - 7% (01) \$2.10  
Discounts (\$0.00)

FISHER \$32.10

FISHER, 7931 Turnbull Rd, Fayetteville, NC 28312

\$32.10

COOPER, 2210 Rich Walker Rd, Wade, NC 28395

\$32.10

Invoice Date May 31, 2025	Terms NET 30	Invoice # I40877	P.O. # ---	Rental # R2275
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Service	Tax Code	Rate	Qty.	Amount
1 MONTHLY May 1, 2025 - May 31, 2025   (5/1/2025 - 5/31/2025) PORTABLE TOILET - 1X WEEKLY SERVICE	01	\$30.00	1	\$30.00

Subtotal \$30.00 CUMBERLAND - 7% (01) \$2.10  
Discounts (\$0.00)

COOPER \$32.10

COOPER, 2210 Rich Walker Rd, Wade, NC 28395

\$32.10

ODOM, 2281 Odom Rd, Hope Mills, NC 28348

\$133.75

Invoice Date May 31, 2025	Terms NET 30	Invoice # I40876	P.O. # ---	Rental # R2274
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Service	Tax Code	Rate	Qty.	Amount
1 MONTHLY May 1, 2025 - May 31, 2025   (5/1/2025 - 5/31/2025) PORTABLE TOILET - 1X WEEKLY SERVICE	01	\$30.00	1	\$30.00
2 MONTHLY May 1, 2025 - May 31, 2025   (5/1/2025 - 5/31/2025) HANDWASH UNIT - 1X WEEKLY SERVICE	01	\$95.00	1	\$95.00

Subtotal \$125.00 CUMBERLAND - 7% (01) \$8.75  
Discounts (\$0.00)

ODOM \$133.75

ODOM, 2281 Odom Rd, Hope Mills, NC 28348

\$133.75

Cliffdale, 7581 Lowell Harris Rd, Fayetteville, NC 28314

\$32.10

Invoice Date May 31, 2025	Terms NET 30	Invoice # I40875	P.O. # ---	Rental # R2273
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Service	Tax Code	Rate	Qty.	Amount
1 MONTHLY May 1, 2025 - May 31, 2025   (5/1/2025 - 5/31/2025) PORTABLE TOILET - 1X WEEKLY SERVICE	01	\$30.00	1	\$30.00

Subtotal \$30.00 CUMBERLAND - 7% (01) \$2.10  
Discounts (\$0.00)

Cliffdale \$32.10

Cliffdale, 7581 Lowell Harris Rd, Fayetteville, NC 28314

\$32.10

CAMDEN, 7427 Camden Rd, Fayetteville, NC 28306

\$32.10

Invoice Date May 31, 2025	Terms NET 30	Invoice # I40874	P.O. # ---	Rental # R2243
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Service	Tax Code	Rate	Qty.	Amount
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Service	Tax Code	Rate	Qty.	Amount
1 MONTHLY May 1, 2025 - May 31, 2025   (5/1/2025 - 5/31/2025) PORTABLE TOILET - 1X WEEKLY SERVICE	01	\$30.00	1	\$30.00
Subtotal \$30.00 CUMBERLAND - 7% (01) \$2.10 Discounts (\$0.00)				
CAMDEN				\$32.10
CAMDEN, 7427 Camden Rd, Fayetteville, NC 28306				\$32.10

MELVIN, 3811 Dudley Rd, Fayetteville, NC 28312 \$32.10

Invoice Date	Terms	Invoice #	P.O. #	Rental #
May 31, 2025	NET 30	I40889	---	R2289

Service	Tax Code	Rate	Qty.	Amount
1 MONTHLY May 1, 2025 - May 31, 2025   (5/1/2025 - 5/31/2025) PORTABLE TOILET - 1X WEEKLY SERVICE	01	\$30.00	1	\$30.00
Subtotal \$30.00 CUMBERLAND - 7% (01) \$2.10 Discounts (\$0.00)				
MELVIN				\$32.10
MELVIN, 3811 Dudley Rd, Fayetteville, NC 28312				\$32.10

**Invoice Summary**

Invoice Subtotal	\$820.00
Tax (01) - CUMBERLAND - 7%	\$57.40
<b>Invoice Total</b>	<b>\$877.40</b>

**Thank you!**

Detach and return (#9 envelope)

CUMBERLAND COUNTY SOLID WASTE  
638 Ann St  
Fayetteville, NC 28301

Customer ID # C915  
Invoice # I40663  
Invoice Date May 31, 2025  
Due Date Jun 30, 2025  
Invoice Total \$877.40  
Payments (\$0.00)

**Remit To:**  
CUMBERLAND SEPTIC SERVICES INC  
PO BOX 35192  
FAYETTEVILLE, NC 28303

**Invoice Due \$877.40**

6254602 533802 30  
4606 60  
4607 30  
4608 605  
4611 95





# INVOICE

ACCOUNT NUMBER
20071231

Invoice Number: 0236383  
 Invoice Date: 07-18-2025  
 Invoice Due Upon Receipt

Cumberland County Engineering  
 PO Box 1829  
 FAYETTEVILLE NC 28301

REMIT PAYMENT TO:  
 Fayetteville Footwear  
 3412 Ramsey Street  
 FAYETTEVILLE NC 28311  
 (910)-484-8855

Date	Ticket #	Purchased By:	PO Number	Reference	Amount
6/19/25	20141952	HALL, AMY	VOUCHER	VOUCHER	100.00

OLD YEAR  
 101451A-533671

Current	Over 30	Over 60	Over 90	TOTAL DUE
100.00	100.00	0.00	0.00	100.00





# Fayetteville Steel

4801 Research Drive  
Fayetteville, NC 28306  
usa

# INVOICE

Invoice Number: 81228  
Invoice Date: Jun 11, 2025  
Page: 1

Duplicate

Voice: 910-424-2978

Fax: 910-424-1131

<b>Bill To:</b>
CUMBERLAND CO. SOLID WASTE 698 ANN STREET FAYETTEVILLE, NC 28301-8106 USA

<b>Ship to:</b>
698 ANN STREET FAYETTEVILLE, NC 28301-8106 USA

Customer ID	Customer PO	Payment Terms	
CUMBERLAND	SALES ORDER #017243	Net 30 Days	
Sales Rep ID	Shipping Method	Ship Date	Due Date
GERALD	Cust. Pickup		7/11/25

Quantity	Item	Description	Unit Price	Amount
2.00		1-1/4" X 3/16" SERRATED BAR GRATING 5' X 5'	70.00	140.00
	6254608 533401		<u>PAST DUE</u>	

**MAKE CHECK OUT TO FAYETTEVILLE STEEL**

Subtotal	140.00
Sales Tax	9.80
Total Invoice Amount	149.80
Payment/Credit Applied	
<b>TOTAL</b>	<b>149.80</b>

Check/Credit Memo No:

**THIS INVOICE IS UNDER OLD COMPANY  
TAX PAYER ID**

We will add finance charges on invoices more than 65 days overdue.



Amanda Lee, PE  
General Manager  
for Natural Resources



**Solid Waste Management &  
Public Utilities Department**

**MEMORANDUM**

TO: ROBIN KOONCE, FINANCE DIRECTOR  
FROM: AMANDA LEE, GENERAL MANAGER FOR NATURAL RESOURCES  
DATE: AUGUST 28, 2025  
SUBJECT: REQUEST TO PAY PRIOR YEAR (FY25) INVOICES

A handwritten signature in black ink, appearing to read "A Lee", is positioned to the right of the memorandum header.

Please approve the attached prior year invoice which was presented for payment after the deadline to pay Fiscal Year 2025 invoices.

**Validation:** We have validated service delivery for the invoice attached.

- Fayetteville Steel – The Solid Waste Department received a request for payment on August 27, 2025 for prior year invoice with Invoice #81228 dated 06/11/2025 in the amount of \$149.80.

**Verification Statement:** We have verified the invoices attached are not a duplicate and have not been previously paid. (ATTACHED)

**Measure of prevention:** We have strengthened additional tracking measures to easier identify when recurring vendor invoices have not been submitted.

The cost of the invoices can be absorbed in this year's budget:

**Solid Waste Department**

Invoice	Budget Org – Obj	Amount
81228	6254608 – 533401	\$149.80





# CUMBERLAND COUNTY

NORTH CAROLINA

## Human Resources

MEMORANDUM

TO: Clarence Grier, County Manager  
Robin Deaver, Chief Operating Officer/Finance Director *EMK*  
Deborah Shaw, Budget and Performance Director *DWS*  
Dominique Hall, Human Resources Director *DH*

FROM: Cathy Woods, Classification & Compensation Manager *CWoods*

DATE: August 4, 2025

SUBJECT: Request to Pay Prior Year (FY 25) Invoice

Please approve payment for the attached prior year invoices.

- Wolfe – Background screenings. Budget 1014111-533301; Invoice 442620 for service from June 30, 2025, in the amount of \$54.50

**Verification Statement:** The attached invoice has been verified and the charge is not a duplicate and has not been previously paid.

**Measure of prevention:** We are strengthened additional training to assist with steps needed for end of year processing.

The cost of the invoice can be absorbed in this year's budget.







Wolfe & Associates, Inc. d/b/a Wolfe, Inc.  
 P O Box 5085, Concord NC 28027

Invoice

DATE	INVOICE #
6/30/2025	442620

<b>BILL TO</b>
Cumberland County Government Accounts Payable P O Box 1829 Fayetteville, NC 28302

**We accept all major credit cards.  
 Please contact us for payment by credit card.  
 1.800.451.3743.**

P.O. NO.	TERMS	PROJECT
	Net 30	

ITEM	QTY	DESCRIPTION	RATE	AMOUNT
Background	1	Group Item - Background Checks - MVR, Credit, Criminal 06/30/2025 PETERS, LANE HARRISON FILE # 596518 Package price for Cumberland County Package \$32.00 NORTH CAROLINA ONLY - North Carolina (PETERS, L \$2.50 County Criminal Records Search - Washtenaw, Michig \$20.00	54.50	54.50
		ORDER FROM JUNE NOT COMPLETED UNTIL JULY 7 2025		

**ORIGINAL**  
 Certified By:  


THANK YOU FOR YOUR BUSINESS	Total	\$54.50
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**CUMBERLAND**  
COUNTY  
NORTH CAROLINA

**Human Resources**

MEMORANDUM

TO: Clarence Grier, County Manager  
Robin Deaver, Chief Operating Officer/Finance Director *RDK*  
Deborah Shaw, Chief Budget and Performance Officer *DWS*  
Dominique Hall, Human Resources Director *DH*

FROM: Cathy Woods, Classification & Compensation Manager *CWoods*

DATE: August 21, 2025

SUBJECT: Request to Pay Prior Year (FY 25) Invoice

Please approve payment for the attached prior year invoice.

- Lafi, Maryam – Tuition Assistance Reimbursement; Budget 1014195-533770; in the amount of \$500.00

**Verification Statement:** The attached invoice has been verified, and the charge is not a duplicate and has not been previously paid.

**Measure of prevention:** We are working with departments to process reimbursements expeditiously, especially at the end of the year.

The cost of the invoice can be absorbed in this year's budget.



## Ebonee Moore-Brantley

---

**From:** Candace Tyler  
**Sent:** Monday, August 4, 2025 9:06 AM  
**To:** Ebonee Moore-Brantley  
**Subject:** RE: Tuition Assistance Program Forms

Good morning Ebonee,

Thanks for the update and I'll be sure to let Maryam know.

Have a good day,



**Candace F. Tyler, SHRM-CP**

Human Resources Manager  
Department of Public Health

1235 Ramsey Street, Fayetteville NC 28301

O: 910-433-3851 F: 910-433-3659

[cumberlandcountync.gov/publichealth](http://cumberlandcountync.gov/publichealth)

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**From:** Ebonee Moore-Brantley <[ebrantley@cumberlandcountync.gov](mailto:ebrantley@cumberlandcountync.gov)>  
**Sent:** Monday, August 4, 2025 8:22 AM  
**To:** Candace Tyler <[ctyler@cumberlandcountync.gov](mailto:ctyler@cumberlandcountync.gov)>  
**Cc:** Jennifer Green <[jgreen@cumberlandcountync.gov](mailto:jgreen@cumberlandcountync.gov)>  
**Subject:** RE: Tuition Assistance Program Forms



Good morning Candace,

Apologies for the delayed response — I've been tied up with internship interviews. I confirmed with Dominique, and she gave her approval, so we'll be processing it this week.

**From:** Candace Tyler <[ctyler@cumberlandcountync.gov](mailto:ctyler@cumberlandcountync.gov)>  
**Sent:** Friday, August 1, 2025 10:02 AM  
**To:** Ebonee Moore-Brantley <[ebrantley@cumberlandcountync.gov](mailto:ebrantley@cumberlandcountync.gov)>  
**Cc:** Jennifer Green <[jgreen@cumberlandcountync.gov](mailto:jgreen@cumberlandcountync.gov)>  
**Subject:** FW: Tuition Assistance Program Forms




Good morning Ebonee,

I wanted to check in to see if there's been any word on the tuition assistance request for Maryam Lafi. I'd like to be able to provide her with an update if possible.

Thanks,

**Candace F. Tyler, SHRM-CP**  
Human Resources Manager  
Department of Public Health  
1235 Ramsey Street, Fayetteville NC 28301  
O: 910-433-3851 F: 910-433-3659

[cumberlandcountync.gov/publichealth](http://cumberlandcountync.gov/publichealth)

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otherwise confidential information is prohibited by law. If you have received this e-mail in error, please notify the sender immediately and delete all records of this e-mail.

**From:** Candace Tyler  
**Sent:** Tuesday, July 29, 2025 2:45 PM  
**To:** Ebonee Moore-Brantley <[ebrantley@cumberlandcountync.gov](mailto:ebrantley@cumberlandcountync.gov)>  
**Cc:** Jennifer Green <[jgreen@cumberlandcountync.gov](mailto:jgreen@cumberlandcountync.gov)>  
**Subject:** Tuition Assistance Program Forms

Hi Ebonee,

Just following up on my earlier message about the tuition assistance forms for Maryam Lafi. I'm attaching both the reimbursement request and the prior approval form here.



The employee originally submitted everything to us on time, but it looks like the prior approval form didn't get routed to the right place and wasn't processed when it should've been. We're hoping you can still consider the reimbursement request and grant a little grace on the prior approval, since the delay was on our end.

Let me know if you need anything else to help support the request.

Thanks again,

**Candace F. Tyler, SHRM-CP**  
Human Resources Manager  
Department of Public Health  
1235 Ramsey Street, Fayetteville NC 28301  
O: 910-433-3851 F: 910-433-3659

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Clarence G. Grier  
County Manager



Dominique Hall, MBA, PHR  
Director

# CUMBERLAND COUNTY

NORTH CAROLINA

## Human Resources

MEMORANDUM

TO: Maryam Lafi (EmpID: #14884)

FROM: Ebonee Moore-Brantley, Professional Development Supervisor *EMB*

DATE: August 12, 2025

SUBJECT: Tuition Assistance Prior Approval

In accordance with Personnel Policy 8.4, Tuition Assistance, your Tuition Assistance Request for Course(s) Primary Care III (04/07/2025 – 06/20/2025) has been approved.

You must submit a completed Employee Tuition Assistance Reimbursement Request (available on the Intranet under Human Resources), receipt for payment, and a grade report showing completion of the course(s) with a "C" or better to your department head for approval within 30 days of completion of the above course(s) to be reimbursed.

If you have any questions or concerns, please feel free to give me a call.

c: Department Head  
Tuition File







**CUMBERLAND**  
**COUNTY**  
 NORTH CAROLINA

Cumberland County Employee Tuition Assistance Program  
 Prior Approval Request Form

Tuition assistance is to aide employees to obtain job related skills to enhance their career with Cumberland County. Complete this form and forward to your department head for consideration.

Employee Information		
Employee Name (First, Middle Initial, Last): Maryam Lafi	Telephone Number: 910-433-3752	
Department: EPI	Employee ID: 14884	
Course Information		
Course Name: Primary Care III	Name Of Accredited Institution or University: Frontier Nursing University	
Course Description: This course focuses on the use of evidence-based clinical practice guidelines to assess, diagnose, and develop a strategy for primary care management of clients across the adult lifespan in the management of gastrointestinal, cardiovascular, and endocrine systems.	Course Beginning Date: 04/07/2025	Course Ending Date: 06/20/2025
	Tuition: \$ 2,455.00	Registration Fees:
	Lab Fees:	Student Fees:
	Books:	Total Cost: \$ 2,455.00
Please explain how this course will either improve your ability to perform your job or help prepare you for a job within the county which requires a higher or different level of responsibility or skill:		
This course is part of the Master's Program for the Family Nurse Practitioner track. Becoming a nurse practitioner will provide me with the opportunity to advance within the health department.		
Course Name:	Name Of Accredited Institution or University:	
Course Description:	Course Beginning Date:	Course Ending Date:
	Tuition:	Registration Fees:
	Lab Fees:	Student Fees:
	Books:	Total Cost: \$ 0.00
Please explain how this course will either improve your ability to perform your job or help prepare you for a job within the county which requires a higher or different level of responsibility or skill:		

Course Name:		Name Of Accredited Institution or University:	
Course Description:		Course Beginning Date:	Course Ending Date:
		Tuition:	Registration Fees:
		Lab Fees:	Student Fees:
		Books:	Total Cost:
		\$ 0.00	
Please explain how this course will either improve your ability to perform your job or help prepare you for a job within the county which requires a higher or different level of responsibility or skill:			
I certify that I have read and understand the Tuition Assistance policy, I have been employed full time with Cumberland County for at least one full year, and I do not have any active disciplinary actions in my personnel file. I understand that if I leave County employment prior to course completion I am no longer eligible for tuition assistance reimbursement. I understand that I must successfully complete this course based on grade requirements as defined in the Tuition Assistance policy, in order to receive reimbursement, up to \$500.			
Applicant's Signature:	<i>Maryam Labi</i>		Date: 3-11-25
Department Head Signature:	<i>Jenny...</i>	<input checked="" type="checkbox"/> Approve <input type="checkbox"/> Deny	Date: 7-29-25
If denied reason for denial:			

For HR Processing Only		
Requisition Number _____	Purchase Order Number _____	Employee Vendor Number _____

Course Name:		Name Of Accredited Institution or University:	
Course Description:		Course Beginning Date:	Course Ending Date:
		Tuition:	Registration Fees:
		Lab Fees:	Student Fees:
		Books:	Total Cost: \$ 0.00
Please explain how this course will either improve your ability to perform your job or help prepare you for a job within the county which requires a higher or different level of responsibility or skill:			
<p>I certify that I have read and understand the Tuition Assistance policy, I have been employed full time with Cumberland County for at least one full year, and I do not have any active disciplinary actions in my personnel file. I understand that if I leave County employment prior to course completion I am no longer eligible for tuition assistance reimbursement. I understand that I must successfully complete this course based on grade requirements as defined in the Tuition Assistance policy, in order to receive reimbursement, up to \$500.</p>			
Applicant's Signature:	<i>Maryam Labi</i>		Date: 3-11-25
Department Head Signature:	<i>Jennifer</i>	<input checked="" type="checkbox"/> Approve <input type="checkbox"/> Deny	Date: 7-29-25
If denied reason for denial:			

For HR Processing Only		
Requisition Number _____	Purchase Order Number _____	Employee Vendor Number _____





**CUMBERLAND**  
COUNTY  
NORTH CAROLINA

Cumberland County Employee Tuition Assistance Program  
Reimbursement Request Checklist

Upon completion of the requested courses please submit the following documents to County Human Resources for reimbursement processing.

Employee Information	
Employee Name (First, Middle Initial, Last): <b>Maryam Y. Lafi</b>	Telephone Number: <b>910-433-3752</b>
Department: <b>EPI</b>	Employee ID: <b>14884</b>

I have attached the following documents:

Receipt(s) for all expenses requested to be reimbursed. (tuition, registration fees, lab fees, student fees, books)

Copy of transcript or other acceptable proof of successful course completion

Course Title	Cost
FNP706 Primary Care III	2,455.00
Total reimbursement requested (up to \$500)	

I certify that I have successfully completed the above courses, while an employee of Cumberland County. I am not requesting reimbursement for any tuition, fees, or books that were paid for by grants or scholarships.

Employee's Signature: *Maryam Lafi* Date: 7/18/25

Department Head's Signature: *Jennifer [unclear]* Date: 7/29/25

For HR Processing Only	
Course completed successfully <input checked="" type="checkbox"/>	Receipt from employee attached <input checked="" type="checkbox"/>
Employee Vendor Number _____	Total reimbursement allowed <u>\$500.00</u>
Purchase Order Number _____	Batch Number _____
Approved and processed by <u><i>Emy</i></u>	Date <u>8/7/25</u>

**Grades Report for 2025/Spring -  
Lafi, Maryam**

Frontier Nursing University, Inc.

Administrative Office

2050 Lexington Road

Versailles

Kentucky

40383

United States

**Sequence - 001**

<b>Credits</b>	Attempted	3.00
	Earned	3.00

<b>GPA</b>	Term	3.00
	Overall	3.46

**Session**      Main

<b>Course</b>	<b>Subtype</b>	<b>Section</b>	<b>Credits</b>	<b>Quality Points</b>	<b>Final Grade</b>
FNP706: Primary Care III	Lecture	1	3.00	9.00	B

**Awards**

**Term:**

**Overall:**

**Grades Report for 2025/Spring -  
Lafi, Maryam**

Frontier Nursing University, Inc.

Administrative Office  
2050 Lexington Road  
Versailles  
Kentucky  
40383  
United States

**Sequence - 001**

<b>Credits</b>	Attempted	3.00
	Earned	3.00

<b>GPA</b>	Term	3.00
	Overall	3.46

Session Main

Course	Subtype	Section	Credits	Quality Points	Final Grade
FNP706: Primary Care III	Lecture	1	3.00	9.00	B

**Awards**

Term: Overall:





Frontier Nursing University  
Statement

Statement Number 663981

Thursday, May 1, 2025

Lafi, Maryam

ID 000-0-25001

3649 Daughtridge Drive

Fayetteville, NC 28311

Year/Term (Term Only + Cumulative) - 2025/Spring

Previous Balance

\$0.00

**Charges**

Date	Period	Description	Amount
4/1/2025	2025/Spring	Technology Fee	\$250.00
4/1/2025	2025/Spring	Student Resource Fee	\$150.00
4/1/2025	2025/Spring	FNP Tuition	\$2,055.00
<b>Total Charges</b>			<b>\$2,455.00</b>

**Credits**

Date	Period	Description	Amount
4/29/2025	2025/Spring	Payment	\$2,455.00
<b>Total Credits</b>			<b>\$2,455.00</b>

Current Balance

\$0.00

Payment Due

\$0.00

Transactions after the statement date will appear on your next statement.

Please email any questions regarding your statement to [bursar@frontier.edu](mailto:bursar@frontier.edu)

Payments can be made via self-service, utilizing debit/credit card or a direct withdrawal from checking or savings account.

Please detach and remit with payment.

ID	Statement Number	Due Date	Current Balance	Payment Due	Less Anticipated Credits	Amount Enclosed
000-0-25001	663981	4/15/2025	\$0.00	\$0.00	\$0.00	

Frontier Nursing University Statement

For Lafi, Maryam

Maryam Lafi  
3649 Daughtridge Drive  
Fayetteville , NC 28311

Frontier Nursing University  
Administrative Office  
2050 Lexington Road  
Versailles , KY 40383

Please detach and remit with payment.

ID	Statement Number	Due Date	Current Balance	Payment Due	Less Anticipated Credits	Amount Enclosed
000-0-25001	663981	4/15/2025	\$0.00	\$0.00	\$0.00	

Frontier Nursing University Statement

For Lafi, Maryam

Maryam Lafi  
3649 Daughtridge Drive  
Fayetteville , NC 28311

Frontier Nursing University  
Administrative Office  
2050 Lexington Road  
Versailles , KY 40383



Approved  
8/11  
by D. Hall

# Tuition Assistance Eligibility & Compliance Checklist

M. Lafi

Email sent 8/7 8:22am

## Employee Eligibility

- Employee is a regular full-time employee
- Employee has successfully completed a one-year probationary period
- Employee has no active disciplinary actions in their personnel file

## Course Eligibility

- Course is directly related to the employee's current position OR prepares them for promotion or transfer within the County
- Course earns credit toward a related degree or certification
- Course is offered by an accredited college, university, community college, or training academy Frontier Nursing University - Verified DAPIP

## Approval Process

- Employee submitted the Employee Tuition Assistance Approval Request form prior to the start of the course
- Department Head reviewed and approved the request Dept failed to send HRIS gave approval
- HR approved the request and notified the employee in writing via email

## Funding & Reimbursement

- Funds are available in the current fiscal year (first-come, first-serve)
- Reimbursement amount does not exceed \$500 in the current fiscal year
- Course was completed in the same fiscal year the reimbursement is requested (or qualifies as spanning fiscal years)

## Eligible Expenses

- Tuition
- Registration fees
- Lab fees
- Student fees
- Books

# Tuition Assistance Eligibility & Compliance Checklist

---

## Ineligible Expenses

Special equipment  
Tools  
Supplies  
Travel  
Meals  
Costs already covered by grants or scholarships

## Grade Requirement

Employee earned a grade of C or higher OR for non-traditional grading, has proof of passing/credit

## Time Off

Employee used pre-approved annual leave for course-related absences during work hours  
 Non-applicable

## Reimbursement Submission

Employee remained actively employed with the County throughout the course and at the time of completion  
 Employee submitted the Reimbursement Request form within 30 days of course completion \_\_\_\_\_  
 Employee included all supporting documentation (grades, receipts, etc.)  
 Department Head sign completed form  
 Employee has not separated from county employment prior to course completion



# Tuition Assistance Eligibility & Compliance Checklist

---

## Ineligible Expenses

- Special equipment
- Tools
- Supplies
- Travel
- Meals
- Costs already covered by grants or scholarships

## Grade Requirement

- Employee earned a grade of C or higher OR for non-traditional grading, has proof of passing/credit

## Time Off

- Employee used pre-approved annual leave for course-related absences during work hours
- Non-applicable

## Reimbursement Submission

- Employee remained actively employed with the County throughout the course and at the time of completion
- Employee submitted the Reimbursement Request form within 30 days of course completion \_\_\_\_\_
- Employee included all supporting documentation (grades, receipts, etc.)
- Department Head sign completed form
- Employee has not separated from county employment prior to course completion





# CUMBERLAND COUNTY

NORTH CAROLINA

## Human Resources

MEMORANDUM

TO: Clarence Grier, County Manager

Robin Deaver, Chief Operating Officer/Finance Director *RD*

Deborah Shaw, Chief Budget and Performance Officer *DWS*

Dominique Hall, Human Resources Director *DH*

FROM: Cathy Woods, Classification & Compensation Manager *CW*

DATE: August 21, 2025

SUBJECT: Request to Pay Prior Year (FY 25) Invoices

In late July 2025, Human Resources became aware that Tawheed McCray (EMPID: 17356), County Intern, had not submitted receipts for reimbursement of Uber costs during the internship.

We are requesting to pay the reimbursement for transportation costs incurred in FY 25 as follows:

Date	Amount	Date	Amount
June 3, 2025	\$13.96	June 20, 2025	\$12.92
June 4, 2025	\$15.98	June 23, 2025	\$12.91
June 9, 2025	\$13.97	June 24, 2025	\$12.96
June 10, 2025	\$13.90	June 24, 2025	\$10.91
June 10, 2025	\$11.90	June 25, 2025	\$12.06
June 12, 2025	\$14.01	June 26, 2025	\$12.97
June 12, 2025	\$11.99	June 26, 2025	\$11.95
June 16, 2025	\$12.95	June 27, 2025	\$9.95
June 18, 2025	\$10.94	June 30, 2025	\$12.96
<b>Total Reimbursement</b>			<b>\$229.19</b>

**Verification Statement:** The attached invoice has been verified, and the charge is not a duplicate and has not been previously paid.

**Measure of prevention:** We are working with departments to process reimbursements expeditiously, especially at the end of the year. The cost of the invoice can be absorbed in this year's budget.



Here's your receipt for your ride, Tawheed

We hope you enjoyed your ride this morning.

Total \$13.96

---

Trip fare \$12.01

---

Subtotal \$12.01

Booking Fee \$1.95

---

Payments



Visa \*\*\*\*9551

6/3/25 7:04 PM

\$13.96

[Visit the trip page](#) for more information, including invoices (where available)

---

You rode with Sam

UberX 6.63 miles | 9 min

8:12 AM | 114 Wyncrest Ln, Fayetteville, NC 28303-5009, US

8:21 AM | 301 E Mountain Dr, Fayetteville, NC 28306-3448, US

Fare does not include fees that may be charged by your bank. Please contact your bank directly for inquiries.



Here's your receipt for your ride, Tawheed

We hope you enjoyed your ride this afternoon.

Total \$15.98

---

Trip fare \$13.94

---

Subtotal \$13.94

Booking Fee \$2.04

---

Payments


 Visa \*\*\*\*9551 \$15.98  
6/4/25 2:32 AM


[Visit the trip page](#) for more information, including invoices (where available)

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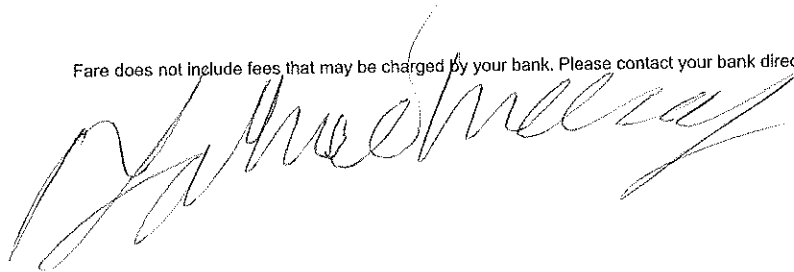
You rode with Dasia

UberX 6.04 miles | 12 min

 3:48 PM | 2491 Gillespie St, Fayetteville, NC 28306-3053, US

 4:00 PM | 114 Wynncrest Ln, Fayetteville, NC 28303-5009, US

Fare does not include fees that may be charged by your bank. Please contact your bank directly for inquiries.







Here's your receipt for your ride, Tawheed

We hope you enjoyed your ride this morning.

Total \$13.97

---

Trip fare \$12.20

---

Subtotal \$12.20

Booking Fee \$1.77

---

Payments


 Visa \*\*\*\*9551 \$13.97  
6/9/25 7:21 PM


[Visit the trip page](#) for more information, including invoices (where available)

---

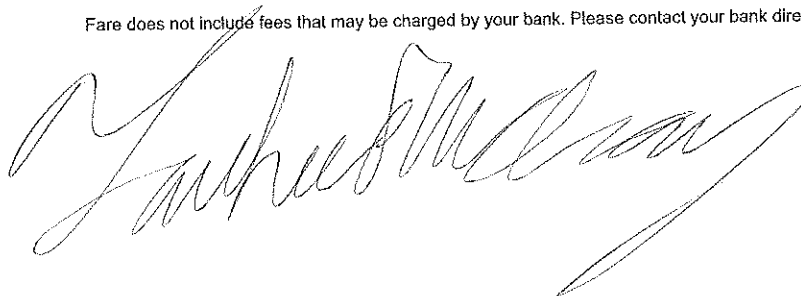
You rode with OSCAR

UberX 5.83 miles | 9 min

 8:28 AM | 114 Wyncrest Ln, Fayetteville, NC 28303-5009, US

 8:38 AM | 301 E Mountain Dr, Fayetteville, NC 28306-3448, US

Fare does not include fees that may be charged by your bank. Please contact your bank directly for inquiries.





Here's your receipt for your ride, Tawheed

We hope you enjoyed your ride this morning.

Total \$13.90

---

Trip fare \$12.09

Subtotal \$12.09

Booking Fee \$1.81

---

Payments


 Visa \*\*\*\*9551 \$13.90  
6/10/25 7:10 PM


[Visit the trip page](#) for more information, including invoices (where available)

---

You rode with Jonathan

UberX 6.72 miles | 12 min

 8:23 AM | 114 Wyncrest Ln, Fayetteville, NC 28303-5009, US

 8:35 AM | 301 E Mountain Dr, Fayetteville, NC 28306-3448, US

Fare does not include fees that may be charged by your bank. Please contact your bank directly for inquiries.





Here's your receipt for your ride, Tawheed

We hope you enjoyed your ride this afternoon.

Total	\$11.90
<hr/>	
Trip fare	\$9.90
<hr/>	
Subtotal	\$9.90
Booking Fee	\$2.00
<hr/>	



Payments

 Visa ****9551	\$11.90
6/10/25 2:01 AM	

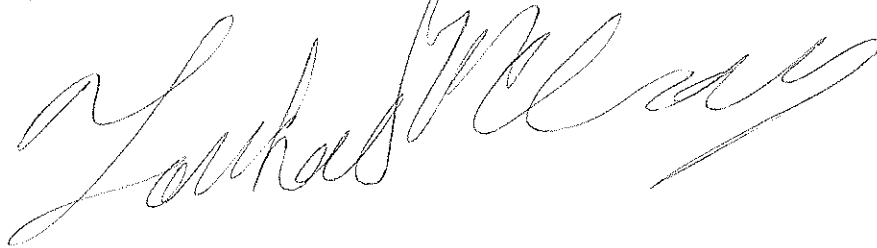
[Visit the trip page](#) for more information, including invoices (where available)

You rode with Jonathan

UberX 7.11 miles | 12 min

-  3:18 PM | 301 e mountain dr, Fayetteville, NC 28306, US
-  3:31 PM | 114 Wynncrest Ln, Fayetteville, NC 28303-5009, US

Fare does not include fees that may be charged by your bank. Please contact your bank directly for inquiries.







Here's your receipt for your ride, Tawheed

We hope you enjoyed your ride this morning.

Total	\$14.01
<hr/>	
Trip fare	\$12.09
<hr/>	
Subtotal	\$12.09
Booking Fee	\$1.85
Wait Time	\$0.07

Payments

 Visa ****9551	\$14.01
6/12/25 7:12 PM	

[Visit the trip page](#) for more information, including invoices (where available)

You rode with Nelson

UberX 6.68 miles | 10 min

- 8:23 AM | 114 Wynncrest Ln, Fayetteville, NC 28303-5009, US
- 8:33 AM | 301 E Mountain Dr, Fayetteville, NC 28306-3448, US

Fare does not include fees that may be charged by your bank. Please contact your bank directly for inquiries.





Here's your receipt for your ride, Tawheed

We hope you enjoyed your ride this morning.

Total \$11.99

---

Trip fare \$10.24

Subtotal \$10.24

Booking Fee \$1.75

---

Payments



 Visa \*\*\*\*9551 \$11.99  
6/12/25 10:10 PM

[Visit the trip page](#) for more information, including invoices (where available)

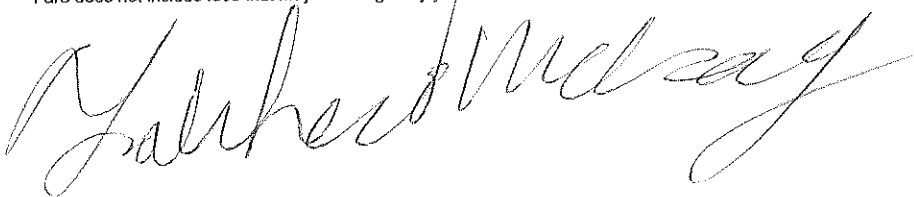
---

You rode with Tristan

UberX 6.22 miles | 10 min

 11:10 AM | 301 E Mountain Dr, Fayetteville, NC 28306-3448, US  
 11:21 AM | 114 Wynncrest Ln, Fayetteville, NC 28303-5009, US

Fare does not include fees that may be charged by your bank. Please contact your bank directly for inquiries.





Here's your receipt for your ride, Tawheed

We hope you enjoyed your ride this morning.

Total \$12.95

---

Trip fare \$11.16

---

Subtotal \$11.16

Booking Fee \$1.79

---

Payments

 Visa \*\*\*\*9551 \$12.95  
6/16/25 7:14 PM

[Visit the trip page](#) for more information, including invoices (where available)

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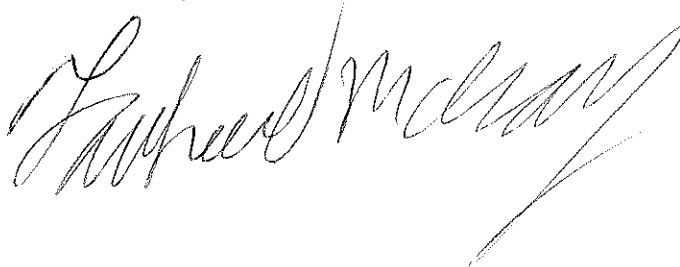
You rode with PAUL

UberX 5.80 miles | 12 min

■ 8:19 AM | 114 Wynncrest Ln, Fayetteville, NC 28303-5009, US

■ 8:32 AM | 301 E Mountain Dr, Fayetteville, NC 28306-3448, US

Fare does not include fees that may be charged by your bank. Please contact your bank directly for inquiries.





Here's your receipt for your ride, Tawheed

We hope you enjoyed your ride this afternoon.

Total \$10.94

---

Trip fare \$9.01

---

Subtotal \$9.01

Booking Fee \$1.93

---

Payments



Visa \*\*\*\*9551  
6/18/25 1:59 AM

\$10.94

[Visit the trip page](#) for more information, including invoices (where available)

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You rode with Ravenmarie

UberX 6.07 miles | 10 min

- 3:11 PM | 301 E Mountain Dr, Fayetteville, NC 28306-3448, US
- 3:22 PM | 114 Wynncrest Ln, Fayetteville, NC 28303-5009, US

Fare does not include fees that may be charged by your bank. Please contact your bank directly for inquiries.





Here's your receipt for your ride, Tawheed

We hope you enjoyed your ride this morning.

Total \$12.92

---

Trip fare \$11.39

---

Subtotal \$11.39

Booking Fee \$1.53

---

Payments

 Visa \*\*\*\*9551 \$12.92  
6/20/25 7:29 PM

[Visit the trip page](#) for more information, including invoices (where available)

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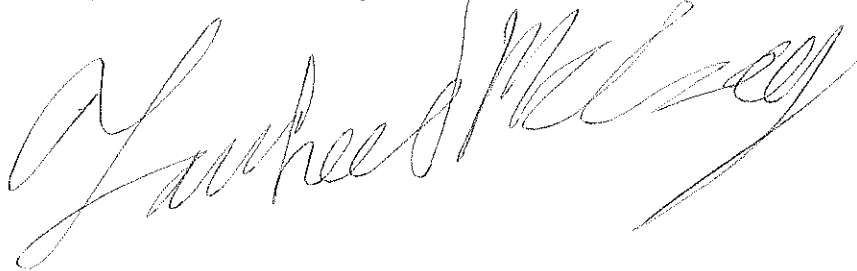
You rode with Checkh

UberX 5.78 miles | 11 min

8:34 AM | 114 Wyncrest Ln, Fayetteville, NC 28303-5009, US

8:46 AM | 301 E Mountain Dr, Fayetteville, NC 28306-3448, US

Fare does not include fees that may be charged by your bank. Please contact your bank directly for inquiries.





Here's your receipt for your ride, Tawheed

We hope you enjoyed your ride this morning.

Total \$12.91

---

Trip fare \$11.20

---

Subtotal \$11.20

Booking Fee \$1.71

---

Payments

 Visa \*\*\*\*9551 \$12.91  
6/23/25 7:37 PM

[Visit the trip page](#) for more information, including invoices (where available)

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You rode with PAUL

UberX 5.79 miles | 12 min

■ 8:46 AM | 114 Wynncrest Ln, Fayetteville, NC 28303-5009, US

■ 8:59 AM | 301 E Mountain Dr, Fayetteville, NC 28306-3448, US

Fare does not include fees that may be charged by your bank. Please contact your bank directly for inquiries.





Here's your receipt for your ride, Tawheed

We hope you enjoyed your ride this morning.

Total \$12.96

---

Trip fare \$11.22

---

Subtotal \$11.22

Booking Fee \$1.74

---

Payments

 Visa \*\*\*\*9551 \$12.96  
6/24/25 7:22 PM

[Visit the trip page](#) for more information, including invoices (where available)

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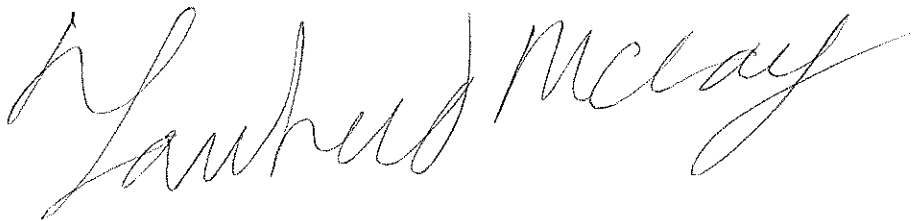
You rode with WALT BIANCA

UberX 5.77 miles | 12 min

■ 8:25 AM | 114 Wynncrest Ln, Fayetteville, NC 28303-5009, US

■ 8:37 AM | 301 E Mountain Dr, Fayetteville, NC 28306-3448, US

Fare does not include fees that may be charged by your bank. Please contact your bank directly for inquiries.





Here's your receipt for your ride, Tawheed

We hope you enjoyed your ride this afternoon.

Total \$10.91

---

Trip fare \$8.99

---

Subtotal \$8.99

Booking Fee \$1.92

---

Payments

 Visa \*\*\*\*9551 \$10.91  
6/24/25 1:52 AM

[Visit the trip page](#) for more information, including invoices (where available)

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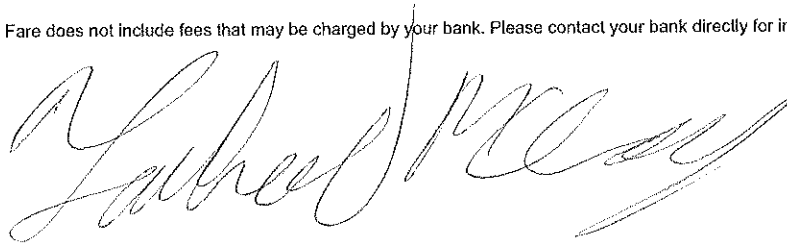
You rode with Richard

UberX 6.21 miles | 10 min

■ 2:57 PM | 301 E Mountain Dr, Fayetteville, NC 28306-3448, US

■ 3:07 PM | 114 Wyncrest Ln, Fayetteville, NC 28303-5009, US

Fare does not include fees that may be charged by your bank. Please contact your bank directly for inquiries.







## Here's your receipt for your ride, Tawheed

We hope you enjoyed your ride this evening.

**Total** **\$12.06**

---

Trip fare \$9.75

---


Subtotal \$9.75

Booking Fee \$2.22

Wait Time \$0.09

---

### Payments

 Visa \*\*\*\*9551 **\$12.06**  
6/25/25 4:02 AM

[Visit the trip page](#) for more information, including invoices (where available)

---

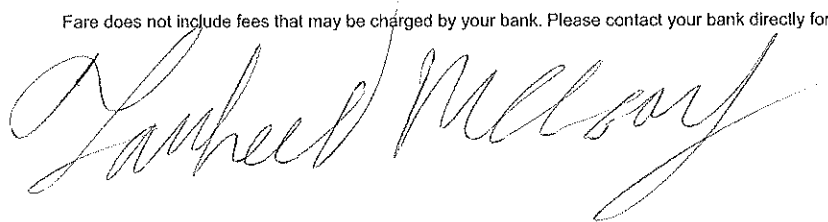
You rode with AZARIAN

UberX 6.08 miles | 10 min

■ 5:07 PM | 301 E Mountain Dr, Fayetteville, NC 28306-3448, US

■ 5:18 PM | 114 Wynncrest Ln, Fayetteville, NC 28303-5009, US

Fare does not include fees that may be charged by your bank. Please contact your bank directly for inquiries.





Here's your receipt for your ride, Tawheed

We hope you enjoyed your ride this morning.

Total \$12.97

---

Trip fare \$11.22

---

Subtotal \$11.22

Booking Fee \$1.75

---

Payments

 Visa \*\*\*\*9551 \$12.97  
6/26/25 7:38 PM

[Visit the trip page](#) for more information, including invoices (where available)

---

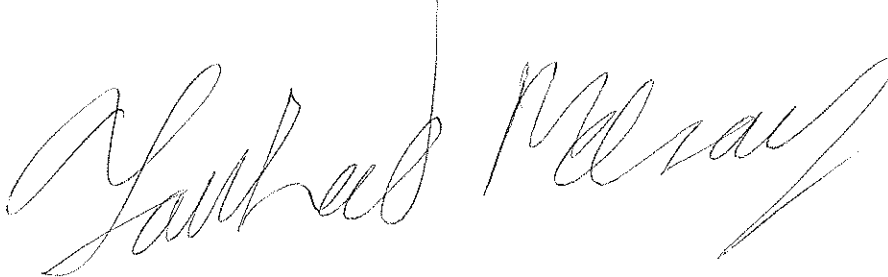
You rode with VINCENT

UberX 5.94 miles | 11 min

■ 8:45 AM | 114 Wynncrest Ln, Fayetteville, NC 28303-5009, US

■ 8:56 AM | 301 E Mountain Dr, Fayetteville, NC 28306-3448, US

Fare does not include fees that may be charged by your bank. Please contact your bank directly for inquiries.





Here's your receipt for your ride, Tawheed

We hope you enjoyed your ride this morning.

Total \$11.95

---

Trip fare \$10.29

---

Subtotal \$10.29

Booking Fee \$1.66

---

Payments

 Visa \*\*\*\*9551 \$11.95  
6/26/25 10:19 PM

[Visit the trip page](#) for more information, including invoices (where available)

---

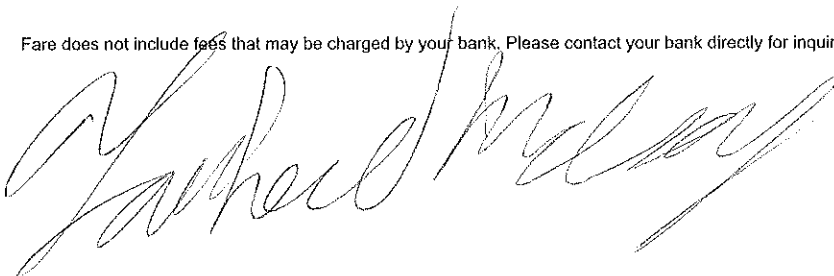
You rode with Janeeka

UberX 6.08 miles | 9 min

■ 11:21 AM | 301 E Mountain Dr, Fayetteville, NC 28306-3448, US

■ 11:31 AM | 114 Wynncrest Ln, Fayetteville, NC 28303-5009, US

Fare does not include fees that may be charged by your bank. Please contact your bank directly for inquiries.





Here's your receipt for your ride, Tawheed

We hope you enjoyed your ride this morning.

Total \$9.95

---

Trip fare \$8.73

---

Subtotal \$8.73

Booking Fee \$1.22

---

Payments

 Visa \*\*\*\*9551 \$9.95  
6/27/25 7:46 PM

[Visit the trip page](#) for more information, including invoices (where available)

---

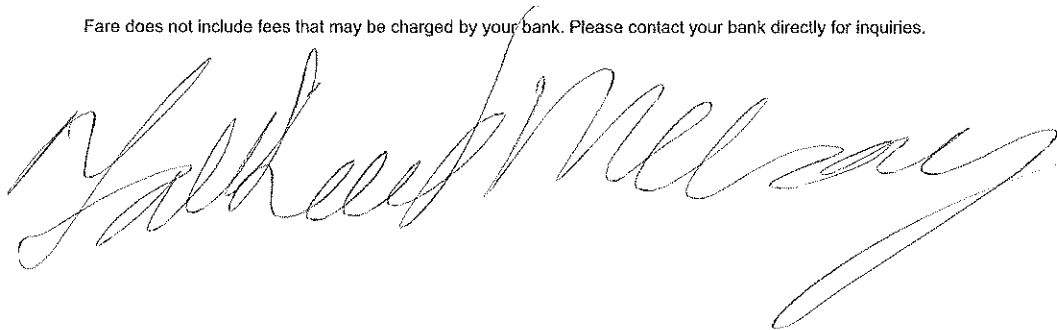
You rode with Michael

UberX 1.55 miles | 4 min

■ 9:00 AM | 114 Wynncrest Ln, Fayetteville, NC 28303-5009, US

■ 9:04 AM | 500 Executive Pl, Fayetteville, NC 28305-5122, US

Fare does not include fees that may be charged by your bank. Please contact your bank directly for inquiries.







Here's your receipt for your ride, Tawheed

We hope you enjoyed your ride this morning.

Total \$12.96

---

Trip fare \$11.22

---

Subtotal \$11.22

Booking Fee \$1.74

---

Payments

 Visa \*\*\*\*9551 \$12.96  
6/30/25 7:29 PM

[Visit the trip page](#) for more information, including invoices (where available)

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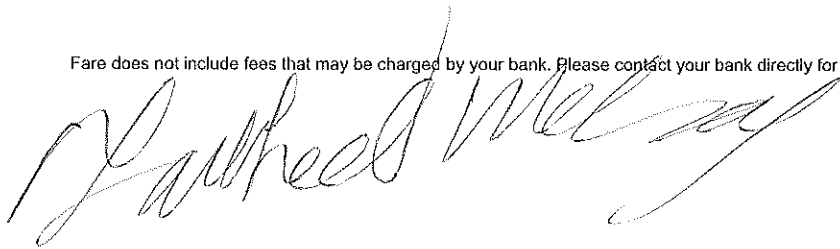
You rode with SABRINA

UberX 5.94 miles | 11 min

■ 8:33 AM | 114 Wyncrest Ln, Fayetteville, NC 28303-5009, US

■ 8:45 AM | 301 E Mountain Dr, Fayetteville, NC 28306-3448, US

Fare does not include fees that may be charged by your bank. Please contact your bank directly for inquiries.







**CUMBERLAND**  
**COUNTY**  
NORTH CAROLINA  
**Engineering Department**

MEMORANDUM

TO: ROBIN DEEVER, FINANCE DIRECTOR  
FROM: DAVID W. DUDLEY, ACTING ENGINEERING DEPT HEAD <sup>DWD</sup>  
DAET: AUGUST 19, 2025  
SUBJECT: REQUEST TO APPROVE PAYMENT OF FY25 INVOICES

The Engineering Department would like to request payment for prior year invoices for the following invoices:

VENDOR	INVOICE DATE	INVOICE NUMBER	PAYMENT AMOUNT	PROJECT	PURCHASE ORDER
Parks Building Solutions	June 30, 2025	CG504125	\$ 69,263.47	Board of Elections Flooring	25000883

Invoices for construction work are generally issued at the end of the month. The above-referenced invoice was submitted through workflow for payment on/about June 30, 2025, the close of the 2025 fiscal year. In its review, Accounts Payable noticed that County and State sales taxes were not broken out on the uploaded invoice. The vendor was contacted and a revised invoice was provided on/about August 4<sup>th</sup>, 2025. This pending invoice was rejected per Department request to revise the MUNIS entry to reflect state and county taxes and upload the corrected attachment.

In order to avoid such issues in the future, we have asked vendors to ensure that taxes are broken out on all invoices and staff have been informed to verify invoices contain the appropriate taxes.

Thank you in advance for your consideration and attention to this matter,



CG504125



INVOICE

Sold To	Ship To
CUMBERLAND COUNTY ENGINEERING & INFRASTRUCTURE 130 GILLESPIE STREET FAYETTEVILLE, NC 28301	CUMBERLAND COUNTY ENGINEERING & INFRASTRUCTURE 227 FOUNTAINHEAD LN FAYETTEVILLE, NC 28301

Invoice Date	Tele #1	PO Number	Order Number
06/30/25		CONTRACT- 2025498	CG504125

Inventory	Style/Item	Color/Description
C56	TANDUS POWERBOND PRIMER 4 GALLON	PRIMER
DV-DIV-420-4G48	DIVERGENT 574 PRESSURE SENSITIVE ADHESIVE 4 GAL	4 GAL
DC-63	COVE BASE RUBBER 4.5 X 1/8 X 120	BURNT UMBER
DV-DIV-WBA-28FL12	DIVERGENT COVE BASE ADHESIVE 30 OZ. CARTRIDGE	DIV BASE ADH
CTA-63-A	ADAPTER 1/4 TO 1/8	BURNT UMBER
ARDEX XF	FEATHER FINISH XF 10# FINISH SELF DRYING UNDERLAYMENT	ARDEX XF
	FREIGHT	
	INSTALL CARPET TILE (SQUARE YARDS)	
	INSTALL COVE BASE	
C-DCT	DEMO CARPET TILE	
	SCARIFY ADHESIVE	
	FLOOR PREP PER SQUARE FOOT	
MVFURNEX-LVP	MOVE FURNITURE (EXCESSIVE)	
DC-63	COVE BASE RUBBER 4.5 X 1/8 X 120	BURNT UMBER
AFTERMATH II FLEXAIR RS 24X24	AFTERMATH II FLEXAIR RS 24X24	TAPESTRY
AFTERMATH II FLEXAIR RS 24X24	AFTERMATH II FLEXAIR RS 24X24	TAPESTRY

*Dan H Rice*

ORIGINAL  
Certified By:  
*Christine*

Sales Representative(s):  
TRAVIS CASHWELL

Our terms are net due the 15th of the month following purchase. Delinquent accounts are subject to a service charge of 1.5 % per month (18% APR).  
Remit payment to:  
Parks Interiors  
PO Box 25489  
Fayetteville, NC 28314

Subtotal:	66,896.63
Sales Tax:	2,366.84
Misc. Tax:	0.00
<b>INVOICE TOTAL:</b>	<b>\$69,263.47</b>
Less Payment(s):	0.00
<b>BALANCE DUE:</b>	<b>\$69,263.47</b>





CG504125



INVOICE

Sold To	Ship To
CUMBERLAND COUNTY ENGINEERING & INFRASTRUCTURE 130 GILLESPIE STREET FAYETTEVILLE, NC 28301	CUMBERLAND COUNTY ENGINEERING & INFRASTRUCTURE 227 FOUNTAINHEAD LN FAYETTEVILLE, NC 28301

Invoice Date	Tele #1	PO Number	Order Number
06/30/25		CONTRACT- 2025498	CG504125

Inventory	Style/Item	Color/Description
AFTERMATH II FLEXAIR RS 24X24	AFTERMATH II FLEXAIR RS 24X24	TAPESTRY
AFTERMATH II FLEXAIR RS 24X24	AFTERMATH II FLEXAIR RS 24X24	TAPESTRY
AFTERMATH II FLEXAIR RS 24X24	AFTERMATH II FLEXAIR RS 24X24	TAPESTRY
AFTERMATH II FLEXAIR RS 24X24	AFTERMATH II FLEXAIR RS 24X24	TAPESTRY
AFTERMATH II FLEXAIR RS 24X24	AFTERMATH II FLEXAIR RS 24X24	TAPESTRY
AFTERMATH II FLEXAIR RS 24X24	AFTERMATH II FLEXAIR RS 24X24	TAPESTRY
AFTERMATH II FLEXAIR RS 24X24	AFTERMATH II FLEXAIR RS 24X24	TAPESTRY
C56	TANDUS POWERBOND PRIMER 4 GALLON	PRIMER
CTA-63-A ARDEX XF	ADAPTER 1/4 TO 1/8 FEATHER FINISH XF 10# FINISH SELF DRYING UNDERLAYMENT	BURNT UMBER ARDEX XF
DC-63	COVE BASE RUBBER 4.5 X 1/8 X 120 YARDS)	BURNT UMBER
C-DCT	INSTALL COVE BASE DEMO CARPET TILE	

Sales Representative(s):  
TRAVIS CASHWELL

Our terms are net due the 15th of the month following purchase. Delinquent accounts are subject to a service charge of 1.5 % per month (18% APR).  
Remit payment to:  
Parks Interiors  
PO Box 25489  
Fayetteville, NC 28314

Subtotal:	66,896.63
Sales Tax:	2,366.84
Misc. Tax:	0.00
<b>INVOICE TOTAL:</b>	<b>\$69,263.47</b>
Less Payment(s):	0.00
<b>BALANCE DUE:</b>	<b>\$69,263.47</b>





CG504125



INVOICE

Sold To	Ship To
CUMBERLAND COUNTY ENGINEERING & INFRASTRUCTURE 130 GILLESPIE STREET FAYETTEVILLE, NC 28301	CUMBERLAND COUNTY ENGINEERING & INFRASTRUCTURE 227 FOUNTAINHEAD LN FAYETTEVILLE, NC 28301

Invoice Date	Tele #1	PO Number	Order Number
06/30/25		CONTRACT- 2025498	CG504125

Inventory	Style/Item	Color/Description
MVFURNEX-LVP	SCARIFY ADHESIVE MOVE FURNITURE (EXCESSIVE)	
DV-DIV-WBA-28FL12	DIVERGENT COVE BASE ADHESIVE 30 OZ. CARTRIDGE	DIV BASE ADH
	INSTALL CARPET TILE (SQUARE YARDS)	
C-DCT	INSTALL COVE BASE DEMO CARPET TILE	
MVFURNEX-LVP	SCARIFY ADHESIVE MOVE FURNITURE (EXCESSIVE)	
C-DCT	DEMO CARPET TILE	
MVFURNEX-LVP	MOVE FURNITURE (EXCESSIVE)	
	INSTALL CARPET TILE (SQUARE YARDS)	
	INSTALL COVE BASE	
	INSTALL CARPET TILE (SQUARE YARDS)	
C-DCT	INSTALL COVE BASE DEMO CARPET TILE	
MVFURNEX-LVP	FLOOR PREP PER SQUARE FOOT MOVE FURNITURE (EXCESSIVE)	

Sales Representative(s):  
TRAVIS CASHWELL

Subtotal: 66,896.63  
 Sales Tax: 2,366.84  
 Misc. Tax: 0.00

Our terms are net due the 15th of the month following purchase. Delinquent accounts are subject to a service charge of 1.5 % per month (18% APR).  
 Remit payment to:  
 Parks Interiors  
 PO Box 25489  
 Fayetteville, NC 28314

**INVOICE TOTAL:** \$69,263.47  
 Less Payment(s): 0.00  
**BALANCE DUE:** \$69,263.47



CG504125



INVOICE

Sold To	Ship To
CUMBERLAND COUNTY ENGINEERING & INFRASTRUCTURE 130 GILLESPIE STREET FAYETTEVILLE, NC 28301	CUMBERLAND COUNTY ENGINEERING & INFRASTRUCTURE 227 FOUNTAINHEAD LN FAYETTEVILLE, NC 28301

Invoice Date	Tele #1	PO Number	Order Number
06/30/25		CONTRACT- 2025498	CG504125

Inventory	Style/Item	Color/Description
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Invoice 1 of 2. Total amount due for both invoices is \$82,757.90  
 Invoice 1 \$69,263.47  
 Invoice 2 \$13,494.43  
 Total \$82,757.90

- No returns are acceptable on special order materials.
- Stocked materials subject to our inspection can be returned within 30 days, full cartons only, and if accepted, require a 25% handling and restocking charge.
- Unless otherwise noted, all materials are special order.
- Credit Card payments require a 3% fee (American Express is 4%). This is in addition to the material and labor total. Payment by check or cash require no additional fees.

Sales Representative(s):  
 TRAVIS CASHWELL

Our terms are net due the 15th of the month following purchase. Delinquent accounts are subject to a service charge of 1.5 % per month (18% APR).  
 Remit payment to:  
 Parks Interiors  
 PO Box 25489  
 Fayetteville, NC 28314

Subtotal:	66,896.63
Sales Tax:	2,366.84
Misc. Tax:	0.00
<b>INVOICE TOTAL:</b>	<b>\$69,263.47</b>
Less Payment(s):	0.00
<b>BALANCE DUE:</b>	<b>\$69,263.47</b>







**Internal Services Department**

*Facilities Management Division · Fleet Management Division · Landscaping & Grounds Division*

TO: ROBIN DEEVERS, FINANCE DIRECTOR

FROM: Jeremy Stefanko INTERNAL SERVICES DIRECTOR JS

DATE: August 27, 2025

SUBJECT: REQUEST TO PAY PRIOR YEAR INVOICES

In the fiscal year 2025, Internal Services has received prior year invoices from multiple vendors that need to be paid. We have verified with the vendors that these invoices are outstanding, ensured these were not duplicates, we have implemented procedures and talked to vendors to prevent this from happening in the future. There is available funding in the current year budget to cover these costs. Below is a breakdown of the prior year invoices that need to be paid.

Fayetteville Footwear invoice 0236380 in the amount of \$400.00. This can be paid out of 1014113-533671.

Napa Auto Parts invoice 787955 in the amount of \$356.89. This can be paid out of 1014113-533404.

Cintas Invoices 9330441731 in the amount of \$17.82, 9330441699 in the amount of \$17.82, 9330441663 in the amount of \$17.82, 9330441631 in the amount of \$17.54, 9330441600 in the amount of \$17.82, 9330441567 in the amount of \$17.82, 9330441530 in the amount of \$17.82, 9330441500 in the amount of \$17.82, 9330441462 in the amount of \$17.82. These can be paid out of 1014166-522120

The grand Total of these invoices equate to ~~\$917.27~~ 916.99 BME

Thank you for your consideration of this request. Please feel free to contact me with any concerns.

Fleet Management  
426 Mayview Street  
Fayetteville, NC 28306  
910 321-6963

Facilities Management  
420 Mayview Street  
Fayetteville, NC 28306  
910-678-7699

Landscaping & Grounds  
807 Grove Street  
Fayetteville, NC 28302  
910-678-7560





# INVOICE

ACCOUNT NUMBER
20100126

Invoice Number: 0236380  
 Invoice Date: 07-18-2025  
 Invoice Due Upon Receipt

CUMBERLAND COUNTY LANDSCAPING  
 807 GROVE ST.  
 Jeese Barton  
 FAYETTEVILLE NC 28301

REMIT PAYMENT TO:  
 Fayetteville Footwear  
 3412 Ramsey Street  
 FAYETTEVILLE NC 28311  
 (910)-484-8855

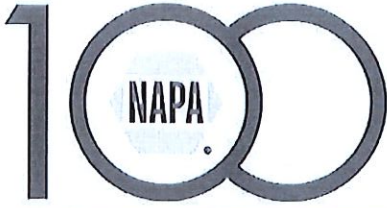
Date	Ticket #	Purchased By:	PO Number	Reference	Amount
6/24/25	20141992	EASTMAN, THOMAS	VOUCHER	VOUCHER	100.00
6/24/25	20141993	FREEMAN, JOEY	VOUCHER	VOUCHER	100.00
6/26/25	20142009	MCNEILL, RANDOM	VOUCHER	VOUCHER	100.00
6/30/25	20142044	BARTON, JESSE	VOUCHER	(20059744) VOUCHER	100.00

LSG-OSHA 2025

Current	Over 30	Over 60	Over 90	TOTAL DUE	400.00
400.00	0.00	0.00	0.00		







600003425  
 NAPA Auto Parts - HP425  
 710 Locust Street  
 Fayetteville, NC 28301  
 (910) 483-0805

Invoice Number 787955 Page: 1/1  
 Invoice Date: 06/24/2025 12:39  
  
 eInvoice# HP 00425787955

39778  
 CUMBERLAND CO. LANDSCAPING  
 807 GROVE STREET  
 FAYETTEVILLE, NC 28301-0000

Employee: 2171 , NICK  
 Sales Rep: 19 , COUNTER  
 Accounting Day: 20  
 Tax Exemption:

Attention:  
 PO#: mnrequip  
 Delivery:  
 Terms: #4 NET 10TH PROXIMATE MONTH

Part Number	Line	Description	Quantity	Price	Net	Total	
945	VAL	Valvoline Advanced Motor Oil 20 ( )	5.00	21.42	10.71	53.55	T
945	VAL	Valvoline Advanced Motor Oil 20 ( )	1.00	21.42	10.71	10.71	T
881164	VAL	Valvoline Advanced Motor Oil 5W ( )	6.00	76.92	38.46	230.76	T
4800	MAC	NON-CHLOR BRAKE CLNR (200)	5.00	9.16	4.40	22.00	T
16-PB-DS	NCB	16 PB DS PENETRANT (200)	2.00	16.52	8.26	16.52	T

ON ACCOUNT

ALL GOODS RETURNED MUST BE ACCOMPANIED BY THIS INVOICE

Customer Signature

REF BY \_\_\_\_\_ VER BY \_\_\_\_\_  
 REMIT TO: PO BOX 409043  
 ATLANTA, GA 30384-9043

Tender Type:	Amount:	Subtotal	333.54
Charge Sale	356.89	NC SALES TAX 7.0000%	23.35
		<b>Total</b>	<b>356.89</b>





REMIT PAYMENT TO:  
 CINTAS CORP  
 P.O. BOX 630803  
 CINCINNATI, OH 45263-0803

VIEW & PAY YOUR BILLS ONLINE:  
 WWW.CINTAS.COM/MYACCOUNT

CUSTOMER SVC/BILLING 833-711-5954  
 CINTAS FAX # 910-223-0837  
 PAYMENT INQUIRY 704-548-7379

# INVOICE

SHIP TO: CUMBERLAND COUNTY  
 426 MAYVIEW ST  
 FAYETTEVILLE, NC 28306-1748

INVOICE # 9330441731  
 INVOICE DATE 07/22/2025  
 SERVICE TICKET # 4229091564

BILL TO: C/O CARPENTRY SHOP PEGGY  
 CUMBERLAND COUNTY  
 420 MAYVIEW ST  
 FAYETTEVILLE, NC 28306

SOLD TO # 13927496  
 PAYER # 13938504  
 PAYMENT TERMS NET 10 EOM  
 SORT # 09360084128  
 CINTAS ROUTE 89 / DAY 4 / STOP 004

EMP#/LOCK#	MATERIAL	DESCRIPTION	FREQ	EXCH	QTY	UNIT PRICE	LINE TOTAL	TAX
	X2	INSURANCE			1	0.000	0.00	N
	X1132	MINIMUM CHARGE			1	0.000	0.00	N
	X106	SERVICE CHARGE	01	F	1	0.000	0.00	N
0001	X270	CARGO PANT/CHARCOAL-03432	01	F	11	0.280	3.08	Y
0001	X935	UNIF SHRT/LT GREY/CMFT/SS-RG0XL	01	F	11	0.170	1.87	Y
0001	X970	PERMA-LND JKT/CH GY TWILL-0XLLS	01	F	2	0.300	0.60	Y
0001	WILLIAM STORMS SUBTOTAL - 5.55							
0005	X270	CARGO PANT/CHARCOAL-03430	01	F	11	0.280	3.08	Y
0005	X935	UNIF SHRT/LT GREY/CMFT/SS-RG0XL	01	F	11	0.170	1.87	Y
0005	X970	PERMA-LND JKT/CH GY TWILL-0XLLS	01	F	2	0.300	0.60	Y
0005	SHAWN CURRAN SUBTOTAL - 5.55							
0006	X270	CARGO PANT/CHARCOAL-04230	01	F	11	0.280	3.08	Y
0006	X935	UNIF SHRT/LT GREY/CMFT/SS-RG2XL	01	F	11	0.170	1.87	Y
0006	X970	PERMA-LND JKT/CH GY TWILL-2XLLS	01	F	2	0.300	0.60	Y
0006	RANDY GASKINS SUBTOTAL - 5.55							
							SUBTOTAL	16.65
							SUBTOTAL	16.65
							SALES TAX	1.17
							TOTAL USD	17.82

*CORRECTED*

original invoice 4229091564 5/1/25





REMIT PAYMENT TO:  
 CINTAS CORP  
 P.O. BOX 630803  
 CINCINNATI, OH 45263-0803

VIEW & PAY YOUR BILLS ONLINE:  
 WWW.CINTAS.COM/MYACCOUNT

CUSTOMER SVC/BILLING 833-711-5954  
 CINTAS FAX # 910-223-0837  
 PAYMENT INQUIRY 704-548-7379

# INVOICE

SHIP TO: CUMBERLAND COUNTY  
 426 MAYVIEW ST  
 FAYETTEVILLE, NC 28306-1748

INVOICE # 9330441699  
 INVOICE DATE 07/22/2025  
 SERVICE TICKET # 4229837402

BILL TO: C/O CARPENTRY SHOP PEGGY  
 CUMBERLAND COUNTY  
 420 MAYVIEW ST  
 FAYETTEVILLE, NC 28306

SOLD TO # 13927496  
 PAYER # 13938504  
 PAYMENT TERMS NET 10 EOM  
 SORT # 09360084128  
 CINTAS ROUTE 89 / DAY 4 / STOP 004

EMP#/LOCK#	MATERIAL	DESCRIPTION	FREQ	EXCH	QTY	UNIT PRICE	LINE TOTAL	TAX	
	X2	INSURANCE			1	0.000	0.00	N	
	X1132	MINIMUM CHARGE			1	0.000	0.00	N	
	X106	SERVICE CHARGE	01	F	1	0.000	0.00	N	
0001	X270	CARGO PANT/CHARCOAL-03432	01	F	11	0.280	3.08	Y	
0001	X935	UNIF SHRT/LT GREY/CMFT/SS-RG0XL	01	F	11	0.170	1.87	Y	
0001	X970	PERMA-LND JKT/CH GY TWILL-0XLLS	01	F	2	0.300	0.60	Y	
0001	<b>WILLIAM STORMS SUBTOTAL - 5.55</b>								
0005	X270	CARGO PANT/CHARCOAL-03430	01	F	11	0.280	3.08	Y	
0005	X935	UNIF SHRT/LT GREY/CMFT/SS-RG0XL	01	F	11	0.170	1.87	Y	
0005	X970	PERMA-LND JKT/CH GY TWILL-0XLLS	01	F	2	0.300	0.60	Y	
0005	<b>SHAWN CURRAN SUBTOTAL - 5.55</b>								
0006	X270	CARGO PANT/CHARCOAL-04230	01	F	11	0.280	3.08	Y	
0006	X935	UNIF SHRT/LT GREY/CMFT/SS-RG2XL	01	F	11	0.170	1.87	Y	
0006	X970	PERMA-LND JKT/CH GY TWILL-2XLLS	01	F	2	0.300	0.60	Y	
0006	<b>RANDY GASKINS SUBTOTAL - 5.55</b>								
<b>SUBTOTAL</b>							<b>16.65</b>		
<b>SUBTOTAL</b>							<b>16.65</b>		
<b>SALES TAX</b>							<b>1.17</b>		
<b>TOTAL USD</b>							<b>17.82</b>		

original invoice 4229837402 5/8/25







REMIT PAYMENT TO:  
 CINTAS CORP  
 P.O. BOX 630803  
 CINCINNATI, OH 45263-0803

VIEW & PAY YOUR BILLS ONLINE:  
 WWW.CINTAS.COM/MYACCOUNT

CUSTOMER SVC/BILLING 833-711-5954  
 CINTAS FAX # 910-223-0837  
 PAYMENT INQUIRY 704-548-7379

# INVOICE

SHIP TO: CUMBERLAND COUNTY  
 426 MAYVIEW ST  
 FAYETTEVILLE, NC 28306-1748

INVOICE # 9330441663  
 INVOICE DATE 07/22/2025  
 SERVICE TICKET # 4230584578

BILL TO: C/O CARPENTRY SHOP PEGGY  
 CUMBERLAND COUNTY  
 420 MAYVIEW ST  
 FAYETTEVILLE, NC 28306

SOLD TO # 13927496  
 PAYER # 13938504  
 PAYMENT TERMS NET 10 EOM  
 SORT # 09360084128  
 CINTAS ROUTE 89 / DAY 4 / STOP 004

EMP#/LOCK#	MATERIAL	DESCRIPTION	FREQ	EXCH	QTY	UNIT PRICE	LINE TOTAL	TAX	
	X2	INSURANCE			1	0.000	0.00	N	
	X1132	MINIMUM CHARGE			1	0.000	0.00	N	
	X106	SERVICE CHARGE	01	F	1	0.000	0.00	N	
0001	X270	CARGO PANT/CHARCOAL-03432	01	F	11	0.280	3.08	Y	
0001	X935	UNIF SHRT/LT GREY/CMFT/SS-RG0XL	01	F	11	0.170	1.87	Y	
0001	X970	PERMA-LND JKT/CH GY TWILL-0XLLS	01	F	2	0.300	0.60	Y	
0001	WILLIAM STORMS SUBTOTAL - 5.55								
0005	X270	CARGO PANT/CHARCOAL-03430	01	F	11	0.280	3.08	Y	
0005	X935	UNIF SHRT/LT GREY/CMFT/SS-RG0XL	01	F	11	0.170	1.87	Y	
0005	X970	PERMA-LND JKT/CH GY TWILL-0XLLS	01	F	2	0.300	0.60	Y	
0005	SHAWN CURRAN SUBTOTAL - 5.55								
0006	X270	CARGO PANT/CHARCOAL-04230	01	F	11	0.280	3.08	Y	
0006	X935	UNIF SHRT/LT GREY/CMFT/SS-RG2XL	01	F	11	0.170	1.87	Y	
0006	X970	PERMA-LND JKT/CH GY TWILL-2XLLS	01	F	2	0.300	0.60	Y	
0006	RANDY GASKINS SUBTOTAL - 5.55								
							SUBTOTAL	16.65	
							SUBTOTAL	16.65	
							SALES TAX	1.17	
							TOTAL USD	17.82	

original invoice 9321157161 5/15/25

✓ 4230584578







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 CINCINNATI, OH 45263-0803

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CUSTOMER SVC/BILLING 833-711-5954  
 CINTAS FAX # 910-223-0837  
 PAYMENT INQUIRY 704-548-7379

# INVOICE

SHIP TO: CUMBERLAND COUNTY  
 426 MAYVIEW ST  
 FAYETTEVILLE, NC 28306-1748

INVOICE # 9330441631  
 INVOICE DATE 07/22/2025  
 SERVICE TICKET # 4231313884

BILL TO: C/O CARPENTRY SHOP PEGGY  
 CUMBERLAND COUNTY  
 420 MAYVIEW ST  
 FAYETTEVILLE, NC 28306

SOLD TO # 13927496  
 PAYER # 13938504  
 PAYMENT TERMS NET 10 EOM  
 SORT # 09360084128  
 CINTAS ROUTE 89 / DAY 4 / STOP 004

EMP#/LOCK#	MATERIAL	DESCRIPTION	FREQ	EXCH	QTY	UNIT PRICE	LINE TOTAL	TAX	
	X2	INSURANCE			1	0.000	0.00	N	
	X1132	MINIMUM CHARGE			1	0.000	0.00	N	
	X106	SERVICE CHARGE	01	F	1	0.000	0.00	N	
0001	X270	CARGO PANT/CHARCOAL-03432	01	F	11	0.280	3.08	Y	
0001	X935	UNIF SHRT/LT GREY/CMFT/SS-RG0XL	01	F	11	0.170	1.87	Y	
0001	X970	PERMA-LND JKT/CH GY TWILL-0XLLS	01	F	2	0.170	0.34	Y	
0001	<b>WILLIAM STORMS SUBTOTAL - 5.29</b>								
0005	X270	CARGO PANT/CHARCOAL-03430	01	F	11	0.280	3.08	Y	
0005	X935	UNIF SHRT/LT GREY/CMFT/SS-RG0XL	01	F	11	0.170	1.87	Y	
0005	X970	PERMA-LND JKT/CH GY TWILL-0XLLS	01	F	2	0.300	0.60	Y	
0005	<b>SHAWN CURRAN SUBTOTAL - 5.55</b>								
0006	X270	CARGO PANT/CHARCOAL-04230	01	F	11	0.280	3.08	Y	
0006	X935	UNIF SHRT/LT GREY/CMFT/SS-RG2XL	01	F	11	0.170	1.87	Y	
0006	X970	PERMA-LND JKT/CH GY TWILL-2XLLS	01	F	2	0.300	0.60	Y	
0006	<b>RANDY GASKINS SUBTOTAL - 5.55</b>								
<b>SUBTOTAL</b>							<b>16.39</b>		
<b>SUBTOTAL</b>							<b>16.39</b>		
<b>SALES TAX</b>							<b>1.15</b>		
<b>TOTAL USD</b>							<b>17.54</b>		

original invoice 4231313884 5/22/25





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 CINTAS FAX # 910-223-0837  
 PAYMENT INQUIRY 704-548-7379

# INVOICE

SHIP TO: CUMBERLAND COUNTY  
 426 MAYVIEW ST  
 FAYETTEVILLE, NC 28306-1748

INVOICE # 9330441600  
 INVOICE DATE 07/22/2025  
 SERVICE TICKET # 4231999105

BILL TO: C/O CARPENTRY SHOP PEGGY  
 CUMBERLAND COUNTY  
 420 MAYVIEW ST  
 FAYETTEVILLE, NC 28306

SOLD TO # 13927496  
 PAYER # 13938504  
 PAYMENT TERMS NET 10 EOM  
 SORT # 09360084128  
 CINTAS ROUTE 89 / DAY 4 / STOP 004

EMP#/LOCK#	MATERIAL	DESCRIPTION	FREQ	EXCH	QTY	UNIT PRICE	LINE TOTAL	TAX	
	X2	INSURANCE			1	0.000	0.00	N	
	X1132	MINIMUM CHARGE			1	0.000	0.00	N	
	X106	SERVICE CHARGE	01	F	1	0.000	0.00	N	
0001	X270	CARGO PANT/CHARCOAL-03432	01	F	11	0.280	3.08	Y	
0001	X935	UNIF SHRT/LT GREY/CMFT/SS-RG0XL	01	F	11	0.170	1.87	Y	
0001	X970	PERMA-LND JKT/CH GY TWILL-0XLLS	01	F	2	0.300	0.60	Y	
0001	WILLIAM STORMS SUBTOTAL - 5.55								
0005	X270	CARGO PANT/CHARCOAL-03430	01	F	11	0.280	3.08	Y	
0005	X935	UNIF SHRT/LT GREY/CMFT/SS-RG0XL	01	F	11	0.170	1.87	Y	
0005	X970	PERMA-LND JKT/CH GY TWILL-0XLLS	01	F	2	0.300	0.60	Y	
0005	SHAWN CURRAN SUBTOTAL - 5.55								
0006	X270	CARGO PANT/CHARCOAL-04230	01	F	11	0.280	3.08	Y	
0006	X935	UNIF SHRT/LT GREY/CMFT/SS-RG2XL	01	F	11	0.170	1.87	Y	
0006	X970	PERMA-LND JKT/CH GY TWILL-2XLLS	01	F	2	0.300	0.60	Y	
0006	RANDY GASKINS SUBTOTAL - 5.55								
							SUBTOTAL	16.65	
							SUBTOTAL	16.65	
							SALES TAX	1.17	
							TOTAL USD	17.82	

original invoice 4231999105 5/29/25





REMIT PAYMENT TO:  
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CUSTOMER SVC/BILLING 833-711-5954  
 CINTAS FAX # 910-223-0837  
 PAYMENT INQUIRY 704-548-7379

# INVOICE

SHIP TO: CUMBERLAND COUNTY  
 426 MAYVIEW ST  
 FAYETTEVILLE, NC 28306-1748

INVOICE # 9330441567  
 INVOICE DATE 07/22/2025  
 SERVICE TICKET # 4232780345

BILL TO: C/O CARPENTRY SHOP PEGGY  
 CUMBERLAND COUNTY  
 420 MAYVIEW ST  
 FAYETTEVILLE, NC 28306

SOLD TO # 13927496  
 PAYER # 13938504  
 PAYMENT TERMS NET 10 EOM  
 SORT # 09360084128  
 CINTAS ROUTE 89 / DAY 4 / STOP 004

EMP#/LOCK#	MATERIAL	DESCRIPTION	FREQ	EXCH	QTY	UNIT PRICE	LINE TOTAL	TAX	
	X2	INSURANCE			1	0.000	0.00	N	
	X1132	MINIMUM CHARGE			1	0.000	0.00	N	
	X106	SERVICE CHARGE	01	F	1	0.000	0.00	N	
0001	X270	CARGO PANT/CHARCOAL-03432	01	F	11	0.280	3.08	Y	
0001	X935	UNIF SHRT/LT GREY/CMFT/SS-RG0XL	01	F	11	0.170	1.87	Y	
0001	X970	PERMA-LND JKT/CH GY TWILL-0XLLS	01	F	2	0.300	0.60	Y	
0001	WILLIAM STORMS SUBTOTAL - 5.55								
0005	X270	CARGO PANT/CHARCOAL-03430	01	F	11	0.280	3.08	Y	
0005	X935	UNIF SHRT/LT GREY/CMFT/SS-RG0XL	01	F	11	0.170	1.87	Y	
0005	X970	PERMA-LND JKT/CH GY TWILL-0XLLS	01	F	2	0.300	0.60	Y	
0005	SHAWN CURRAN SUBTOTAL - 5.55								
0006	X270	CARGO PANT/CHARCOAL-04230	01	F	11	0.280	3.08	Y	
0006	X935	UNIF SHRT/LT GREY/CMFT/SS-RG2XL	01	F	11	0.170	1.87	Y	
0006	X970	PERMA-LND JKT/CH GY TWILL-2XLLS	01	F	2	0.300	0.60	Y	
0006	RANDY GASKINS SUBTOTAL - 5.55								
							SUBTOTAL	16.65	
							SUBTOTAL	16.65	
							SALES TAX	1.17	
							TOTAL USD	17.82	

original invoice 4232780345 6/5/25







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 CINCINNATI, OH 45263-0803

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CUSTOMER SVC/BILLING 833-711-5954  
 CINTAS FAX # 910-223-0837  
 PAYMENT INQUIRY 704-548-7379

# INVOICE

SHIP TO: CUMBERLAND COUNTY  
 426 MAYVIEW ST  
 FAYETTEVILLE, NC 28306-1748

INVOICE # 9330441530  
 INVOICE DATE 07/22/2025  
 SERVICE TICKET # 4233510852

BILL TO: C/O CARPENTRY SHOP PEGGY  
 CUMBERLAND COUNTY  
 420 MAYVIEW ST  
 FAYETTEVILLE, NC 28306

SOLD TO # 13927496  
 PAYER # 13938504  
 PAYMENT TERMS NET 10 EOM  
 SORT # 09360084128  
 CINTAS ROUTE 89 / DAY 4 / STOP 004

EMP#/LOCK#	MATERIAL	DESCRIPTION	FREQ	EXCH	QTY	UNIT PRICE	LINE TOTAL	TAX
	X2	INSURANCE			1	0.000	0.00	N
	X1132	MINIMUM CHARGE			1	0.000	0.00	N
	X106	SERVICE CHARGE	01	F	1	0.000	0.00	N
0001	X270	CARGO PANT/CHARCOAL-03432	01	F	11	0.280	3.08	Y
0001	X935	UNIF SHRT/LT GREY/CMFT/SS-RG0XL	01	F	11	0.170	1.87	Y
0001	X970	PERMA-LND JKT/CH GY TWILL-0XLLS	01	F	2	0.300	0.60	Y
0001	WILLIAM STORMS SUBTOTAL - 5.55							
0005	X270	CARGO PANT/CHARCOAL-03430	01	F	11	0.280	3.08	Y
0005	X935	UNIF SHRT/LT GREY/CMFT/SS-RG0XL	01	F	11	0.170	1.87	Y
0005	X970	PERMA-LND JKT/CH GY TWILL-0XLLS	01	F	2	0.300	0.60	Y
0005	SHAWN CURRAN SUBTOTAL - 5.55							
0006	X270	CARGO PANT/CHARCOAL-04230	01	F	11	0.280	3.08	Y
0006	X935	UNIF SHRT/LT GREY/CMFT/SS-RG2XL	01	F	11	0.170	1.87	Y
0006	X970	PERMA-LND JKT/CH GY TWILL-2XLLS	01	F	2	0.300	0.60	Y
0006	RANDY GASKINS SUBTOTAL - 5.55							
SUBTOTAL							16.65	
SUBTOTAL							16.65	
SALES TAX							1.17	
TOTAL USD							17.82	

original invoice 4233510852 6/12/25







REMIT PAYMENT TO:  
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 P.O. BOX 630803  
 CINCINNATI, OH 45263-0803

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CUSTOMER SVC/BILLING 833-711-5954  
 CINTAS FAX # 910-223-0837  
 PAYMENT INQUIRY 704-548-7379

# INVOICE

SHIP TO: CUMBERLAND COUNTY  
 426 MAYVIEW ST  
 FAYETTEVILLE, NC 28306-1748

INVOICE # 9330441500  
 INVOICE DATE 07/22/2025  
 SERVICE TICKET # 4234244472

BILL TO: C/O CARPENTRY SHOP PEGGY  
 CUMBERLAND COUNTY  
 420 MAYVIEW ST  
 FAYETTEVILLE, NC 28306

SOLD TO # 13927496  
 PAYER # 13938504  
 PAYMENT TERMS NET 10 EOM  
 SORT # 09360084128  
 CINTAS ROUTE 89 / DAY 4 / STOP 004

EMP#/LOCK#	MATERIAL	DESCRIPTION	FREQ	EXCH	QTY	UNIT PRICE	LINE TOTAL	TAX	
	X2	INSURANCE			1	0.000	0.00	N	
	X1132	MINIMUM CHARGE			1	0.000	0.00	N	
	X106	SERVICE CHARGE	01	F	1	0.000	0.00	N	
0001	X270	CARGO PANT/CHARCOAL-03432	01	F	11	0.280	3.08	Y	
0001	X935	UNIF SHRT/LT GREY/CMFT/SS-RG0XL	01	F	11	0.170	1.87	Y	
0001	X970	PERMA-LND JKT/CH GY TWILL-0XLLS	01	F	2	0.300	0.60	Y	
0001	WILLIAM STORMS SUBTOTAL - 5.55								
0005	X270	CARGO PANT/CHARCOAL-03430	01	F	11	0.280	3.08	Y	
0005	X935	UNIF SHRT/LT GREY/CMFT/SS-RG0XL	01	F	11	0.170	1.87	Y	
0005	X970	PERMA-LND JKT/CH GY TWILL-0XLLS	01	F	2	0.300	0.60	Y	
0005	SHAWN CURRAN SUBTOTAL - 5.55								
0006	X270	CARGO PANT/CHARCOAL-04230	01	F	11	0.280	3.08	Y	
0006	X935	UNIF SHRT/LT GREY/CMFT/SS-RG2XL	01	F	11	0.170	1.87	Y	
0006	X970	PERMA-LND JKT/CH GY TWILL-2XLLS	01	F	2	0.300	0.60	Y	
0006	RANDY GASKINS SUBTOTAL - 5.55								
SUBTOTAL							16.65		
SUBTOTAL							16.65		
SALES TAX							1.17		
TOTAL USD							17.82		

original invoice 4234244472 6/19/25





REMIT PAYMENT TO:  
 CINTAS CORP  
 P.O. BOX 630803  
 CINCINNATI, OH 45263-0803

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CUSTOMER SVC/BILLING 833-711-5954  
 CINTAS FAX # 910-223-0837  
 PAYMENT INQUIRY 704-548-7379

# INVOICE

SHIP TO: CUMBERLAND COUNTY  
 426 MAYVIEW ST  
 FAYETTEVILLE, NC 28306-1748

INVOICE # 9330441462  
 INVOICE DATE 07/22/2025  
 SERVICE TICKET # 4234979847

BILL TO: C/O CARPENTRY SHOP PEGGY  
 CUMBERLAND COUNTY  
 420 MAYVIEW ST  
 FAYETTEVILLE, NC 28306

SOLD TO # 13927496  
 PAYER # 13938504  
 PAYMENT TERMS NET 10 EOM  
 SORT # 09360084128  
 CINTAS ROUTE 89 / DAY 4 / STOP 004

EMP#/LOCK#	MATERIAL	DESCRIPTION	FREQ	EXCH	QTY	UNIT PRICE	LINE TOTAL	TAX	
	X2	INSURANCE			1	0.000	0.00	N	
	X1132	MINIMUM CHARGE			1	0.000	0.00	N	
	X106	SERVICE CHARGE	01	F	1	0.000	0.00	N	
0001	X270	CARGO PANT/CHARCOAL-03432	01	F	11	0.280	3.08	Y	
0001	X935	UNIF SHRT/LT GREY/CMFT/SS-RG0XL	01	F	11	0.170	1.87	Y	
0001	X970	PERMA-LND JKT/CH GY TWILL-0XLLS	01	F	2	0.300	0.60	Y	
0001	WILLIAM STORMS SUBTOTAL - 5.55								
0005	X270	CARGO PANT/CHARCOAL-03430	01	F	11	0.280	3.08	Y	
0005	X935	UNIF SHRT/LT GREY/CMFT/SS-RG0XL	01	F	11	0.170	1.87	Y	
0005	X970	PERMA-LND JKT/CH GY TWILL-0XLLS	01	F	2	0.300	0.60	Y	
0005	SHAWN CURRAN SUBTOTAL - 5.55								
0006	X270	CARGO PANT/CHARCOAL-04230	01	F	11	0.280	3.08	Y	
0006	X935	UNIF SHRT/LT GREY/CMFT/SS-RG2XL	01	F	11	0.170	1.87	Y	
0006	X970	PERMA-LND JKT/CH GY TWILL-2XLLS	01	F	2	0.300	0.60	Y	
0006	RANDY GASKINS SUBTOTAL - 5.55								
							SUBTOTAL	16.65	
							SUBTOTAL	16.65	
							SALES TAX	1.17	
							TOTAL USD	17.82	


original invoice 4234979847 6/26/25



Robin M. Koonce  
Finance Director  
Chief Financial Officer



MEMORANDUM

TO: Robin Deaver, Finance Director/CFO   
FROM: Liz Cherry, Finance Accountant  
DATE: August 29, 2025  
SUBJECT: Request to Pay Prior Year Invoices

Please approve the attached prior year invoice from Community Development Foundation in the total of \$23,812.50. The invoice was presented for payment after the deadline to pay fiscal year 2025 invoices.

I have verified that the invoice has not been paid and can be absorbed in the current year's budget. There are sufficient funds in the FY26 budget on line 1074186 533301 CIF11 to cover the cost of the FY25 invoice.

Thank you for your consideration of this request.







To: Heather Skeens, Assistant County Manager for Community Support  
CC: Elizabeth Cherry, Finance Accountant & Systems Administrator  
CC: Robert Van Geons, FCEDC President & CEO; Jasmin Ellis, Finance Manager  
From: Chela Scott, Project Manager  
Date: August 18, 2025  
RE: Black Voices Museum Project (BVM) – Request for Disbursement of Funds

Dear Heather,

We sincerely appreciate the County’s continued support of this project. All expenditures to this point have been carefully reviewed to ensure alignment with established budget expectations.

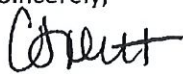
FCEDC has paid the full balance reflected in the attached invoices, totaling **\$68,112.50**. We are now requesting reimbursement for the County’s portion of this amount.

Invoice Number	Date Received	Amount Due	Payee
1183196	7/23/2025	\$47,625.00	Gensler
1187272	8/13/2025	\$20,487.50	Gensler
	Total:	\$68,112.50	
	County’s Portion (50%):	\$34,056.25	

All invoices have been reviewed and approved for payment by Robert M. Van Geons and Michael Gibson. Detailed supporting documentation is attached for your review.

With the disbursement of these funds, the County will have paid \$342,020.54 of the \$450,000 approved budget for the project.

Should you require any additional information or documentation, please do not hesitate to reach out. We are more than happy to answer any questions you may have.

Sincerely,  
  
Chela Scott

PAYING HALF OF INVOICE # 1183196

ORIGINAL  
Certified By:







Project No: **009.0415.000**  
 Invoice No: **1183196**  
 Invoice Date: **July 8, 2025**

**To Remit By Check:**  
 Gensler  
 4541 Collection Center Drive  
 Chicago, Illinois 60693  
 Tel 202.721.5200  
 Fax 202.872.8587

**To Remit By Electronic Fund Transfer:**  
 Account: M. Arthur Gensler, Jr. & Associates, Inc.  
 Account Number: 14996-01877  
 Bank Information: Bank of America, 315 Montgomery Street  
 San Francisco, CA 94104  
 ACH Routing No: 121000358  
 Federal Wire ABA No: 0260-0959-3  
 Remittance Advice: cashgroup@gensler.com

# Gensler Invoice

William (Bill) Cassell  
 Black Voice and History Museum  
 5509 B W Friendly Ave  
 Greensboro, NC 27410

## Black Voice Museum - Project Management

Professional Services from June 1, 2025 through June 28, 2025

### PROFESSIONAL PERSONNEL

	Hours	Rate	Amount
Darwin, Chandra	3.00	175.00	525.00
Greenbaum, David	7.50	350.00	2,625.00
Salomon, April	2.00	250.00	500.00
Truxon, Reggie	1.00	250.00	250.00
Totals	13.50		3,900.00
<b>Total Labor</b>			<b>3,900.00</b>

BILLING LIMITS	Current	Prior	To-Date
Labor	3,900.00	196,905.00	200,805.00
Limit			220,000.00
Remaining			19,195.00
<b>Total this Project</b>			<b>USD\$3,900.00</b>

## Black Voice Museum - Architectural Design

### FEE

Billing Phase	Fee	Percent Complete	Earned	Previous Fee Billing	Current Fee Billing
Programming and Initial Concept Design	150,000.00	100.00	150,000.00	150,000.00	
Total Fee	150,000.00		150,000.00	150,000.00	0.00
<b>Total Fee</b>					<b>0.00</b>
<b>Total this Project</b>					<b>0.00</b>

## Black Voice Museum - Reimbursable Expenses



Project	009.0415.000	Black Voice Museum - Project Management	Invoice	1183196
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**REIMBURSABLE EXPENSES**

Models/Renderings				
6/26/2025	VSTUDIOS 3D LLC	June 2025 Renderings	15,000.00	
<b>Total Reimbursables</b>		<b>1.1 times</b>	<b>15,000.00</b>	<b>16,500.00</b>

<b>BILLING LIMITS</b>	<b>Current</b>	<b>Prior</b>	<b>To-Date</b>
Expense	16,500.00	5,936.09	22,436.09
Limit			34,000.00
Remaining			11,563.91

**Total this Project** **USD\$16,500.00**

**Black Voice Museum Feasibility & Business Planning**

**FEE**

<b>Billing Phase</b>	<b>Fee</b>	<b>Percent Complete</b>	<b>Earned</b>	<b>Previous Fee Billing</b>	<b>Current Fee Billing</b>
WA01- Feasibility and Business Planning	75,000.00	62.7133	47,035.00	19,810.00	27,225.00
Total Fee	75,000.00		47,035.00	19,810.00	27,225.00
	<b>Total Fee</b>				<b>27,225.00</b>

**Total this Project** **USD\$27,225.00**

**Black Voice Museum Stakeholder and Community Outreach**

<b>BILLING LIMITS</b>	<b>Current</b>	<b>Prior</b>	<b>To-Date</b>
Labor	0.00	124,587.50	124,587.50
Limit			125,000.00
Remaining			412.50

**Total this Project** **0.00**

**Total this Invoice** **USD\$47,625.00**



			<b>Date</b>	<b>Total Hours</b>	<b>Total Billing</b>
<b>Project Number: 009.0415.000 Black Voice Museum - Project Management</b>					
management/call	10026280	Truxon, Reggie	6/18/2025	1.00	250.00
Project Summary slides	10029482	Darwin, Chandra	6/4/2025	3.00	525.00
Robo presentation	10042921	Greenbaum, David	6/3/2025	1.00	350.00
BVM next steps and follow up	10042921	Greenbaum, David	6/5/2025	2.00	700.00
Cost estimate review, coord with MBE	10042921	Greenbaum, David	6/12/2025	2.00	700.00
Feasibility Meeting	10042921	Greenbaum, David	6/18/2025	1.50	525.00
BWF bullet points and check in with Rachel	10042921	Greenbaum, David	6/26/2025	1.00	350.00
BVM next steps mtg w/Rachel, Bill, Gerry, and David	10044364	Salomon, April	6/5/2025	1.00	250.00
BVM Feasibility/Business Plan mtg	10044364	Salomon, April	6/18/2025	1.00	250.00
<b>Total for 009.0415.000</b>				<b>13.50</b>	<b>3,900.00</b>



**VStudios3D LLC**

31 SE 5TH # CU-203  
Miami, FL 33131 US  
+16023243521  
accounting@vstudios3d.com  
www.vstudios3d.com



**INVOICE**

**BILL TO**  
#009.0415.000 - Black Voice Museum  
Gensler - DC  
2020 K Street NW  
Washinton, DC 20006 USA

**INVOICE** 1452  
**DATE** 06/13/2025  
**TERMS** Due on receipt  
**DUE DATE** 06/13/2025

DATE	ACTIVITY	DESCRIPTION	QTY	RATE	AMOUNT
	Rendering Services	5 (FIVE) 3D Exterior perspectives with realistic materials, textures and environment.  Note: This proposal includes the estimated hours Vstudios will need to model the necessary assets before rendering.  Note: Under this contract, a maximum of 3 rounds of iterations are included.  Each additional iteration will have a cost of \$500 per image.  Note: The final delivery date will be determined upon approval of this proposal. The estimated delivery date is approximately 2 to 3 weeks from the start date.	5	3,000.00	15,000.00

**Payment Info:**

**Bank Transfers:**  
Name on Account: VStudios 3D LLC  
Address: 4770 Biscayne Blvd, Ste 400, Miami, FL 33137  
Account Number: 898127775093  
ACH Routing: 063100277  
Wires Routing Number: 026009593  
SWIFT: BOFAUS3N

<b>SUBTOTAL</b>	15,000.00
<b>TAX</b>	0.00
<b>TOTAL</b>	15,000.00
<b>BALANCE DUE</b>	<b>\$15,000.00</b>

Zelle: Use the following email address to process transfer: Emiliano.Daniele@VStudios3d.com Please include the Invoice Number in the Memo.

Check: Mail your check to the following address: 20200 W Dixie Hwy, Suite 606, Aventura, FL 33180. Please include the Invoice Number.

Tax ID: EIN 87-2930401





Robin M. Koonce  
Finance Director  
Chief Financial Officer



MEMORANDUM

TO: Robin Deaver, Finance Director/CFO *RD*  
FROM: Liz Cherry, Finance Accountant  
DATE: August 29, 2025  
SUBJECT: Request to Pay Prior Year Invoices

Please approve the attached prior year invoice for FCEDC from Lafayette Society in the total of \$2,500. The invoice was presented for payment after the deadline to pay fiscal year 2025 invoices. The invoice was sent via email to the employee's email address, and she is no longer employed. The invoice was discovered once the employee left the organization and was discovered on August 12<sup>th</sup>, 2025. Finance will ensure that invoices are processed before employees leave.

I have verified that the invoice has not been paid and can be absorbed in the current year's budget. There are sufficient funds in the FY26 budget on line 6314525 533503 to cover the cost of the FY25 invoice.

Thank you for your consideration of this request.





**Lafayette's  
Farewell Tour Bicentennial**  
March 4-5, 2025 ~ Fayetteville, NC  
**The French Hero of American Liberty Returns!**



August 1, 2024

**SPONSORSHIP INVOICE FOR:**

The Fayetteville Cumberland County Economic Development Corporation  
201 Hay Street  
Fayetteville, NC 28301

Attn: Jennifer Hammond

Marketing for Lafayette's Farewell Tour Bicentennial

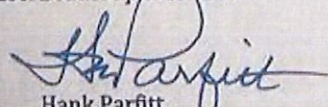
"The Viscount" Marketing Sponsorship Package     \$2500    

Please make payable to:

Lafayette Society  
Bicentennial Committee  
PO Box 43712  
Fayetteville, NC 28309

DATE:	8/12/2025
VENDOR #:	5000
ORG #:	6314525
OBJECT CODE:	533503
SIGNATURE:	<i>Robert M. Van Gons</i>

On Behalf of the "Committee of Arrangements" for the Bicentennial Celebration  
of Lafayette's Farewell Tour, Merci Beaucoup & Thanks!

  
Hank Parfitt  
Committee Chair

Fayetteville's celebration of the Farewell Tour Bicentennial is a community-wide event. The planning committee includes individuals representing over 20 nonprofit organizations, schools, museums, and government agencies. The committee has partnered with the Lafayette Society, which is a 501(c)3 organization. Sponsors who support the bicentennial celebration financially may be eligible for tax deductions for charitable contributions or for business-related marketing expenses, but the advice of a tax accountant is advised.

Address mail to: The Bicentennial Committee, c/o Lafayette Society, PO Box 43712, Fayetteville, NC 28309





## **SOLID WASTE MANAGEMENT**

### **MEMORANDUM FOR BOARD OF COMMISSIONERS AGENDA OF SEPTEMBER 15, 2025**

**TO: BOARD OF COUNTY COMMISSIONERS**

**FROM: AMANDA LEE, PE, GENERAL MANAGER FOR NATURAL RESOURCES**

**DATE: 9/10/2025**

**SUBJECT: APPROVAL OF ASSET MANAGEMENT PLANS FOR THE WATER AND SEWER DISTRICTS**

#### **BACKGROUND**

The Public Utilities Department has been working with McGill Associates, PA, on Asset Management Plans (AMP) for the water and sewer districts owned by Cumberland County. These plans are needed to effectively manage the systems and budget for projects that support the utility needs of customers within each district. As part of the AMP studies a 10-year Capital Improvements Plan (CIP) is being included for each district in accordance with NC Department of Environmental Quality Division of Water Infrastructure Guidance. Projects will include focusing on operational and maintenance challenges and consideration to potential growth.

The suggested CIP was incorporated into the FY26 budget. The CIP for the Water and Sewer Enterprise funds can be found on page 77 of the Recommended Annual Budget for FY26. It should be noted that in the CIP Cost Summary for each AMP has a year one of FY26, and continues for ten years, whereas FY30+ is combined in the CIP Recommended Budget document. All amounts remain the same.

Matthew Jones, PE, with McGill Associates, presented an overview of the studies to the Infrastructure Committee on September 8, 2025. The Infrastructure Committee approved moving this item to the Consent Agenda of the September 15, 2025, Board of Commissioners' meeting, as well as to the Consent Agendas of the Kelly Hills Water and Sewer District Governing Board, the NORCRESS Water and Sewer District Governing Board, the Overhills Park Water and Sewer District Governing Board, and the Gray's Creek Water and Sewer District Governing Board.

#### **RECOMMENDATION / PROPOSED ACTION**

The Public Utilities Project Manager, General Manager for Natural Resources and Management recommend

the following proposed actions for the Board of Commissioners and the Kelly Hills Water and Sewer District Governing Board, the NORCRESS Water and Sewer District Governing Board, the Overhills Park Water and Sewer District Governing Board, and the Gray's Creek Water and Sewer District Governing Board:

Approve the Asset Management Plans (AMP), including the 10-year Capital Improvements Plans (CIP), for the Kelly Hills, NORCRESS, Overhills Park, and Gray's Creek Water and Sewer Districts.

**ATTACHMENTS:**

Description	Type
Kelly Hills Asset Management Plan	Backup Material
NORCRESS Asset Management Plan	Backup Material
Overhills Asset Management Plan	Backup Material
Southpoint Asset Management Plan	Backup Material
McGill Associates AMP Presentation	Backup Material

**SEWER ASSET MANAGEMENT PLAN**

**KELLY HILLS / SLOCOMB ROAD  
WATER AND SEWER DISTRICT**

**CUMBERLAND COUNTY, NC**



PINEHURST, NORTH CAROLINA



**SEWER ASSET MANAGEMENT PLAN**

**KELLY HILLS / SLOCOMB ROAD  
WATER AND SEWER DISTRICT**

**CUMBERLAND COUNTY, NC**

**MATTHEW JONES, PE**  
matthew.jones@mcgillassociates.com



5 Regional Circle, Suite A  
Pinehurst, NC 28374  
910.295.3159

**AUGUST 2025**

**PROJECT NO. 20.02507**



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- Appendix A – Manhole Inspection List**
- Appendix B – Smoke Testing Results List**
- Appendix C – Wastewater Collection System Permit**
- Appendix D – PWC Agreement**

## EXECUTIVE SUMMARY

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The purpose of this Asset Management Plan (AMP) is to document the condition of the Kelly Hills/Slocomb Road (Kelly Hills) Sewer District's infrastructure to assist the County with becoming more proactive in the management, operation and financing of its sewer collection system. The Kelly Hills Sewer District serves approximately 102 residential connections in the northern area of Cumberland County. There are 166 properties within the Kelly Hills District are not currently connected and are paying the sewer availability fee. The District's sewer collection system consists of approximately four and a half miles of gravity sewer and approximately 100 manholes. Collected wastewater is pumped from the Kelly Hills Lift Station, which is owned and operated by Fayetteville PWC, to the PWC collection system. Wastewater generated from the district is ultimately treated at the Cross Creek Water Reclamation Facility (NC0023957), which is also owned and operated by Fayetteville PWC.

This asset inventory and assessment consisted of assembling data on sewer pipe, manholes, and other appurtenances in the collection system. This assessment included performing inspections of selected manholes, performing smoke testing throughout the system, and reviewing existing data with County Staff. This information was evaluated and is summarized in this document which includes the asset management plan and capital improvements plan. This process resulted in the development of a 10-year Capital Improvements Plan (CIP) to guide the County with scheduling and financing the capital projects and equipment purchases necessary to maintain and improve its wastewater collection system. Through the AMP process, approximately 20% of the manholes and 25% of the cleanouts in the sewer collection system are in need of rehabilitation due to deterioration and fair condition.

The CIP includes a focused improvement to components within the sewer system that need rehabilitation or replacement based on existing condition, and on improvements that could improve management of the sewer system for staff. These planned projects will bring the County into a better position to serve its customers by improving the reliability

of the collection system. The County should look to its CIP to guide its next projects, and the CIP should be updated regularly as priorities change and as projects are completed. It is noted that many factors may impact the priorities including failures, and funding availability both local and through grant and loan programs. This assessment project provides evidence for the prioritization of manhole rehabilitation and improvement projects in the CIP.

### ***System Evaluation***

All of the pipe material in the Kelly Hills sewer system is PVC pipe. The collection system was first put into service in 2005, therefore the relative age of the system is low. PVC pipe is the most common material used for sewer systems today. The typical useful life for PVC pipe is anywhere from 40 to 60 years.

As part of the AMP, McGill Associates, PA (McGill) assisted the County with evaluating the condition of its sewer infrastructure to identify projects in line with these goals. The following items were included in the AMP scope:

- Identify areas to conduct smoke testing to identify potential sources of I/I into the sewer system;
- Analyze the Kelly Hills lift station, based on County-provided data
- Inspect selected sewer manholes within the system to establish overall system condition;
- Identify and evaluate potential sewer system improvements;
- Prioritize sewer system improvements;
- Prepare opinions of probable costs for sewer system improvements; and
- Create a Capital Improvements Plan.

### **Manhole Inspections**

All manholes in the Kelly Hills sewer system are precast concrete based on information provided by County staff. The results of the selected manhole inspections performed as a part of this inventory were used to develop an assessment of manhole conditions in the

system. Based on the inspections performed, manholes that were inspected were assigned a condition rating – excellent, good, fair, or poor. Of the ten manholes they were all in good to fair condition. The remaining 90 are noted as unknown condition, but the manholes inspected are believed to be representative of the system based on input from County staff. These results are recorded in Figure 5 and included in Appendix A.

### Lift Station Inspection

The Lift Station serving the Kelly Hills District is owned and operated by Fayetteville PWC, therefore inspection of the station was not included as a part of this assessment. The Lift Station is located at 355 Bethune Drive. Analysis of flow data and customer usage was performed and is included in this report.

### Findings and Recommendations

The system evaluation allowed McGill to assemble a list of general recommendations and high priority projects to guide the County in the next 10 years. General recommendations to the District included establishing its own flow monitoring and smoke testing programs in high priority areas to determine sewer rehabilitation needs and inspecting sewer lines and manholes with CCTV equipment during routine cleanings to track the condition of these items. McGill also recommended the County begin rehabilitation and/or replacement of existing manholes within the collection system in order to reduce the risk of I/I.

Data and field investigation reporting were utilized to identify the priority projects within the collection system, focusing on manhole rehabilitation.

Table 1 summarizes projects identified during this assessment, centering around manhole rehabilitation projects. A project to install flow monitors is included to give greater control and understanding of flows from the collection system.

**Table 1: Summary of Capital Improvements Projects**

No.	Project Name	Cost
1	Manhole Rehabilitation Project 1	\$81,000.00
2	Flow Monitoring Improvements	\$103,900.00
3	Manhole Rehabilitation Project 2	\$81,000.00
4	Manhole Rehabilitation Project 3	\$81,000.00
5	Manhole Rehabilitation Project 4	\$81,000.00
<b>10-Year CIP Total Project Cost</b>		<b>\$427,900.00</b>

***Capital Improvements Plan***

The purpose of this asset inventory and assessment was to document the condition of the District’s inventoried infrastructure to assist the County with becoming proactive in the management of its wastewater system, to include capital project planning. The County does not currently have a Capital Improvements Plan (CIP) for its wastewater system. The CIP being developed from this current assessment will guide the County through its planning for projects within the 10-year window. The CIP will remain a living document and be updated in the future so that it remains current to the Districts’ highest priorities and provides accurate cost estimates. The CIP included in this assessment includes projects focused on rehabilitation of existing manholes, which have been identified to be potential sources for I/I into the system. Through discussion with County staff, field investigation and review of existing system data, the specific defects and general problematic areas within the wastewater system have been summarized. These results were used to develop the CIP and formulate a 10-year plan.

The complete asset inventory and assessment task consisted of multiple field work and analysis components, culminating in the development of the Kelly Hills/Slocomb Road Water and Sewer District’s CIP. McGill developed cost estimates for all projects based on current 2024 materials and construction costs. The updated CIP is intended to be adopted by the County to guide its selection of sewer system improvement projects over the next decade. This plan also includes a budget-level recommendation for staffing associated with system operations and maintenance for all County utility districts.

## 1.1 BACKGROUND

The Kelly Hills/Slocomb Road Water and Sewer District is located in Cumberland County, North Carolina, and is owned and operated by Cumberland County. The District includes a wastewater collection system that currently serves 102 residential customers as of August 2025. The collection system consists of approximately four and a half miles of gravity sewer mains that are 8-inch, 12-inch, 15-inch, and 16-inch in diameter. These gravity sewer mains are constructed of PVC and Ductile Iron pipe. The system was put into service in 2005. Figure 1 shows the existing sewer collection system.

Developing a Capital Improvements Plan (CIP) will allow the District to update its current rate setting model to better estimate future revenue and expenses, capital outlay, indebtedness, and overall health of the sewer system enterprise fund reserves. A model of this nature would continue to balance revenues and expenditures with a longer-term approach to rate setting and establish a financially sound framework for the District to follow.

The District has experienced the degradation of manholes within its sewer collection system due to the age of the system and resulting from wear over time.

Even with the relatively young age of the Kelly Hills system, County staff remains cognizant that infiltration and inflow (I/I) is always a concern, particularly in a scenario where the County's operation costs are based on the gallons of flow that enter into the existing lift station. Therefore, the top challenges for the Kelly Hills sewer system are mitigating I/I that results from deteriorated infrastructure and collecting reliable data on existing sewer flows for operations and maintenance planning. The information collected through this assessment project will help identify system deficiencies and develop improvement projects to reach these goals.

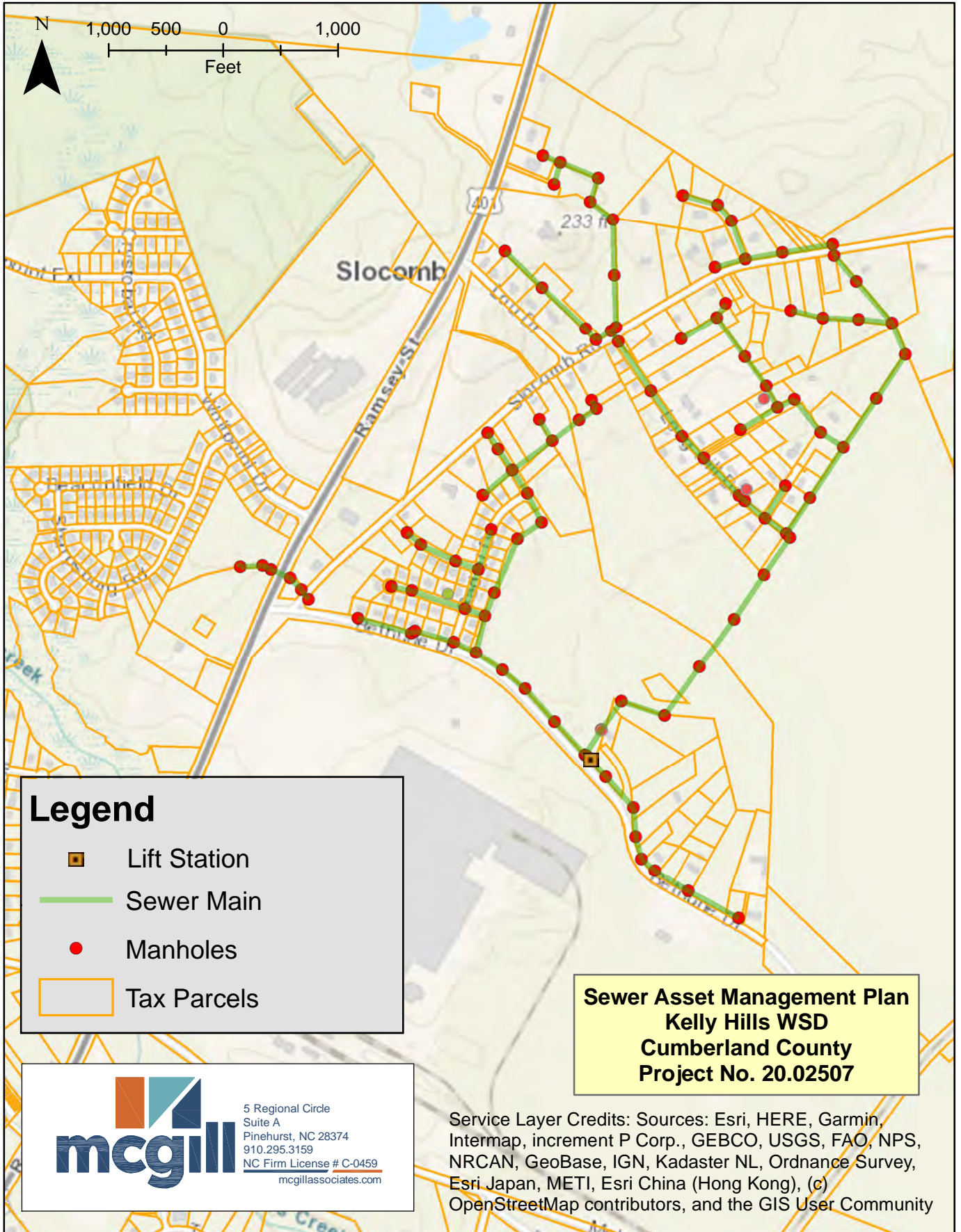
This process resulted in the development of a 10-year Capital Improvements Plan (CIP) to guide the District with scheduling and financing the capital projects and equipment purchases necessary to restore its wastewater collection system. Through the AMP process, the McGill and County staff have identified approximately multiple that require rehabilitation or replacement due to their poor condition.

The purpose of this Asset Management Plan (AMP) is to document the condition of the Districts' inventoried infrastructure to assist the District with becoming more viable and proactive in the management and financing of its wastewater system. The District continues to look to its CIP to guide its next projects; therefore, it is vital that the CIP remains current to the Districts' highest priorities and provides accurate cost estimates. This assessment project was utilized for the prioritization of replacement of lines and improvement projects in the CIP.



# Kelly Hills Overall System Map

## Figure 1



**2.1 SMOKE TESTING****2.1.1 Overview**

Smoke testing is one of the most cost-effective ways to locate defects in sewer mains and laterals. In this process, artificially produced non-harmful smoke is injected into the sewer line via a blower placed over a selected manhole. The pressurized smoke travels up and down the sewer line and connections and emerges at openings in the system. This visual aide allows test crews to easily identify, record, and mark locations where defects are present. If the sewer is in good condition, one should only see smoke rising from manhole lids and house roof vents. If the line has defects, such as breaks or illegal connections, the smoke will emerge at these points.

**2.1.2 Investigation**

McGill met with County staff to identify areas that would benefit most from smoke testing. Based on the size of the Kelly Hills District, it was determined that the entire system could be smoke tested. McGill prepared a detailed map of the area based on the County's GIS database. The Fire Department and customers along the route were alerted to the upcoming testing.

### **2.1.3 Methodology**

McGill and County staff smoke tested all four and a half miles of gravity sewer lines over a period of two days to determine locations where I/I enter the wastewater collection system. For each line to be tested, County staff recommended a centrally located manhole on which to place the blower based on the manhole's accessibility and avoidance of traffic. The manhole nomenclature used by the County was utilized and the location, configuration and condition of each one was recorded.

At each location, the following procedure was executed.

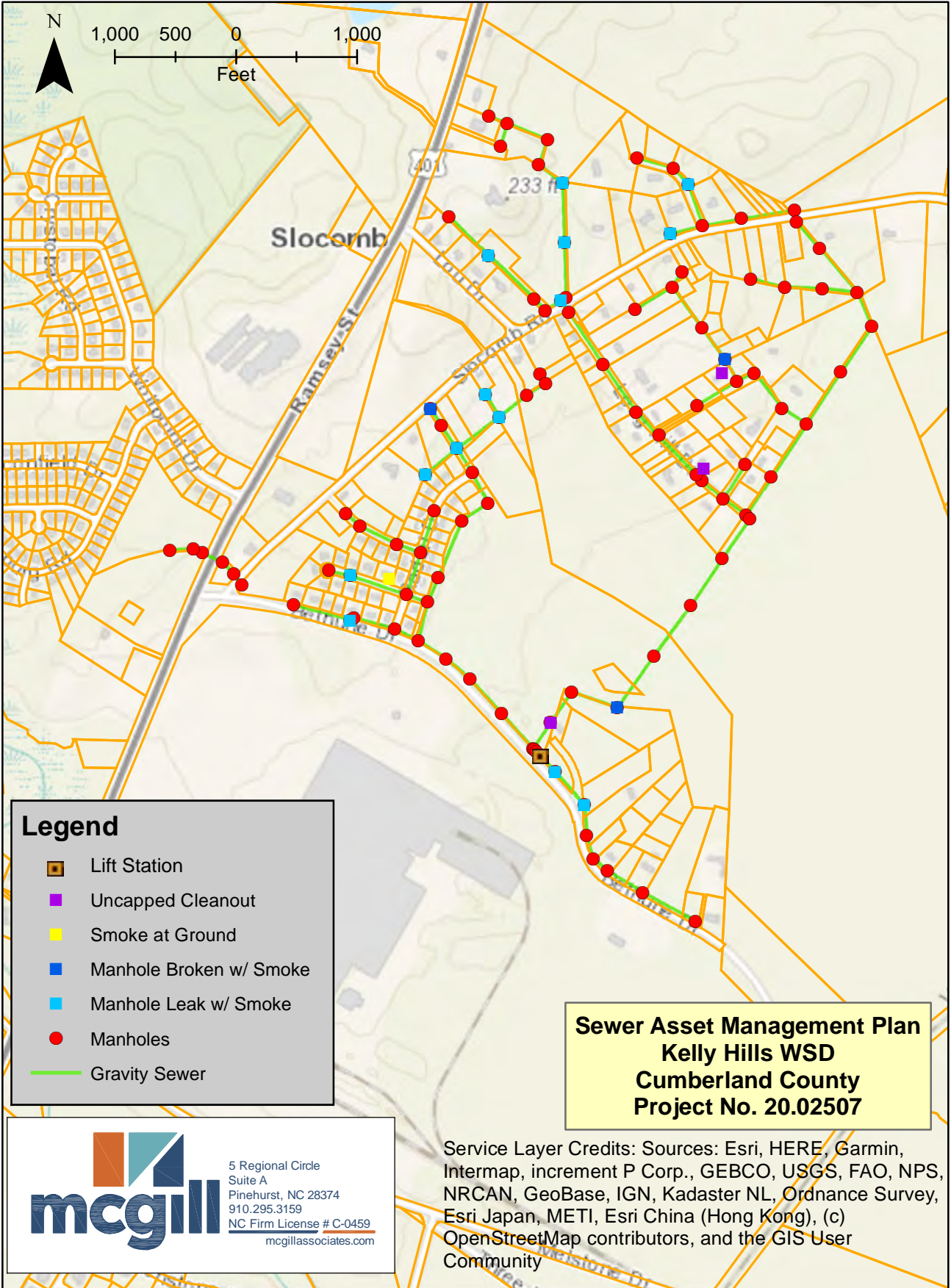
1. Place the blower on the manhole (with the rubber seal, if necessary).
2. Fill smoke pump up to  $\frac{3}{4}$  with liquid smoke.
3. Close all smoke pump valves.
4. Start blower and allow to warm up.
5. Open smoke pump valves.
6. Pressurize smoke pump by pumping the canister manually.
7. Once smoke begins emerging from roof vents, begin surveying for smoke emergencies indicating defects or problem areas in the pipeline.
8. For each defect, record the opening type, address, manhole identifier, and notes.
9. Additionally, mark each defect with paint.

This process continued until all visible defects were marked and recorded. Figure 2 shows some problematic system openings.



# Kelly Hills Smoke Testing Map

## Figure 2



## **2.2.4 Results**

The crew recorded 54 abnormal smoke outlets, which divided generally into four categories.

1. **Uncapped cleanouts:** Several cleanout caps were missing or broken. The cumulative number of broken cleanouts in the District can contribute significant I/I. County staff had repair caps on hand during the testing and were able to install new caps where needed.
2. **Broken Cleanouts:** Ground smoke was detected adjacent to the cleanout, which appeared to be damaged or below grade. Replacement of the cleanout assembly will be needed.
3. **Ground Smoke:** Ground smoke can be the result of broken lines, joint separation, etc. Any of these problems can cause significant I/I.
4. **Unsealed manholes:** Some manholes emitted excess smoke indicating cracked concrete or offset rings. Manholes located in ditches are most likely to contribute I/I.

A spreadsheet describing all smoke occurrences can be found in Appendix A and all locations were documented in the mapping information in ArcGIS for the County staff's use.

## **2.2 SEWER MAINS**

### **2.2.1 Overview**

Kelly Hills/Slocomb road sewer mains consist of polyvinyl chloride (PVC) pipe. The District's existing sewer lines range from 8-16-inches in diameter. The age of the system and system materials were confirmed by the County based records from construction of the system in 2005. Condition was determined based on visual inspection of select manholes and smoke testing of the system.

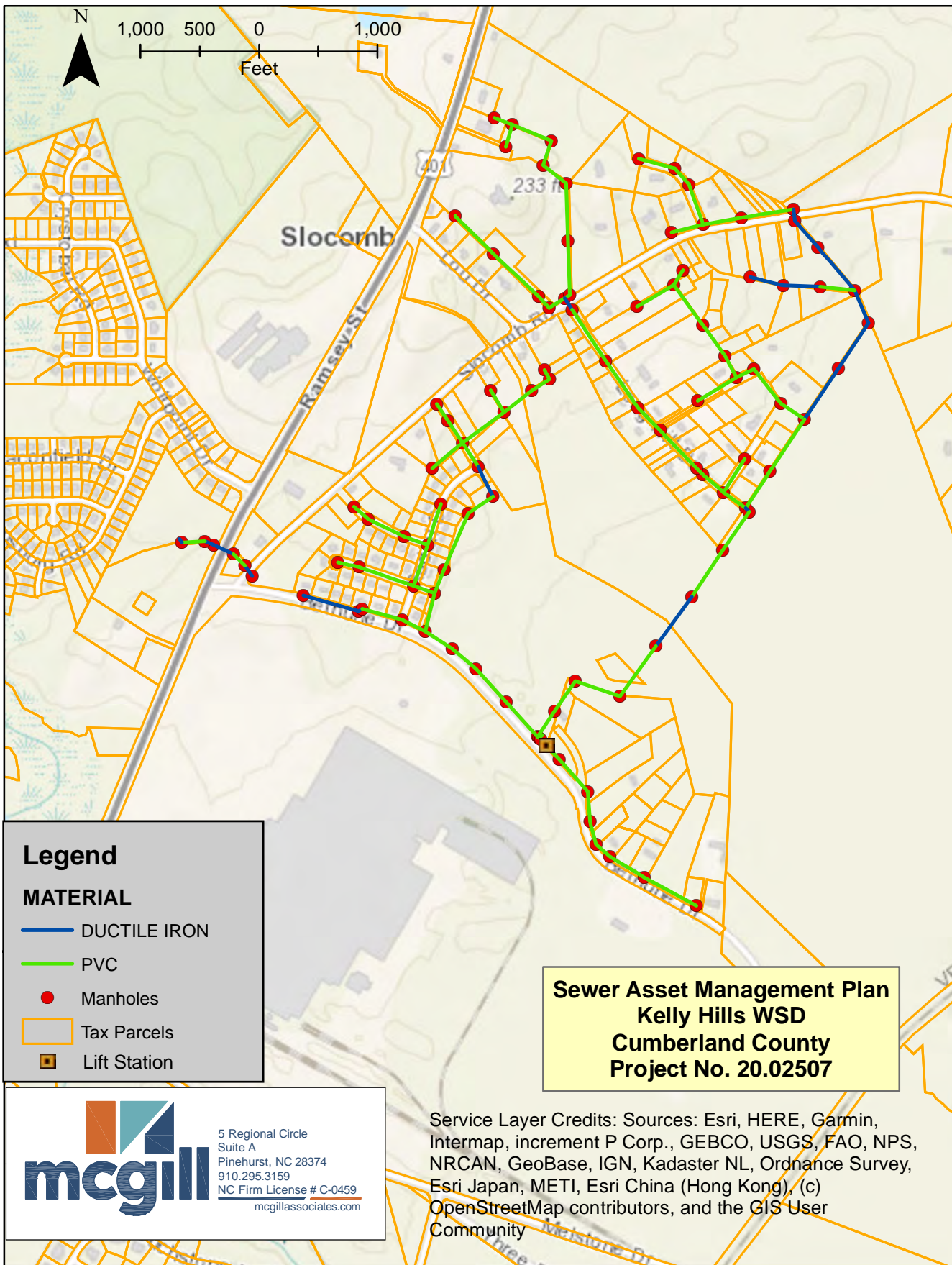
### **2.2.2 Investigation**

With District input from County staff, McGill has reviewed the district's data on the sewer mains throughout the District's collection system. The sewer main material and diameters were verified by the County and updated according to GIS records. Figure 3 shows the sewer line materials in the system, and Figure 4 shows the sewer line diameter throughout the system.

The purpose of this portion of the assessment was to create a working system inventory and then review which areas of Kelly Hills District have system components in need of replacement or rehabilitation.

# Kelly Hills Sewer Line Material Map

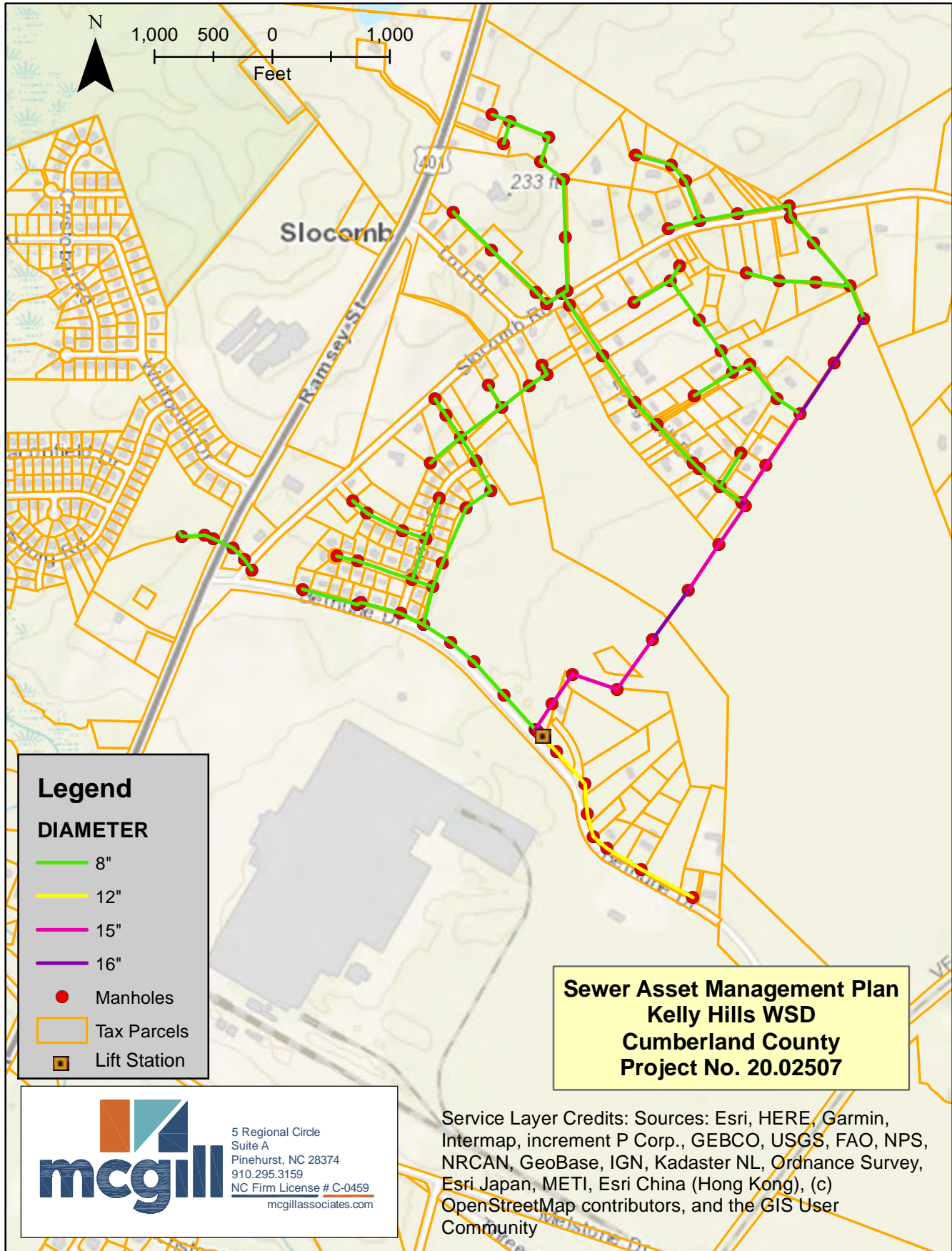
## Figure 3





# Kelly Hills Sewer Line Diameter Map

## Figure 4





### 2.2.3 Methodology

McGill reviewed the District's GIS data for the sewer collection system. County staff provided information on manholes where deterioration was suspected. Smoke testing was performed throughout the system. The County's GIS mapping was utilized to create maps that document the collection system by material and by diameter.

### 2.2.4 Results

The existing gravity sewer pipe in the sewer system ranges from 8-inch to 16-inch in diameter based on County records. All pipe diameters therefore do meet current NCDEQ minimum design standards. Based on the age of the system, the PVC and ductile iron pipe installed in 2005 has not exceeded its useful life, and therefore replacement is not recommended outright. Recommendations will include planned CCTV inspections by the County of the existing piping in order to verify existing condition and provide future updates to this AMP/CIP. Based on the age of the pipes and no documented issues from County staff, pipe in the system has been noted to be in good/excellent condition. Tables 2 and 3 show the assessment based on material and then broken out by diameter.

**Table 2: Summary of Gravity Sewer Main by Material**

<b>Material</b>	<b>Diameters (in)</b>	<b>Total LF</b>	<b>% of System</b>
<b>Polyvinyl Chloride</b>	<i>8, 12, 15</i>	<b>19,750</b>	<b>83.9%</b>
<b>Ductile Iron</b>	<i>8, 16</i>	<b>3,790</b>	<b>16.1%</b>
<b>Total LF</b>		<b>23,540</b>	<b>100%</b>

**Table 3: Summary of Gravity Sewer Main by Diameter**

<b>Diameter</b>	<b>Total LF</b>	<b>% of System</b>
<b>8"</b>	<b>17,900</b>	<b>76.0%</b>
<b>12"</b>	<b>1,670</b>	<b>7.1%</b>
<b>15"</b>	<b>2,690</b>	<b>11.4%</b>
<b>16"</b>	<b>1,280</b>	<b>5.5%</b>
<b>Total LF</b>	<b>23,540</b>	<b>100%</b>

**Table 4: Summary of Gravity Sewer Main Conditions by Age**

<b>Year Put Into Service</b>	<b>Total LF</b>	<b>% of System</b>
<b>2005</b>	<b>23,544</b>	<b>100%</b>
<b>Total LF</b>	<b>23,544</b>	<b>100%</b>

## **2.3 MANHOLE INSPECTIONS**

### **2.3.1 Overview**

Manholes are the primary access points to the sanitary sewer system and are essential for its operation and maintenance. As they allow personnel access to the sewer system, manholes are also likely culprits for allowing I/I to enter the sewer system. Manholes in low-lying areas with improperly sealed lids, manhole joints, and poor connection practices can all be sources of I/I. Storm drains or the presence of manholes in ditches and low-lying areas in Kelly Hills/Slocomb road frequently allow standing water to remain for hours or days after a storm event which can exacerbate inflow through manhole lids.

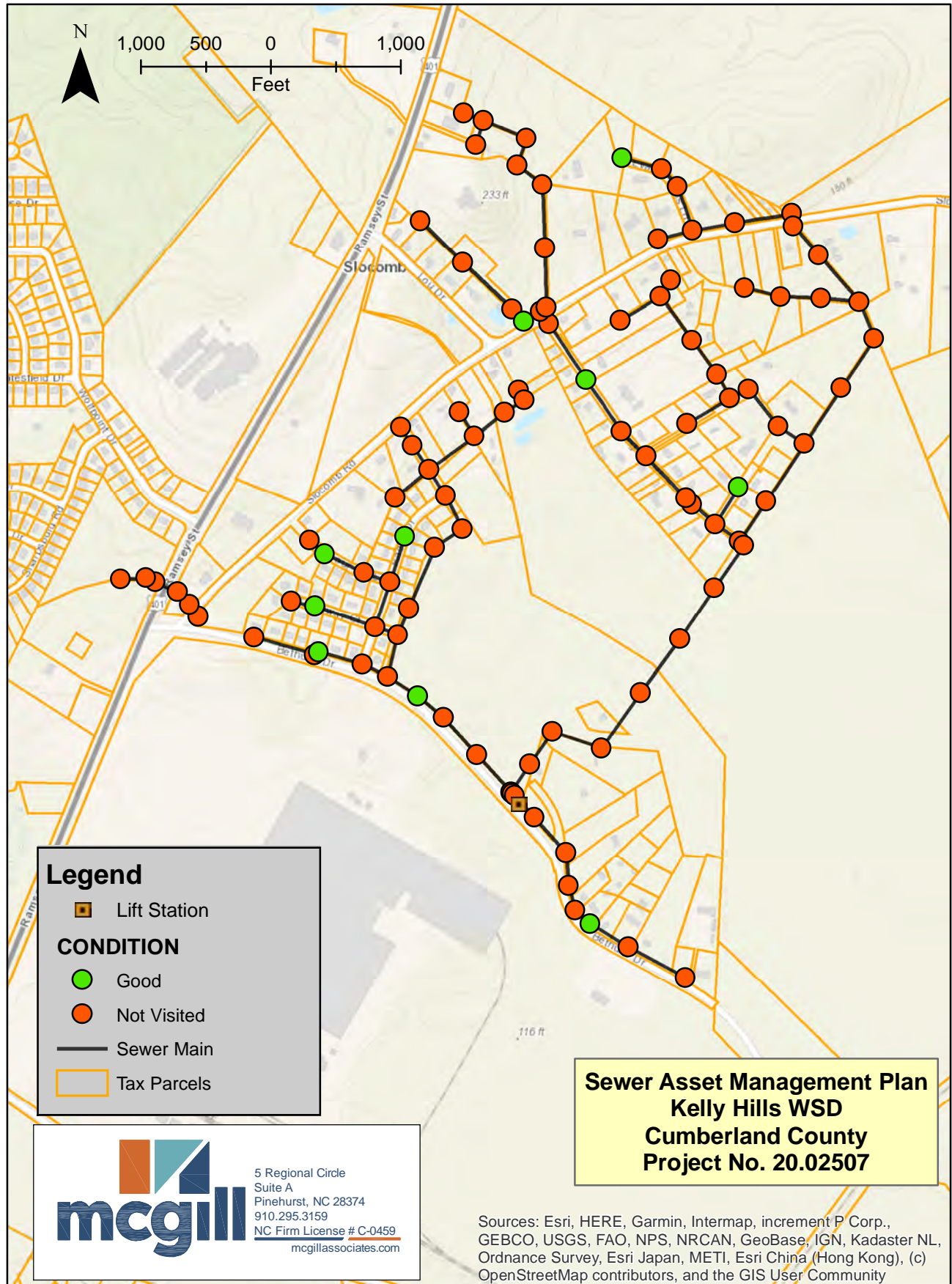
One of the most cost-effective practices for managing this intrusion is visual manhole inspections, where the various components of the manhole are rated according to their condition. Some examples of noticeable deficiencies are benches which have deteriorated from abrasion and corrosion and rings which can be moved by traffic, soil, and the freeze/thaw cycle. Defects in any aspect of the manhole can lead to I/I, structural instability, and manhole failure.

### **2.3.2 Investigation**

After the Kelly Hills system was put into service, the GIS record was created in 2006. The purpose of this portion of the assessment was to perform selected field inspections to determine an overall system assessment. A total of 100 manholes are currently inventoried by the District. Approximately ten manholes were inspected as a part of this inventory and assessment. The map of the diameter of all manholes that were accessible (not paved over or otherwise not located) are shown in Figure 3.

# Kelly Hills Manhole Condition Map

## Figure 5



### **2.3.3 Methodology**

The District of Kelly Hills/Slocomb Road sewer collection system contains 100 sewer manholes. Working with County staff, McGill inspected selected manholes within the sewer system to obtain a representative condition sampling. County staff determined which manholes to inspect in each area based on manhole location and orientation. Manholes prioritized for inspection include those located in existing ditches or low-lying areas where the manhole would be susceptible to degradation and inflow from surface water. At each manhole, the inspector recorded the manhole's location, dimensions, material, and condition of its various components. All information including photographs of the interior of the manhole and top area were uploaded into the GIS mapping.

Some typical distresses include:

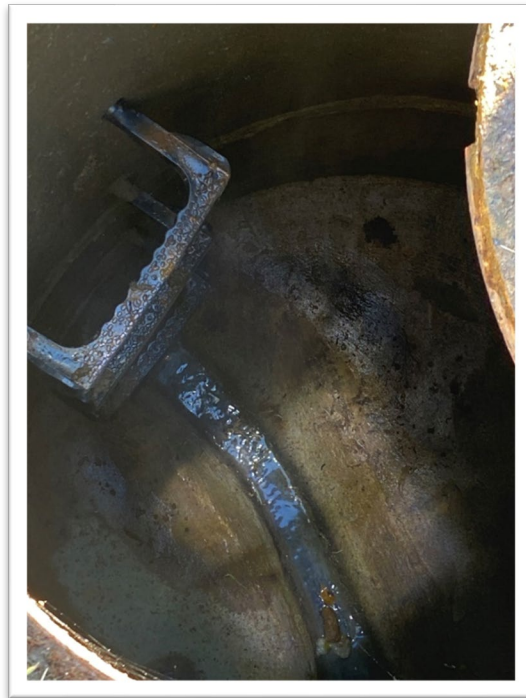
- Wear and asphalt paving on the cover;
- Corrosion and mud seepage on the ring and frame;
- Gas residue, corrosion, seepage, and deteriorating concrete on the cone and riser;
- Wetness, silt, root intrusion, and deteriorating concrete on the barrel;
- Dirt and corrosion on the rungs;
- Silt accumulation on the bench; and
- Misaligned pipes, obstructions, trough deteriorating, standing water, and no flow in the channel.

Based on the recorded comments, each component was assigned a condition score, and these scores were combined into an overall condition rating for each manhole- excellent, good, fair, or poor. The images below depict the interiors of various condition manholes.





*SMH-027203, Treadway Court. Precast manhole shows signs of corrosion and wear over time. Invert is well-formed.*



*SMH-027197, Bethune Drive. Precast manhole in good condition, invert well formed.*

### 2.3.4 Results

All of the ten inspected manholes are precast manholes. Due to the relative low age of the system, County staff confirmed that all of the existing manholes in Kelly Hills are precast sewer manholes. Of the manholes observed, all were noted as good to fair condition. Still, the presence of I/I and deterioration was observed in several instances. Based on the condition of those observed, it is suspected that the remaining manholes not inspected would have similar condition to those observed. Tables 5 and 6 summarize the manhole materials and condition.

**Table 5: Summary of Manholes by Material**

<b>Material</b>	<b>Total</b>
<b>Precast Concrete</b>	<b>100</b>
	<b>100</b>

**Table 6: Summary of Manholes by Condition**

<b>Condition</b>	<b>Total</b>
<b>Good-Fair</b>	<b>10</b>
<b>Unknown</b>	<b>90</b>
	<b>100</b>

The County maintains its collection system using the ESRI platform and includes the attribute data for each manhole. A spreadsheet including condition comments for each manhole can be found in Appendix A.

## 2.4 LIFT STATION

### 2.4.1 Overview

The Kelly Hills Lift Station is owned and operated by Fayetteville PWC. The station includes a flow meter that is used for recording flow generated by the Kelly Hills Sewer Collection System. The monthly records from that station were provided by the County and have used to develop an average use per user for the District. The results of the analysis are below.

Lift Station Design Capacity	100,000 GPD
Metered Average Daily Use	16,900 GPD
Permitted, Not Yet Tributary Flow	29,520 GPD
<i>Pending Development Usage</i>	<i>41,400 GPD</i>
Lift Station Available Capacity*	<b>53,580 GPD</b>

\*Does not include pending development usage. Available capacity including pending amount is 12,150 GPD.



Recommendations for various sewer system improvements to include the gravity sewer pipe and manholes in the collection system include general recommendations, high priority projects (within 10-years) and future projects (past the 10-year planning window). General recommendations are typically less costly and can be implemented more quickly, whereas high priority projects may require financial assistance and be undertaken in phases.

### **3.1 GENERAL RECOMMENDATIONS**

#### **3.1.1 *Smoke Testing***

Smoke testing is a valuable tool that can be used to locate broken pipe, cleanouts, or manholes that need repair. Any of these issues can be a source for the inflow and infiltration (I&I) of surface water into the sewer collection system. It is recommended that the District utilize smoke testing on an “as needed” basis to troubleshoot possible problem areas. The most common repairs that would result from smoke testing include replacing missing or broken cleanout caps and removing buildup from manholes. Other repairs that can be performed at this time are patching the exterior concrete or replacing the rings/lids of manholes identified to be leaking during smoke testing. These may be contributing to significant I/I into the wastewater collection system. Similarly, line breaks in flooded areas should also be addressed promptly. It is also recommended that the District continue to conduct regular smoke testing to monitor the system’s ongoing wear and identify specific areas for improvement.

#### **3.1.2 *Video Evaluations***

Based on information provided by the County, video evaluations were not performed as part of the system inventory. County staff reports that no video evaluations have been performed on the collection system to date. It is recommended that the County plan to perform video evaluation of the system as a part of O&M in order to stay vigilant concerning potential issues within the collection system.

### **3.1.3 Manhole Inspections**

Manhole inspections uncovered some infrastructure deficiencies which can be repaired immediately to improve the condition and function of the wastewater collection system. The full list of manholes and their field assessment is included in Appendix A. Manhole rehabilitation and replacement is the priority work that is targeted by the CIP. The proposed projects are divided out on an annual basis in order to include the improvements as a reasonable component of annual budgeting.

### **3.1.4 Flow Monitoring**

The District and McGill have discussed that flow monitoring is not needed at this time. Should the County begin to suspect the presence of I&I, they will engage in flow monitoring to verify as needed. The PWC Lift Station does provide for metering of flow received within the district. It is recommended within the CIP that the County install an in-line flow meter within the collection system just upstream of the lift station, in order to assist with recording of data and calibration with the PWC maintained lift station.

## 3.2 PRIORITY PROJECTS

### 3.2.1 *Manhole Rehabilitation Projects*

In these projects, manholes will be repaired and lined. The projects are scoped to be undertaken every 3 years. Each project is priority targeting any manhole deficiencies or evidence of I/I observed during manhole inspections or leaks based on the results of the smoke testing. There are a range of issues from broken risers to cracks in the frame of the manhole that warrant various repairs. To reduce the amount of I/I that enters the system it is imperative to repair these manholes. The project will be ongoing to spread out the cost for the County over a 10-year period. There are 100 manholes in the system, and for planning purposes it is assumed that 50% of the manholes would benefit from rehabilitation and lining. In order to fit a reasonable budgeting target, the rehabilitation of those 50 manholes is broken into four projects, which are included in the CIP separately, but can be combined or modified as needed given annual budgetary considerations. The projects also include replacement of existing cleanout assemblies for select residences. The results of the smoke testing identified that some cleanouts were damaged below grade, therefore replacement of the assembly would be necessary.

This project is recommended to be pursued with a manhole rehabilitation specialty company with scopes large enough to get competitive pricing for each mobilization. The manholes proposed for rehabilitation or replacement range in depth; therefore an average depth of seven vertical feet (VF) was used per manhole for estimating purposes. The capital improvements plan breaks this project into four phases with a budget of approximately \$81,000 every three years over a 10-year span with the exception of year four, if the County elects to perform the flow monitoring improvement project, as outlined in Table 7. The total cost of the manhole rehabilitation projects is estimated to be \$324,000.

**Table 7: Preliminary Opinion of Probable Cost for Manhole Rehabilitation Projects**

Item	Description	Units	Quantity	Unit Price	Total Cost
1	Mobilization	LS	3%	N/A	\$ 1,900
2	Rehabilitate Existing Manhole	VF	84	\$ 500	\$ 42,000
3	Additional Manhole Repairs	LS	1	\$ 10,000	\$ 10,000
4	Asphalt Surface Restoration	LS	1	\$ 8,500	\$ 8,500
5	Replace Cleanout Assembly on Existing Service	EA	3	\$ 1,100	\$ 3,300
<b>Construction Subtotal</b>					<b>\$ 65,700</b>
Contingency (15%)					\$ 9,800
Engineering Coordination					\$ 5,500
<b>Total Base Project Cost</b>					<b>\$ 81,000</b>

*\*Cost estimates are based on the knowledge of a professional engineer based on 2024 construction costs and are subject to change due to bidding environment and other factors.*

**3.2.2 Flow Monitoring Improvement Project**

This project includes installing two in-line flow monitoring devices on the two downstream collection lines within the sewer system. These devices will allow the County to monitor its own sewer flow. This data can be utilized by staff for planning and budgeting purposes.

The project includes two 8-inch electromagnetic flow meters in a precast underground bypass vault with associated piping and appurtenances. The meters will be installed on the County’s 12-inch and 15-inch lines outside of the existing lift station. The preliminary cost estimate for this project is \$103,900 as outlined in Table 8 below.

**Table 8: Preliminary Opinion of Probable Cost for Flow Monitoring Improvements Project**

Item	Description	Units	Quantity	Unit Price	Total Cost
1	Mobilization	LS	3%	N/A	\$ 2,400
2	8-inch Mag Meter	EA	2	\$ 25,000	\$ 50,000
3	Precast Concrete Valve Vault	EA	2	\$ 8,000	\$ 16,000
4	Piping, Valves, Fittings	LS	1	\$ 15,000	\$ 15,000
<b>Construction Subtotal</b>					<b>\$ 83,400</b>
Construction Contingency (15%)					\$ 12,500
Engineering Coordination					\$ 8,000
<b>Total Base Project Cost</b>					<b>\$ 103,900</b>

*\*Cost estimates are based on the knowledge of a professional engineer based on 2024 construction costs and are subject to change due to bidding environment and other factors.*

### **3.3 CIP PROJECTS SUMMARY**

The purpose of this asset management plan was to document the condition of the Kelly Hills sewer infrastructure to assist the County with becoming more viable and proactive in the management and financing of its wastewater system. The County intends to look to its CIP to guide its next project; therefore, it is vital that the CIP be established as an accurate depiction of current conditions and reflect the Districts' highest priorities with accurate cost estimates. The development of this AMP will serve as a positive step towards ensuring that the District can maintain its level of service agreement.

Sewer manhole rehabilitation and cleanout replacement was evaluated based on current staff input and the results of the field inspections. The existing manholes and cleanouts were divided into projects recommended for the next 10-years.

McGill prepared cost estimates for all projects based on current materials and construction costs. The 10-year CIP is intended to be adopted by the District to guide its selection of sewer system improvement projects over the next two decades. The cost summary for the 10-year CIP is shown below in Table 9.

**Table 7: CIP Cost Summary**

Year <sup>1</sup>	Manhole Rehabilitation Project 1	Flow Monitoring Improvements	Manhole Rehabilitation Project 2	Manhole Rehabilitation Project 3	Manhole Rehabilitation Project 4	TOTAL COST
1	\$ 81,000.00	\$ -	\$ -	\$ -	\$ -	\$ 81,000.00
2	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3	\$ -	\$ 103,900.00	\$ -	\$ -	\$ -	\$ 103,900.00
4	\$ -	\$ -	\$ 81,000.00	\$ -	\$ -	\$ 81,000.00
5	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
7	\$ -	\$ -	\$ -	\$ 81,000.00	\$ -	\$ 81,000.00
8	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
9	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
10	\$ -	\$ -	\$ -	\$ -	\$ 81,000.00	\$ 81,000.00
<b>TOTAL ESTIMATED CIP COST</b>						<b>\$ 427,900.00</b>

Notes:

1: Considering timeline for adoption of this plan and County budget planning cycle, Year 1 is anticipated to be FY 2026

## 4.0

## OPERATIONS AND MAINTENANCE PLAN

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### 4.1 GENERAL RECOMMENDATIONS

The purpose of an Operations and Maintenance (O&M) Program is to provide an organized and cost-effective approach to ongoing maintenance, repair and replacement activities that will maintain the sewer collection system, so it performs as intended and meets the requirements of the sewer utility's System-Wide Collection System Permit, issued under North Carolina General Statutes Article 21 of Chapter 143.

This section provides a general description of proactive O&M, which can be defined as scheduled maintenance activities (preventive maintenance), performed on a regular basis in order to achieve the highest level of system performance using available resources and minimizing failures that can result in Sewer System Overflows (SSOs)

Developing an O&M Program begins with accurate records of infrastructure inventory, asset locations and physical condition. Coupled with work records and system performance history, preventive maintenance schedules can be developed to efficiently address general system needs, from cleaning and debris removal to site-specific maintenance work such as cutting and repair work.

The following elements provide the foundation for an effective O&M program:

- Maintain up-to-date wastewater treatment plant equipment documentation, sewer collection system maps and related work history and operational data.
- Develop a routine preventive O&M program and activities for staff and contractors maintaining the sewer collection system and a system to document scheduled activities.
- Develop a rehabilitation and replacement plan identifying and prioritizing system deficiencies and implement short- and long-term actions to address the deficiencies.
- Develop and implement training programs to build technical competence and emergency preparedness.
- Develop and provide equipment and replacement part inventories, including critical replacement parts.



## **Sewer System Mapping**

Sewer system maps and related databases are typically managed using a Geographic Information System (GIS). The District of Kelly Hills/ Slocomb Road currently utilizes ESRI as the GIS platform from which to manage the utility systems. This GIS mapping is supported by a database that records sewer main size, material types, and locations of manholes and clean-out connections. The platform has the ability to store more information that is currently being utilized by the County, including invert and rim elevations and other attributes of system appurtenances. If County intends to utilize the GIS platform for managing and recording maintenance performed and planned, it is recommended that the County investigate alternative software to ensure that they are utilizing a software that meets their needs with respect to budget.

The GIS database should be updated on a regular basis. Software applications such as work order systems are available to allow field staff to update GIS data as inspection and maintenance activities are completed. Other applications can also allow staff to update and edit maps. Field information that was gathered by McGill and County staff as a part of this assessment is now included in the County's GIS system database for future reference.

GIS can organize work history along with operational data, inspection records and images to provide managers, operations staff and engineers with powerful data sets to track current resource allocations and forecast short and long-term operational and capital needs. Outcomes of detailed analysis such as recommended sewer main rehabilitation work versus sewer overflows can be mapped to present the relationship visually for ease of understanding.

## **Preventive Operation and Maintenance (O&M)**

Preventive maintenance is performing routine and scheduled maintenance activities before wastewater treatment plant and lift station equipment or buried infrastructure fails, for the purpose of extending useful life, reducing overall operating costs, and increasing system reliability. This proactive approach to maintenance work is more efficient and cost effective than reactive and curative operations. Preventive maintenance activities will also help operations staff to better understand the wastewater treatment plant equipment, lift station equipment, and collection system components and how they work under various conditions. This knowledge is essential to setting maintenance priorities and developing the scope and timing of long-term rehabilitation and replacement projects.

## **Scheduled Cleaning of Sewers**

EPA recommends, at a minimum, that 100% of sewer mains should be cleaned every five (5) years, or 20% of the system annually. The sewer utility's Collection System Operating Permit requires 10% of the gravity sewers to be cleaned annually. High pressure jetting is the most common approach using various spray nozzles for general cleaning and debris removal. Mechanical cutters are used to address root intrusion and cleaning agents can be added to help remove fats, oils, and grease (FOG).

More frequent cleaning is scheduled for areas with a history of heavy debris, grease buildup and roots. CCTV inspections are also used to identify areas to clean more often, such as sections with minor defects such as offset joints and service taps protruding into the main line. Sewer sections near siphons are cleaned more frequently to ensure continuous and uninterrupted operation.

As part of the O&M Program, a master list of cleaning operations, priority locations and scheduling can be incorporated into GIS. Maps can be produced to define work areas, schedule resources, including contracted services, track progress and task completion. Updating GIS maintenance operations data (partial blockages found, debris quantity, etc.)

will help managers adjust cleaning frequency and area boundaries as needed to increase program efficiency, reduce sewer blockages, and avoid SSOs.

## **Routine Visual Inspections**

Routine inspections are used to assess the condition of lift stations, manholes and surface facilities, recording general conditions and evidence of possible structural problems or failures (offset structures, etc.), corrosion, surcharging, overflows and excessive Inflow and Infiltration (I&I). Work orders are generated based on inspection records to effect operational adjustments, scheduling more detailed inspections and/or making necessary repairs.

## **Manhole Inspection Program**

Manhole inspections keep the asset inventory up-to-date and are used not only to update collection system maps, but to determine structural condition. During manhole inspections, a complete inventory is taken of each manhole including construction materials, ring size, depth to invert, flow conditions and evidence of problems. The National Association of Sewer Service Companies (NASSCO) Manhole Assessment and Certification Program (MACP) may be adopted or used as a guide to ensure consistency and reliability of evaluation and ranking methodology.

The results from routine manhole inspections and monitoring are used to prioritize areas needing CCTV inspections to assess pipe condition such as manholes with evidence of slow flow or surcharging. Information is recorded and used to schedule maintenance and repairs.

## **CCTV Inspection Program**

While routine cleaning and visual inspection are used to assess the condition of surface facilities and manholes, CCTV video inspections are the primary method used to assess the condition of the sewer pipes. Using conventional defect criteria is highly recommended to provide standardization and consistency in sewer pipe condition

assessment and ranking. The NASSCO Pipeline Assessment and Certification Program (PACP) may be adopted or used as a guide to ensure consistency and reliability of evaluation and ranking methodology.

## **Maintenance Activity Records**

Detailed records and daily logs of O&M work provide valuable information to help managers evaluate the effectiveness of maintenance activities and make adjustments to optimize the use of limited resources. Equipment, manpower and other resources are tracked along with detailed descriptions of defects and/or obstructions encountered including debris, FOG, structural failures, etc. Maintenance work resulting in system modifications or extensions is required to be incorporated into record drawings and system maps. Scheduled testing of emergency and standby equipment is also a requirement of the collection system permit.

These records are required to be reviewed periodically to identify problems that cannot be resolved in a short period of time in order to develop a plan to address the problem(s). Maintaining these records for an extended period of time (5-years or more) will also provide accurate reference points of maintenance investments made over time that will track the effectiveness of operation and maintenance activities.

In the event of a sewer spill or system overflow, maintenance records will need to provide sufficient detail to satisfy reporting requirements for the event, including location(s), volume of wastewater, corrective actions, etc. This data may also be integrated into GIS to allow mapping of these events over time in order to identify patterns and/or trends that will assist with scheduling maintenance and planning rehabilitation and other capital improvements.

## **Resolution of Customer Complaints**

Customer complaints are primarily for sewer backups and odors. Sewer backups require an immediate response to diagnose and resolve the problem. These complaints can occur outside normal business hours, significantly escalating costs. Detailed records of the problems found, and the resources needed to address the failed condition, provide valuable feedback for making adjustments to the preventive maintenance program that can reduce these types of calls and help lower overall maintenance costs.

These records can also identify areas where private service laterals frequently fail. Notifying customers in these areas will allow them the opportunity to address deficiencies proactively, which will also help reduce customer “emergency” calls.

## **Capital Improvements Plan**

A Capital Improvements Plan (CIP) is required by the collection system permit to identify rehabilitation, replacement and expansion needs of the system. The CIP is required to address the short and long-term needs of the system, covering at least a 3 to 5-year planning period, and must include the estimated cost of each capital project.

CIP development incorporates maintenance activity, cleaning and inspection records, and system performance data that may include flow monitoring and hydraulic modeling to evaluate the existing system and to recommend improvements needed to correct existing deficiencies, and ensure adequate capacity is maintained throughout the system.

Capital planning includes consideration of on-going funding for rehabilitation and replacement of the collection system as it wears out, and potential upgrades for expansion as needed.

## **Training Program**

Training programs provide a mechanism for educating employees and establishing their technical competence to perform operations, maintenance, and emergency responses safely and effectively. A combination of in-house skill training and specialized training purchased or provided through state and national associations, conferences and vendor training programs are typically used to build and enhance skills for performing daily work duties. Periodic training reinforces previous efforts, as people often overlook things that are used infrequently. It also provides an opportunity to train new staff and learn about new problems, new techniques, and changes in equipment.

Emergency training educates system personnel about emergency situations and resulting effects on the wastewater system, public health, and environmental impacts. It also provides an opportunity to practice responses. Good record keeping ensures personnel are properly trained and prepared to effectively operate and maintain the collection system under any given circumstance. Regular review of training records is essential for keeping content up-to-date and maintaining proper employee awareness.

## **Equipment and Replacement Parts**

A reasonable supply of equipment and replacement parts should be maintained to fully support all operations and maintenance activities. A detailed inventory is essential to ensure availability under normal operations and emergency conditions. Specialized equipment or parts may be too costly to keep in stock, so arrangements with vendors and/or contractors may be necessary to ensure availability during non-business hours or during emergencies.

## 4.2 STAFFING RECOMMENDATIONS

Cumberland County is responsible for three wastewater collection systems and one water system: NORCRESS, Overhills, Kelly Hills, and Southpoint Water System. While each of these districts maintains its own operating budget, the Board leadership and operational management is performed solely by Cumberland County. Therefore, in consideration of the typical utility system management and operations and maintenance that is necessary for maintaining each of the systems, McGill has considered all of the four utility systems cumulatively. While each system could be analyzed separately, considering the systems together is more consistent with actual management of the systems.

Typical metrics for analyzing full-time equivalent (FTE, representing quantity full-time workers) are based on either the population served by the system or by miles of utility piping (water main or sewer line) within each system. For reference, Table 8 below summarizes the customers and piping in each of the County’s utility systems.

**Table 8: Utility System Comparison**

DISTRICT	Number of Connections		Paying Avail. Fee	Pipe in System (mi.)
	Water	Sewer		
<b>Southpoint</b>	84		129	2.8
<b>Kelly Hills</b>		102	166	4.5
<b>Overhills</b>		107	318	4.0
<b>NORCRESS</b>		452	666	41.1
<b>TOTALS</b>	<b>84</b>	<b>661</b>	<b>1279</b>	<b>52.4</b>

**Table 9: Typical Population vs. Pipe Length**

<b>Population</b>	<b>Pipe in System (mi.)</b>
0-100	5
101-500	5
501-3300	21
3301-10000	62

The typical sizes of utility systems from a community system EPA study<sup>1</sup> are shown in Table 9, and are generally consistent when compared to the County’s systems. This study was selected as a basis for comparison due to its comprehensive nature, having included water systems nationwide in its breadth. NORCRESS is the exception when compared to Table 9. This is mostly likely indicative of the system serving a more rural population where the connection density is less, and resulting from the length of force main piping in the system that increases the overall length but does not contribute to population density. Overall, these metrics were found to be reasonably consistent with the County’s systems. Similarly, the data is consistent regardless of whether the utility system is a water systems or wastewater collection system.

The objective is to make budget-level staffing recommendations for the County’s utility systems based on what is typical across the industry and other utility systems of comparable size. The EPA study utilized provides typical FTE for the roles of manager, plant operator, distribution (and collection, for our purposes), and administrative functions. All of these were considered applicable to management and operation of the County’s utility systems. Note: while the County is not responsible for plant operation in any system, the lift stations in the NORCRESS and Overhills systems are the County’s responsibility, therefore this metric was used, albeit in a smaller percentage, to account for the management of those resources.

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<sup>1</sup> Analysis conducted using excerpts from US EPA document, “National Characteristics of Drinking Water Systems Serving 10,000 or Fewer People,” published July 2011.



Table 10 shows Further utilizing the EPA statistics as base for typical FTE for each of the positions, based on the system size in terms of miles of pipe main.

**Table 10: Average Community System Statistics**

Employee Category	System Size (miles of Main)		Mean	Cumberland County
	Pop. 500-3300	Pop. 3300-10000		
	21	62	41.5	51.7
<b>Manager FTE</b> per mile	0.6	1.1	0.85	1.06
	0.029	0.018	0.020	0.020
<b>Plant Operator FTE</b> per mile	0.6	1.3	0.95	1.03
	0.029	0.021	0.023	0.023
<b>Distribution FTE</b> per mile	0.8	2.5	1.65	2.06
	0.038	0.040	0.040	0.040
<b>Administrative FTE</b> per mile	0.6	1.5	1.05	1.31
	0.029	0.024	0.025	0.025

The green highlighted cells are the calculated FTEs that were applied to estimate staffing size based on the quantity of pipe across the County’s four utility systems. Those calculated FTEs are based on the size of systems managed by the County and reasonable estimate of staffing needed for these systems.

Each of the FTEs is applied to each respective employee category. McGill utilized wage information from Zip Recruiter and a benefits multiplier of 1.38 from the U.S. Bureau of Labor Statistics to develop the summary shown in Table 11.

**Table 11: Overall Salary Estimates**

Employee Category	Hourly Rate	Annual Salary	Ben. Mult.	Total	Applied FTE	Applied Budget Cost
Manager	\$38.50	\$80,080.00	1.38	\$110,510.40	1.06	\$117,000
Operator	\$24.52	\$51,001.60	1.38	\$70,382.21	1.03	\$72,700
Distribution	\$23.57	\$49,025.60	1.38	\$67,655.33	2.06	\$139,100
Administrative	\$21.33	\$44,366.40	1.38	\$61,225.63	1.31	\$80,100
<b>Total Applied Budget Cost Based FTEs</b>						<b>\$408,900</b>

Utilizing industry metrics and comparing to systems of comparable size, McGill offers the proceeding section as a general staffing recommendation. This section and these budget values are provided for preliminary planning purposes only.

Staffing levels appear to be reasonable based on the District's ability to operate and maintain the system while providing a reliable level service to its customers.

While this budget number is higher than the current budget staffing, consideration should also be given to the cumulative effect cost to the County for contracted operation and distribution support in the NORCRESS and Kelly Hills district.

# **APPENDICES**



## **Appendix A**

### **Manhole Inspection List**

# Kelly Hills Manhole Inspection

**DATE:** January 17th, 2024

<b>FACILITYID</b>	<b>MH ID NO.</b>	<b>CONDITION</b>
115136	SMH027236	Good
115167	SMH027267	Good
115168	SMH027268	Good
115098	SMH027198	Good
115101	SMH027201	Good
115103	SMH027203	Good
115109	SMH027209	Good
115113	SMH027213	Good
115125	SMH027225	Good
115188	SMH027287	Good

## **Appendix B**

### **Smoke Testing Results List**

## Kelly Hills Smoke Testing Manholes

Date: September 21, 28, 2023		
Manhole ID	Status	Notes
SMH027233	Leak	Smoke around lid
SMH027234	Leak	Smoke around lid
SMH027246	Broken	
SMH027248	Seal	Smoke from lid
SMH027258	Seal	Smoke from collar
SMH027259	Seal	Smoke around lid
SMH027264	Leak	From around bottom of mh
SMH027265	Leak	
SMH027197	Leak	Leak around the lid
SMH027198	Seal	Smoke around lid
SMH027203	Leak	Smoke around rim
SMH027209	Seal	Smoke around lid
SMH027214	Leak	Smoking from top
SMH027215	Leak	
SMH027218	Broken	Cracked ring
SMH027219	Leak	
SMH027220	Leak	
SMH027223	Leak	
SMH027226	Leak	
SMH027277	Broken	
SMH027279	Seal	Smoke around concrete collar
SMH027283	Leak	
SMH027284	Leak	
SMH027288	Seal	Smoke around lid



<b>Kelly Hills Smoke Testing Cleanouts</b>		
<b>Date: September 21, 28, 2023</b>		
<b>Facility ID</b>	<b>Status</b>	<b>Notes</b>
33904	Broken	Broken cap
33991	Broken	Broken no cap
34012	Broken	Needs cap 9/28/2023 no cap
33889	Broken	
33908	Broken	
33961	Broken	Both valves broken
33895	Broken	
33990	Broken	cleanout cap repaired
33927	Broken	smoking from sides, burnt
33945	Broken	
34014	Broken	
33972	Broken	Missing lid covers
34029	Broken	
33913	Broken	
33916	Broken	
33985	Broken	broken cap
34033	Broken	Replace whole top
33926	Broken	Broken cap unable to open
33937	Broken	CO broken from bush hogging
34031	Broken	Around lid cracked
33966	Broken	
33976	Broken	CO in yard house
33906	Broken	Repaired
33964	Broken	Vacant lot
33955	Broken	Possible I&I issue.
33901	Broken	No cap repaired
33910	Broken	Broken cap in yard, cap replaced



## **Appendix C**

### **Wastewater Collection System Permit**



Michael F. Easley, Governor  
William G. Ross Jr., Secretary  
North Carolina Department of Environment and Natural Resources  
Alan W. Klimek, P.E. Director  
Division of Water Quality

October 27, 2003

Mr. Joseph Glass  
City of Fayetteville,  
Public Works Commission  
PO Drawer 1089  
Fayetteville, NC 28302

**SUBJECT: Permit No. WQ0023202  
Kelly Hills/Slocomb Road Water & Sewer District  
Wastewater Collection System Extension  
Cumberland County**

Dear Mr. Glass:

In accordance with your application received October 23, 2003, we are forwarding herewith Permit No. WQ0023202, dated October 27, 2003, to the City of Fayetteville, Public Works Commission for the construction and operation of the subject wastewater collection system extension. This permit shall be effective from the date of issuance until rescinded and shall be subject to the conditions and limitations as specified therein. This cover letter shall be considered a part of this permit and is therefore incorporated therein by reference.

Please pay particular attention to Permit Condition 3 which requires that the wastewater collection facilities be properly operated and maintained in accordance with 15A NCAC 2H .0227 or any individual system-wide collection system permit issued to the Permittee.

Permitting of this project does not constitute an acceptance of any part of the project that does not meet 15A NCAC 2H .0200; the Division of Water Quality's (Division) Gravity Sewer Minimum Design Criteria adopted February 12, 1996 as applicable; and the Division's Minimum Design Criteria for the Fast-Track Permitting of Pump Stations and Force Mains adopted June 1, 2000 as applicable, unless specifically mentioned therein. Division approval is based on acceptance of the certification provided by the North Carolina-licensed Professional Engineer named in the application. It shall be the Permittee's responsibility to ensure that the as-constructed project meets the appropriate design criteria and rules. Failure to comply may result in penalties in accordance with North Carolina General Statute § 143-215.6A through § 143-215.6C, construction of additional or replacement wastewater collection facilities, and/or referral of the North Carolina-licensed Professional Engineer to the licensing board.

In accordance with provisions of Article 21 of Chapter 143, General Statutes of North Carolina as amended, and other applicable Laws, Rules, and Regulations, permission is hereby granted to the City of Fayetteville, Public Works Commission for the construction and operation of



Mr. Joseph Glass  
Page 2  
October 27, 2003

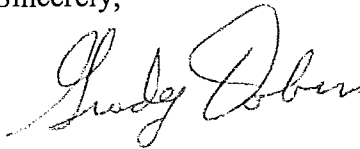
approximately 18,811 linear feet of 8-inch gravity sewer; as well as approximately 1,699 linear feet of 12-inch gravity sewer; as well as approximately 2,664 linear feet of 15-inch gravity sewer; as well as approximately 1,258 linear feet gravity sewer; a 0.1416 mgd, 225 gpm @ 74' TDH pump station with permanent generator; as well as approximately 2,388 linear feet of 6-inch force main to serve 144 three-bedroom residences, 10 three-bedroom mobile homes and 2 two-hundred seat churches as part of the Kelly Hills/Slocumb Road Water & Sewer District project, and the discharge of 56,640 gallons per day of collected domestic wastewater into the City of Fayetteville, Public Works Commission Cross Creek Wastewater Treatment Facility's existing sewerage system, pursuant to the application received October 23, 2003 and in conformity with 15A NCAC 2H .0200; the Division's Gravity Sewer Minimum Design Criteria adopted February 12, 1996 as applicable; the Division's Minimum Design Criteria for the Fast-Track Permitting of Pump Stations and Force Mains adopted June 1, 2000 as applicable; and other supporting data subsequently filed and approved by the Department of Environment and Natural Resources and considered as part of this permit.

The sewage and wastewater collected by this system shall be treated in the City of Fayetteville, Public Works Commission Cross Creek Wastewater Treatment Facility (Permit No. NC0023957) prior to being discharged into the receiving stream.

If any parts, requirements, or limitations contained in this permit are unacceptable, you have the right to request an adjudicatory hearing upon written request within 30 days following receipt of this permit. This request must be in the form of a written petition, conforming to Chapter 150B of North Carolina General Statutes, and filed with the Office of Administrative Hearings, 6714 Mail Service Center, Raleigh, NC 27699-6714. Unless such demands are made, this permit shall be final and binding.

If you need additional information concerning this matter, please contact Grady Dobson at (910) 486-1541 extension 729.

Sincerely,



for Alan W. Klimek, P.E.

cc: Cumberland County Health Department  
Fayetteville Regional Office, Water Quality Section (WWTF Permit No. NC0023957)  
Mr. James M. Kizer, Jr., Moorman, Kizer & Reitzel, Inc.  
Water Quality Central Files  
NDPU

**NORTH CAROLINA**  
**ENVIRONMENTAL MANAGEMENT COMMISSION**  
**DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES**  
**RALEIGH**  
**WASTEWATER COLLECTION SYSTEM EXTENSION PERMIT**

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This permit shall be effective from the date of issuance until rescinded and shall be subject to the following specified conditions and limitations:

1. This permit shall become voidable unless the wastewater collection facilities are constructed in accordance with the conditions of this permit; 15A NCAC 2H .0200; the Division of Water Quality's (Division) Gravity Sewer Minimum Design Criteria adopted February 12, 1996 as applicable; the Division's Minimum Design Criteria for the Fast-Track Permitting of Pump Stations and Force Mains adopted June 1, 2000 as applicable; and other supporting materials unless specifically mentioned herein.
2. This permit shall be effective only with respect to the nature and volume of wastes described in the application and other supporting data.
3. The wastewater collection facilities shall be properly maintained and operated at all times. The Permittee shall maintain compliance with an individual system-wide collection system permit for the operation and maintenance of these facilities as required by 15A NCAC 2H .0227. If an individual permit is not required, the following performance criteria shall be met as provided in 15A NCAC 2H .0227:
  - a. The sewer system shall be effectively maintained and operated at all times to prevent discharge to land or surface waters, and any contravention of the groundwater standards in 15A NCAC 2L .0200 or the surface water standards in 15A NCAC 2B .0200.
  - b. A map of the sewer system shall be developed prior to January 1, 2004 and shall be actively maintained.
  - c. An operation and maintenance plan shall be developed and implemented.
  - d. Pump stations that are not connected to a telemetry system shall be inspected every day (i.e. 365 days per year). Pump stations that are connected to a telemetry system shall be inspected at least once per week.
  - e. High-priority sewer lines shall be inspected at least once per every six-month period of time.
  - f. A general observation of the entire sewer system shall be conducted at least once per year.
  - g. Inspection and maintenance records shall be maintained for a period of at least three years.
  - h. Overflows and bypasses shall be reported to the appropriate Division regional office in accordance with 15A NCAC 2B .0506(a), and public notice shall be provided as required by North Carolina General Statute §143-215.1C.

4. **This permit shall not be transferable.** In the event there is a desire for the wastewater collection facilities to change ownership, or there is a name change of the Permittee, a formal permit request shall be submitted to the Division accompanied by documentation from the parties involved, and other supporting materials as may be appropriate. The approval of this request shall be considered on its merits and may or may not be approved.
5. Construction of the gravity sewers, pump stations, and force mains shall be scheduled so as not to interrupt service by the existing utilities nor result in an overflow or bypass discharge of wastewater to the surface waters of the State.
6. Upon completion of construction and prior to operation of these permitted facilities, a certification, a copy of the construction record drawings, as well as supporting design calculations for any pump stations permitted as part of this project shall be received from a North Carolina-licensed Professional Engineer certifying that the facilities have been installed in accordance with this permit; 15A NCAC 2H .0200; the Division's Gravity Sewer Design Criteria adopted February 12, 1996 as applicable; the Division's Minimum Design Criteria for the Fast-Track Permitting of Pump Station and Force Main adopted June 1, 2000 as applicable; and other supporting materials. If this project is to be completed in phases and partially certified, you shall retain the responsibility to track further construction approved under the same permit, and shall provide a final certificate of completion once the entire project has been completed. A copy of the construction record drawings, indicating the facilities constructed in the phase being certified, shall be submitted with each partial certification. Mail the Engineer's Certification, one copy of the "Construction Record Drawings," and one copy of the supporting design calculations to the Non-Discharge Permitting Unit, 1617 Mail Service Center, Raleigh, NC 27699-1617.
7. A copy of the construction record drawings shall be maintained on file by the Permittee for the life of the wastewater collection facilities.
8. Failure to abide by the conditions and limitations contained in this permit; 15A NCAC 2H .0200; the Division's Gravity Sewer Design Criteria adopted February 12, 1996 as applicable; the Division's Minimum Design Criteria for the Fast-Track Permitting of Pump Station and Force Mains adopted June 1, 2000 as applicable; and other supporting materials may subject the Permittee to an enforcement action by the Division, in accordance with North Carolina General Statutes §143-215.6A through §143-215.6C.
9. In the event that the wastewater collection facilities fail to perform satisfactorily, including the creation of nuisance conditions, the Permittee shall take immediate corrective action, including those as may be required by this Division, such as the construction of additional or replacement facilities.
10. The issuance of this permit shall not exempt the Permittee from complying with any and all statutes, rules, regulations, or ordinances that may be imposed by other government agencies (local, state and federal) which have jurisdiction, including but not limited to applicable river buffer rules in 15A NCAC 2B .0200, erosion and sedimentation control requirements in 15A NCAC Ch. 4 and under the Division's General Permit NCG010000, and any requirements pertaining to wetlands under 15A NCAC 2B .0200 and 15A NCAC 2H .0500.

**11. Noncompliance Notification:**

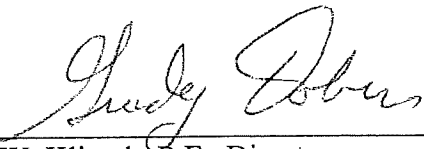
The Permittee shall report by telephone to the Fayetteville Regional Office, telephone number (910) 486-1541, as soon as possible, but in no case more than 24 hours or on the next working day, following the occurrence or first knowledge of the occurrence of either of the following:

- a. Any process unit failure, due to known or unknown reasons, that renders the facility incapable of adequate wastewater transport, such as mechanical or electrical failures of pumps, line blockage or breakage, etc.; or
- b. Any failure of a pumping station or sewer line resulting in a by-pass directly to receiving waters without treatment of all or any portion of the influent to such station or facility.

Persons reporting such occurrences by telephone shall also file a written report in letter form within five days following first knowledge of the occurrence. This report must outline the actions taken or proposed to be taken to ensure that the problem does not recur.

Permit issued this the twenty-seventh day of October 2003

NORTH CAROLINA ENVIRONMENTAL MANAGEMENT COMMISSION



for Alan W. Klimek, P.E., Director  
Division of Water Quality

By Authority of the Environmental Management Commission

**Permit Number WQ0023202**



**Fast Track Engineering Certification**

Permit No. WQ0023202  
October 27, 2003

Complete and submit this form to the permit issuing regional office with the following:

- One copy of the project record drawings (plan & profile views of sewer lines) of the wastewater collection system extension
- supporting design calculations (selected pumps, system curve, operating point, available storage if portable generator(s) or storage greater than longest past three year outage reliability option selected) for any pump stations permitted as part of this project
- Changes to the project should be clearly identified on the record drawings or in written summary form. Permit modifications are required for any changes resulting in non-compliance with this permit, regulations or minimum design criteria.

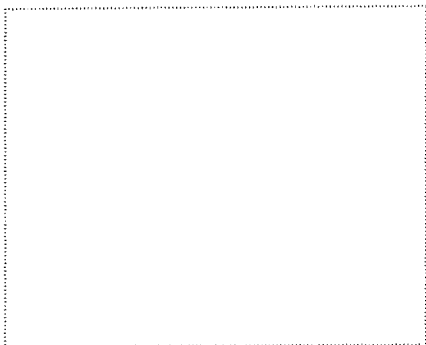
This project shall not be considered complete nor allowed to operate until this Engineer's Certification and all required supporting documentation have been received by the Division. **Therefore, it is highly recommended that this certification be sent in a manner that provides proof of receipt by the Division.**

**ENGINEER'S CERTIFICATION**

Partial                       Final

I, \_\_\_\_\_, as a duly registered Professional Engineer in the State of North Carolina, having been authorized to observe ( periodically,  weekly,  full time) the construction of the Kelly Hills/Slocomb Road Water & Sewer District, Cumberland County project for the Permittee hereby state that, to the best of my abilities, due care and diligence was used in the observation of the construction such that the construction was observed to be built within substantial compliance of this permit; 15A NCAC 2H .0200; the Division of Water Quality's (Division) Gravity Sewer Minimum Design Criteria adopted February 12, 1996 as applicable; the Division's Minimum Design Criteria for the Fast-Track Permitting of Pump Stations and Force Mains adopted June 1, 2000 as applicable; and other supporting materials.

North Carolina Professional Engineer's seal, signature, and date:



**SEND THIS FORM & SUPPORTING DOCUMENTATION WITH REQUIRED ATTACHMENTS TO THE FOLLOWING ADDRESS**

**FAYETTEVILLE REGIONAL OFFICE  
225 GREEN STREET, SUITE 714  
FAYETTEVILLE NC 28301**

The Permittee is responsible for tracking all partial certifications up until a final certification is received. Any wastewater flow made tributary to the wastewater collection system extension prior to completion of this Engineer's Certification shall be considered a violation of the permit and shall subject the Permittee to appropriate enforcement actions.



## **Appendix D**

### **PWC Agreement**

**STATE OF NORTH CAROLINA  
COUNTY OF CUMBERLAND  
SANITARY SEWER WHOLESALE AGREEMENT**

**THIS AGREEMENT** made and entered into this 24<sup>th</sup> day of September 2014 by and between the City of Fayetteville acting by and through its Public Works Commission of the City of Fayetteville (hereinafter referred to as "Commission" or "PWC") and the County of Cumberland, a North Carolina body politic acting by and through its Kelly Hills/Slocomb Road Water & Sewer District, (hereinafter referred to as "Kelly Hills").

**WITNESSETH**

**THAT, WHEREAS,** Kelly Hills owns and operates a wastewater collection system, as described in Exhibit B, that currently serves approximately 115 customers in the Kelly Hills/Slocomb Road area; and,

**WHEREAS,** Commission owns and operates wastewater treatment facilities (the "Municipal Wastewater System") and provides wholesale wastewater treatment services; and,

**WHEREAS,** Kelly Hills wishes to contract with Commission for PWC to furnish wholesale wastewater treatment service to Kelly Hills for the treatment of Kelly Hills wastewater; and ,

**WHEREAS,** Commission agrees to furnish wastewater treatment service pursuant to the terms of this agreement; and,

**WHEREAS,** Kelly Hills wishes to contract with Commission for PWC to provide operation and maintenance services to Kelly Hills for the Kelly Hills Sanitary Sewer system; and,

**WHEREAS,** Commission agrees to furnish operation and maintenance services to Kelly Hills for the Kelly Hills Sanitary Sewer system pursuant to the terms of this agreement; and,

**WHEREAS,** both parties recognize the Commission must implement and enforce a pretreatment program to control wastewater discharges from Significant Industrial Users ("SIUs") under 40 CFR Part 403 or other dischargers who require issuance of SIU or local permits.

**NOW THEREFORE,** Commission and Kelly Hills agree to the following terms and conditions:

1. Discharge Points:

As of the Effective Date, wastewater from Kelly Hills existing sanitary sewer collection system will be discharged into the Commission's Municipal Wastewater System at the

existing entry point listed in this Section 1 and thence treated at Commission's plants as deemed appropriate. Existing entry point is PWC Lift station at 355 Bethune Drive. Kelly Hills shall not discharge into Commission's Municipal Wastewater System at any other entry point without prior written approval from the Commission. Exhibit A shows the approved discharge points.

2. Flow Measurement:

Within one hundred and twenty (120) business days from the Effective Date of this agreement, Commission shall install at Kelly Hills' expense a flow measurement device at the Kelly Hills approach main where Kelly Hills discharges wastewater into the Commission's Municipal Wastewater System. Commission at its expense, shall be responsible for maintenance and calibration of the flow measurement device and calibration shall be done annually and shall operate within the accuracy tolerances as specified by the manufacturer. Commission shall provide Kelly Hills a copy of the calibration records of the flow measurement device.

3. Basic Operations and Maintenance

A. The cost of basic operation and maintenance of the sanitary sewer collection system is built into the sanitary sewer rate being charged to Kelly Hills. Basic operation and maintenance includes:

1. Rights-of-way and/or easement maintenance to allow for accessibility to the sanitary sewer collection system.
2. Cleaning of at least 10% of the sanitary sewer collection system each year.
3. A general observation of the entire sanitary sewer collection system throughout the course of every year.
4. Semiannual inspections of all high priority lines (i.e. aerial, sub-waterway crossing, line contacting surface waters, siphon, line positioned parallel to stream banks subject to eroding, or line designated as high priority in a permit if applicable).
5. Point repair to a damaged or broken sanitary sewer main pipe, not to include replacement of multiple pipe joints.
6. Point repair to a damaged or broken sanitary sewer lateral or cleanout, not to include outright renewal of entire lateral.
7. Cleaning and rodding of clogged sanitary sewer mains and laterals.
8. Repair of manholes to include resetting of manhole ring and cover, not to include adjustments to or replacement of manhole or ring and cover; not to include repairs warranted to address I&I or corrosion issues.

- B. Other extraordinary work required or requested by Kelly Hills will be NU billed at the appropriate rate to include applicable overtime and overhead for labor, equipment and materials ( to include an amount for all direct and indirect charges) plus 10%. Examples of extraordinary work are: SSO remediation and post cleaning and inspection, work consider as a capital improvement under Financial Accounting Standards Board (FASB) standards, replacement of multiple joints of sanitary sewer pipe, renewal of a sanitary sewer lateral, installation of a new sanitary sewer lateral, elder valve installation, smokedye testing and CCTV inspection. Kelly Hills shall have the right to install themselves or to hire a contractor(s) to perform this work to PWC standards.
- C. The Commission shall at its discretion exercise the right to decline or subcontract any work required or requested by Kelly Hills that would conflict with the Commission's responsibilities and requirements for the operation and maintenance of the Commissions' sanitary sewer collection system.
- D. Commission will provide other services, upon request, but which will be billed separately and not included in the Wholesale Sewer Rate. A partial list of the other services that may be available to Kelly Hills include the following:
1. Promote participation agreements with other benefitted parties;
  2. Participation and administration of utility extension contracts;
  3. Right-of-way acquisition for land and easement requirements to be secured in the name of Kelly Hills within the limits permitted by law but not to include actions in eminent domain;
  4. Inspection services during construction;
  5. Miscellaneous services such as GIS mapping as requested.
- E. Other services requested by Kelly Hills will be NU billed at the appropriate rate to include applicable overtime and overhead for labor, equipment and materials ( to include an amount for all direct and indirect charges) plus 10%.

4. Upsizing Mains

Commission will be responsible for the cost associated with upsizing mains within the delineated Kelly Hills service as may be deemed necessary in order to meet

Commission's existing and future sanitary sewer needs which would not be otherwise required for the sanitary sewer collection system being installed by Kelly Hills pursuant to this Agreement.

5. Ownership of Sewer Lines

A. All sanitary sewer lines installed within the boundaries of the Kelly Hills Sanitary Sewer District shall be owned and operated by Kelly Hills subject to Commission's right to upsize such mains at its expense and to transmit sanitary sewer through such mains to areas beyond the Kelly Hills area.

B. Commission shall own and operate the lift station located at 355 Bethune Drive, Fayetteville, NC and the associated force main.

6. Rights-of-way and encroachments

Kelly Hills will acquire all rights-of-way and/or encroachments as may be needed for construction and maintenance of the sanitary sewer collection system as referenced herein.

7. Extension of Mains Outside Kelly Hills Service Area

Commission reserves the right to extend or continue sanitary sewer mains from such mains as initially constructed by Kelly Hills to points outside of the delineated Kelly Hills service area. Future connections or main extensions that occur outside of the delineated Kelly Hills area are not subject to this Agreement and shall be the property of Commission unless the Kelly Hills boundary is expanded by law to serve development of contiguous properties. If such extensions occur, then the Commission shall install a flow measurement device at its expense to measure all flow being generated by customers outside of the Kelly Hills Service Area. A map of showing the boundaries of the Kelly Hills service is show as Exhibit B.

8. Extension of Mains Within Kelly Hills Service Area

The further extension of or connection to mains within the delineated Kelly Hills service area will be pursuant to applicable extension and connection policies and procedures of Kelly Hills in effect at the time a request for service is made.

9. Compliance with Commission Policies and Procedures

Kelly Hills may by resolution adopt a policy whereby future customers and/or extenders of sanitary sewer infrastructure in the Kelly Hills service area will be subject to the then current applicable Commission Policies and Procedures to simplify the application process for customers with the understanding that such customers remain responsible to Kelly Hills for compliance with such policies and procedures.



10. Notification of Excessive Inflow/Infiltration

Upon notification by Commission that volumes of Kelly Hills wastewater entering Commission's lines, based on flow measuring data, exceed one hundred twenty-five percent (125%) of the average volume of sewer measured at the Discharge Point during any consecutive three-month billing period, Kelly Hills shall initiate an infiltration/inflow study to be conducted or supervised by a professional consulting engineer. Such study will provide Kelly Hills with recommendations designed to reduce infiltration/inflow to acceptable levels as delineated by the United States Environmental Protection Agency. Said study shall be made during the fiscal year immediately following notification. Corrective measures shall be taken by Kelly Hills upon receipt of and based on said infiltration/inflow study. Kelly Hills shall be responsible for all costs associated with any required infiltration/inflow study and corrective measures. Results of any infiltration/inflow study and proposed corrective measures shall be sent to Commission for review and approval.

11. New Laterals

- A. At Kelly Hills request, Commission will install new laterals in the Kelly Hills Sanitary Sewer District at Kelly Hills expense. Commission will NU bill Kelly Hills for such laterals at the appropriate rate to include applicable overtime and overhead for labor, equipment and materials (to include an amount for all direct and indirect charges) plus 10%.
- B. Kelly Hills, at its sole discretion, may install or contract for the installation of new laterals in the Kelly Hills Sanitary Sewer District.
- C. All new laterals will be designed and built to the PWC standards in effect at the time of the design and construction.

12. Monthly Billing:

- A. As of the Effective Date, the flow measuring device at the Kelly Hills connective main will be read, as nearly as practical, at regular monthly intervals. The period of time between device readings shall not be less than twenty-seven (27) days and not more than thirty-three (33) days. If Commission is unable to read the flow measuring device, for any reason, the wastewater flow shall be estimated by Commission on the basis of Kelly Hills wastewater flow for the preceding three billing periods for which readings were obtained. Bills rendered on the basis of such estimates shall be as valid as if made from actual device readings and appropriate adjustment of Kelly Hills bill shall be made at first actual reading of the flow measuring device subsequent to such estimate.
- B. The term "month" or "monthly" refers to the interval(s) transpiring between the previous meter reading date and the current meter reading date, and bills shall be rendered accordingly.



- C. The Commission will submit bills to Kelly Hills on a monthly basis for the prior month's sewer treatment service.
- D. If at the time of this Agreement's Effective Date, the flow measurement device at Kelly Hills approach main is not installed, the parties agree that billing shall continue under the existing arrangement, as specified in the Kelly Hills/Slocomb Road Water & Sewer District Sanitary Sewer Service Agreement as amended October 24, 2005 until such time that the flow measurement device is installed and calibrated.
- E. The Commission will, annually, or such time as shall be determined by Commission, perform a rate analysis to determine the rates which are applicable to serving Commission's various classes of water and sanitary sewer service. Among those classes of service will be wholesale sanitary sewer service classes, a class which includes Kelly Hills.
- F. Commission will use audited balance sheets, income statements, comparable wholesale market rate data, and return on investment financial information as the basis for determining the rates applicable to this Agreement. Commission may at its option, adjust audited financial data for changes to such financial data known or reasonably expected to occur during the period in which the billing rate will be in effect.
- G. Commission will provide at least 30 days' notice to Kelly Hills of any rate changes.
- H. The initial Wholesale Sewer Rate to be charged to Kelly Hills, including the cost of O&M, is \$ 4.1267 per 1,000 gallons, or \$ .0041267 per gallon, the rate effective January 1, 2014. This cost includes the cost of basic operation and maintenance of the sanitary sewer collection system as described in paragraph 3.

13. Capacity Charges

- A. Commission shall receive and treat up to 100,000 gallons per day of Kelly Hills wastewater, representing the projected average daily usage generated from sources within the Kelly Hills Sanitary Sewer District. Kelly Hills has purchased 32,430 gallons per day sanitary sewer treatment capacity using \$ 92,640 of FIF credits. Upon execution of this agreement Kelly Hills will purchase an additional 67,570 gallons per day of sanitary sewer treatment capacity using \$ 201,358.60 of their existing FIF credits that expire in October 2015.

Kelly Hills has the option, in the future, to purchase any or all of the remaining 50,000 gallons per day force main capacity at the then current FIF charge. Such purchases will be made in increments of at least 5% of the then current contract capacity.

- B. Kelly Hills shall, advise Commission of any anticipated growth in number of connections to its sanitary sewer system, population served and anticipated volume of wastewater as Kelly Hills becomes aware of such growth.. Commission does not anticipate any restriction on annual increase in flow from Kelly Hills, if within limits of the contract demand of 100,000 gallons per day. However, flow limits may be imposed if a regulatory agency having jurisdiction over Commission's treatment facilities requires restriction on flow increases on Commission's system.
  - C. Commission shall notify Kelly Hills if the measured average daily usage in gallons per day of wastewater reaches 80% of the contract demand.
  - D. If the measured average daily usage in gallons per day of wastewater from Kelly Hills exceeds 90% of the contract demand, Kelly Hills shall purchase additional contract demand at the current Commission capacity rate in increments of at least 5% of the existing contract demand.
14. Surcharges for Carbonaceous Biochemical Oxygen Demand (CBOD) and Suspended Solids (SS) and Total Kjeldhal Nitrogen (TKN):
- A. A surcharge for CBOD, Suspended Solids or NH<sub>3</sub> will be applied to those customers of Kelly Hills who are issued SIU or local permits ("Industrial Users"). These surcharges will be determined in accordance with the Commission Rate Schedule "Sanitary Sewer Surcharges" currently indexed as 620.05. Such surcharge billing will be determined by testing samples of wastewater from each Industrial Users' discharge at Commission's laboratories pursuant to standard test requirements and procedures of the State and Federal governments. Commission shall bill surcharges directly to the Industrial Users. The additional costs to treat wastewater in excess of limits stated above are determined by the Commission and published annually. The Commission will, from time-to-time, review and revise the surcharge applicable to Industrial Users based on testing.
  - B. Kelly Hills shall terminate sewer service to any Industrial User upon notice from the Commission that said Industrial User has failed to pay surcharges pursuant to Sections 5 or 7 or any additional fees or penalties under the City of Fayetteville's Sewer Use Ordinance.
15. Sewer Use Ordinance Requirement:
- A. The Sanitary Sewer Ordinance of the City of Fayetteville, as amended from time-to-time, shall be applicable to all Kelly Hills customers whose wastewater is discharged to Commission's Municipal Wastewater System.

- B. Kelly Hills shall be responsible for regulation of all customers who discharge wastewater through Kelly Hills system to the Commission's Municipal Wastewater System. Kelly Hills shall be responsible for enforcement of the requirements of the City of Fayetteville's Sanitary Sewer Ordinance.

16. Sewer Use Ordinance, and Pretreatment Requirements and Costs:

- A. The Sanitary Sewer Use Ordinance of the City of Fayetteville and subsequent revisions of such Ordinance to include pretreatment requirements and cost, both incorporated herein by reference, shall be applicable to the effluent of Kelly Hills' sanitary sewer being discharged into the Commission's sanitary sewer system.
- B. Kelly Hills hereby designates Commission as the agent of Kelly Hills for the purposes of implementation and enforcement of the pretreatment requirements of Kelly Hills for industrial users located in Kelly Hills' jurisdiction. Commission hereby accepts the designation of agent of Kelly Hills' jurisdiction for purposes of implementation and enforcement of the pretreatment requirements. If Commission determines the pretreatment requirements are not enforceable by Commission, then Kelly Hills shall provide timely enforcement. Kelly Hills shall continue to enforce all other provisions of the City's Sanitary Sewer Use Ordinance.
- C. Commission, on behalf of and as an agent for Kelly Hills', agrees to perform technical and administrative duties necessary to implement and enforce the pretreatment requirements, including but not limited to the following:
  - 1. Updating industrial waste survey no less than once every five (5) years;
  - 2. Providing technical services such as sampling and analysis;
  - 3. Permitting of Significant Industrial Users (SIU's);
  - 4. Conducting inspection and compliance monitoring at permitted SIU's and certain commercial users; and
  - 5. Performing enforcement activities.

In addition, Kelly Hills authorizes the Commission, as its agent, to take emergency action to stop or prevent any discharge which presents or may present an imminent danger to the health or welfare of humans, reasonably appears to threaten the environment, threatens to interfere with the operation of Commission's sanitary sewer treatment system (including the collection system and its workers' safety), or which could pass through the treatment plant and threaten the integrity of the publicly owned treatment works receiving stream.

- D. Kelly Hills, as with other Commission customers, shall be responsible for additional cost associated with treatment of sanitary sewer in excess of published limits as determined by Commission. Such pretreatment surcharge billing will be determined by testing of samples of sanitary sewer from the Kelly Hills sanitary sewer collection system at Commission's laboratories pursuant to standard test requirements and procedures of the State and Federal governments. The pretreatment surcharge procedure as it applies to commercial industrial customers is described in Commission's Rates and Policies Manual and is incorporated herein by reference.
- E. Kelly Hills shall pay Commission for actual costs incurred by Commission, including all reasonably allocated overhead costs, implementing and enforcing pretreatment requirements on behalf of Kelly Hills'. Commission shall bill Kelly Hills monthly for pretreatment costs incurred by Commission in implementing and enforcing Kelly Hills' pretreatment requirements, which shall be payable within 30 days of date of invoice.

17. Corrosion Control:

Kelly Hills shall be responsible for ensuring compliance with hydrogen sulfide discharge limits at the point(s) of discharge to the Commission's Municipal Wastewater System. The discharge of dissolved sulfide by Kelly Hills to Commission's Municipal Wastewater System at the discharge point(s) identified in Section 1 of this Agreement, are limited to the following: a daily average of 5mg/l in solution and/or 10 ppm in atmosphere and a maximum of 10 mg/l in solution and/or 30 ppm in atmosphere per day. PWC, at its own expense, shall perform all testing and as needed shall coordinate with Kelly Hills. Kelly Hills, at its own expense, shall be responsible for the addition of any chemicals or additional treatment necessary to comply with the hydrogen sulfide limit. Any addition of chemicals to control hydrogen sulfide shall be coordinated with Commission prior to introduction into the system.

18. Indemnity and Responsibilities:

Kelly Hills assumes responsibility for and shall indemnify (or defend at Commission's sole option) Commission, its successors and assigns, and hold it harmless against all injuries, liabilities, claims, damages, losses, costs and expenses, including reasonable attorney's fees and costs, personal injury or property damage, arising out of or related to 1) the construction, maintenance and operation of Kelly Hills sanitary sewer system, 2) Kelly Hill's discharge into the Commission's Municipal Wastewater System, 3) this Agreement, or 4) fines or penalties by any Federal, State or local agency or body.. Kelly Hills will not indemnify PWC for intentional or negligent acts solely attributable to PWC, its employees, agents, or contractors.

19. Suspension or Termination of Sanitary Wastewater Treatment Service:

Commission, in addition to all other legal remedies, may either terminate this Agreement or suspend sanitary sewer treatment service to Kelly Hills for:



- a) Any material default or breach of this Agreement by Kelly Hills; Fraudulent or unauthorized use of the sanitary sewer treatment service or discharge of sanitary sewer in such manner as to circumvent Commission's meter(s) serving Kelly Hills; or,
- b) Failure to pay monthly sanitary sewer bills when due and payable.
- c) No such termination or suspension, however, will be made by Commission without thirty (30) days written notice delivered to Kelly Hills personally or by mail, within which time Kelly Hills may cure any such alleged default or breach or commence in good faith to cure any such default or breach which cannot reasonably be cured within thirty (30) days, except that only seven (7) days' notice need be given under subsection (b) above.
- d) Commission's suspension of sanitary sewer service or termination of this Agreement upon any authorized grounds shall not relieve Kelly Hills of:
  - 1) Liability for the payment of sanitary sewer treatment service to the date of suspension or termination of this Agreement; nor
  - 2) Liability for any actual damages sustained by Commission.

20. Payment:

Monthly bills are payable within thirty (30) days from date thereof at P.O. Box 1089, Fayetteville, North Carolina, 28302, or its successors. A late payment charge in accordance with PWC's Schedule of Deposits, Fees, and Charges shall be applicable to all bills rendered pursuant to this Agreement except when notified within fifteen (15) days by Kelly Hills in writing of an invoice dispute, but Kelly Hills shall pay the undisputed amount pursuant to this contract.

21. Term of Agreement:

The term of this Agreement is for twenty (20) years from September 24, 2014 until September 24, 2034 (the "Initial Term"). This Agreement shall automatically renew at the end of the Initial Term for a period of one (1) year, and shall automatically renew each year thereafter for a period of one year, unless terminated pursuant to the terms of Paragraph 10, or by either party by giving not less than one (1) year written notice to the other party, or upon mutual consent of both parties. Either party may terminate this Agreement during the Initial Term by giving the other party one (1) year written notice.

22. Prior Agreements: This Sanitary Sewer Wholesale Agreement shall replace the Sanitary Sewer Service Agreement by and between the City of Fayetteville acting by and through its Public Works Commission of the City of Fayetteville and the Kelly Hills /Slocomb Road Sanitary Sewer District dated April 19, 2004 and amended October 24, 2005.

23. Continuity of Service:

Commission does not guarantee continuous utility service, but shall use reasonable diligence in providing uninterrupted services. Having used such reasonable diligence, Commission shall not be liable to Kelly Hills or its customers for failure to provide continuous services. The performance of Commission's obligations under this Agreement shall be excused during such times and to the extent such performance is prevented by reason of any event beyond the control of Commission, including without limitation, flood, earthquake, storm, lightning, fire, explosion, war, riot, civil disturbances, terrorist act, strikes, sabotage, or act of God.

24. Dispute Resolution:

Commission and Kelly Hills will attempt in good faith to resolve any dispute or claim arising out of or in relation to this Agreement through direct negotiations between Commission and Kelly Hills' staff. If the dispute is not settled through such negotiations, then Commission and Kelly Hills agree to attend voluntary mediation prior to initiating formal legal proceedings. Said voluntary mediation shall be initiated by either party giving notice of the same, and shall be concluded within 30 days of such notice. Said voluntary mediation shall be conducted pursuant to the North Carolina Rules Implementing Statewide Mediated Settlement Conferences in Superior Court Civil Actions in effect at the time said notice is given. The requirements of this Section 25 shall not apply to emergency situations where the dispute involves potential harm to the Commission's Municipal Wastewater System.

25. Amendment Proceedings:

This Agreement may be amended, changed, modified, altered, or assigned only by written consent of Commission and Kelly Hills.

26. Notices:

All notices hereunder, other than monthly invoices and payment of the same, shall be sent to the following addresses using regular mail unless otherwise specified in writing:

Commission:           General Manager  
                              Public Works Commission  
                              P.O. Box 1089  
                              Fayetteville, NC 28302

Kelly Hills: Chairman, Governing Board  
Kelly Hills/Slocomb Road Water and Sewer District  
P. O. Box 1829  
Fayetteville, NC 28302-1829

27. Binding Effect:

This Agreement shall be binding upon and inure to the benefit of the parties hereto, their heirs, successors and assigns.

28. Entire Agreement:

This Agreement contains the entire Agreement of the parties and there are no representations, inducements, or other provisions other than those expressed in writing.

29. Kelly Hills acknowledges that, in carrying out the terms of this agreement, PWC will disclose certain confidential customer information to Kelly Hills (the "Confidential Information"). Kelly Hills agrees not to disclose the Confidential Information to third parties, except as may be reasonably necessary to carry out the terms of this Agreement. Kelly Hills will advise PWC of any such disclosure prior to disclosure and obtain PWC's consent. In the event Kelly Hills inadvertently discloses Confidential Information, Kelly Hills will immediately notify PWC of such inadvertent disclosure and will take all appropriate actions to prevent further dissemination or disclosure of the Confidential Information.

29. Governing Law:

This Agreement shall be governed by the laws of the State of North Carolina.

30. Severability:


It is hereby declared to be the intention of Commission and Kelly Hills that the paragraphs, sentences, clauses, and phrases of this Agreement are severable. If one or more paragraphs, sections, sentences, clauses, or phrases shall be declared void, invalid, or otherwise unenforceable for any reason by valid and final judgment or decree of any court of competent jurisdiction, such judgment or decree shall not affect the remaining provisions of this Agreement and the same shall continue to be fully effective and enforceable on the basis that said remaining provisions would have been agreed to by Commission and Kelly Hills without the incorporation of such void, invalid, or otherwise unenforceable paragraph, section, sentence, clause, or phrase.

31. Effective Date:

The Effective Date, as that term is used in this Agreement, shall be the date that the Agreement is fully executed by both parties.

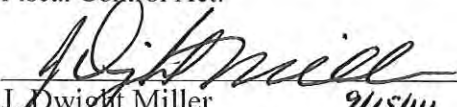
IN WITNESS WHEREOF, the parties hereto, through their duly authorized officers, have executed this contract as to the date and year first above written.

PUBLIC WORKS COMMISSION  
OF THE CITY OF FAYETTEVILLE

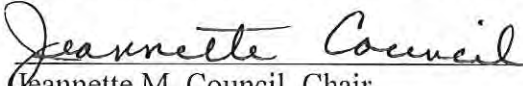
By:   
Michael G. Lallier, Chairman

ATTEST:  
  
Lynne Greene, Secretary

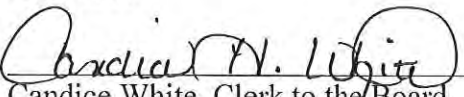
This instrument has been preaudited in the manner required by the Local Government Budget and Fiscal Control Act.

  
J. Dwight Miller *9/15/14*  
PWC Chief Financial Officer

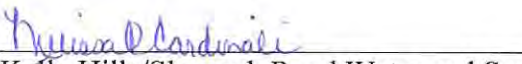
KELLY HILLS/SLOCOMB ROAD WATER AND SEWER DISTRICT

By:   
Jeannette M. Council, Chair



ATTEST:  
  
Candice White, Clerk to the Board

This instrument has been preaudited in the manner required by the Local Government Budget and Fiscal Control Act.

  
Kelly Hills/Slocomb Road Water and Sewer District  
Finance Officer



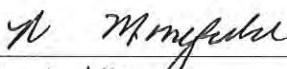
**Legal Review of the Contract between the City of Fayetteville, Acting through its Public Works Commission, and Cumberland County, Acting through its Kelly Hills/Slocumb Road Water & Sewer District, Approved by the Board of Commissioners August 18, 2014**

Section 18 of this agreement is subject to N.C.G.S. § 22B-1. Construction indemnity agreements invalid. That statute states:

Any promise or agreement in, or in connection with, a contract or agreement relative to the design, planning, construction, alteration, repair or maintenance of a building, structure, highway, road, appurtenance or appliance, including moving, demolition and excavating connected therewith, purporting to indemnify or hold harmless the promisee, the promisee's independent contractors, agents, employees, or indemnitees against liability for damages arising out of bodily injury to persons or damage to property proximately caused by or resulting from the negligence, in whole or in part, of the promisee, its independent contractors, agents, employees, or indemnitees, is against public policy and is void and unenforceable.

To the extent that any portion of this indemnity agreement is enforceable, there is no limit on the amount of the obligation that may be incurred.

Subject to proper execution by both parties and the effective dates of the term being inserted into Section 21, this agreement is approved for legal sufficiency for the reason that the Public Works Commission is the sole provider of sewer service for the Kelly Hills Water & Sewer District and the agreement terms were not negotiable.

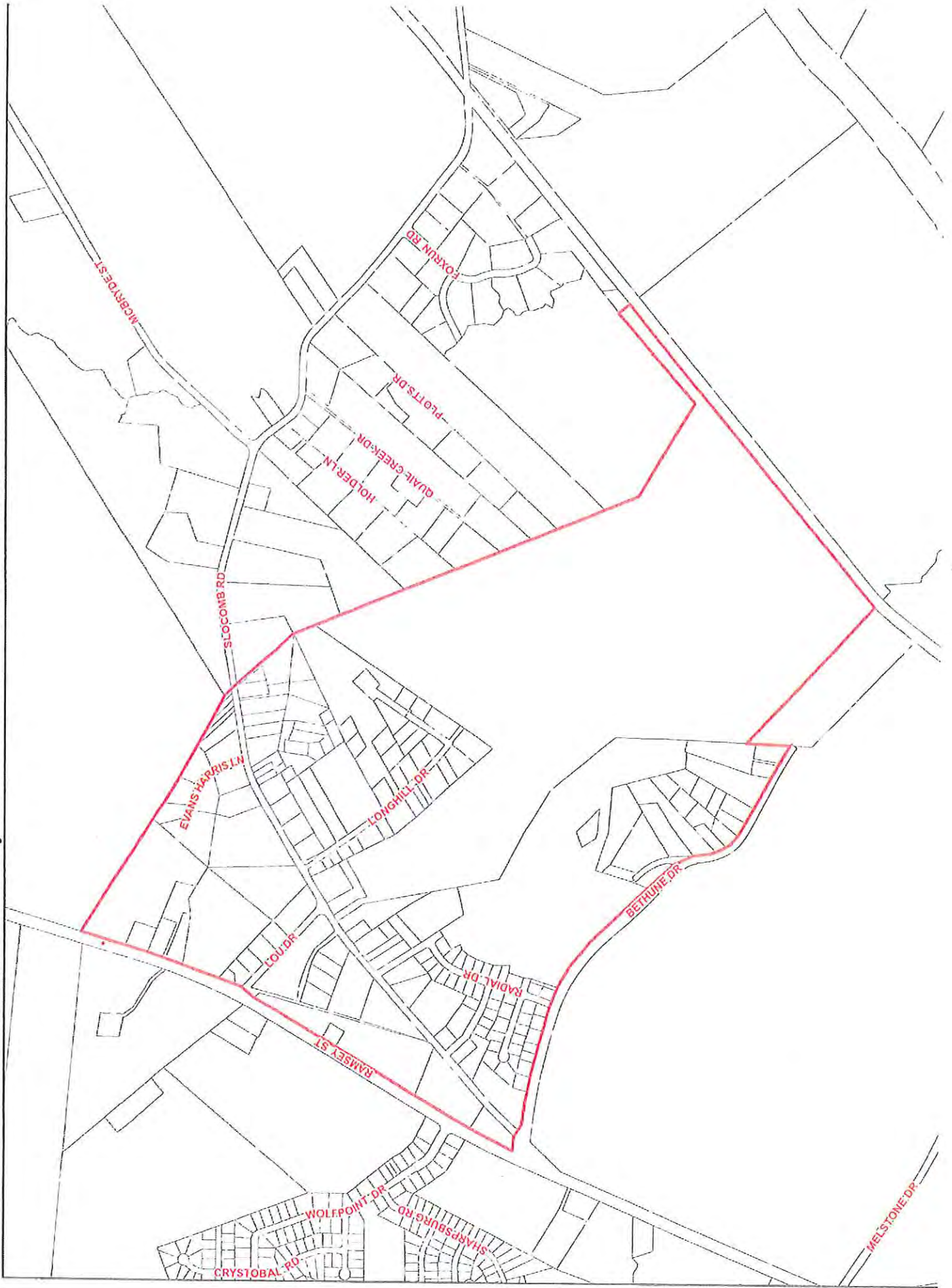
  
County Attorney 8-19-14

## **Exhibit A – Kelly Hills Discharge Points**

The approved discharge point(s) for Kelly Hills are:

1. The flow measurement device at the Kelly Hills force main.

EXHIBIT-B: Kelly Hills Water and Sewer District



**SEWER ASSET MANAGEMENT PLAN**  
**NORTHERN CUMBERLAND REGIONAL**  
**SEWER SYSTEM (NORCRESS) DISTRICT**  
**CUMBERLAND COUNTY, NC**



PINEHURST, NORTH CAROLINA

**SEWER ASSET MANAGEMENT PLAN**

**NORTHERN CUMBERLAND REGIONAL  
SEWER SYSTEM (NORCRESS) DISTRICT**

**CUMBERLAND COUNTY, NC**

**MATTHEW JONES, PE**  
matthew.jones@mcgillassociates.com



5 Regional Circle, Suite A  
Pinehurst, NC 28374  
910.295.3159

**AUGUST 2025**

**PROJECT NO. 20.02507**

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**Appendix A – Manhole Inventory List**

**Appendix B – Smoke Testing Results List**

**Appendix C – Rainfall Data**

**Appendix D – Flow Monitoring Data, Hourly Graphs**

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## EXECUTIVE SUMMARY

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The purpose of this Asset Management Plan (AMP) is to document the condition of the Northern Cumberland Regional Sewer System (NORCRESS) District's infrastructure to assist the County with becoming more proactive in the management, operation, and financing of its wastewater collection system. The NORCRESS District serves approximately 452 connections in the northeastern area of Cumberland County. Approximately 666 properties within the district are not currently connected and are paying the sewer availability fee. The District's wastewater collection system consists of approximately 26 miles of gravity sewer, four sewer lift stations, 15 miles of force main, and 424 manholes. Collected wastewater is pumped from the Wade 2 Lift Station to Eastover Central Lift Station and then sent to Fayetteville PWC. Flow generated from the district is ultimately treated at the Cross Creek Water Reclamation Facility (NC0023957), which is owned and operated by Fayetteville PWC. A copy of the agreement is included in Appendix F.

This asset inventory and assessment consisted of assembling data on gravity sewer pipe, manholes, and other appurtenances in the collection system. This assessment included performing inspections of selected manholes, performing smoke testing throughout the system, performing flow monitoring at select locations within the system, and reviewing existing data with County Staff. The information was evaluated and is summarized in this document which includes the asset management plan and capital improvements plan. This process resulted in the development of a 10-year Capital Improvements Plan (CIP) to guide the District with scheduling and financing the capital projects and equipment purchases necessary to maintain and improve its wastewater collection system. Through the AMP process, it is estimated that approximately 40% of the manholes in the sewer collection system are in need of rehabilitation due to deterioration.

The CIP includes a focused improvement to components within the sewer system that need rehabilitation or replacement based on existing condition, and on improvements that could improve management of the sewer system for staff. These planned projects will

bring the system into a better position to serve its customers by improving reliability of the collection system. The District should look to its CIP to guide its next projects, and the CIP should be updated regularly as priorities change and as projects are completed. It is noted that many factors may impact the priorities including failures, and funding availability both local and through grant and loan programs. This assessment project provides evidence for the prioritization of manhole rehabilitation and improvement projects in the CIP.

### ***System Evaluation***

The pipe material in the NORCRESS system is primarily PVC pipe. The collection system was first put into service in 2005, therefore the relative age of the system is low. PVC pipe is the most common material used for sewer systems today. The typical useful life for PVC pipe is anywhere from 40 to 60 years. There is some ductile iron pipe (DIP) used at culvert crossings and HDPE used for directional drill of the Falcon and Wade force mains.

As part of the AMP, McGill Associates, PA (McGill) assisted the District with evaluating the condition of its sewer infrastructure to identify projects in line with these goals. The following items were included in the AMP scope:

- Identify areas to conduct smoke testing to locate potential sources of I/I into the sewer system;
- Flow monitoring in select areas (6 sewershed areas within the Towns of Godwin and Falcon)
- Inspect selected sewer manholes within the system to establish overall system condition;
- Identify and evaluate potential sewer system improvements;
- Prioritize sewer system improvements;
- Prepare opinions of probable costs for sewer system improvements; and
- Create a Capital Improvements Plan.

### Flow Monitoring

McGill met with County staff to identify areas of concern within the sewer system and select locations to place flow meters. From these discussions, the NORCRESS wastewater collection system was divided into six total sewersheds between the Towns of Godwin and Falcon, according to the GIS mapping as depicted in Figure 2. These sites were selected to favor areas where County staff suspected I/I and the sewershed was easily able to be isolated within the total system. Overall, flow monitoring revealed that while all sites had sufficient capacity to handle dry weather flow, there was additional flow during dry weather conditions that raises some concern. Falcon Site 2 had peak flows which used around 40% of the estimated capacity during dry weather conditions, and Falcon Site 1 had peak flows over 60% existing capacity. There was only one significant rainfall event during the flow monitoring period, and I/I did seem to be an issue for the system. All six flow monitoring locations logged higher flows immediately following the event.

### Smoke Testing

McGill and the Cumberland County staff smoke tested segments of gravity sewer lines connected to multiple manholes across the system, enabling the full smoke testing of the entire 26 miles of the sewer system. This testing occurred over a period of several days to determine locations where I/I could enter the wastewater collection system. For each segment, McGill and County staff selected a centrally located manhole on which to place the blower based on the manhole's accessibility. The crew recorded smoke emerging from 240 abnormal locations, which divided generally into four categories- broken or uncapped cleanouts, broken lines, unsealed manholes, and unknown defects. All smoke occurrences are recorded in Appendix A and shown in Figure 3.

### Manhole Inspections

All manholes in the NORCRESS system are precast concrete based on information provided by County staff. The results of the selected manhole inspections performed as a part of this inventory were used to develop an assessment of manhole conditions in the

system. Based on the inspections performed, manholes that were inspected were assigned a condition score, and these scores were combined into an overall condition rating for each manhole- excellent, good, fair, or poor. Of the 37 manholes inspected, approximately 34 were in good condition and four were in fair condition. These results are recorded in Figure 7 and included in Appendix A.

### Lift Station Inspections

The NORCRESS System is served by four lift stations: one in Godwin, one in Falcon, and two in Wade. The County previously contracted with Freese and Nichols to perform an analysis and report on the lift stations. Lift station inspection was not included in the scope of this assessment. Analysis of the lift stations was included the NOCRESS Comprehensive Sewer Evaluation study completed by Freese and Nichols in June 2021. For reference, record drawings for the lift stations are included in Appendix G of this report.

### Findings and Recommendations

The system evaluation allowed McGill to assemble a list of general recommendations and high priority projects to guide the County in the next 10 years. General recommendations to the District included establishing its own flow monitoring and smoke testing programs in high priority areas to determine sewer rehabilitation needs and inspecting sewer lines and manholes with CCTV equipment during routine cleanings to track the condition of these items. McGill also recommended the County begin rehabilitation and/or replacement of existing manholes within the collection system in order to reduce the risk of I/I.

Data and field investigation reporting were utilized to identify the priority projects within the collection system, focusing on manhole rehabilitation.

Table 1 summarizes projects identified during this assessment, centering around additional flow monitoring, flow meters, and manhole rehabilitation projects. A project to

install flow monitors is included to give greater control and understanding of flows from the collection system.

**Table 1: Summary of Capital Improvements Projects**

<b>No.</b>	<b>Project Name</b>	<b>Cost</b>
1	Flow Monitoring Study	\$25,440.00
2	Manhole Rehabilitation Project 1	\$118,600.00
3	Flow Monitoring Improvements	\$203,900.00
4	Manhole Rehabilitation Project 2	\$118,600.00
5	Manhole Rehabilitation Project 3	\$118,600.00
6	Manhole Rehabilitation Project 4	\$118,600.00
7	New Generators All Lift Stations	\$640,000.00
8	Upgrade SCADA	\$240,000.00
9	Falcon Force Main-Inspect, Clean, and Replace ARVs	\$80,000.00
<b>10-Year CIP Total Project Cost</b>		<b>\$1,714,620.00</b>

***Capital Improvements Plan***

The purpose of this asset inventory and assessment was to document the condition of the District’s inventoried infrastructure to assist the County with becoming proactive in the management of its wastewater system, to include capital project planning. The County does not currently have a Capital Improvements Plan (CIP) for its wastewater system. The CIP being developed from this current assessment will guide the County through its planning for projects within the 10-year window. The CIP will remain a living document and be updated in the future so that it remains current to the Districts’ highest priorities and provides accurate cost estimates. The CIP included in this assessment includes projects focused on rehabilitation of existing manholes, which have been identified to be potential sources for I/I into the system. Through discussion with County staff, field investigation and review of existing system data, the specific defects and general problematic areas within the wastewater system have been summarized. These results were used to update the CIP and formulate a ten-year plan.

The complete asset inventory and assessment task consisted of five parts culminating in the development of the NORCRESS Water and Sewer District’s CIP. McGill developed

cost estimates for all projects based on current 2024 materials and construction costs. The updated CIP is intended to be adopted by the County to guide its selection of sewer system improvement projects over the next decade. This plan also includes a budget-level recommendation for staffing associated with system operations and maintenance for all County utility districts.

**1.1 BACKGROUND**

The NORCRESS District is located in Cumberland County, North Carolina, and is owned and operated by Cumberland County. The District includes a wastewater collection system that currently serves 452 customers. A summary of customer type based on use is provided in Table 2. The collection system consists of approximately four and a half miles of gravity sewer mains that are 8-inch, 12-inch, 15-inch, and 16-inch in diameter. These gravity sewer mains are constructed of PVC and Ductile Iron pipe and are all 15 years old. Figure 1 shows the existing sewer collection system.

Developing a Capital Improvements Plan (CIP) will allow the District to update its current rate setting model to better estimate future revenue and expenses, capital outlay, indebtedness, and overall health of the sewer system enterprise fund reserves. A model of this nature would continue to balance revenues and expenditures with a longer-term approach to rate setting and establish a financially sound framework for the District to follow.

The District has experienced the degradation of manholes within its sewer collection system due to the age of the system and resulting from wear over time.

Even with the relatively young age of the NORCRESS system, County staff remains cognizant that infiltration and inflow (I/I) is always a concern, particularly in a scenario where the County's operation costs are based on the gallons of flow that enter into the existing lift station. The County is also aware that during dry weather there tend to be excessive flows in Godwin and Falcon (and therefore Wade, where flows are pumped from both Towns). Therefore, the top challenges for the NORCRESS system are mitigating I/I that results from deteriorated infrastructure and identifying the source of any additional flows into the collection system that do not first enter via water connection and are therefore billable. This additional information will help the County anticipate typical flows and assist with operations and maintenance planning. The information collected



throughout this assessment project will help identify system deficiencies and develop improvement projects to reach these goals.

This process resulted in the development of a 10-year Capital Improvements Plan (CIP) to guide the District with scheduling and financing the capital projects and equipment purchases necessary to restore its wastewater collection system. Through the AMP process, the McGill and County staff have estimated that approximately eighty-four (84) manholes would benefit from rehabilitation due to their poor condition.

The purpose of this Asset Management Plan (AMP) is to document the condition of the Districts' inventoried infrastructure to assist the District with becoming more viable and proactive in the management and financing of its wastewater system. The District continues to look to its CIP to guide its next projects; therefore, it is vital that the CIP remains current to the Districts' highest priorities and provides accurate cost estimates. This assessment project was utilized for the prioritization of replacement lines and improvements projects in the CIP.

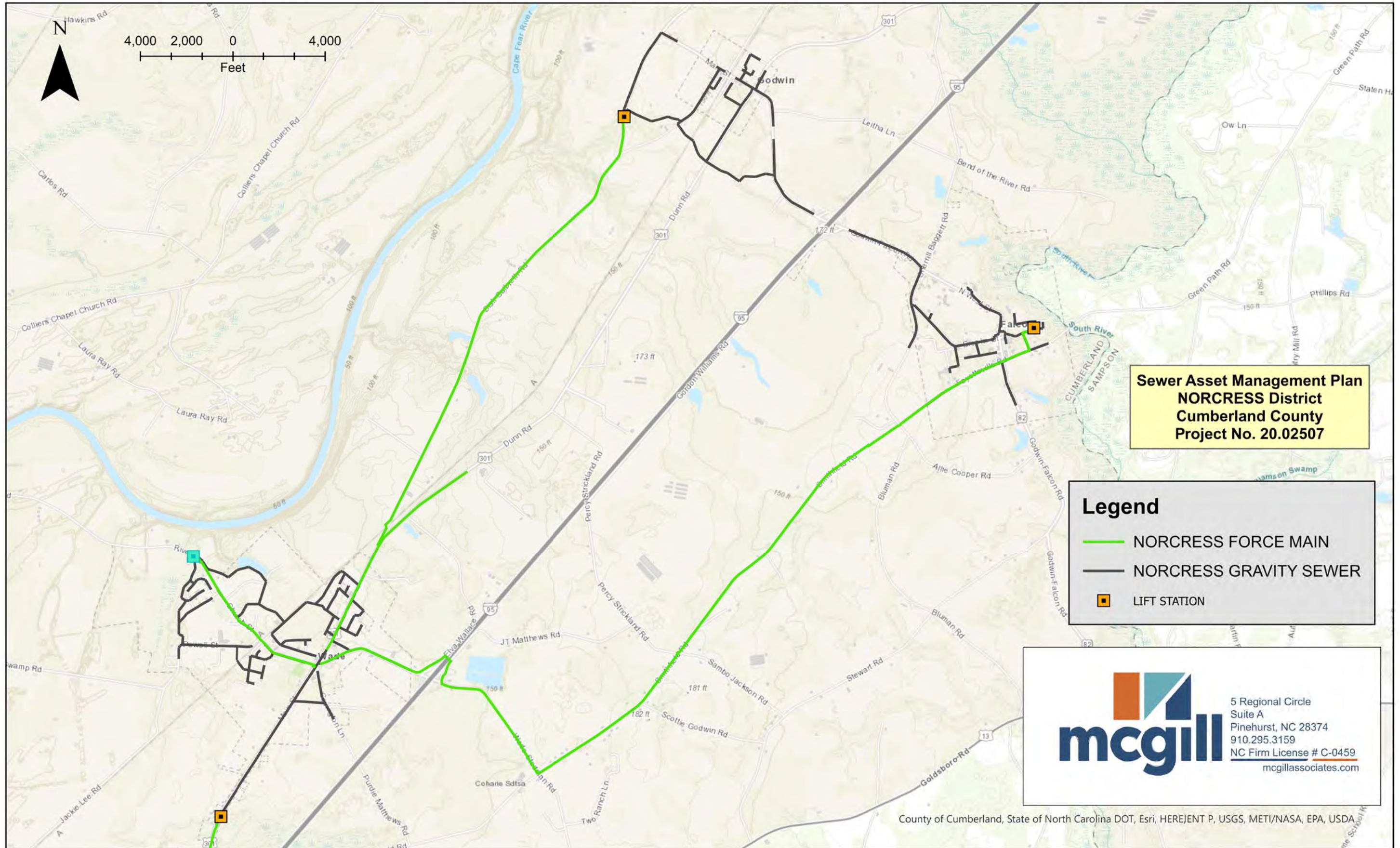
**Table 2: Summary of Customers by Use**

<b>Diameter</b>	<b>Total</b>	<b>% of System</b>
<b>Residential</b>	<b>394</b>	<b>87.1%</b>
<b>Commercial</b>	<b>50</b>	<b>11.1%</b>
<b>Industrial</b>	<b>3</b>	<b>0.7%</b>
<b>Flat Rate</b>	<b>5</b>	<b>1.1%</b>
<b>Total LF</b>	<b>452</b>	<b>100%</b>



# NORCRESS Overall System Map

## Figure 1



**Sewer Asset Management Plan**  
**NORCRESS District**  
**Cumberland County**  
**Project No. 20.02507**

**Legend**

- NORCRESS FORCE MAIN
- NORCRESS GRAVITY SEWER
- LIFT STATION



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 Suite A  
 Pinehurst, NC 28374  
 910.295.3159  
 NC Firm License # C-0459  
 mcgillassociates.com

County of Cumberland, State of North Carolina DOT, Esri, HERE/JENT P, USGS, METI/NASA, EPA, USDA



## 2.1 FLOW MONITORING

### 2.1.1 Overview

The purpose of flow monitoring was to determine the capacity, average daily flow, and wet-weather flows within areas of the NORCRESS system. This information reveals locations where significant Infiltration and Inflow (I/I) enters the system causing a reduction in available capacity and potential for overflows and sewer backups in the system. Infiltration and Inflow have similar impacts but are contributed to by different sources and can be located and/or resolved using different methods.

Infiltration is water, besides wastewater, that seeps into the sewer system through the ground. Typical infiltration sources include broken pipes, defective pipe joints, damaged manhole walls, and broken service connections. Infiltration typically enters a system slowly and may remain evident in the sewer system for several days following a rainfall event. Although infiltration generally does not produce high peak flows, infiltration regularly results in large volumes if I/I.

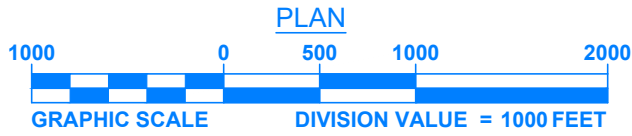
Inflow is water, besides wastewater, that enters the sewer system directly. Typical inflow sources include storm/sewer cross-connections, roof leader connections to sewers, vented manhole covers, and missing cleanout caps. Inflow produces rapid flow increases and often causes sewer system surcharging and overflows during rainfall events. Inflow regularly results in peak I/I flow and high peaking factors.

### 2.1.2 Investigation

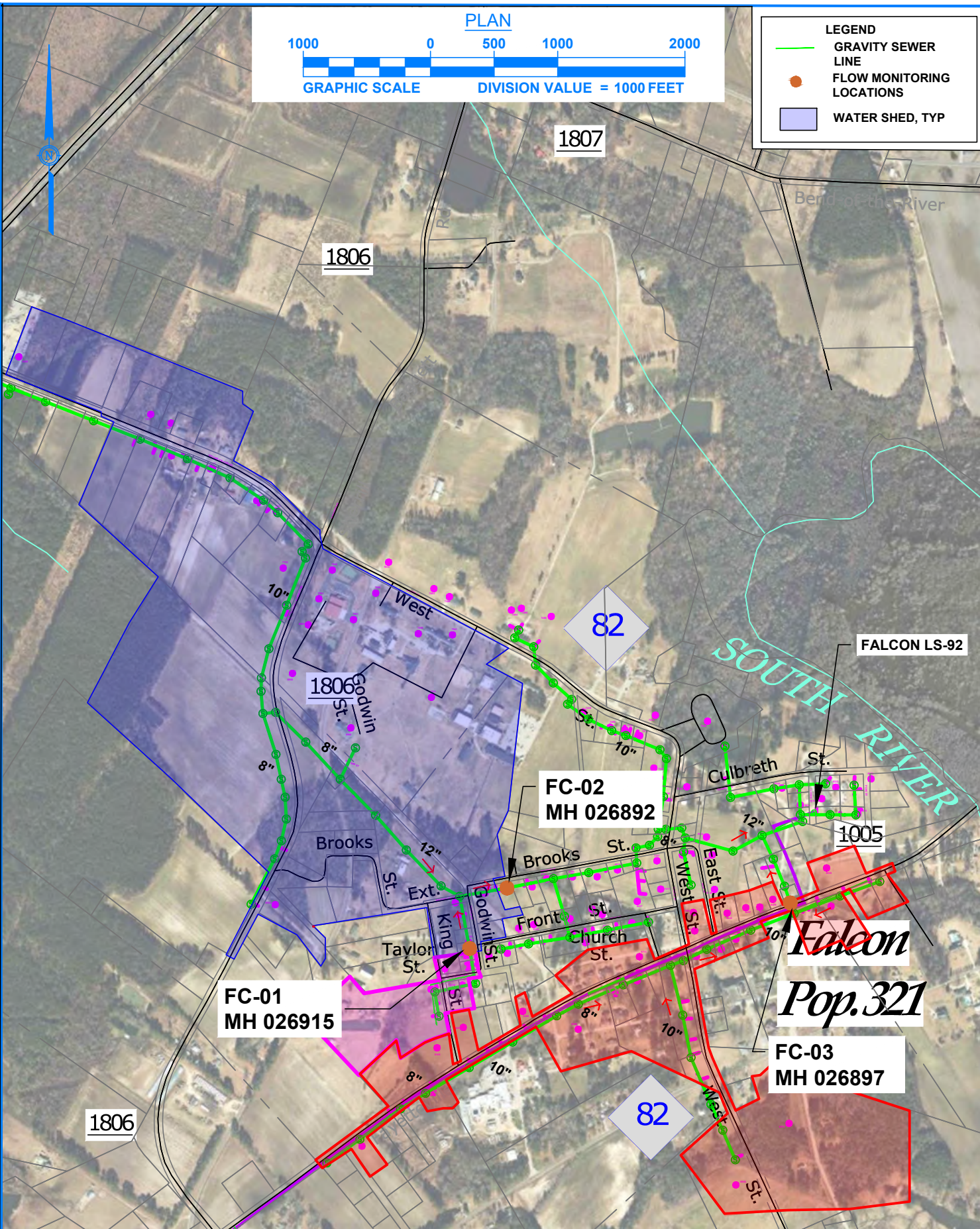
Meetings were held with County staff to identify areas of concern within the sewer system and select locations to place flow meters. McGill reviewed the results of the 2021 Freese and Nichols NORCRESS Study, in which the recommendation was to further monitor the flow in Godwin and Falcon. Both of those Towns produced higher than anticipated flow during the period of monitoring during that study. From discussions with County staff, it

was determined that flow monitors would be placed within the Towns of Godwin and Falcon. Three sewersheds were developed for each Town, resulting in the placement of three flow monitors in each Town. Utilizing staff from KRG Utility, McGill owned flow monitors were installed and flow was monitored from October 18 through November 28, 2023. A map of both Towns and the sewersheds and monitoring locations is shown in Figure 2 and Figure 3. The shaded areas denote the sewersheds for each site.





LEGEND	
	GRAVITY SEWER LINE
	FLOW MONITORING LOCATIONS
	WATER SHED, TYP



P:\2020\20.02507-CUMBERLAND-ENGINEERING\DRAWINGS\FIGURES\20.02507 FLOW MONITORING FIGURE.DWG PLOT DATE 3/21/2024 3:52 PM DEMI WATKINS

5 Regional Circle  
Suite A  
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910.295.3159  
NC Firm License # C-0459  
mcgillassociates.com

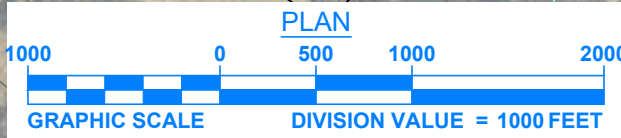
<b>DATE</b>	OCTOBER 2023
<b>PROJECT #</b>	20.02507
<b>PROJECT MANAGER</b>	M. JONES

**ASSET MANAGEMENT PLAN**  
**CUMBERLAND COUNTY PUBLIC UTILITIES**  
CUMBERLAND COUNTY, NORTH CAROLINA

NORCRESS FLOW  
MONITORING IN FALCON

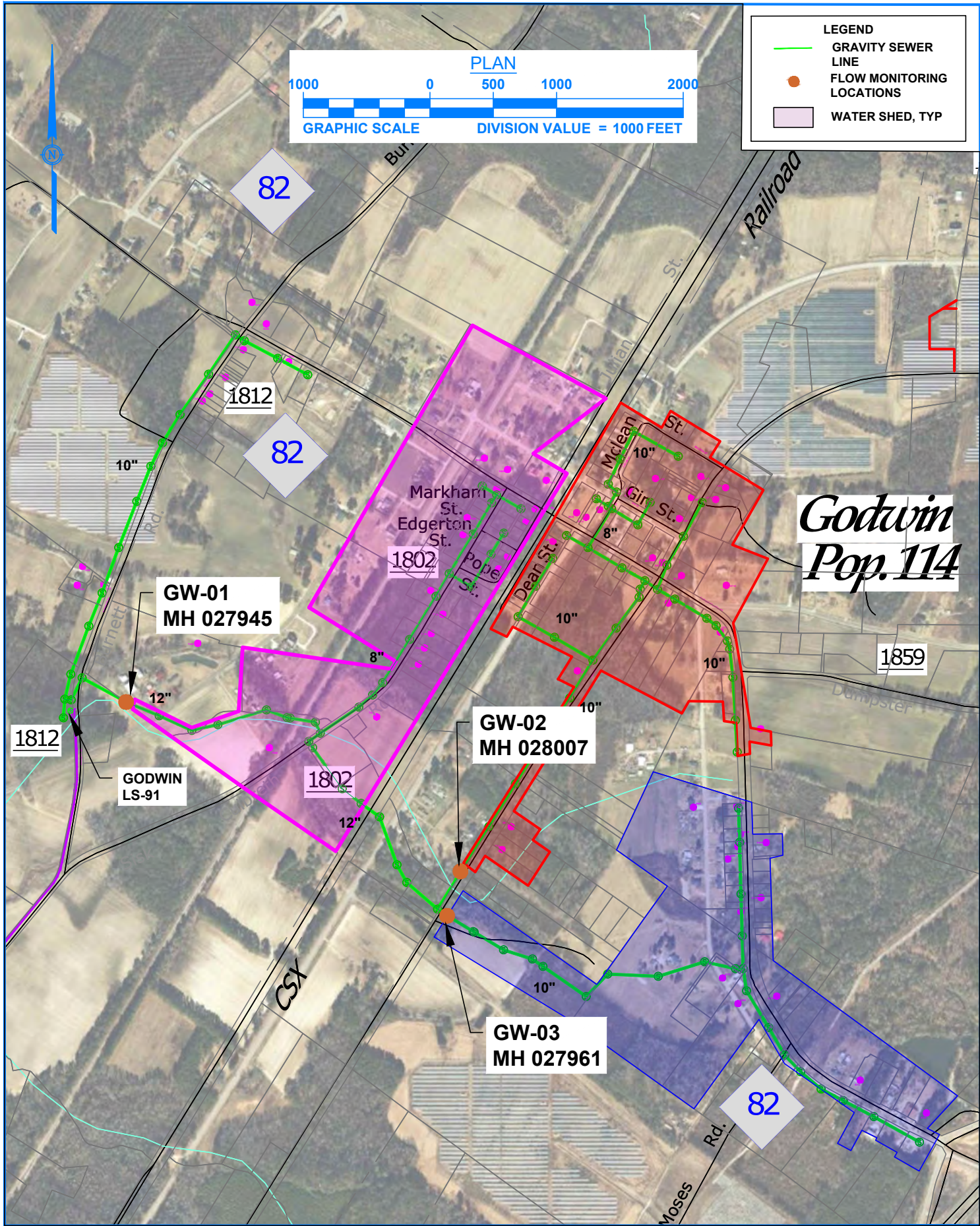
SHEET  
**FIG 2**





**LEGEND**

- GRAVITY SEWER LINE
- FLOW MONITORING LOCATIONS
- WATER SHED, TYP



P:\2020\20.02507-CUMBERLAND CONC-ENGINEERING\DRAWINGS\FIGURES\20.02507 FLOW MONITORING FIGURE.DWG PLOT DATE 3/21/2024 3:59 PM DEMI WATKINS

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DATE OCTOBER 2023
PROJECT # 20.02507
PROJECT MANAGER M. JONES

ASSET MANAGEMENT PLAN  
**CUMBERLAND COUNTY PUBLIC UTILITIES**  
CUMBERLAND COUNTY, NORTH CAROLINA

NORCRESS FLOW MONITORING IN GODWIN

SHEET  
**FIG 3**



### 2.1.3 Methodology

Average dry-weather flows provide the basis for capacity and wet-weather flow analyses. To develop the average dry-weather flows, McGill averaged the flows for each day with typical flow (no rain events or evidence of silt/debris). Several days that fit this criterion were used in the calculation to acquire the dry-weather flow each respective meter. If present, daily groundwater infiltration into the sewer system is included in the reported average daily flows.

During the flow monitoring period, rain events were recorded on October 21, Nov 11-13, and November 23 based on rainfall data recorded at the Fayetteville Regional Airport (provided in Appendix C). The flows at each of the six flow monitoring devices were recorded during these events. The rainfall event on October 21 was less than 0.5 inches and did not cause I/I based on the monitoring data. The events from November 11-13 and November 22 recorded over 2 inches of rainfall and did contribute I/I into the system. Anticipated flows for each basin were estimated based on the dwellings served. The range represents the estimated value based on usage of 225 gpd/dwelling, which is the updated estimate from 360 gpd/dwelling based on NCAC 02T rules. Dry weather flows were approximated based on the flow seen between rain events at the meter. Actual average daily flow recorded by the meters is also noted.

**Table 3: Summary of Flow Monitoring Drainage Areas**

Site	Flow Meter Location	Structures/Dwellings	Area (acres)	Estimated Flow (gpd)	Dry Average Flow (gpd)	Total Average Flow (gpd)
FC-01	Godwin St	5	14.4	22,925*	11,970	12,070
FC-02	Brooks St	22	224.3	16,050*	23,170	24,970
FC-03	Fayetteville Rd	22	88.9	4,950	1,660	1,625
GW-01	Burnette Rd	17	111.8	6120	7,800	7,930
GW-02	Dunn Rd	21	84.1	7560	7,875	7,290
GW-03	Dunn Rd	13	95.0	4680	4,560	4,340

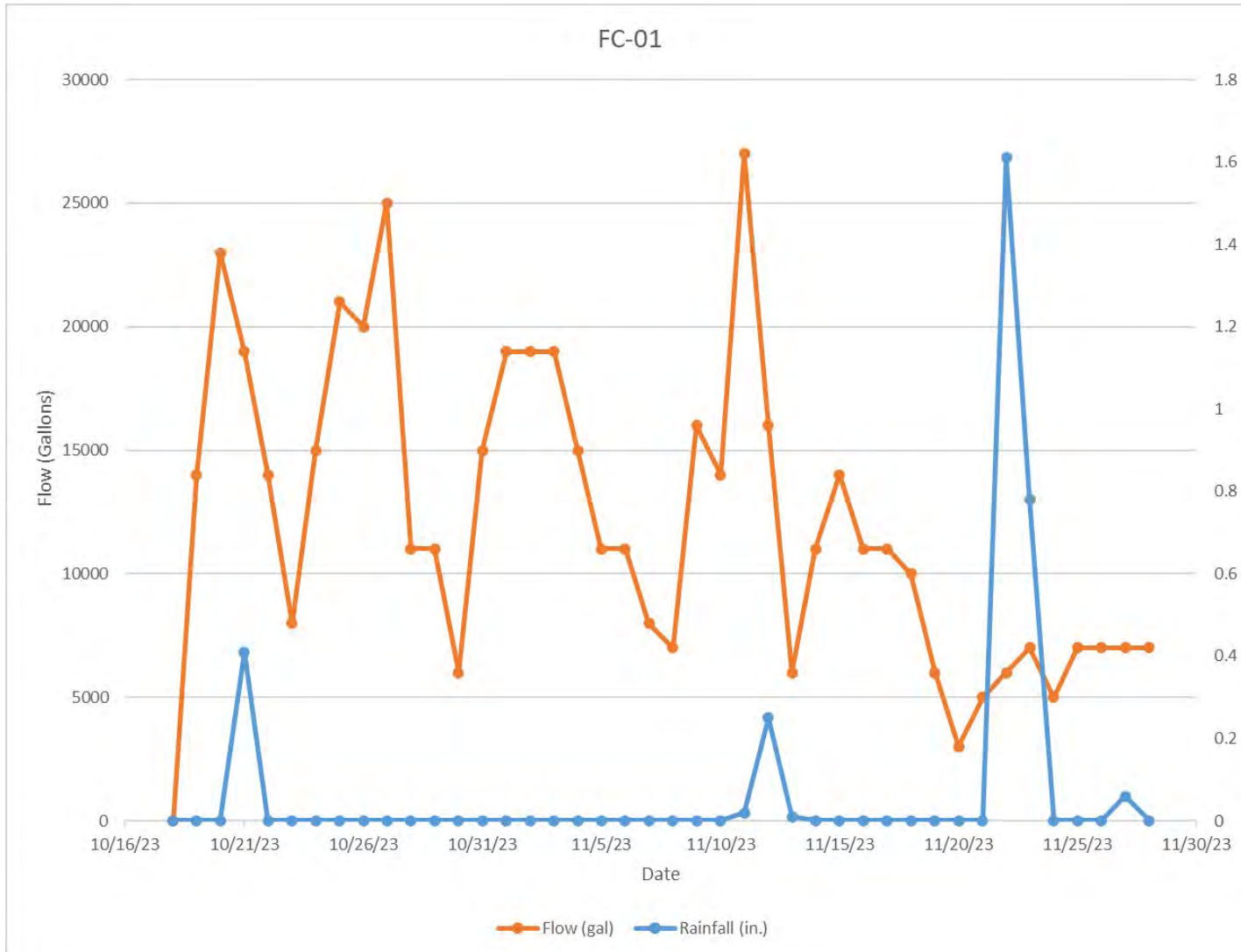
\*FC-01 and FC-02 Expected Flows include estimated average daily flows for Martins Meats and the Falcon Children’s home. These two entities represent the largest water users in the system.

**Table 4: Summary of Large Users In Falcon**

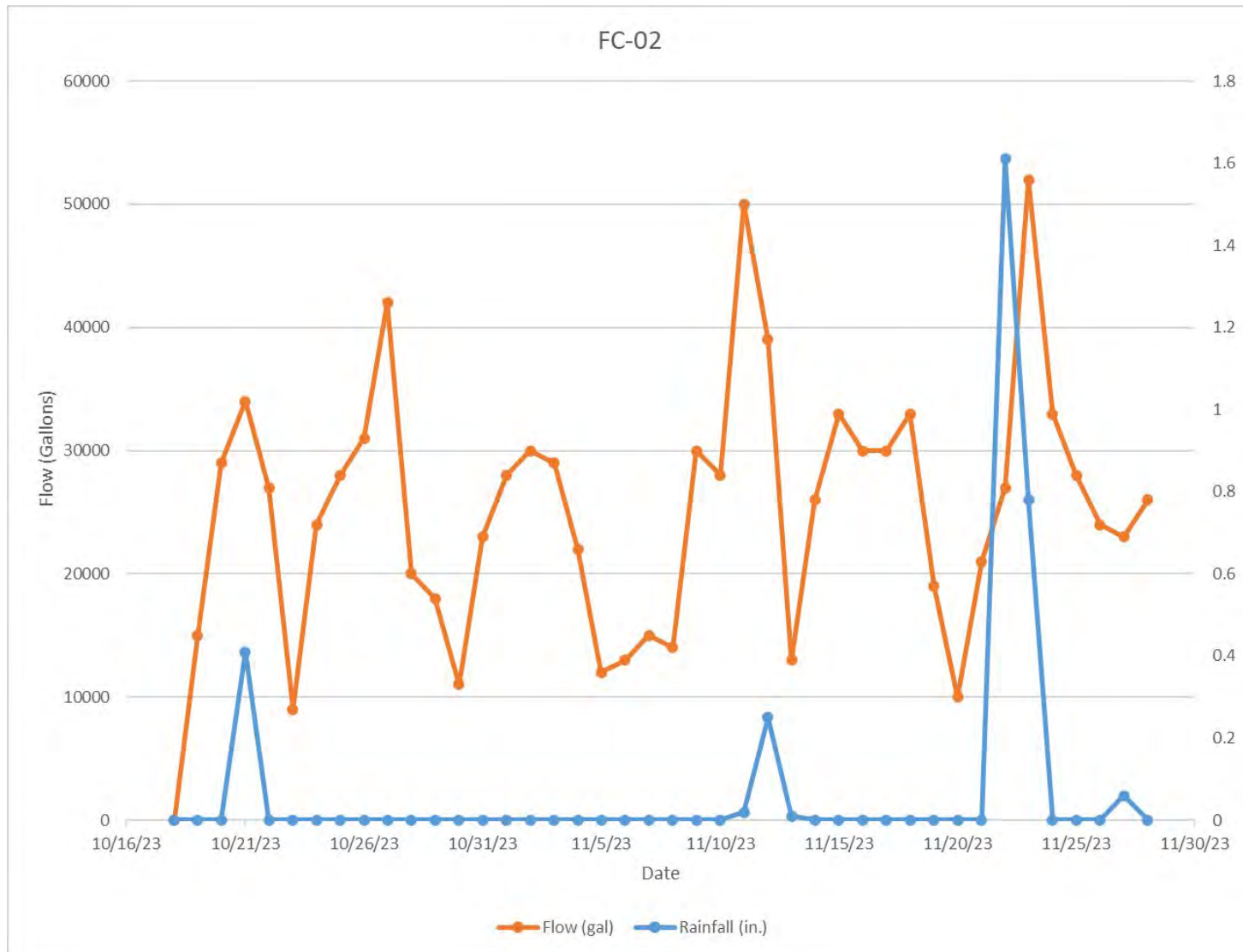
	<b>Total Water Usage (gal)</b>	<b>Total Sewer flow (gal)</b>	<b>Notes</b>
<b>Martins (Accts: 562,665,808)</b>			
October	736,630	202,000	<i>Sewer Flow monitored 10/18-10/31</i>
November	573,810	305,000	<i>Sewer Flow monitored 11/1-11/28</i>
Avg Flow (gpd)	21,840.67		
<b>Falcon Children's Home (Accts: 96,97,98,101,102,103,208,209,210,211,213,328,378,495,585,913,914,915,982,1052)</b>			
October	406,750	109,000	<i>Sewer Flow monitored 10/18-10/31</i>
November	258,500	433,000	<i>Sewer Flow monitored 11/1-11/28</i>
Avg Flow (gpd)	11,087.50		



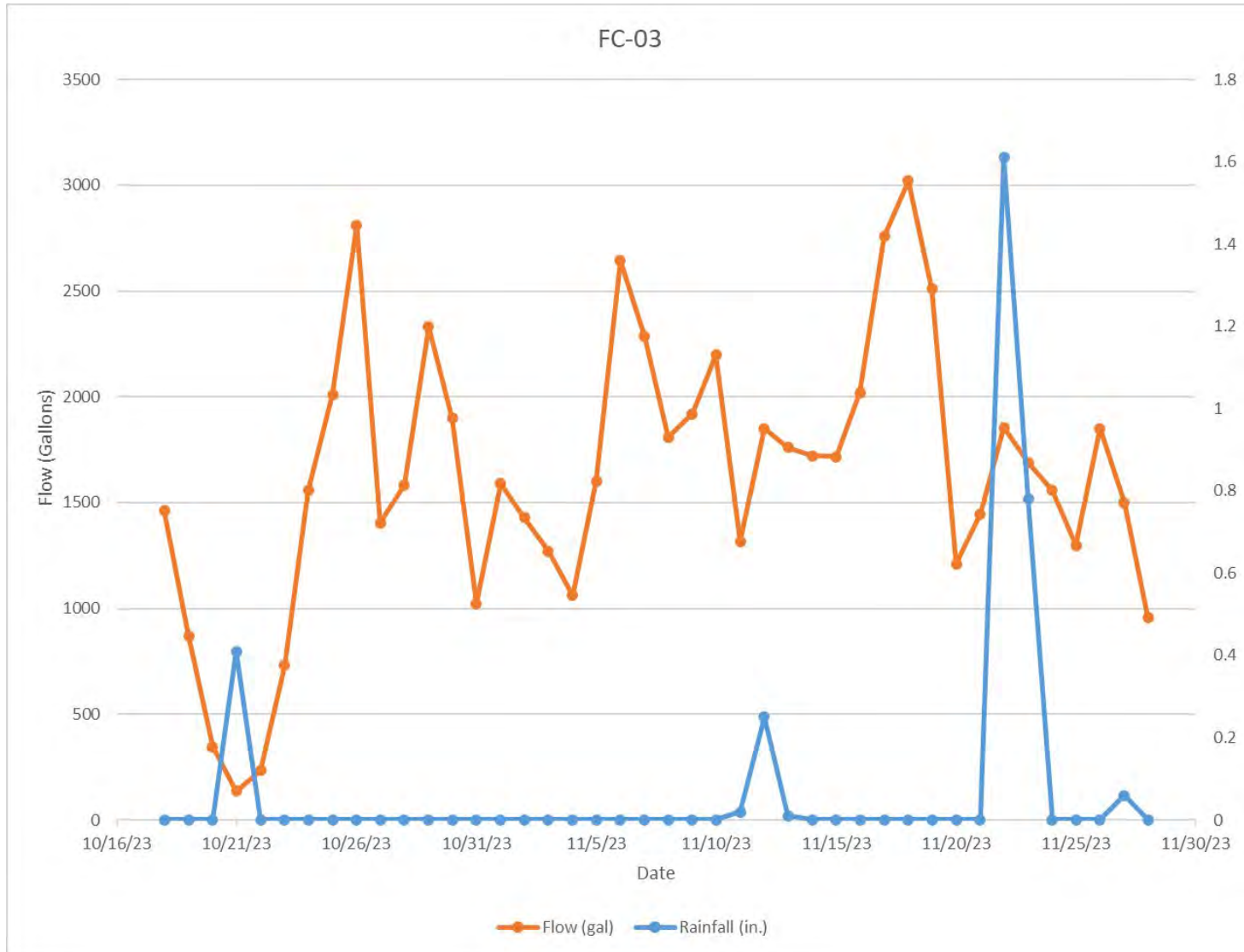
**Graph 1: Falcon Location 01, Daily Flow vs. Rainfall**



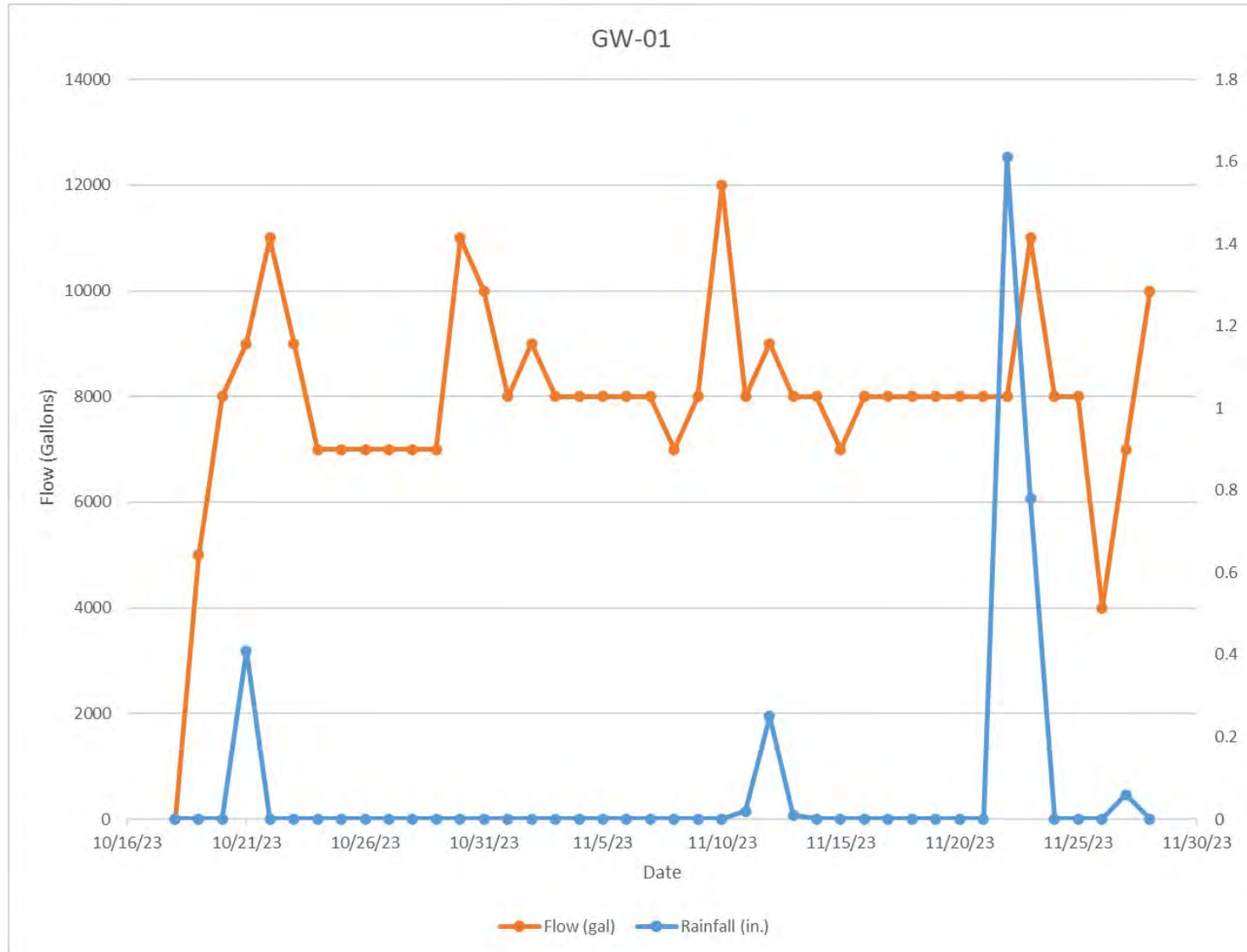
**Graph 2: Falcon Location 02, Daily Flow vs. Rainfall**



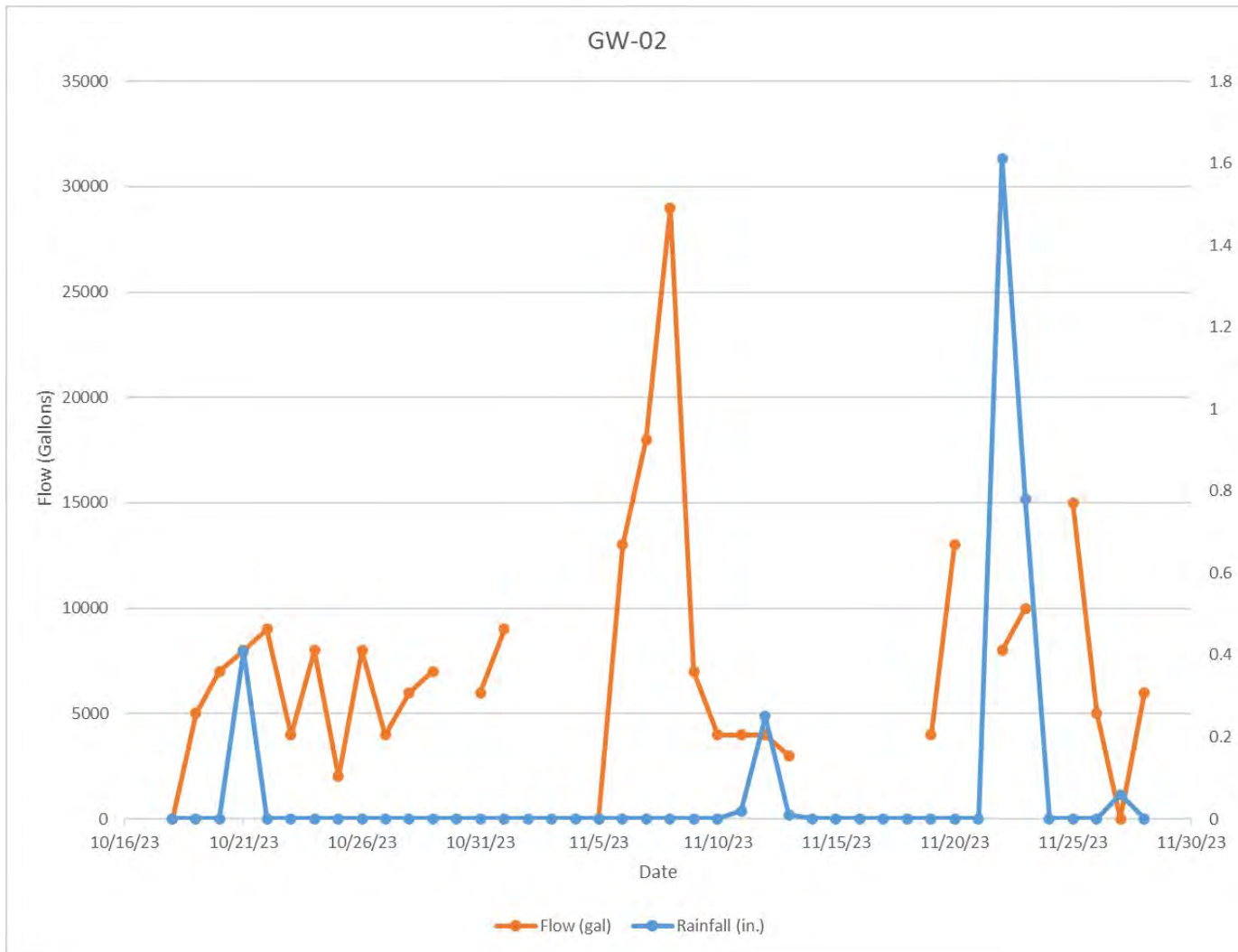
**Graph 3: Falcon Location 03, Daily Flow vs. Rainfall**



**Graph 4: Godwin Location 01, Daily Flow vs. Rainfall**

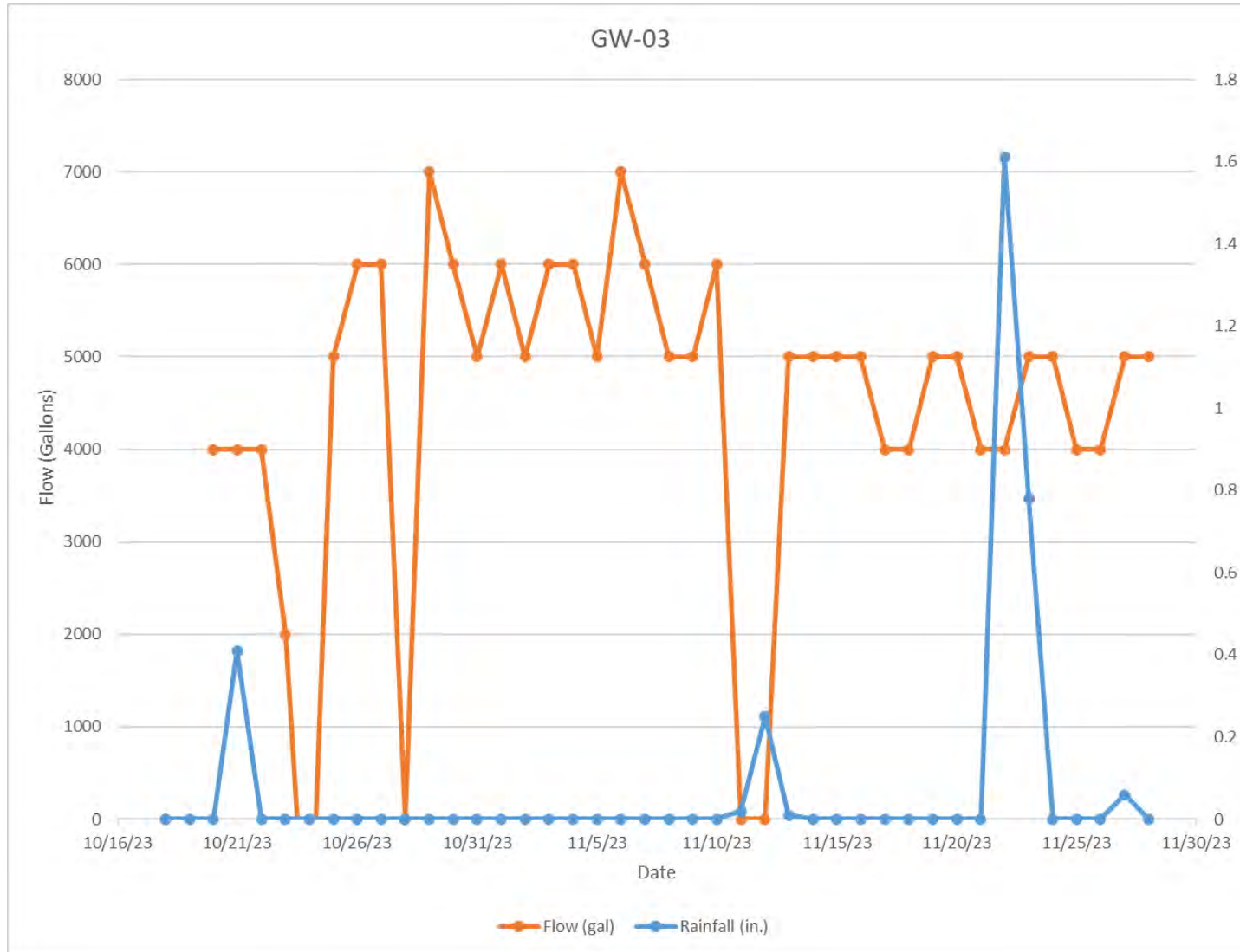


**Graph 5: Godwin Location 02, Daily Flow vs. Rainfall**



Note: Several segments on the graphed flow line show no recorded flow as a result of a negative recorded reading for total flow during the day. There was evidence in the manhole of flow backing up to the mounted meter during this period.

**Graph 6: Godwin Location 03, Daily Flow vs. Rainfall**



#### **2.1.4 Results**

The purpose of the flow monitoring was to determine which locations in the NORCRESS wastewater collection system were the best candidates for further field testing to uncover sources of I/I and other issues. Flow monitoring revealed the following behaviors for the sites/sewersheds depicted in Figure 1:

- All sites had sufficient capacity to handle current dry-weather flow.
- No locations exhibited significant I/I indicators
- Location FC-02 had evidence of inflow as the flow spiked during rain event but then returned quickly.
- Most of the locations monitored showed flows following events that were typical based on dry weather conditions.
- Flow from Martin's Meats do not appear to exceed water usage based on FC-01.
- Flow from Falcon Children's Home does appear to exceed water usage based on FC-02.

The County experiences frequent issues with increased flow from the NORCRESS system that exceeds water usage in the system. Given the results of flow monitoring, it is recommended that additional flow monitoring be performed in Falcon. Additionally, further investigation of possible groundwater or other sources of flow into the system from the Falcon Children's Home property.

In terms of additional monitoring, McGill recommends mid-term flow monitoring of the Falcon area (and any other areas where I/I or unaccounted flow is suspected). Duration would be for a year to begin with, in order to have 12-months of data to review against rainfall and water usage.



## **2.2 SMOKE TESTING**

### **2.2.1 Overview**

Smoke testing is one of the most cost-effective ways to locate defects in sewer mains and laterals. In this process, artificially produced non-harmful smoke is injected into the sewer line via a blower placed over a selected manhole. The pressurized smoke travels up and down the sewer line and connections and emerges at openings in the system. This visual aide allows test crews to easily identify, record, and mark locations where defects are present. If the sewer is in good condition, one should only see smoke rising from manhole lids and house roof vents. If the line has defects, such as breaks or illegal connections, the smoke will emerge at these points.

### **2.2.2 Investigation**

McGill met with County staff to identify areas that would benefit most from smoke testing. Based on the size of the NORCRESS District and having the use of the County's team and equipment in addition to McGill, it was determined that the entire system could be smoke tested. McGill prepared a detailed map of the areas based on the County's GIS database. The Fire Department and customers along the route were alerted to the upcoming testing.



### **2.2.3 Methodology**

McGill and County staff smoke tested all 26 miles of gravity sewer lines over a period of three days to determine locations where I/I enter the wastewater collection system. For each line to be tested, County staff recommended a centrally-located manhole on which to place the blower based on the manhole's accessibility and avoidance of traffic. The manhole nomenclature used by the County was utilized and the location, configuration and condition of each one was recorded.

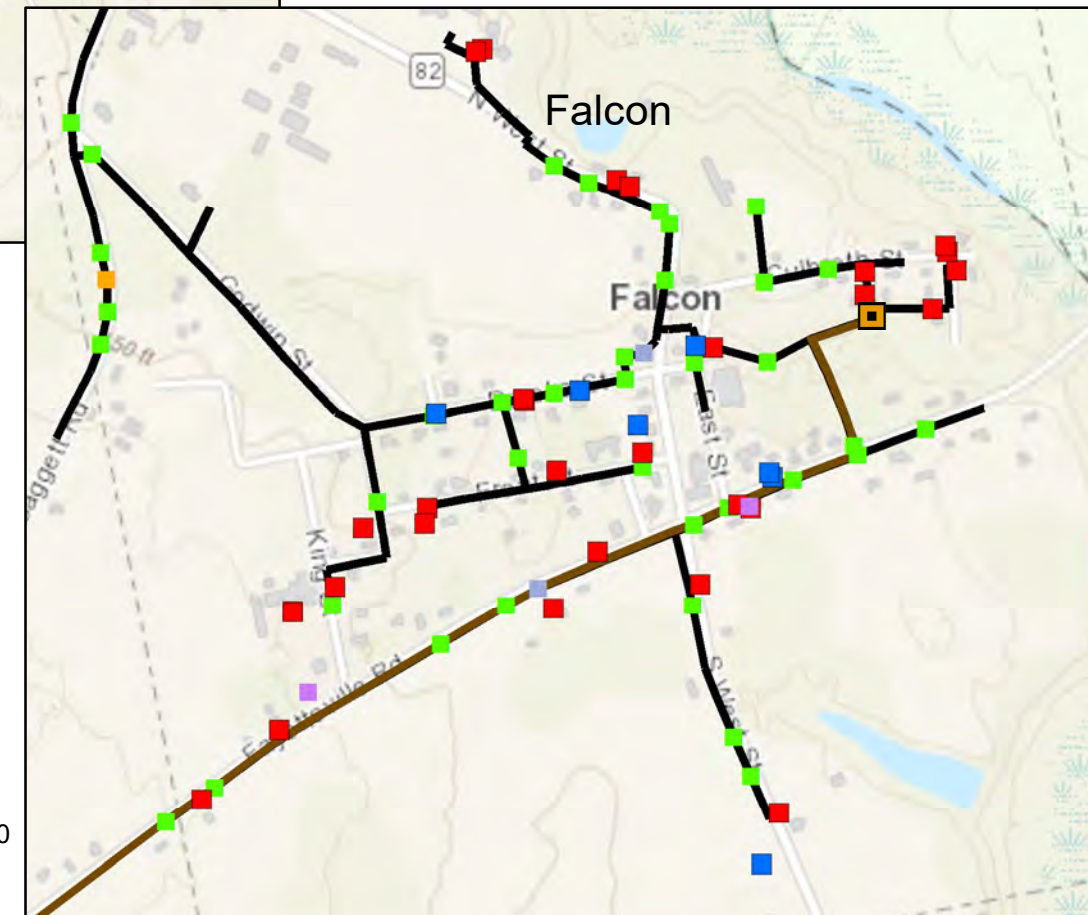
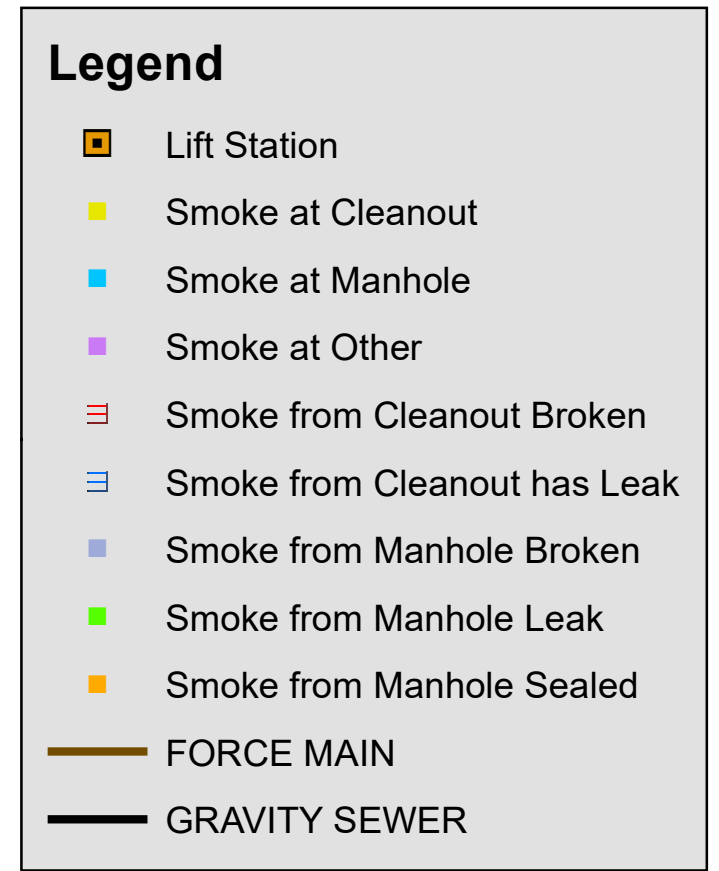
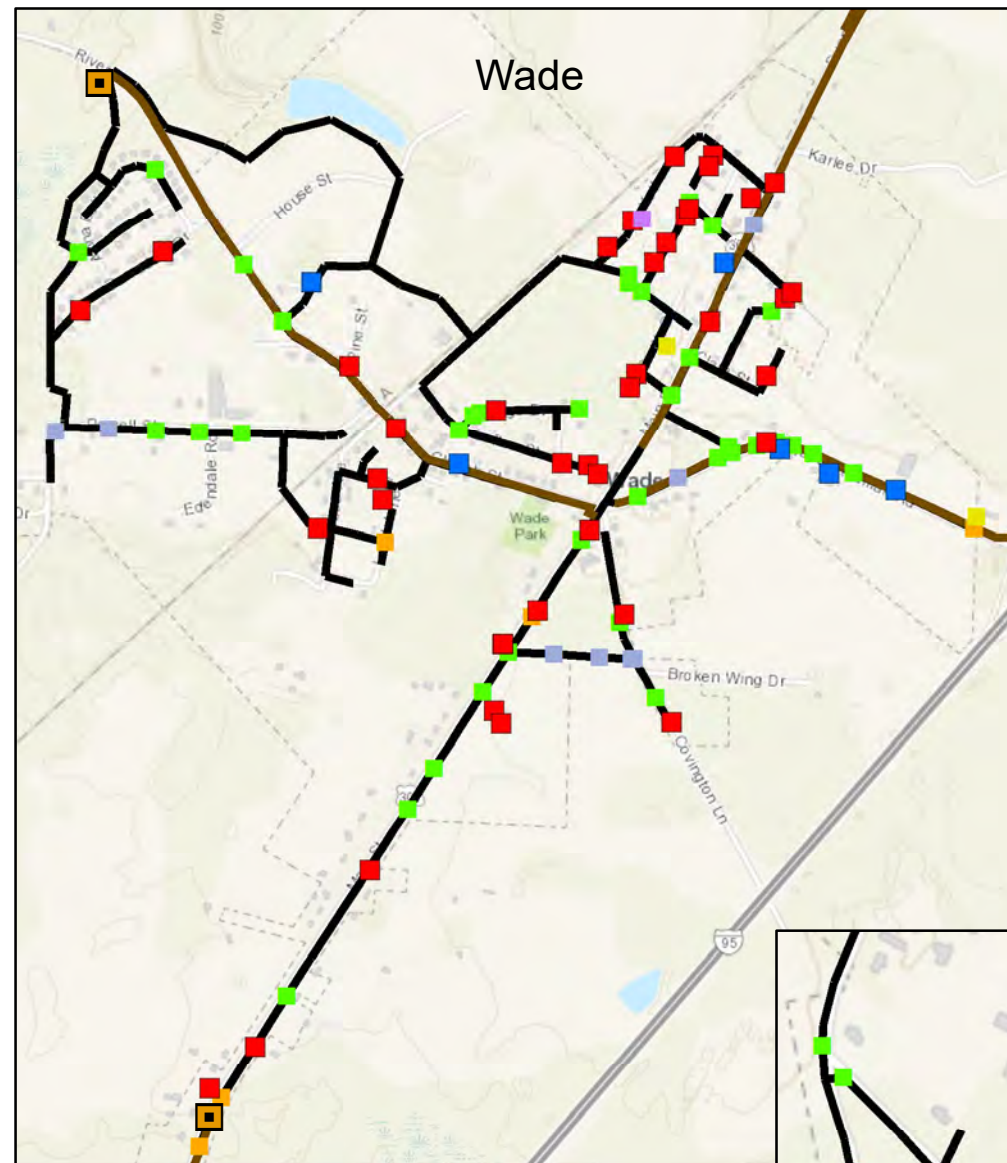
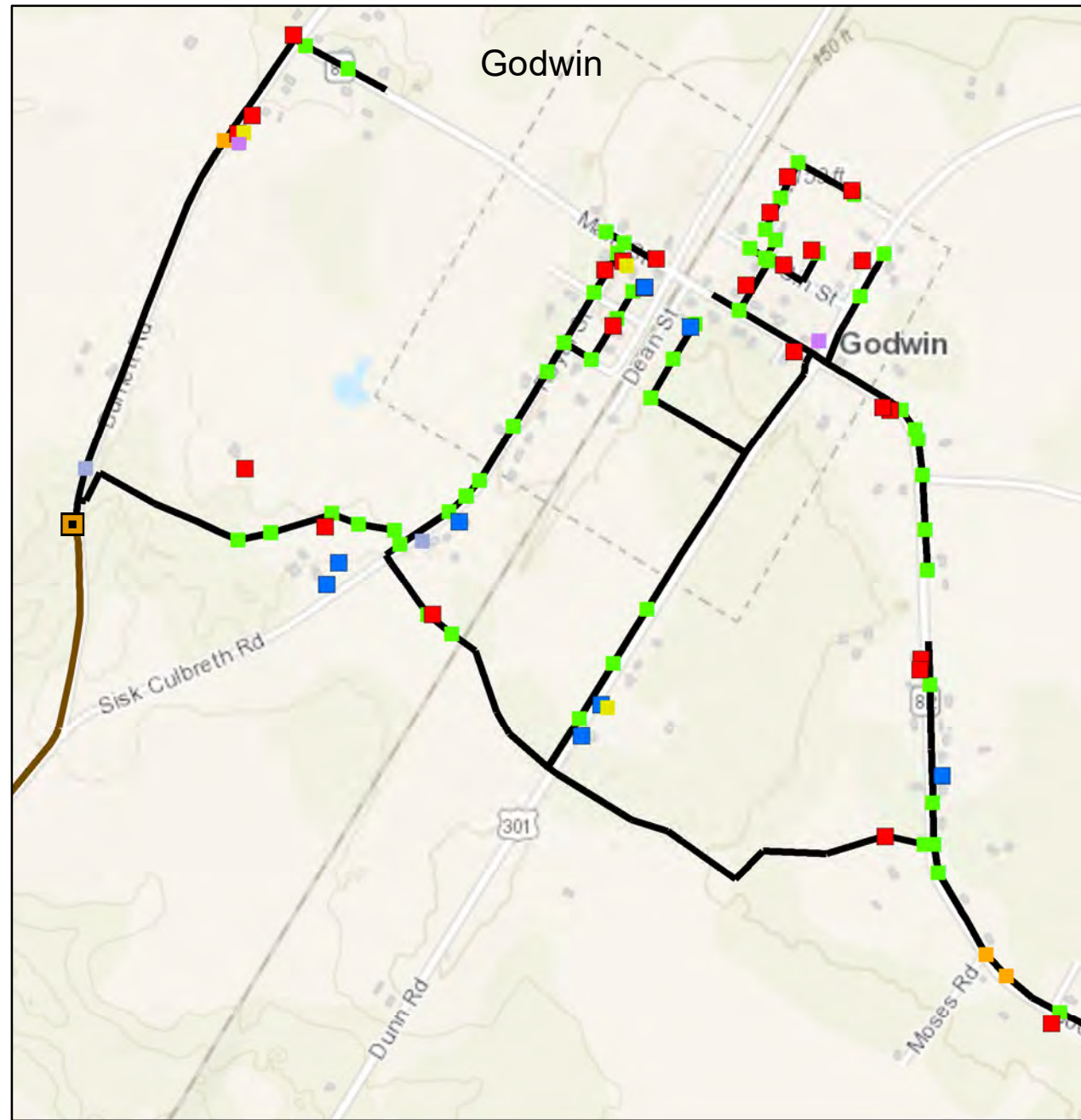
At each location, the following procedure was executed.

1. Place the blower on the manhole (with the rubber seal, if necessary).
2. Fill smoke pump up to  $\frac{3}{4}$  with liquid smoke.
3. Close all smoke pump valves.
4. Start blower and allow to warm up.
5. Open smoke pump valves.
6. Pressurize smoke pump by pumping the canister manually.
7. Once smoke begins emerging from roof vents, begin surveying for smoke emergencies indicating defects or problem areas in the pipeline.
8. For each defect, record the opening type, address, manhole identifier, and notes.
9. Additionally, mark each defect with paint.

This process continued until all visible defects were marked and recorded. Figure 4 shows some problematic system openings.

# NORCRESS Smoke Testing Map

## Figure 4

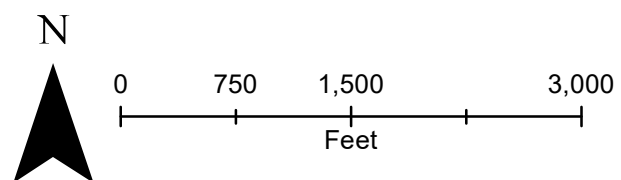


**Sewer Asset Management Plan**  
**NORCRESS District**  
**Cumberland County**  
**Project No. 20.02507**



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### **2.2.4 Results**

The crew recorded 240 abnormal smoke outlets, which divided generally into five categories.

1. Broken or uncapped cleanouts: Several cleanout caps were missing or broken. The cumulative number of broken cleanouts in the District can contribute to significant I/I. County staff had repair caps on hand during the testing and was able to install new caps where needed.
2. Ground Smoke: Ground smoke can be the result of broken lines, joint separation, etc. Any of these problems can cause significant I/I.
3. Unsealed manholes: Some manholes emitted excess smoke indicating cracked concrete or offset rings. Manholes located in ditches are most likely to contribute I/I.
4. Connected storm drains and culverts: Storm drains and culverts connected to the sanitary sewer systems contribute significant amounts of I/I into the system. These connections are good candidates for video testing.
5. Unknown: Some smoke occurrences require further investigation to determine the type of opening.

A spreadsheet describing all smoke occurrences can be found in Appendix A and all locations were documented in the mapping information in ArcGIS for the County staff to use.

## **2.3 SEWER MAINS**

### **2.3.1 Overview**

NORCESS sewer mains consist of polyvinyl chloride (PVC) and ductile iron pipe. The District's existing sewer lines range from 8-16 inches in diameter. The age of the system and system materials were confirmed by the County based records from construction of the system in 2005. Condition was determined based on visual inspection of select manholes and smoke testing of the system.

### **2.3.2 Investigation**

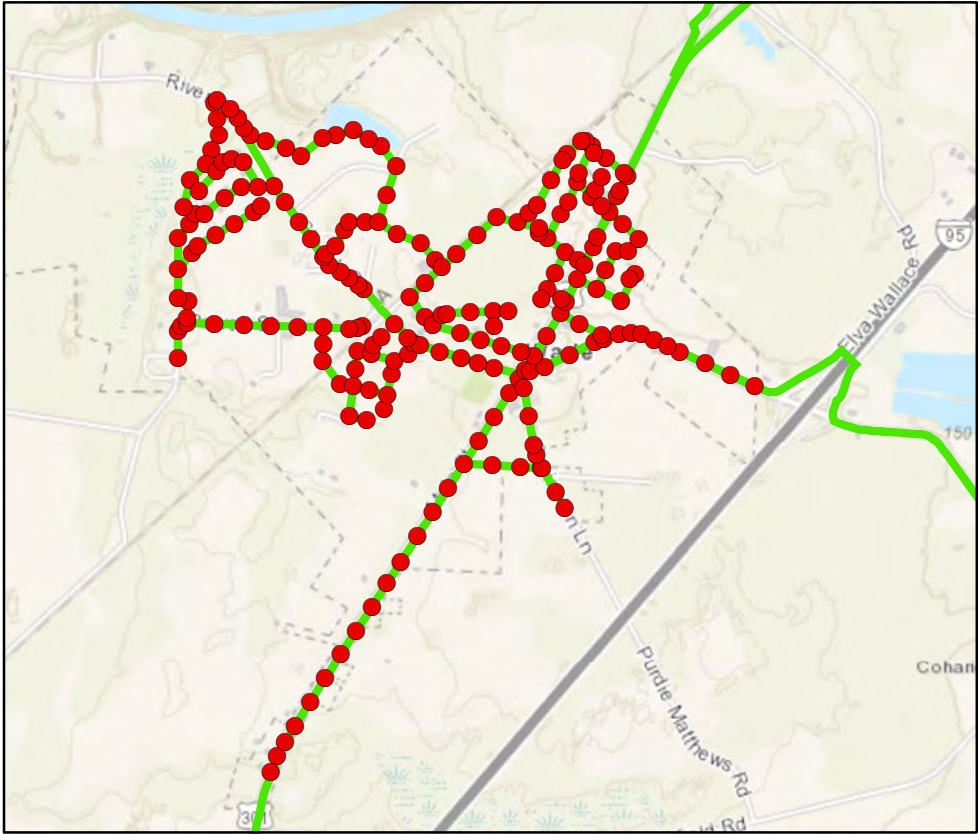
With County input, McGill has reviewed the District's data on sewer mains throughout the collection system. The sewer main material and diameters were verified by the County and updated according to GIS records. Figure 5 shows the sewer line materials in the system, and Figure 6 shows the sewer line diameter throughout the system.

The purpose of this portion of the assessment was to create a working system inventory and then review which areas of the NORCESS District have system components in need of replacement or rehabilitation.

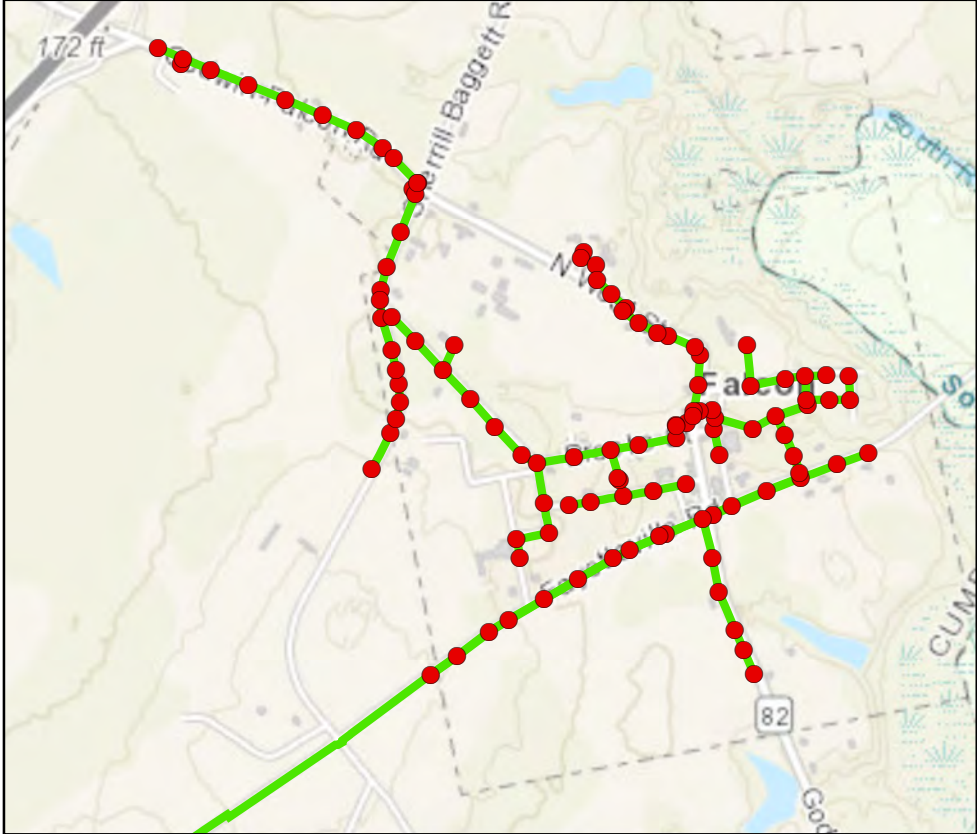


# Norcross Line Material Map Figure 5

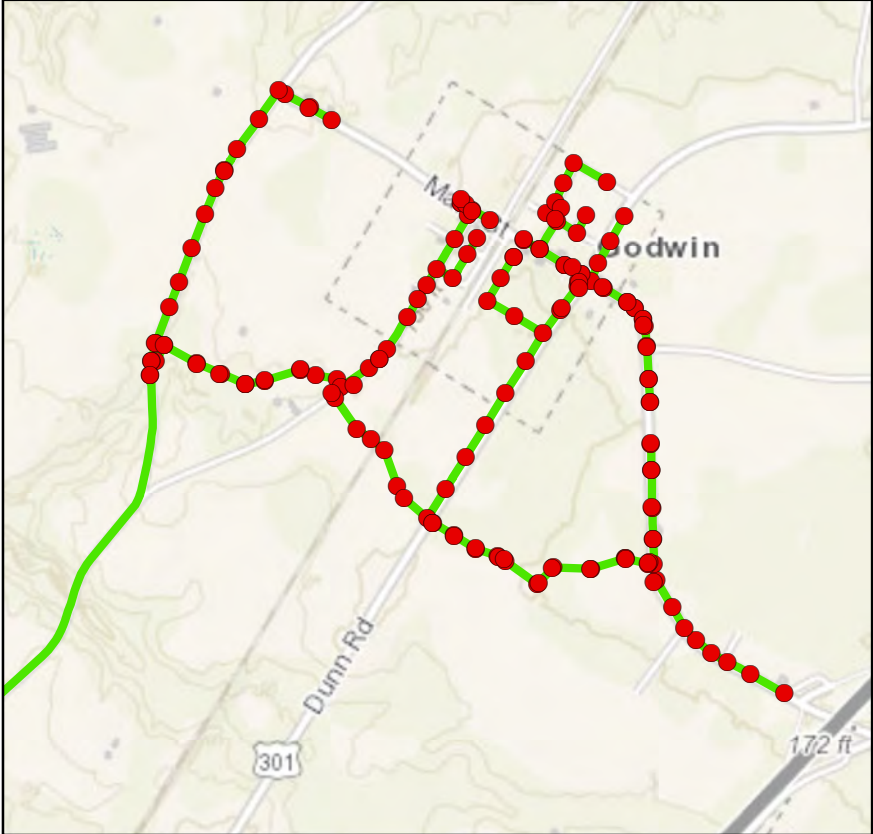
Wade



Falcon



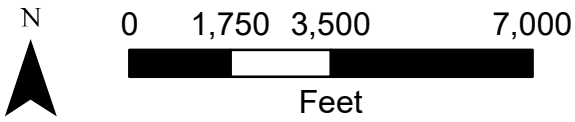
Godwin



**Sewer Asset Management Plan  
NORCRESS District  
Cumberland County  
Project No. 20.02507**

**Legend**

- PVC
- Norcross Manholes



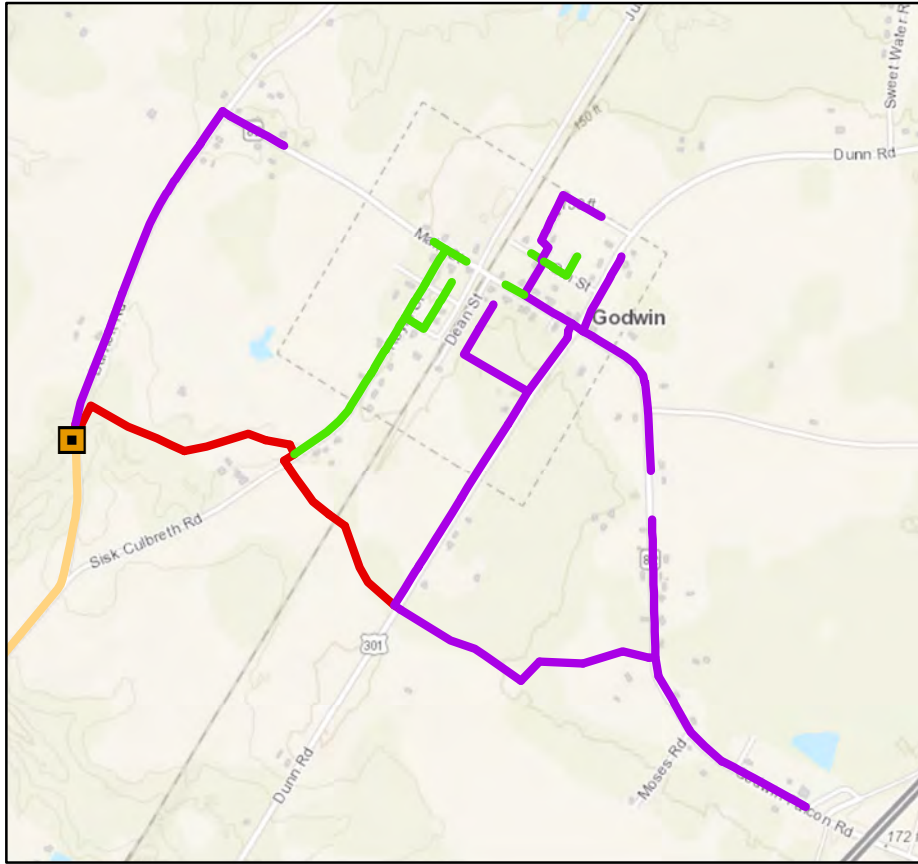

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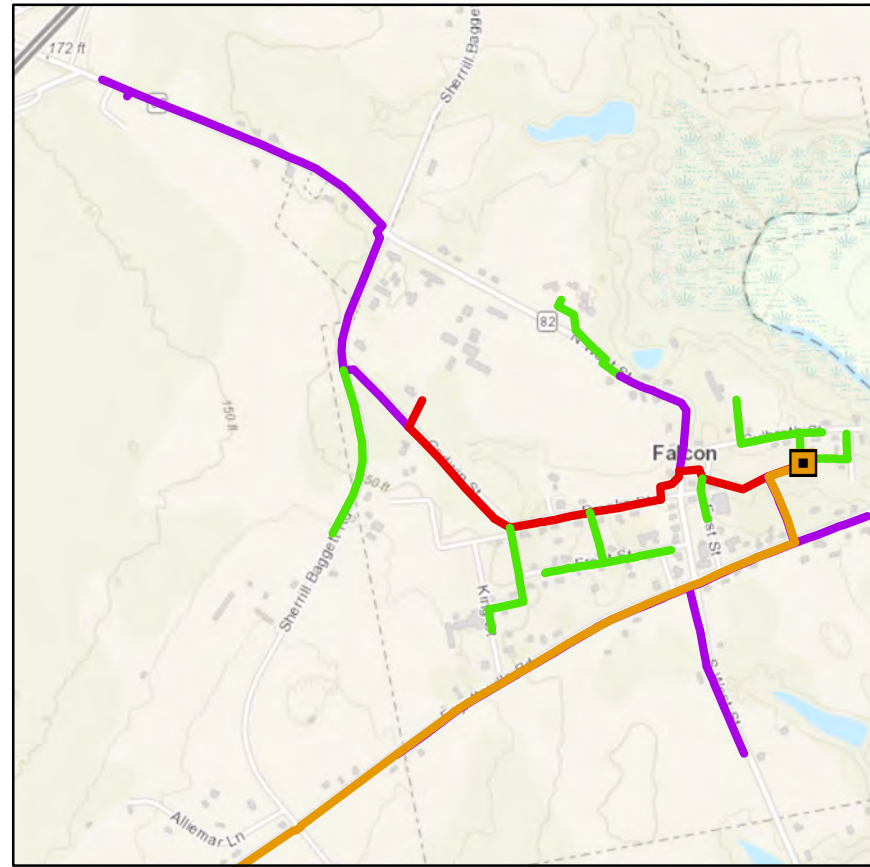
# NORCRESS Sewer Line Diameter Map

## Figure 6

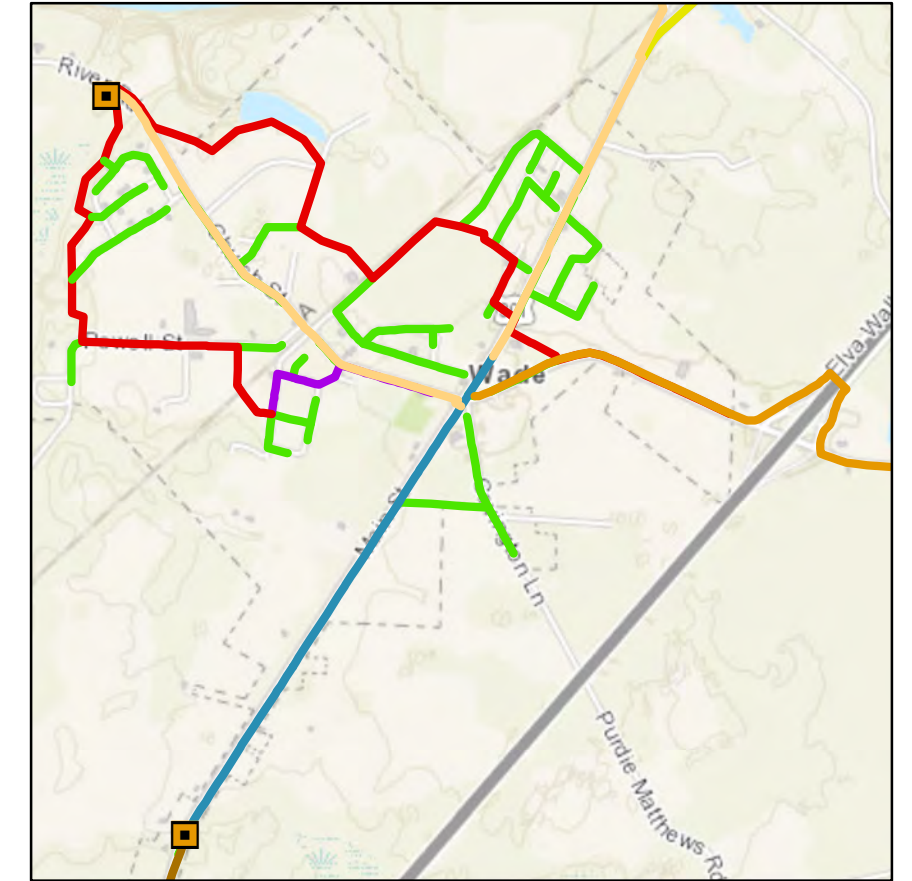
Godwin



Falcon



Wade



**Legend**

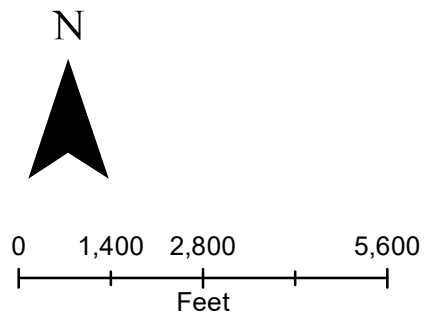
**GRAVITY SEWER DIAMETER**

- 8"
- 10"
- 12"
- 15"

**FORCE MAIN DIAMETER**

- 3"
- 6"
- 8"
- 10"

Lift Station



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**NORCRESS District**  
**Cumberland County**  
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\*PVC Material throughout Norcross System



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### 2.3.3 Methodology

McGill reviewed the County's GIS data for the sewer collection system. County staff provided information on manholes where deterioration was suspected. Flow monitoring and smoke testing were performed throughout the system. The County's GIS mapping was utilized to create maps that document the collection system by material and by diameter.

### 2.3.4 Results

The existing gravity sewer pipe in the sewer system ranges from 8-inch to 16-inch in diameter based on County records. All pipe diameters therefore do meet current NCDEQ minimum design standards. Based on the age of the system, the PVC and ductile iron pipe installed in 2005 have not exceeded its useful life, and therefore replacement is not recommended outright. Recommendations will include planned CCTV inspections by the County of the existing piping in order to verify existing condition and provide future updates to this AMP/CIP. Based on the age of the pipes and no documented issues from County staff, pipe in the system has been noted to be in good/excellent condition. Tables 5 through 9 show the assessment based on material and then broken out by diameter and age.

**Table 5: Summary of Gravity Sewer Main by Material**

<b>Material</b>	<b>Diameters (in)</b>	<b>Total LF</b>	<b>% of System</b>
<b>Polyvinyl Chloride</b>	<i>8, 12, 15</i>	<b>134,275</b>	<b>97.2%</b>
<b>Ductile Iron</b>	<i>8, 16</i>	<b>3,907</b>	<b>2.8%</b>
<b>Total LF</b>	<b>N/A</b>	<b>138,182</b>	<b>100%</b>

**Table 6: Summary of Gravity Main Sewer Main by Diameter**

Diameter	Total LF	% of System
8"	85,144	37.71%
10"	23,235	27.29%
12"	22,720	26.68%
15"	7,083	8.32%
<b>Total LF</b>	<b>138,182</b>	<b>100%</b>

**Table 7: Summary of Force Main by Material**

Material	Diameters (in)	Total LF	% of System
Polyvinyl Chloride	8, 12, 15	73,650	93.6%
Ductile Iron	8, 16	4,015	5.1%
HDPE	8	1,013	1.3%
<b>Total LF</b>	<b>N/A</b>	<b>78,678</b>	<b>100%</b>

**Table 8: Summary of Force Main Sewer Main by Diameter**

Diameter	Total LF	% of System
3"	4,082	5.2%
6"	28,123	35.7%
8"	35,364	45.0%
10"	11,109	14.1%
<b>Total LF</b>	<b>78,678</b>	<b>100%</b>

**Table 9: Summary of Pipe Condition by Age**

Year Put Into Service	Type	Total LF	% of System
2005	Gravity	138,182	64%
2005	Force Main	78,678	36%
<b>Total LF</b>		<b>216,860</b>	<b>100%</b>



## **2.4 MANHOLE INSPECTIONS**

### **2.4.1 Overview**

Manholes are the primary access points to the sanitary sewer system and are essential for its operation and maintenance. As they allow personnel access to the sewer system, manholes are also likely culprits for allowing I/I to enter the sewer system. Manholes in low-lying areas with improperly sealed lids, manhole joints, and poor connection practices can all be sources of I/I. Storm drains or the presence of manholes in ditches and low-lying areas in NORCRESS frequently allow standing water to remain for hours or days after a storm event which can exacerbate inflow through manhole lids.

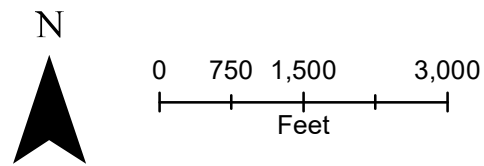
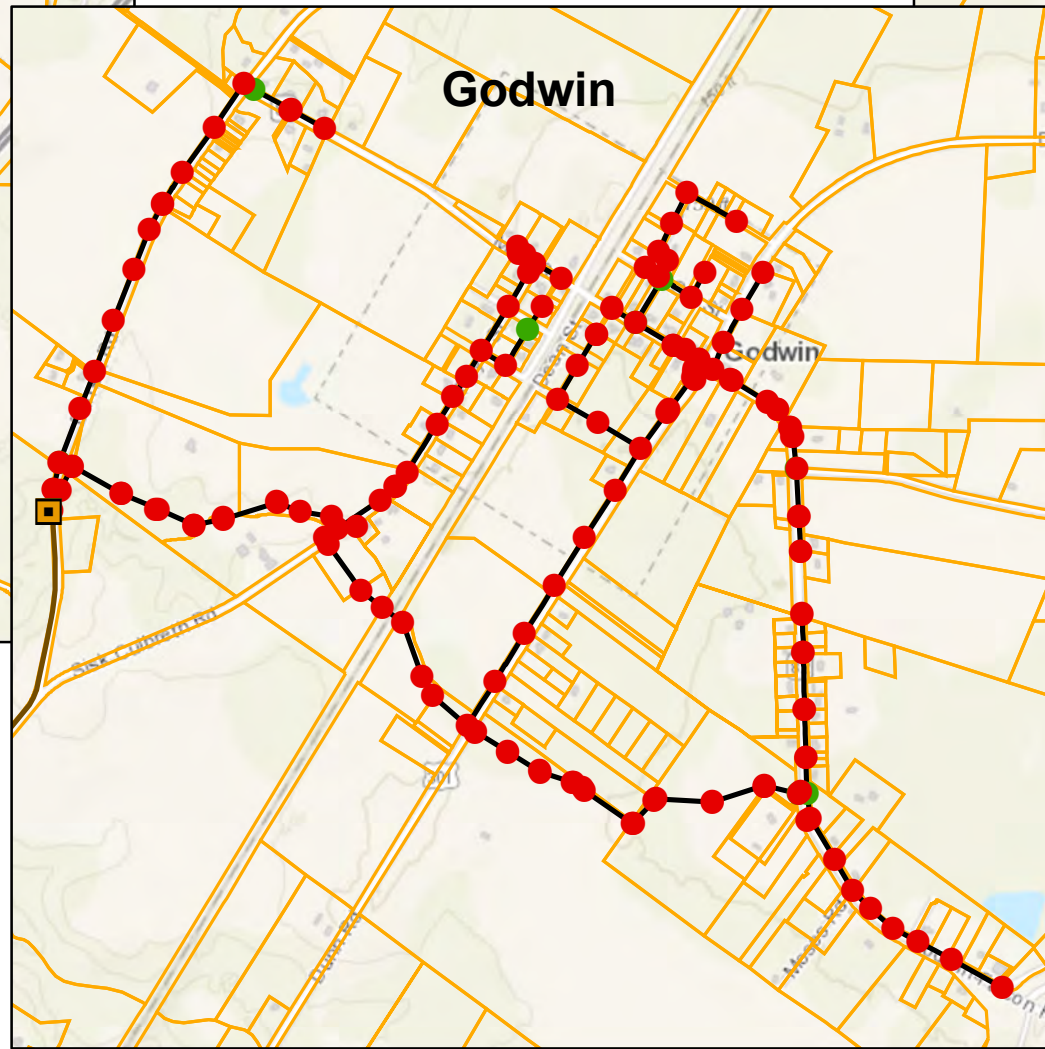
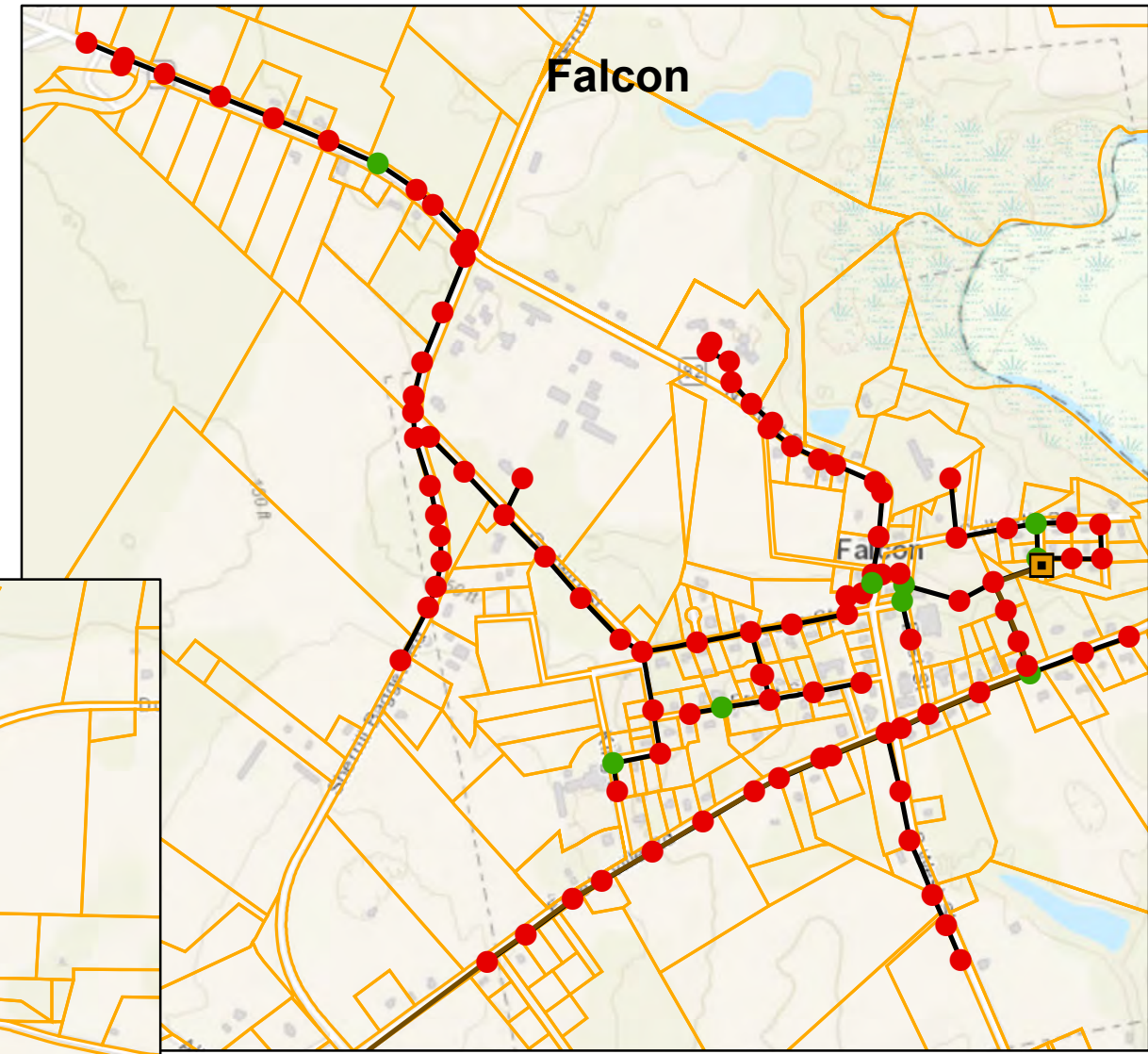
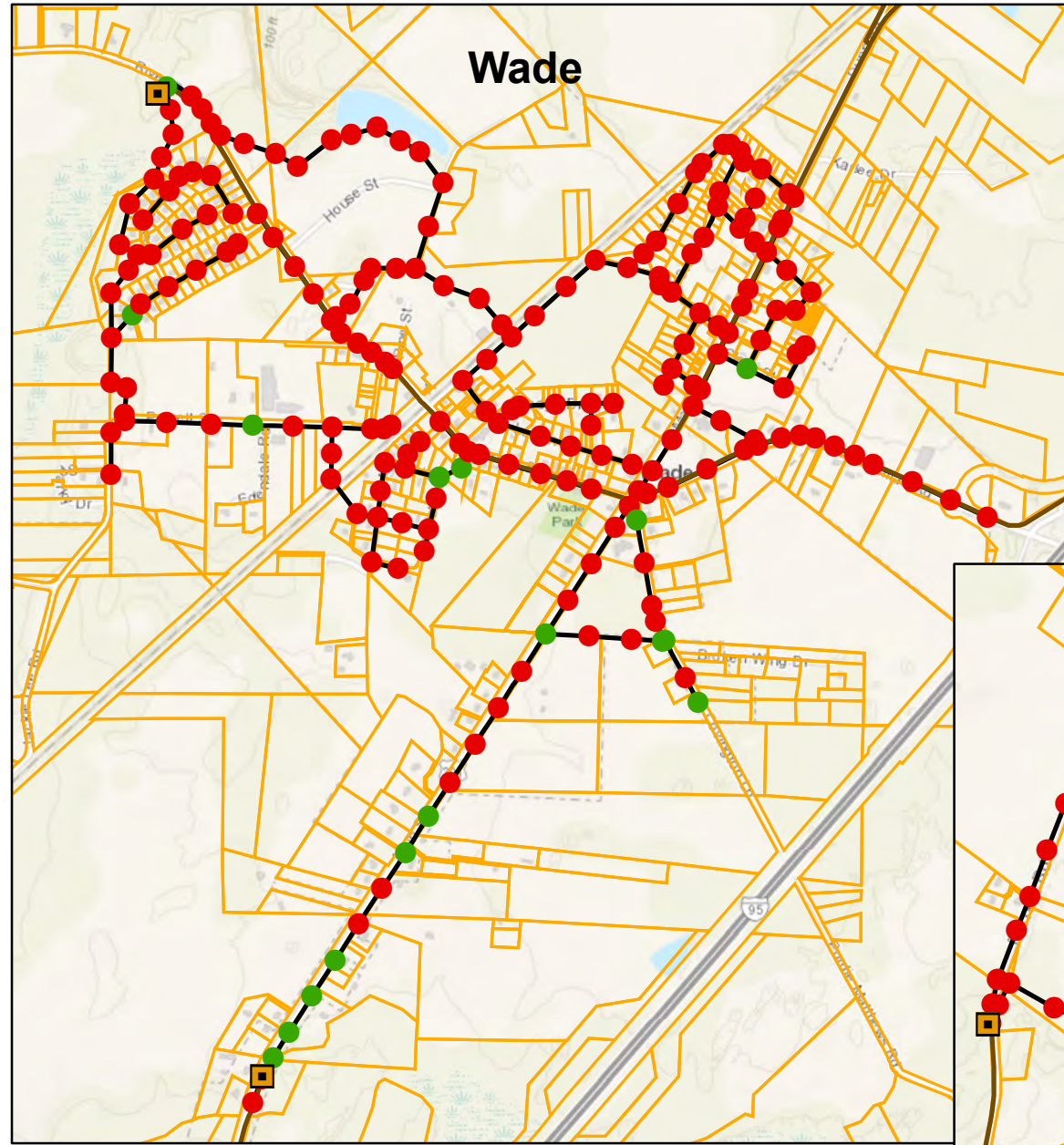
One of the most cost-effective practices for managing this intrusion is visual manhole inspections, where the various components of the manhole are rated according to their condition. Some examples of noticeable deficiencies are benches which have deteriorated from abrasion and corrosion and rings which can be moved by traffic, soil, and the freeze/thaw cycle. Defects in any aspect of the manhole can lead to I/I, structural instability, and manhole failure.

### **2.4.2 Investigation**

After the NORCRESS system was put into service, the GIS record was created in 2006. The purpose of this portion of the assessment was to perform field inspections of select manholes within the system to develop an overall system assessment. A total of 424 manholes are currently inventoried by the District. Approximately 37 manholes were inspected as a part of this inventory and assessment. The map including all manholes that were inspected is shown in Figure 7.

# NORCRESS Manhole Inspection Map

## Figure 7



**Legend**

**Manholes**

**Condition**

- Not Visited
- Good
- NORCRESS FORCE MAIN
- NORCRESS SEWER MAIN
- Lift Station
- Tax Parcels



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**Sewer Asset Management Plan**  
**NORCRESS District**  
**Cumberland County**  
**Project No. 20.02507**

### **2.4.3 Methodology**

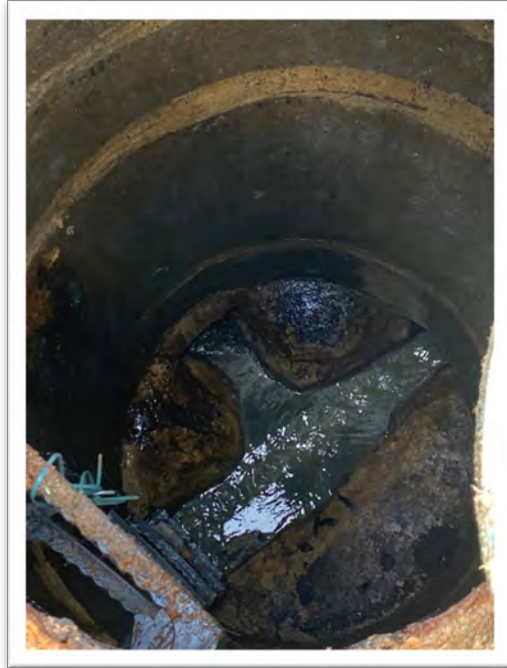
The NORCRESS District sewer collection system contains 424 sewer manholes. Working with County staff, McGill inspected selected manholes within the sewer system to obtain a representative condition sampling. County staff determined which manholes to inspect in each area based on manhole location and orientation. Manholes prioritized for inspection include those located in existing ditches or low-lying areas where the manhole would be susceptible to degradation and inflow from surface water. At each manhole, the inspector recorded the manhole's location, dimensions, material, and condition of its various components. All information including photographs of the interior of the manhole and top area were uploaded into the GIS mapping.

Some typical distresses include:

- Wear and asphalt paving on the cover;
- Corrosion and mud seepage on the ring and frame;
- Gas residue, corrosion, seepage, and deteriorating concrete on the cone and riser;
- Wetness, silt, root intrusion, and deteriorating concrete on the barrel;
- Dirt and corrosion on the rungs;
- Silt accumulation on the bench; and
- Misaligned pipes, obstructions, trough deteriorating, standing water, and no flow in the channel.

Based on the recorded comments, each component was assigned a condition score, and these scores were combined into an overall condition rating for each manhole- excellent, good, fair, or poor. The images below depict the interiors of various condition manholes.





*SMH 028208, River Road in Wade. Manhole shows minor corrosion over time.*



*SMH 028044, Main Street in Wade. Rehabilitated manhole with lining, some corrosion on frame.*



*SMH 027930, Main Street in Godwin. Manhole in good condition.*



*SMH 026913, King Street in Falcon. Manhole in good condition.*

#### 2.4.4 Results

All of the 37 inspected manholes were precast manholes. Due to the relative low age of the system, County staff confirmed that all of the existing manholes in NORCRESS are precast sewer manholes. Of the manholes observed, a majority were noted as good condition, and others observed were described as poor condition. Based on the condition of those observed, it is suspected that the remaining manholes not inspected would have similar condition to those observed. Tables 10 and 11 summarize the manhole materials and condition.

**Table 10: Summary of Manholes by Material**

<b>Material</b>	<b>Total</b>
<b>Precast Concrete</b>	<b>424</b>
	<b>424</b>

**Table 11: Summary of Manholes by Condition**

<b>Material</b>	<b>Total</b>
<b>Excellent-Good</b>	<b>33</b>
<b>Fair-Poor</b>	<b>4</b>
<b>Unknown</b>	<b>387</b>
	<b>424</b>

The County maintains its collection system using the ESRI platform and includes the attribute data for each manhole. A spreadsheet including condition comments for each manhole can be found in Appendix A.

## 2.5 LIFT STATIONS

### 2.5.1 Overview

The NORCRESS Lift Station is owned and operated by Fayetteville PWC. The station includes a flow meter that is used for recording flow generated by the NORCRESS Sewer Collection System. The capacities of each lift station are listed below.

Falcon Lift Station #92:

Lift Station Design Capacity	70,000 GPD
------------------------------	------------

Wade Lift Station #89:

Lift Station Design Capacity	45,000 GPD
------------------------------	------------

Wade Lift Station #90:

Lift Station Design Capacity	125,000 GPD
------------------------------	-------------

Godwin Lift Station # 91:

Lift Station Design Capacity	10,000 GPD
------------------------------	------------

\*Lift Station Design Capacity information is from the Freese and Nichols report called Northern Cumberland Regional Sewer System Comprehensive Sewer Evaluation.



## 3.0

## CAPITAL IMPROVEMENTS PLAN

---

Recommendations for various sewer system improvements to include the gravity sewer pipe and manholes in the collection system include general recommendations, high priority projects (within 10-years) and future projects (past the 10-year planning window). General recommendations are typically less costly and can be implemented more quickly, whereas high priority projects may require financial assistance and be undertaken in phases.

### 3.1 GENERAL RECOMMENDATIONS

#### 3.1.1 *Smoke Testing*

Smoke testing is a valuable tool that can be used to locate broken pipe, cleanouts, or manholes that need repair. Any of these issues can be a source for the inflow and infiltration (I&I) of surface water into the sewer collection system. It is recommended that the District perform comprehensive smoke testing of the entire system at least every other year. Additionally, the District should utilize smoke testing on an “as needed” basis to troubleshoot possible problem areas. The most common repairs that would result from smoke testing include replacing missing or broken cleanout caps and removing buildup from manholes. Other repairs that can be performed at this time are patching the exterior concrete or replacing the rings/lids of manholes identified to be leaking during smoke testing. These may be contributing significant I/I into the wastewater collection system. Similarly, line breaks in flooded areas should also be addressed promptly. It is also recommended that the District continue to perform regular smoke testing to monitor the system’s ongoing wear and identify specific areas for improvement.

#### 3.1.2 *Video Evaluations*

Based on information provided from the County, video evaluations were performed by Hydrostructures. Hydrostructures cleaned and provided CCTV inspections of the gravity lines in 2016 as part of the system inventory. It is recommended that the District plan to

perform video evaluation of the system every 5 years as a part of O&M in order to stay vigilant concerning potential issues within the collection system.

### **3.1.3 Manhole Inspections**

Manhole inspections uncovered some infrastructure deficiencies which can be repaired immediately to improve the condition and function of the wastewater collection system. The full list of manholes and their field assessment is included in Appendix A. Manhole rehabilitation and replacement is the priority work that is targeted by the CIP. The proposed projects are divided out over an annual basis in order to include the improvements as a reasonable component of annual budgeting.

### **3.1.4 Flow Monitoring**

The County and McGill have discussed that additional flow monitoring would be beneficial to the County in this system. It is recommended that the County perform flow monitoring at a frequency of every 3 to 5 years to monitor I/I within the system. Initially, we recommend focusing the monitoring in the Town of Falcon.

Additionally, should the County begin to suspect the presence of I&I at specific locations within the system, they will engage in flow monitoring to verify as needed. The PWC Lift Station does provide for metering of flow received within the district. It is recommended within the CIP that the County install an in-line flow meter within the collection system just upstream of the lift station, in order to assist with recording of data and calibration with the PWC maintained lift station.

## **3.2 PRIORITY PROJECTS**

### **3.2.1 Manhole Rehabilitation Projects**

In these projects, manholes will be repaired and lined where possible, unless replacement is needed. The projects are scoped to be undertaken every three years. Each project is priority targeting any manhole deficiencies or evidence of I/I observed during manhole inspections. There are a range of issues from broken risers to cracks in the frame of the manhole that warrant various repairs. To reduce the amount of I/I that enters the system it is imperative to repair these manholes. The project will be ongoing as to spread out the cost for the County over a 10-year period. There are 424 manholes in the system, and based on inspections and smoke testing, it is estimated that approximately 20% of the manholes would benefit from rehabilitation and lining. In order to fit a reasonable budgeting target, the rehabilitation of 84 manholes is broken into 4 projects, which are included in the CIP separately, but can be combined or modified as needed given annual budgetary considerations.

This project is recommended to be pursued with a manhole rehabilitation specialty company with scopes large enough to get competitive pricing for each mobilization. The manholes proposed for rehabilitation or replacement range in depth, therefore an average depth of seven vertical feet (VF) was used per manhole for estimating purposes. The capital improvements plan breaks this project into 4 phases with a budget of approximately \$118,600 every three years over a 10-year span, as outlined in Table 12. The total cost of the manhole rehabilitation projects is estimated to be \$474,400.

**Table 12: Preliminary Opinion of Probable Cost for Manhole Rehab Projects**

Item	Description	Units	Quantity	Unit Price	Total Cost
1	Mobilization	LS	3%	N/A	\$ 2,800
2	Rehabilitate Existing Manhole	VF	147	\$ 500	\$ 73,500
3	Additional Manhole Repairs	LS	1	\$ 10,000	\$ 10,000
4	Asphalt Surface Restoration	LS	1	\$ 12,500	\$ 12,500
<b>Construction Subtotal</b>					<b>\$ 98,800</b>
Contingency (15%)					\$ 14,800
Engineering Coordination					\$ 5,000
<b>Total Base Project Cost</b>					<b>\$ 118,600</b>

*\*Cost estimates are based on the knowledge of a professional engineer based on 2024 construction costs and are subject to change due to bidding environment and other factors.*

**3.2.2 Flow Meter Project**

This project includes installing four in-line flow meters on the existing gravity lines upstream of the four lift stations the sewer system. These devices will allow the County to monitor its own sewer flow. This data can be utilized by staff for planning and budgeting purposes.

The project includes two 8-inch electromagnetic flow meters in a precast underground bypass vault with associated piping and appurtenances. The meters will be installed on the County’s gravity sewer lines outside of the existing lift stations. The preliminary cost estimate for this project is \$203,900 as outlined in Table 13 below.

**Table 13: Preliminary Opinion of Probable Cost for Flow Meter Project**

Item	Description	Units	Quantity	Unit Price	Total Cost
1	Mobilization	LS	3%	N/A	\$ 4,900
2	8-inch Mag Meter	EA	4	\$ 25,000	\$ 100,000
3	Precast Concrete Valve Vault	EA	4	\$ 8,000	\$ 32,000
4	Piping, Valves, Fittings	LS	1	\$ 30,000	\$ 30,000
<b>Construction Subtotal</b>					<b>\$ 166,900</b>
Construction Contingency (15%)					\$ 25,000
Engineering Coordination					\$ 12,000
<b>Total Base Project Cost</b>					<b>\$ 203,900</b>

*\*Cost estimates are based on the knowledge of a professional engineer based on 2024 construction costs and are subject to change due to bidding environment and other factors.*

**3.2.3 Flow Monitoring Study**

This project includes the rental of four non-contact flow monitors. These devices will give the County the ability to develop a database of real-time sewer flow data in the collection system in order to pinpoint potential sources for I/I and uncaptured flow. Additionally, the budget includes utilizing the Flow Works software, a cloud-based data management program that will put flow monitoring and rainfall data into usable format for tracking and reporting. This data can be utilized by staff for planning and budgeting purposes.

The project includes rental of four Hach Flo-Dar Area/Velocity Flow Meter Sensors with wireless data transmission. The monitors are designed to be installed above the flow, therefore can typically be installed from the surface without the need for confined-space entry permit. The project also includes the purchase of a rain gauge with RTU. The project is quoted for 2-months of monitoring with the FlowWorks Software. Longer duration and the option for flow monitoring equipment purchase can be further explored. The preliminary cost estimate for this project is \$25,440 as outlined in Table 14 below.

**Table 14: Preliminary Opinion of Probable Cost for Flow Monitoring Study**

Item	Description	Units	Quantity	Unit Price	Total Cost
1	Hach Flo-Dar Rental	EA	8	\$ 1,925	\$ 15,400
2	Device Data Hosting	EA	4	\$ 555	\$ 2,220
3	FlowWorks Device Monthly	EA	8	\$ 100	\$ 800
4	FlowWorks Device Setup	EA	4	\$ 180	\$ 720
5	Rain Guage with RTU	EA	1	\$ 3,000	\$ 3,000
<b>Construction Subtotal</b>					<b>\$ 22,140</b>
Construction Contingency (15%)					\$ 3,300
<b>Total Base Project Cost</b>					<b>\$ 25,440</b>

*\*Cost estimates are based on the knowledge of a professional engineer based on 2024 construction costs and are subject to change due to bidding environment and other factors.*

**3.2.4 Air Release Valve Replacement and Ice Pigging**

This project includes replacement of existing air release valves along the 8-inches force main that extends from the Falcon lift station to a sewer manhole in the Town of Wade. These devices will give improvement performance of force main by more adequately allowing for release of built up air within the over seven miles of existing force main.

**Table 155: Preliminary Opinion of Probable Cost for ARV and Ice Pigging**

Item	Description	Units	Quantity	Unit Price	Total Cost
1	Mobilization	LS	3%	N/A	\$ 2,400
2	2" Combination Air Release Valve	EA	8	\$ 10,000	\$ 80,000
3	Install Pigging Stations and Perform Ice Pigging on Force Main	LS	1	\$ 150,000	\$ 150,000
<b>Construction Subtotal</b>					<b>\$ 232,400</b>
Construction Contingency (15%)					\$ 34,900
<b>Total Base Project Cost</b>					<b>\$ 267,300</b>



### **3.3 CIP PROJECTS SUMMARY**

The purpose of this asset management plan was to document the condition of the NORCRESS sewer infrastructure to assist the County with becoming more viable and proactive in the management and financing of its wastewater system. The County intends to look to its CIP to guide its next projects; therefore, it is vital that the CIP be established as an accurate depiction of current conditions and reflect the District's highest priorities with accurate cost estimates. The development of this AMP will serve as a positive step towards ensuring that the District can maintain its level of service agreement.

Sewer manhole rehabilitation was evaluated based on current staff input and the results of the field inspections. The existing manholes were divided into projects recommended for the next 10 years.

McGill prepared cost estimates for all projects based on current materials and construction costs. The 10-year CIP is intended to be adopted by the District to guide its selection of sewer system improvement projects over the next two decades. The cost summary for the 10-year CIP is shown below in Table 16.

**Table 16: CIP Projects Cost Summary**

Year <sup>1</sup>	Flow Monitoring Study	Manhole Rehabilitation Project 1	Flow Meter Project	Manhole Rehabilitation Project 2	Manhole Rehabilitation Project 3	Manhole Rehabilitation Project 4	New Generators- All Lift Stations <sup>2</sup>	Upgrade SCADA <sup>2</sup>	Falcon Force Main- Inspect, Clean, Replace ARVs <sup>2</sup>	TOTAL COST
1	\$ 25,440.00						\$ 640,000.00			\$ 665,440.00
2		\$ 118,600.00						\$ 240,000.00		\$ 358,600.00
3			\$ 203,900.00						\$ 80,000.00	\$ 283,900.00
4				\$ 118,600.00						\$ 118,600.00
5	\$ 25,440.00									\$ 25,440.00
6										\$ -
7					\$ 118,600.00					\$ 118,600.00
8										\$ -
9										\$ -
10	\$ 25,440.00					\$ 118,600.00				\$ 144,040.00
<b>TOTAL ESTIMATED CIP COST</b>										<b>\$ 1,714,620.00</b>

**Notes:**

- 1: Considering the timeline for adoption of this plan and County budget planning cycle, Year 1 is anticipated to be FY 2026
- 2: Project was previously included in a Capital Improvements Plan developed by Freese and Nichols for the NORCRESS District.

**4.1 GENERAL RECOMMENDATIONS**

The purpose of an Operations and Maintenance (O&M) Program is to provide an organized and cost-effective approach to ongoing maintenance, repair and replacement activities that will maintain the sewer collection system, so it performs as intended and meets the requirements of the sewer utility's System-Wide Collection System Permit, issued under North Carolina General Statutes Article 21 of Chapter 143.

This section provides a general description of proactive O&M, that can be defined as scheduled maintenance activities (preventive maintenance), performed on a regular basis in order to achieve the highest level of system performance using available resources and minimizing failures that can result in Sewer System Overflows (SSOs)

Developing an O&M Program begins with accurate records of infrastructure inventory, asset locations and physical condition. Coupled with work records and system performance history, preventive maintenance schedules can be developed to efficiently address general system needs, from cleaning and debris removal to site-specific maintenance work such as cutting and repair work.

The following elements provide the foundation for an effective O&M program:

- Maintain up-to-date wastewater treatment plant equipment documentation, sewer collection system maps and related work history and operational data.
- Develop a routine preventive O&M program and activities for staff and contractors maintaining the sewer collection system and a system to document scheduled activities
- Develop a rehabilitation and replacement plan identifying and prioritizing system deficiencies and implement short- and long-term actions to address the deficiencies
- Develop and implement training programs to build technical competence and emergency preparedness.
- Develop and provide equipment and replacement part inventories, including critical replacement parts

## **Sewer System Mapping**

Sewer system maps and related databases are typically managed using a Geographic Information System (GIS). The NORCRESS District currently utilizes ESRI as the GIS platform from which to manage the utility systems. This GIS mapping is supported by a database that records sewer main size, material types, and locations of manholes and clean-out connections. The platform has the ability to store more information that is currently being utilized by the County, including invert and rim elevations and other attributes of system appurtenances. If the County intends to utilize the GIS platform for managing and recording maintenance performed and planned, it is recommended that the County investigate alternative software to ensure that they are utilizing a software that meets their needs with respect to budget.

The GIS database should be updated on a regular basis. Software applications such as work order systems are available to allow field staff to update GIS data as inspection and maintenance activities are completed. Other applications can also allow staff to update and edit maps. Field information that was gathered by McGill and County staff as a part of this assessment is now included in the County's GIS system database for future reference.

GIS can organize work history along with operational data, inspection records and images to provide managers, operations staff and engineers with powerful data sets to track current resource allocations and forecast short and long-term operational and capital needs. Outcomes of detailed analysis such as recommended sewer main rehabilitation work versus sewer overflows can be mapped to present the relationship visually for ease of understanding.

## **Preventive Operation and Maintenance (O&M)**

Preventive maintenance is performing routine and scheduled maintenance activities before wastewater treatment plant and lift station equipment or buried infrastructure fails, for the purpose of extending useful life, reducing overall operating costs, and increasing system reliability. This proactive approach to maintenance work is more efficient and cost effective than reactive and curative operations. Preventive maintenance activities will also help operations staff to better understand the lift station equipment, and collection system components and how they work under various conditions. This knowledge is essential to setting maintenance priorities and developing the scope and timing of long-term rehabilitation and replacement projects.

## **Scheduled Cleaning of Sewers**

EPA recommends, at a minimum, that 100% of sewer mains should be cleaned every 5-years, or 20% of the system annually. The sewer utility's Collection System Operating Permit requires 10% of the gravity sewers to be cleaned annually. High pressure jetting is the most common approach using various spray nozzles for general cleaning and debris removal. Mechanical cutters are used to address root intrusion and cleaning agents can be added to help remove fats, oils, and grease (FOG).

More frequent cleaning is scheduled for areas with a history of heavy debris, grease buildup and roots. CCTV inspections are also used to identify areas to clean more often, such as sections with minor defects such as offset joints and service taps protruding into the main line. Sewer sections near siphons are cleaned more frequently to ensure continuous and uninterrupted operation.

As part of the O&M Program, a master list of cleaning operations, priority locations and scheduling can be incorporated into GIS. Maps can be produced to define work areas, schedule resources, including contracted services, track progress and task completion. Updating GIS maintenance operations data (partial blockages found, debris quantity, etc.)

will help managers adjust cleaning frequency and area boundaries as needed to increase program efficiency, reduce sewer blockages, and avoid SSOs.

## **Routine Visual Inspections**

Routine inspections are used to assess the condition of lift stations, manholes and surface facilities, recording general conditions and evidence of possible structural problems or failures (offset structures, etc.), corrosion, surcharging, overflows and excessive Inflow and Infiltration (I&I). Work orders are generated based on inspection records to effect operational adjustments, scheduling more detailed inspections and/or making necessary repairs.

## **Manhole Inspection Program**

Manhole inspections keep the asset inventory up-to-date and are used not only to update collection system maps, but to determine structural condition. During manhole inspections, a complete inventory is taken of each manhole including construction materials, ring size, depth to invert, flow conditions and evidence of problems. The National Association of Sewer Service Companies (NASSCO) Manhole Assessment and Certification Program (MACP) may be adopted or used as a guide to ensure consistency and reliability of evaluation and ranking methodology.

The results from routine manhole inspections and monitoring are used to prioritize areas needing CCTV inspections to assess pipe condition such as manholes with evidence of slow flow or surcharging. Information is recorded and used to schedule maintenance and repairs.

## **CCTV Inspection Program**

While routine cleaning and visual inspection are used to assess the condition of surface facilities and manholes, CCTV video inspections are the primary method used to assess the condition of the sewer pipes. Using conventional defect criteria is highly recommended to provide standardization and consistency in sewer pipe condition

assessment and ranking. The NASSCO Pipeline Assessment and Certification Program (PACP) may be adopted or used as a guide to ensure consistency and reliability of evaluation and ranking methodology.

## **Maintenance Activity Records**

Detailed records and daily logs of O&M work provide valuable information to help managers evaluate the effectiveness of maintenance activities and make adjustments to optimize the use of limited resources. Equipment, manpower and other resources are tracked along with detailed descriptions of defects and/or obstructions encountered including debris, FOG, structural failures, etc. Maintenance work resulting in system modifications or extensions is required to be incorporated into record drawings and system maps. Scheduled testing of emergency and standby equipment is also a requirement of the collection system permit.

These records are required to be reviewed periodically to identify problems that cannot be resolved in a short period of time in order to develop a plan to address the problem(s). Maintaining these records for an extended period of time (5-years or more) will also provide accurate reference points of maintenance investments made over time that will track the effectiveness of operation and maintenance activities.

In the event of a sewer spill or system overflow, maintenance records will need to provide sufficient detail to satisfy reporting requirements for the event, including location(s), volume of wastewater, corrective actions, etc. This data may also be integrated into GIS to allow mapping of these events over time in order to identify patterns and/or trends that will assist with scheduling maintenance and planning rehabilitation and other capital improvements.



## **Resolution of Customer Complaints**

Customer complaints are primarily about sewer backups and odors. Sewer backups require an immediate response to diagnose and resolve the problem. These complaints can occur outside normal business hours, significantly escalating costs. Detailed records of the problems found, and the resources needed to address the failed condition, provide valuable feedback for making adjustments to the preventive maintenance program that can reduce these types of calls and help lower overall maintenance costs.

These records can also identify areas where private service laterals frequently fail. Notifying customers in these areas will allow them the opportunity to address deficiencies proactively, which will also help reduce customer “emergency” calls.

## **Capital Improvements Plan**

A Capital Improvements Plan (CIP) is required by the collection system permit to identify rehabilitation, replacement and expansion needs of the system. The CIP is required to address the short and long-term needs of the system, covering at least a 3 to 5-year planning period, and must include the estimated cost of each capital project.

CIP development incorporates maintenance activity, cleaning and inspection records, and system performance data that may include flow monitoring and hydraulic modeling to evaluate the existing system and to recommend improvements needed to correct existing deficiencies, and ensure adequate capacity is maintained throughout the system.

Capital planning includes consideration of on-going funding for rehabilitation and replacement of the collection system as it wears out, and potential upgrades for expansion as needed.

## **Training Program**

Training programs provide a mechanism for educating employees and establishing their technical competence to perform operations, maintenance, and emergency responses safely and effectively. A combination of in-house skill training and specialized training purchased or provided through state and national associations, conferences and vendor training programs are typically used to build and enhance skills for performing daily work duties. Periodic training reinforces previous efforts, as people often overlook things that are used infrequently. It also provides an opportunity to train new staff and learn about new problems, new techniques, and changes in equipment.

Emergency training educates system personnel about emergency situations and resulting effects on the wastewater system, public health, and environmental impacts. It also provides an opportunity to practice responses. Good record keeping ensures personnel are properly trained and prepared to effectively operate and maintain the collection system under any given circumstance. Regular review of training records is essential for keeping content up-to-date and maintaining proper employee awareness.

## **Equipment and Replacement Parts**

A reasonable supply of equipment and replacement parts should be maintained to fully support all operations and maintenance activities. A detailed inventory is essential to ensure availability under normal operations and emergency conditions. Specialized equipment or parts may be too costly to keep in stock, so arrangements with vendors and/or contractors may be necessary to ensure availability during non-business hours or during emergencies.

## 4.2 STAFFING RECOMMENDATIONS

Cumberland County is responsible for three wastewater collection systems and one water system: NORCRESS, Overhills, Kelly Hills, and Southpoint Water System. While each of these districts maintains its own operating budget, the Board leadership and operational management is performed solely by Cumberland County. Therefore, in consideration of the typical utility system management and operations and maintenance that is necessary for maintaining each of the systems, McGill has considered all of the four (4) utility systems cumulatively. While each system could be analyzed separately, considering the systems together is more consistent with actual management of the systems.

Typical metrics for analyzing full-time equivalent (FTE, representing quantity full-time workers) are based on either the population served by the system or by miles of utility piping (water main or sewer line) within each system. For reference, Table 17 below summarizes the customers and piping in each of the County’s utility systems.

**Table 17: Utility System Comparison**

DISTRICT	Number of Connections		Paying Avail. Fee	Pipe in System (mi.)
	Water	Sewer		
<b>Southpoint</b>	84		129	2.8
<b>Kelly Hills</b>		102	166	4.5
<b>Overhills</b>		107	318	4.0
<b>NORCRESS</b>		452	666	41.1
<b>TOTALS</b>	<b>84</b>	<b>661</b>	<b>1279</b>	<b>52.4</b>

**Table 18: Typical Population vs. Pipe Length**

<b>Population</b>	<b>Pipe in System (mi.)</b>
0-100	5
101-500	5
501-3300	21
3301-10000	62

The typical sizes of utility systems from a community system EPA study<sup>1</sup> are shown in Table 18, and are generally consistent when compared to the County's systems. This study was selected as a basis for comparison due to its comprehensive nature, having included water systems nationwide in its breadth. NORCRESS is the exception when compared to Table 18. This is mostly likely indicative of the system serving a more rural population where the connection density is less, and resulting from the length of force main piping in the system that increases the overall length but does not contribute to population density. Overall, these metrics were found to be reasonably consistent with the County's systems. Similarly, the data is consistent regardless of whether the utility system is a water systems or wastewater collection system.

The objective is to make budget-level staffing recommendations for the County's utility systems based on what is typical across the industry and other utility systems of comparable size. The EPA study utilized provides typical FTE for the roles of manager, plant operator, distribution (and collection, for our purposes), and administrative functions. All of these were considered applicable to management and operation of the County's utility systems. Note: while the County is not responsible for plant operation in any system, the lift stations in the NORCRESS and Overhills systems are the County's responsibility, therefore this metric was used, albeit in a smaller percentage, to account for the management of those resources.

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<sup>1</sup> Analysis conducted using excerpts from US EPA document, "National Characteristics of Drinking Water Systems Serving 10,000 or Fewer People," published July 2011.

Table 19 shows Further utilizing the EPA statistics as base for typical FTE for each of the positions, based on the system size in terms of miles of pipe main.

**Table 19: Average Community System Statistics**

Employee Category	System Size (miles of Main)		Mean	Cumberland County
	Pop. 500-3300	Pop. 3300-10000		
	21	62	41.5	51.7
<b>Manager FTE</b> per mile	0.6	1.1	0.85	1.06
	0.029	0.018	0.020	0.020
<b>Plant Operator FTE</b> per mile	0.6	1.3	0.95	1.03
	0.029	0.021	0.023	0.023
<b>Distribution FTE</b> per mile	0.8	2.5	1.65	2.06
	0.038	0.040	0.040	0.040
<b>Administrative FTE</b> per mile	0.6	1.5	1.05	1.31
	0.029	0.024	0.025	0.025

The green highlighted cells are the calculated FTEs that were applied to estimate staffing size based on the quantity of pipe across the County’s four utility systems. Those calculated FTEs are based on the size of systems managed by the County and reasonable estimate of staffing needed for these systems.

Each of the FTEs is applied to each respective employee category. McGill utilized wage information from Zip Recruiter and a benefits multiplier of 1.38 from the U.S. Bureau of Labor Statistics to develop the summary shown in Table 20.

**Table 20: Overall Salary Estimates**

Employee Category	Hourly Rate	Annual Salary	Ben. Mult.	Total	Applied FTE	Applied Budget Cost
Manager	\$38.50	\$80,080.00	1.38	\$110,510.40	1.06	\$117,000
Operator	\$24.52	\$51,001.60	1.38	\$70,382.21	1.03	\$72,700
Distribution	\$23.57	\$49,025.60	1.38	\$67,655.33	2.06	\$139,100
Administrative	\$21.33	\$44,366.40	1.38	\$61,225.63	1.31	\$80,100
<b>Total Applied Budget Cost Based FTEs</b>						<b>\$408,900</b>

Utilizing industry metrics and comparing to systems of comparable size, McGill offers the proceeding section as a general staffing recommendation. This section and these budget values are provided for preliminary planning purposes only.

Staffing levels appear to be reasonable based on the District's ability to operate and maintain the system while providing a reliable level service to its customers.

While this budget number is higher than the current budget staffing, consideration should also be given to the cumulative effect cost to the County for contracted operation and distribution support in the NORCRESS and Kelly Hills district.

# **APPENDICES**





# **Appendix A**

## **Manhole Inspection List**



<b>Norcross Manhole Inspection</b>		
<b>Date:</b>	<b>Nov. 28 and 30, 2023, Feb. 5, 2024</b>	
<b>Manhole ID</b>	<b>Condition</b>	<b>Notes</b>
SMH028220	Poor	Crack on interior from being hit by mower
SMH028209	Poor	
SMH026946	Poor	Black inside manhole and corrosion around collar
SMH028208	Good	
SMH028215	Good	
SMH029390	Good	
SMH028093	Good	
SMH027974	Good	
SMH027985	Good	
SMH028003	Good	
SMH028033	Good	
SMH028025	Good	
SMH028026	Good	
SMH027171	Good	
SMH026913	Good	Outside of Martin's Meats
SMH026927	Good	
SMH026896	Good	
SMH026879	Good	
SMH026880	Good	
SMH026933	Good	
SMH026934	Good	
SMH027941	Good	
SMH027930	Good	
SMH028067	Good	
SMH028038	Good	
SMH028039	Good	
SMH028054	Good	
SMH028053	Good	
SMH028040	Good	
SMH028061	Good	
SMH028045	Good	
SMH028050	Good	
SMH028041	Good	
SMH028044	Good	Ring very rusted
SMH028146	Good	
SMH028145	Good	
SMH026946	Poor	Black inside manhole and corrosion around collar



## **Appendix B**

### **Smoke Testing Results List**

# Norcross Smoke Testing Manholes

Date: October 24-26th 2023		
Manhole ID	Smoke Status	Notes in the field
SMH026878	Leak	
SMH026879	Leak	Smoke around concrete
SMH026880	Leak	Cracked ring
SMH026885	Broken	smoke
SMH026886	Leak	
SMH026887	Leak	Smoking from edges
SMH026887	Leak	Smoking from edges
SMH026892	Leak	Smoking from edges
SMH026895	Leak	Smoking from edges
SMH026896	Leak	Small amount of smoke
SMH026897	Leak	
SMH026900	Leak	Smoking from edges
SMH026901	Leak	Small amount of smoke
SMH026904	Broken	concrete collar broken
SMH026905	Leak	Rim broken
SMH026906	Leak	
SMH026906	Leak	
SMH026911	Leak	
SMH026912	Leak	Buried in front of Martin's
SMH026915	Leak	Smoking
SMH026916	Leak	smoking
SMH026918	Leak	Smoking
SMH026919	Leak	Small amount of smoke
SMH026921	Leak	
SMH026922	Leak	
SMH026923	Leak	
SMH026925	Leak	Smoke around lid
SMH026929	Leak	
SMH026930	Leak	
SMH026931	Leak	
SMH026932	Leak	
SMH026934	Leak	
SMH026941	Leak	Smoking
SMH026942	Leak	Small amount of smoke
SMH026944	Leak	Cracked concrete smoke around lid and collar
SMH026945	Leak	
SMH027168	Leak	
SMH027170	Leak	Smoking from edges
SMH027172	Leak	
SMH027173	Leak	
SMH027174	Leak	
SMH027175	Leak	



SMH027176	Leak	
SMH027179	Leak	smoking
SMH027180	Leak	smoking
SMH027183	Leak	smoke around lid
SMH027184	Leak	smoking
SMH027185	Seal	smoking around sealed lid
SMH027188	Leak	
SMH027441	Leak	
SMH027929	Leak	
SMH027930	Leak	
SMH027933	Broken	Lid removed, possible dumping
SMH027941	Broken	Lid missing, possible dumping
SMH027947	Leak	smoking from lid edges
SMH027948	Leak	
SMH027950	Leak	
SMH027951	Leak	
SMH027952	Leak	smoking from edges
SMH027955	Leak	Smoking from edges
SMH027956	Leak	Smoking from edges
SMH027963	Leak	
SMH027964	Leak	
SMH027965	Leak	
SMH027966	Leak	
SMH027967	Leak	
SMH027968	Leak	Smoking from edges
SMH027969	Leak	Smoking from edges
SMH027970	Leak	
SMH027971	Leak	
SMH027972	Leak	
SMH027973	Leak	Smoking from edges
SMH027974	Leak	Smoking from edges
SMH027975	Leak	
SMH027976	Leak	
SMH027985	Leak	Smoking from edges
SMH027987	Leak	
SMH027988	Leak	
SMH027989	Leak	
SMH027993	Leak	
SMH027994	Leak	
SMH027995	Leak	
SMH027996	Leak	
SMH027997	Leak	
SMH027998	Leak	
SMH027999	Leak	Smoke around lid and ground
SMH028000	Leak	smoke around lid

SMH028002	Leak	
SMH028003	Leak	
SMH028004	Leak	
SMH028006	Leak	
SMH028007	Leak	Smoking from edges
SMH028008	Leak	
SMH028018	Leak	Riser is shifted
SMH028019	Leak	Smoke around lid
SMH028021	Seal	smoking
SMH028022	Seal	smoking
SMH028024	Leak	
SMH028025	Leak	
SMH028026	Leak	
SMH028027	Leak	
SMH028029	Leak	
SMH028031	Leak	smoke around ground and concrete
SMH028032	Leak	
SMH028033	Leak	
SMH028034	Leak	
SMH028035	Leak	
SMH028036	Leak	
SMH028038	Seal	smoke around rim
SMH028041	Leak	
SMH028046	Leak	
SMH028047	Leak	Smoking from edges
SMH028048	Leak	
SMH028049	Leak	
SMH028050	Leak	Smoking from edges
SMH028051	Broken	smoke from collar
SMH028052	Broken	smoke from collar
SMH028053	Broken	smoke from collar
SMH028054	Broken	collar busted
SMH028056	Leak	
SMH028057	Seal	
SMH028059	Leak	Smoking from edges
SMH028073	Broken	Concrete cracked around mh
SMH028074	Leak	
SMH028075	Leak	
SMH028076	Leak	
SMH028077	Leak	
SMH028078	Leak	
SMH028079	Leak	
SMH028080	Leak	
SMH028081	Leak	
SMH028084	Leak	

SMH028092	Leak	Smoking from edges
SMH028099	Leak	Smoking from top sides of mh
SMH028104	Leak	Small amount of smoke from edges of mh. Concrete base is cracked
SMH028105	Leak	Smoking from edges of mh and ground around it
SMH028106	Leak	Small amount of smoke come from edges. Looks like holes in top from missing screw or bolt
SMH028113	Leak	Small amount of smoke coming from sides of mh
SMH028114	Leak	Smoking from mh and ground around it
SMH028117	Broken	
SMH028129	Seal	Smoking from mh
SMH028142	Seal	Broken around concrete
SMH028160	Leak	Small amount of smoke from edges of mh
SMH028164	Leak	Very small amount of smoke coming from mh
SMH028165	Leak	Smoking from edges of mh
SMH028169	Leak	Small amount of smoke coming from edges of mh
SMH028181	Leak	
SMH028189	Leak	Small amount of smoke coming from edges of mh
SMH028214	Leak	
SMH028215	Leak	
SMH028216	Leak	
SMH028217	Broken	Smoke coming up around the ground near manhole
SMH028230	Seal	Smoke around seal
SMH029404	Leak	Small amount of smoke from edges of mh

## Norcross Smoke Testing Cleanouts

Date: October 24-26th 2023

Facility ID	Smoke Status	Notes in the field
32849	Leak	Smoking from c/o and house
32851	Leak	Leaking from broken cap
32853	Broken	
32855	Leak	
32866	Broken	
32867	Broken	
32870	Broken	
32871	Broken	
32874	Broken	
32877	Broken	Busted pipe
32878	Broken	Busted pipe
32900	Broken	Stack
32901	Leak	
32905	Leak	
32907	Broken	
32909	Broken	Smoking
32915	Broken	
32918	Broken	Busted pipe
32930	Broken	
32943	Broken	
32964	Leak	Small amount of smoke
32967	Broken	Missing cap broken sides on c/o
36922	Broken	
36925	Broken	Broken off cap
36926	Broken	
36934	Broken	Pipe busted
36935	Broken	Pipe busted
36946	Broken	Broken stack
36947	Broken	Stack broke no cap
36948	Broken	
36949	Broken	Broken needs cap
36955	Broken	Needs cap
36964	Leak	
36990	Broken	
36991	Broken	
36999	Broken	Pipe busted
37003	Broken	Pipe broken
37005	Broken	
37009	Broken	
37018	Broken	
37019	Broken	
37020	Broken	

37023	Broken	
37023	Broken	
37025	Broken	
37236	Broken	
37238	Broken	
37265	Broken	
37266	Broken	Smoking from house, c/o and ground
37272	Broken	
37058	Broken	
37070	Broken	Broken cap but fixed in field
37078	Broken	Pipe broken
37079	Broken	Pipe broken
37080	Broken	Broken ring and cap
37091	Broken	Cap broken
37138	Leak	Small amount of smoke coming from c/o
37145	Broken	Cap missing
37149	Broken	
37169	Broken	
37172	Broken	Vacant lot near manhole
37181	Leak	
37202	Broken	
37219	Broken	
37222	Broken	
37225	Broken	
37277	Leak	Smoking from cap and ground around c
37284	Broken	
37287	Broken	
37291	Broken	Stack cracked
37292	Broken	Broken cap
37307	Broken	
37314	Broken	
41110	Leak	
41695	Broken	
41712	Broken	
43878	Broken	
42156	Leak	
46282	Broken	Smoke coming from holes in cap
54547	Broken	Busted pipe
59583	Broken	
62262	Leak	
32864	Leak	
32865	Broken	
32882	Leak	No cap
32883	Broken	Pipe busted



## **Appendix C**

### **Rainfall Data**





Daily Precipitation from Fayetteville Regional Airport  
Cumberland County 20.02507

<b>Time</b>	<b>Precipitation (in)</b>
Day	Total
18-Oct	0
19-Oct	0
20-Oct	0
21-Oct	0.41
22-Oct	0
23-Oct	0
24-Oct	0
25-Oct	0
26-Oct	0
27-Oct	0
28-Oct	0
29-Oct	0
30-Oct	0
31-Oct	0
1-Nov	0
2-Nov	0
3-Nov	0
4-Nov	0
5-Nov	0
6-Nov	0
7-Nov	0
8-Nov	0
9-Nov	0
10-Nov	0
11-Nov	0.02
12-Nov	0.25
13-Nov	0.01
14-Nov	0
15-Nov	0
16-Nov	0
17-Nov	0
18-Nov	0
19-Nov	0
20-Nov	0
21-Nov	0
22-Nov	1.61
23-Nov	0.78
24-Nov	0
25-Nov	0
26-Nov	0
27-Nov	0.06
28-Nov	0
29-Nov	0
	<b>3.14</b>

Source: <https://www.wunderground.com/history/weekly/us/nc/fayetteville/KFAY/date>

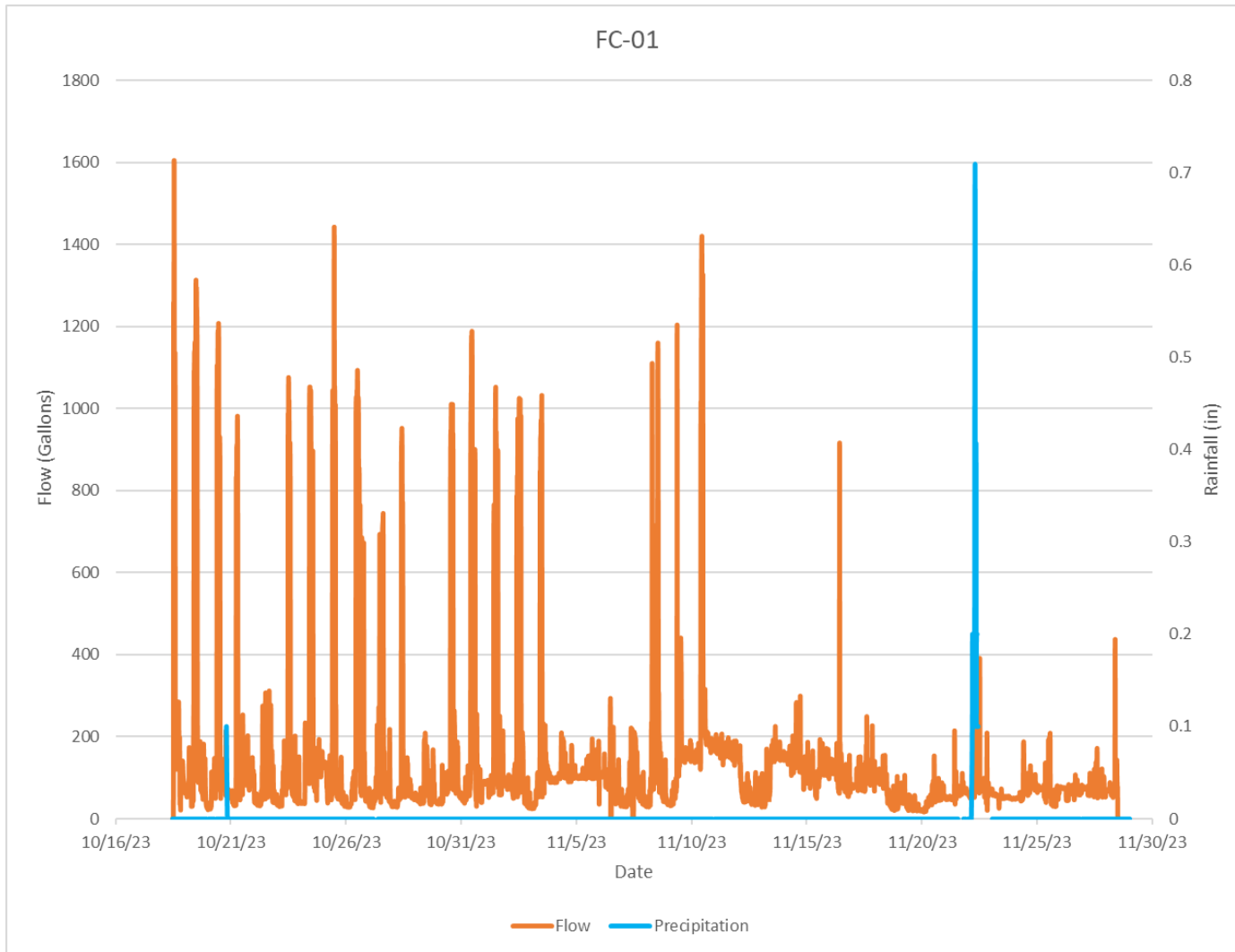


## **Appendix D**

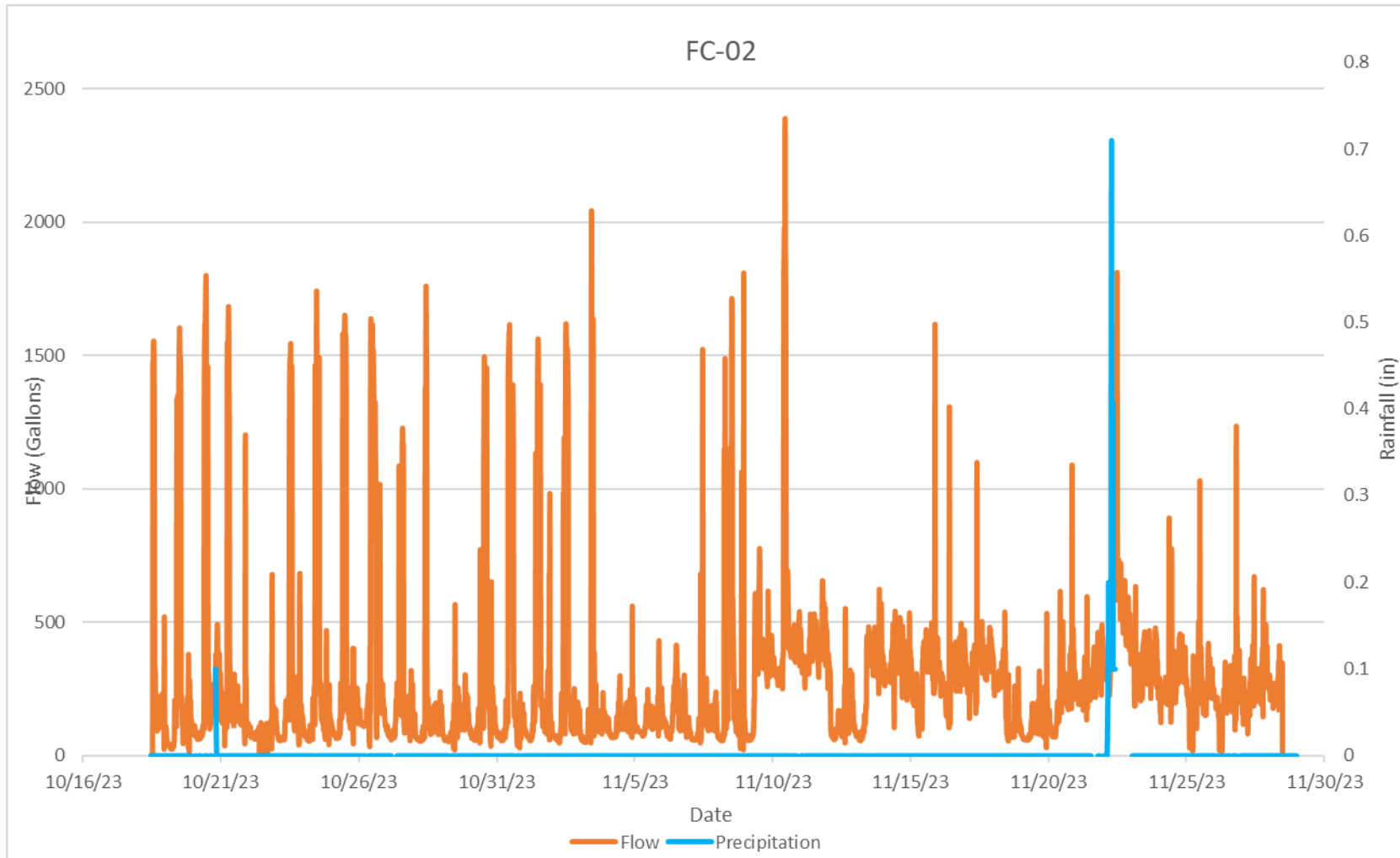
### **Flow Monitoring Data, Hourly Graphs**



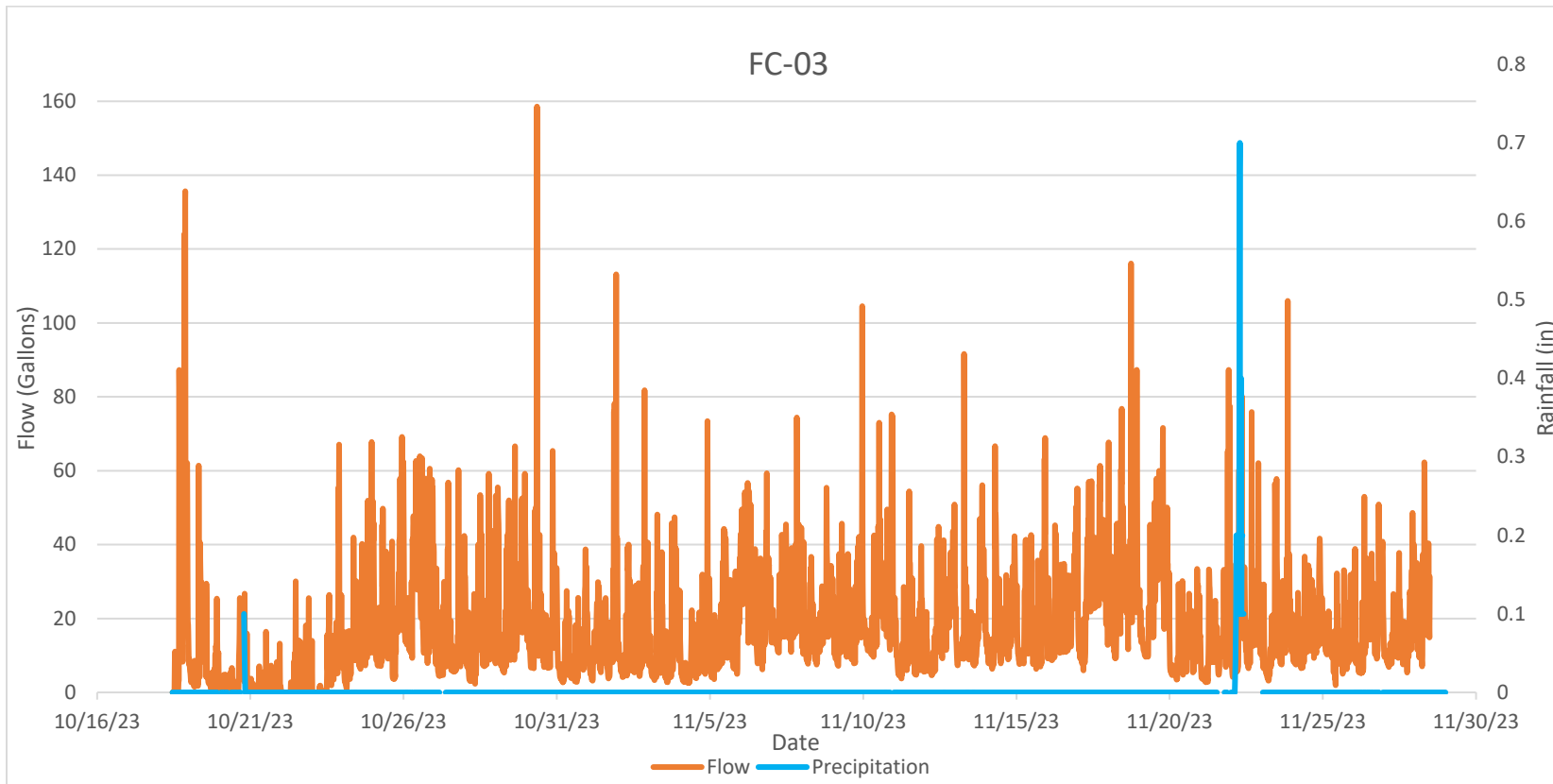
**Graph 1A: Falcon Location 01, Hourly Flow vs. Rainfall**



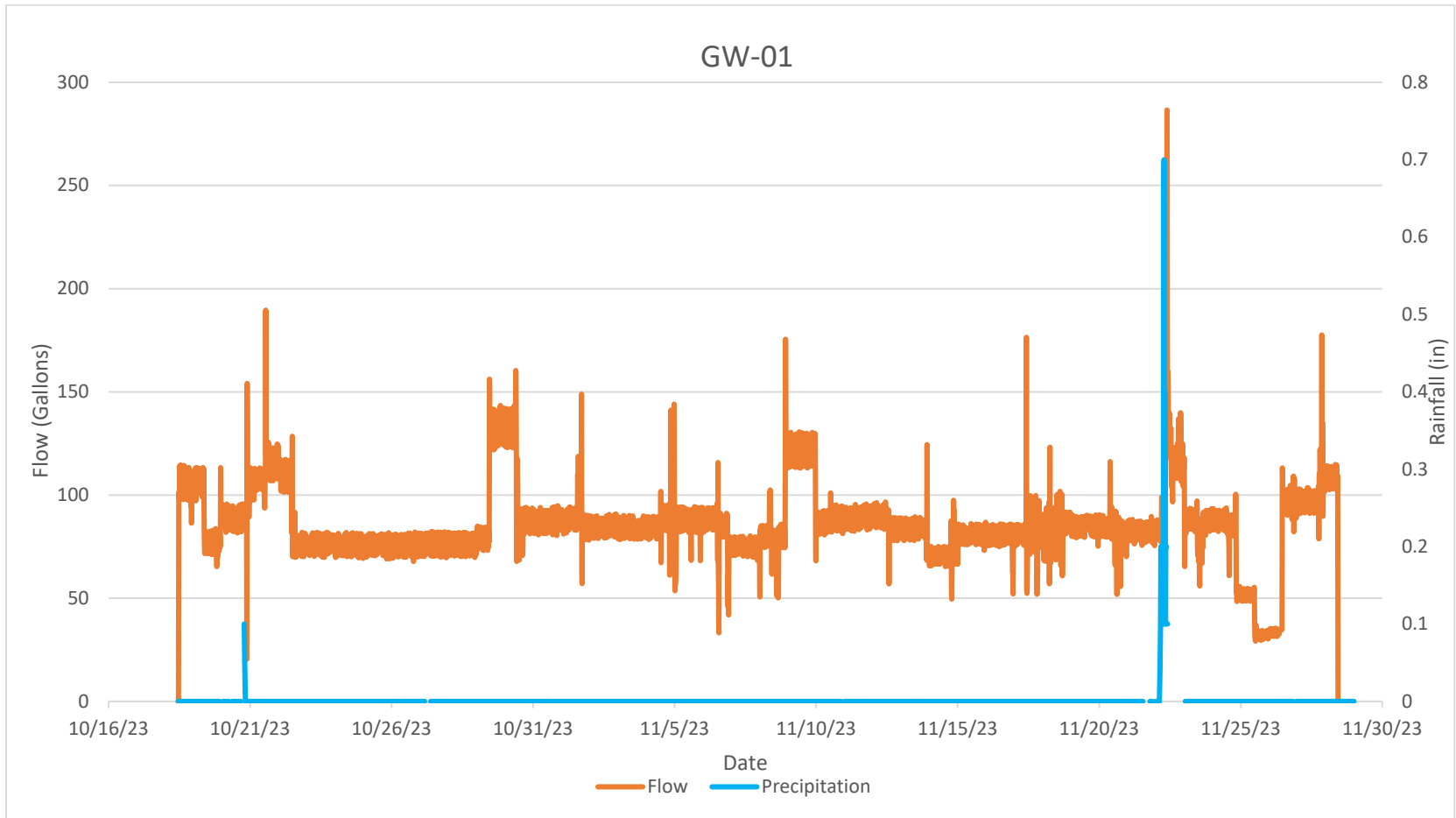
**Graph 2A: Falcon Location 02, Hourly Flow vs. Rainfall**



**Graph 3A: Falcon Location 03, Hourly Flow vs. Rainfall**

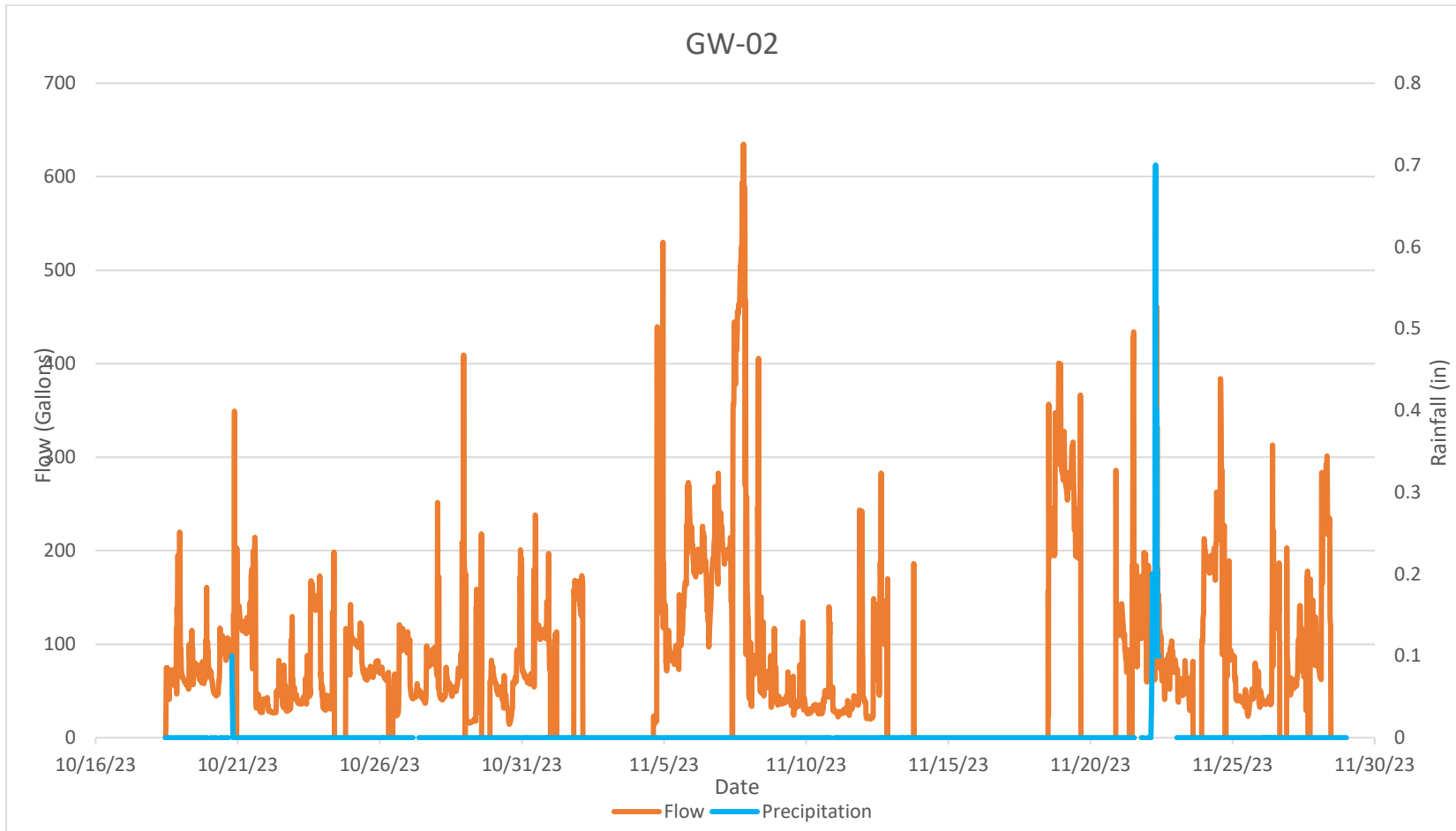


**Graph 4A: Godwin Location 01, Hourly Flow vs. Rainfall**

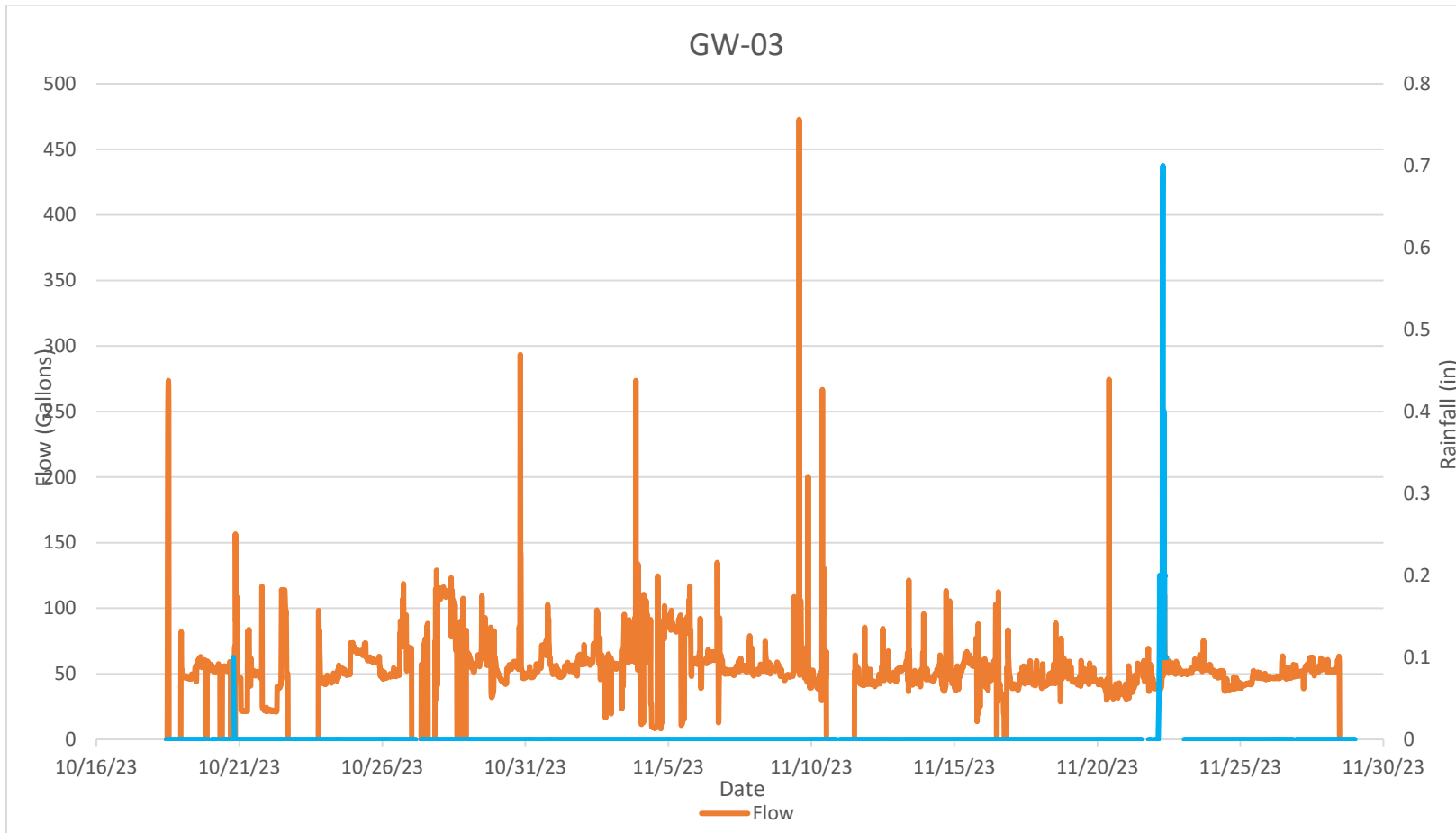




**Graph 5A: Godwin Location 02, Hourly Flow vs. Rainfall**



**Graph 6A: Godwin Location 03, Hourly Flow vs. Rainfall**



## **Appendix E**

### **Capital Improvement Project Product Data**



# HACH FL900 SERIES FLOW LOGGER -WIRELESS

**The wireless Hach FL900 Series Flow Logger revolutionizes open channel flow monitoring by providing reliable, innovative solutions for any sewer flow measurement challenge.**

From wireless communication with free data hosting to longer battery life, the FL900 is designed to reduce monitoring costs, increase efficiency, and provide better data 24/7 with less hassle than you ever thought possible. When combined with any of our full array of smart sensors, the FL900 wireless flow monitoring system will provide reliable flow data for any wastewater flow monitoring application. And with the FL900's included software tool, *fsDATA*® Online Data Manager, site time is reduced dramatically, allowing for increased time for data analysis and proactive actions for solving any flow related issue.

## Plug and Play Sensor Ports

The FL900 is available with 1, 2 or 4 sensor ports. The sensor ports are "plug and play"; the logger auto detects the type of sensor connected to allow customers maximum flexibility for their Hach flow sensor inventories.

Compatible FL900 Flow Logger sensors include:

- *FLO-DAR*® AV Sensor with optional Surcharge Velocity Sensor
- *FLO-TOTE*® 3 AV Sensor
- *Sigma Submerged AV Sensor*
- *Hach US9001 Down-Looking Ultrasonic Sensor*
- *Hach US9003 In-Pipe Ultrasonic Sensor*

## Quick Installation/On-Site Confirmation

Not only is the FL900 easy to install with a variety of mounting options, it also includes an LED status light so that you know it's fully functional before leaving the site.



## Applications

- Wastewater
- Collection Systems
- Industrial Water

## Affordable Alarming Capabilities

User-selectable alarms can be sent by email or text (SMS) to specified recipients to keep you continuously informed on your monitoring sites. Up to 16 channel alarms can be selected, as well as alarms for low battery, low RTC battery, low slate memory, slate memory full, sensor timeout, sensor ID error or missed call.

## Wireless Data Available 24/7 with *fsDATA*

Eliminate risk and make smarter, more-timely decisions with your sewer flow data. The *fsDATA* Online Data Manager provides secure 24/7 access to your flow data and wireless meter from the comfort of the internet. With *fsDATA*, site visits to collect flow data or to adjust meter settings are eliminated, decreasing maintenance costs. Set alarms and view sensor diagnostics remotely to maximize uptime. Multiple users can be granted different data access levels based on job function.

## Redundant-Level Flow Monitoring

With FL900 Series plug-and-play flow meters, you can pair a Sigma Submerged AV Sensor with a Hach US9003 In-Pipe Ultrasonic Sensor for integrated redundant-level flow monitoring.

## Specifications\*

### Portable DC Powered Electronics (Includes Models FL901, FL902 & FL904)

<b>Dimensions (W x D x H)</b>	25.4 x 22 x 40 cm (10.0 x 8.7 x 16.0 in.)
<b>Enclosure</b>	PC/ABS structural foam
<b>Environmental Rating</b>	NEMA 6P (IP68)
<b>Weight (Using Model FL900)</b>	4.5 kg (10 lb)—no batteries; 6.3 kg (14 lb)—2 batteries; 8.2 kg (18 lb)—4 batteries
<b>Operating Temperature</b>	-18 to 60°C (0 to 140°F) at 95% RH
<b>Storage Temperature</b>	-40 to 60°C (-40 to 140°F)
<b>Power Requirements</b>	8 to 18 Vdc from batteries or external power source, 2.5W max.

#### Battery Life

Varies with sensor type, logging intervals, telemetry and environment.

For a 15-minute logging interval, 60 minute call frequency, four 6 V lantern batteries at room temperature:  
130 days with 4 lantern batteries and a FLO-DAR sensor  
180 days with 4 lantern batteries and a FLO-TOTE 3 sensor  
160 days with 4 lantern batteries and a Sigma Submerged AV sensor with AV9000 Analyzer  
200 days with 4 lantern batteries and Ultrasonic Down-Looking or In-Pipe sensor

The optional long life alkaline battery pack can be used to extend battery life, if the Flow Logger is ordered with the external power option connector.

#### LED Status Indicator

- Green Flashes every 3 seconds during normal operation.  
Flashes every 15 seconds during sleep mode.
- Red Flashes when an attached sensor does not agree with the logger program, when an expected sensor is not found or the sensor is not working properly.

#### LED Modem Indicator

- Stays green during a call to the server. Goes blank after the call is successfully completed and terminated.
- Flashes red if the call to the server failed.

**Sensor Ports** 1, 2 or 4 ports

**Connectors** Stainless steel connectors

**Datalog Channels** 16 maximum

#### Alarms

Maximum of 16 channel alarms including high/high, high, low, low/low and system alarms including low battery, low RTC battery, low slate memory, slate memory full, sensor timeout, sensor ID error.

#### Alarm Actions

Trigger sampler, change logging interval, change call interval, send an e-mail, or send text message (SMS).

#### Call Monitor

Sends a message by e-mail or text (SMS) if a logger has not called the server within an user-defined amount of time.

#### Logging Intervals

1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30 or 60 minutes  
Primary and secondary intervals for dynamic logging.

#### Data Storage

Event Log: 1,000 events maximum in non-volatile flash memory  
Sample History: 2,000 sample events maximum in non-volatile flash memory  
Datalog: 325,000 data points; 1128 days for 3 channels at 15-minute log intervals

#### Data Storage

Event Log: 1,000 events maximum in non-volatile flash memory  
Sample History: 2,000 sample events maximum in non-volatile flash memory  
Datalog: 325,000 data points; 1128 days for 3 channels at 15-minute log intervals

#### Local Communication

USB  
RS232 (Baud rates: 9600, 19200, 38400, 57600, 115200)

#### Remote Communication

Wireless modem; CDMA or GPRS technology with a mobile provider.

#### Protocols

Local Modbus RTU

#### Timebase Accuracy

±0.002%, synchronized every 24 hours with server software and modem

#### Supported Sensors

FLO-TOTE 3, FLO-DAR, FLO-DAR with SVS, Sigma Submerged AV Sensor†, Sigma 950†, and Rain Gauge

#### Sampler Interface

Compatible with Sigma 900 Standard, Sigma 900MAX, Sigma SD900 to support set-point sampling, flow pacing, and logging sample history.

#### Desktop Software

FLO-WARE software is required for programming the logger and can be used for data management and report generation. It is compatible with desktop/lap top computers utilizing Windows operating system. Minimum resolution needed is 1024x768.

#### Internet Application Software

FSDATA web-based software for flow meter programming, data management and report generation for wireless flow meters.

#### Certifications

Logger: CE; optional AC power supply: UL/CSA/CE

#### Warranty

1 year

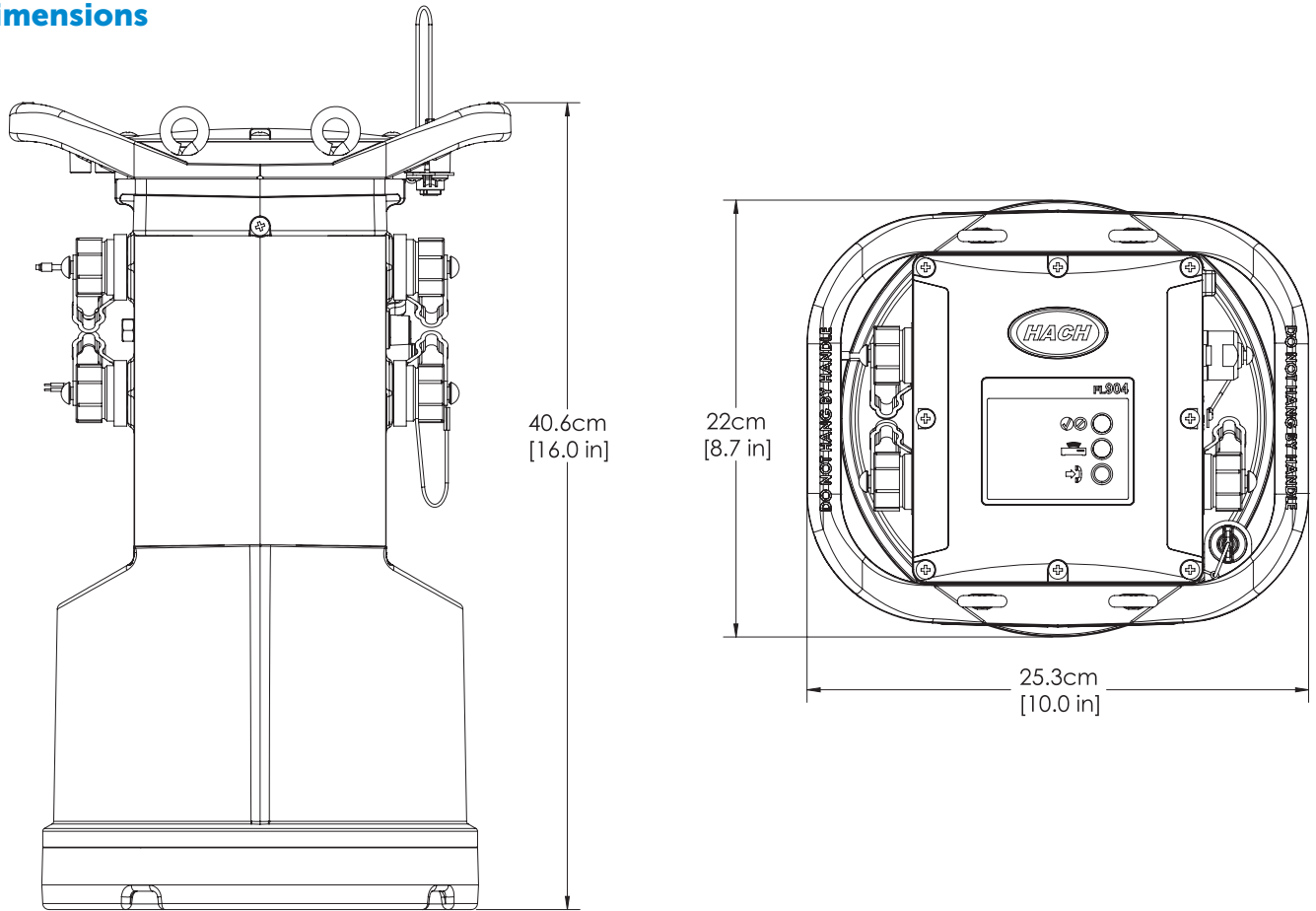


The FL900 Series Loggers meet CE requirements.

<sup>†</sup>Requires external module.

\*Subject to change without notice.

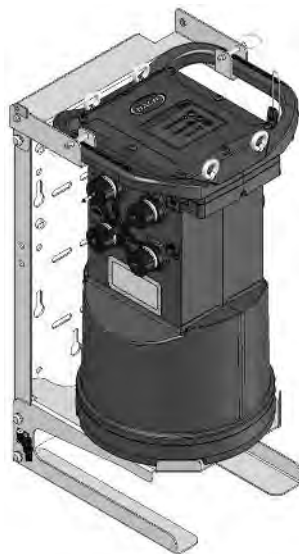
### Dimensions



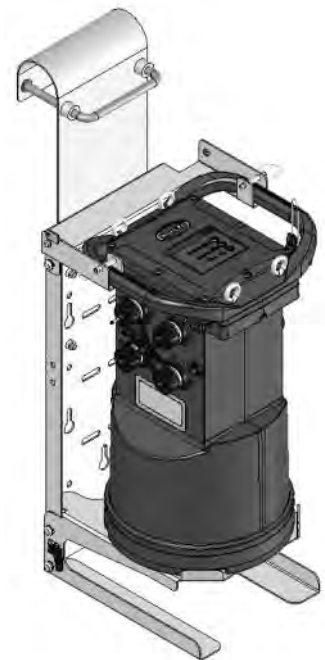
### Installation/Mounting Options



*Flow Logger Suspension Cable with Carabiner (Standard)*



*Flow Logger Wall Mount Prod. No. 8542700 (Optional)*



*Flow Logger Ladder Rung Mount Prod. No. 8544500 (Optional)*

## Ordering Information

		Sensor Connector(s)	Country Code	Modem	Rain Gauge
<b>FL90X Electronics (Flow Logger)</b>	<b>Model FL90</b>	—	97	—	—
1 Sensor Connector		1			
2 Sensor Connectors		2			
4 Sensor Connectors		4			
None				X	
AT&T (Activated)				A	
GPRS no SIM				G	
Sprint (Inactive)				R	
Sprint (Activated)				S	
Verizon (Inactive)				U	
Verizon (Activated)				V	
No Rain Gauge Connector					X
With Rain Gauge Connector					R

### External Modules

- 8531300** AV9000 Area Velocity Analyzer module (required to attach a Sigma Sub AV sensor)
- 8549800** IM9001 Interface module (required to attach a Sigma 950 flow meter)

### Cables

- 8528700** Cable, External power, 2 wire, 9 ft.
- 8528200** Cable, Communication, RS232
- 8528300** Cable, Communication, USB
- 8528400** Cable, Aux, 7pin MIL 5015 (Connect to Sigma Sampler), 9 ft.
- 8528401** Cable, Aux, 7pin MIL 5015 (Connect to Sigma Sampler), 25 ft

### Software

- Model T200-900** FLO-WARE Desktop Software
- FS-HOSTING** Monthly data hosting service for FS-DATA
- FS-DATA XFR** Monthly wireless service

### Mounting Hardware

- 8543800** Wall mount bracket (304 Stainless)
- 8545600** Wall mount bracket with ladder hanger (304 Stainless)
- 8542700** Wall mount bracket with AC Power Supply shelf (304 Stainless)
- 8544500** Wall mount bracket with AC Power Supply Shelf with ladder hanger (304 Stainless)

### Replacement Parts

- 8755500** Desiccant refill beads, Bulk 1.5 lb
- 11013M** Battery, 6V lantern
- 8542900** Battery, long-life alkaline
- 8543000** Battery pack top cap adaptor and cable (for long-life alkaline battery pack 800017701)
- 8542800** Rain Gauge with 100 ft. cable

For additional information on products mentioned in this data sheet, request the following data sheets:

**FS-DATA® Online Data Manager (LIT2707)**

**FLO-DAR® AV Sensor (LIT2708)**

**FLO-TOTE® 3 AV Sensor (LIT2712)**

**HACH US9000 Ultrasonic Sensors (LIT2804)**

**HACH Redundant Flow Monitoring System (LIT2805)**

**HACH Wireless Level Alarming System (LIT2806)**

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In the interest of improving and updating its equipment,

Hach Company reserves the right to alter specifications to equipment at any time.



Be Right™



# Marsh-McBirney FLO-DAR® Area/Velocity Radar Flow Meter Sensor



*The Flo-Dar Sensor provides an ideal solution for non-contact, maintenance-free portable or permanent sewer flow monitoring.*

## Features and Benefits

The Flo-Dar Area/Velocity Radar Flow Meter provides a revolutionary approach to open channel flow monitoring. The sensor combines advanced Digital Doppler Radar velocity sensing technology with ultrasonic pulse echo depth sensing to remotely measure open channel flow. Use with FL900 Series Flow Logger or Flo-Logger/Logger XT for portable monitoring; for permanent monitoring sites, the Flo-Dar can be connected to the Flo-Station which displays flow rate, velocity, and level. (See Lit. No. 2709 [standard] or Lit. No. 2711 [wireless] for Flow Logger product information, or Lit. No. 2616 for Flo-Station product information). Intrinsically safe models available.

### Accurate Flow Measurement

Flo-Dar provides the user with highly accurate flow measurements under a wide range of flows and site conditions. By measuring the velocity of the fluid from above, Flo-Dar eliminates accuracy problems inherent with submerged sensors including sensor disturbances, high solids content and distribution of reflectors.

### Non-Contact Sensor Eliminates Lost Data

No lost data with non-contact, above the flow sensor that is unaffected by fouling due to debris and grease.

### Easy Installation and Maintenance

As the sensor is mounted above the flow, personnel have little or no contact with the flow during installation. Future sensor removal can be done without the need for confined space entry.

### Independent Accuracy / Long-Term Stability Verification

Flo-Dar sensor accuracy and long-term stability (up to 3 years without need for site calibration) from low flow depths up to surcharge conditions has been independently verified

many times over the years including a formal evaluation by the Alden Research Laboratory, Inc. and recent field evaluations done by municipalities and consulting engineering firms.

### Perfect Solution for Difficult Flow Conditions

Operates in the most difficult conditions including flows with high solids content, high temperature, shallow and caustic flows, large man-made channels, and high velocities up to 20 ft/s.

### Optional Surcharge Velocity Sensor

During surcharge events Flo-Dar's optional electromagnetic sensor will continue to provide uninterrupted and accurate flow monitoring through dry and wet weather flows without the need for routine sensor cleaning or maintenance.

### Applications

#### Municipal

- Sanitary Sewer Evaluation Studies
- Collection Systems
- Capacity Studies
- Combined Sewer Overflows
- Inflow and Infiltration (I&I) Studies
- Billing / Custody Transfer
- Plant Influent and Effluent

#### Industrial

- Process Waste
- Plant Influent
- Plant Effluent
- Non-contact Cooling Water
- Stormwater Monitoring and Compliance

DW = drinking water WW = wastewater municipal PW = pure water / power  
IW = industrial water E = environmental C = collections FB = food and beverage



Be Right™

WW

IW

C

## Specifications\*

### FLO-DAR SENSOR

#### Enclosure

IP68 Waterproof rating, Polystyrene

#### Dimensions

160.5 W x 432.2 L x 297 D mm (6.32 x 16.66 x 11.7 in.), with SVS, D = 387 mm (15.2 in.)

#### Weight

4.8 kg (10.5 lbs.)

#### Operating Temperature

-10 to 50°C (14 to 122°F)

#### Storage Temperature

-40 to 60°C (-40 to 140°F)

#### Power Requirements

Supplied by FL900 Flow Logger, Flo-Logger, or Flo-Station

#### Interconnecting Cable

**-Disconnectable at both sensor and logger or Flo-Station**

Polyurethane, 0.400 (±0.015) in. diameter; IP68  
Standard length 9M (30 ft), maximum 305 m (1000 ft)

Cables are available in two styles:

- connectors both ends
- connector from sensor with open leads to desiccant hub, desiccant hub with connector to logger. A potting/sealant kit will be included. This can be used to run the cable through conduit.

Important Note: The sensor cable assembly with desiccant hub is compatible with either the Marsh-McBirney Flo-Logger/Logger XT or the Hach FL900 Series Flow Loggers. When using this cable assembly with the Marsh-McBirney Flo-Logger, do not disconnect the desiccant cartridge that is attached to the Flo-Logger itself. It is important to keep the air tube plugged.

If using Flo-Dar cable with Flo-Station, the cable will have bare leads to the Flo-Station (30 to 1000 ft. lengths) and there will be no desiccant hub, as the air tube terminates inside of the Flo-Station housing.

#### Warranty

1 year

#### Set-up/Data Retrieval

Flo-Ware for Windows software is the user on-site set-up, data management, and report generation software. It is compatible with desktop/laptop computers utilizing Windows operating system.

#### Certification

The Flo-Dar Transmitter is certified to the following requirements:

- Transmitter type: Field Disturbance Sensor
- Frequency: 24.125 GHz - Doppler pulse
- Maximum rated power output: 128 dbuV (ave) @ 3 meters

Certified to: FCC Part 15.245: FCC ID: VIC-FLODAR24  
Industry Canada Spec. RSS210. v7: IC No.: 6149A-FLODAR24

Use of this device is subject to the following conditions:

1. There are no used serviceable items inside this device.
2. The user must install this device in accordance with the supplied installation instructions and must not modify the device in any manner whatsoever.
3. Any service involving the transmitter must only be performed by Hach Company.
4. The user must ensure that no one is within 20 cm of the face of the transmitter when operating.

### SURCHARGE DEPTH MEASUREMENT

Auto zero function maintains zero error below 0.5 cm (0.2 in.)

#### Method

Piezo-resistive pressure transducer with stainless steel diaphragm

#### Range

3.5 m (138 in.), overpressure rating 2.5 x full scale

### VELOCITY MEASUREMENT

#### Method

Radar

#### Range

0.23 to 6.10 m/s (0.75 to 20 ft/s)

#### Frequency Range

24.075 to 24.175 G-Hz, 15.2mW (max.)

#### Accuracy

±0.5%; ±0.03 m/s (±0.1 ft/s)

### DEPTH MEASUREMENT

#### Method

Ultrasonic

#### Standard Operating Range from Flo-Dar Housing to Liquid

0 to 152.4 cm (0 to 60 in.)

#### Optional Extended Level Operating Range from Transducer Face to Liquid

0 to 6.1 m (0 to 20 ft.) with 43.18 cm (17 in.) dead band, temperature compensated.

#### Accuracy

±1%; ±0.25 cm (±0.1 in.)

### FLOW MEASUREMENT

#### Method

Based on Continuity Equation

#### Accuracy

±5% of reading typical where flow is in a channel with uniform flow conditions and is not surcharged, ±1% full scale max.

### SURCHARGE CONDITIONS DEPTH/VELOCITY

#### DEPTH (Std with Flo-Dar Sensor)

Surcharge depth supplied by Flo-Dar sensor.

#### VELOCITY (Optional Surcharge Velocity Sensor)

#### Method

Electromagnetic

#### Range

±4.8 m/s (±16 ft/s)

#### Accuracy

±0.15 ft/s or 4% of reading, whichever is greater.

#### Zero Stability

> ±0.05 ft/s

### CERTIFICATION INTRINSICALLY SAFE

The Flo-Dar and Surcharge Velocity Sensors are certified to Class I, Zone 1 Standards. They conform to ANSI/UL 60079-11 and are certified to CAN/CSA E60079-11 and EN 60079-11 standards.

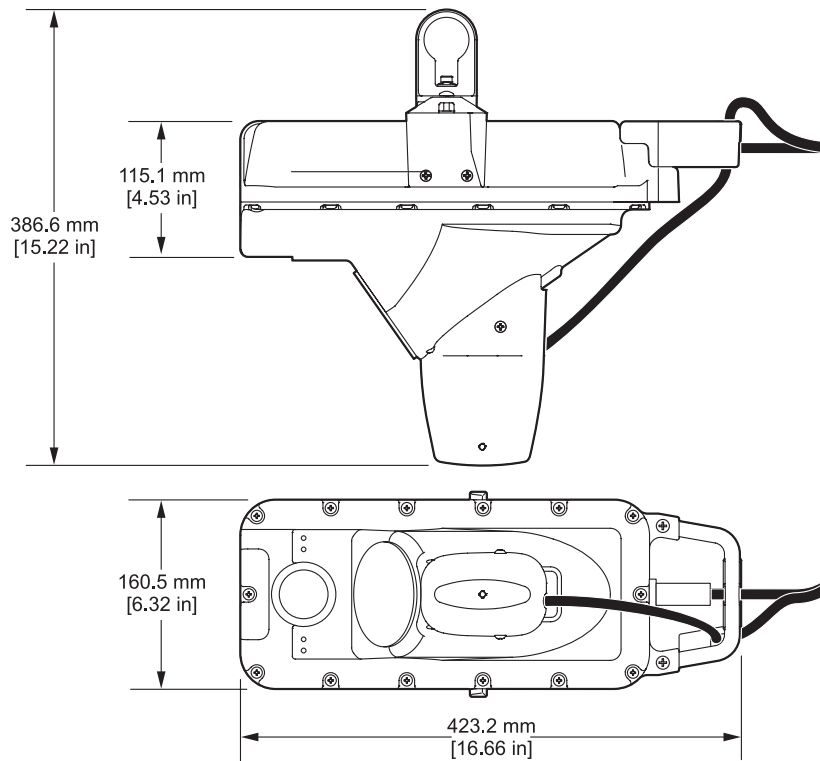


The Flo-Dar sensor meets CE requirements.

## Engineering Specifications

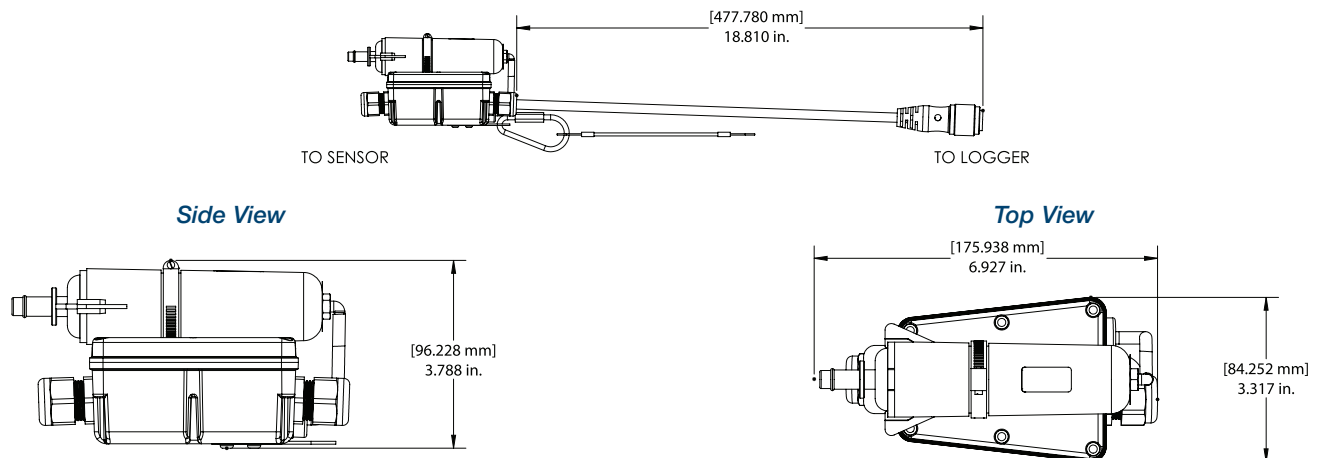
- The flow meter shall be capable of measuring level, average velocity and surcharge depth.
- The method of velocity measurement shall be Doppler radar.
- The sensor shall combine advanced Doppler Radar velocity sensing technology with ultrasonic pulse echo depth sensing to remotely measure open channel flow.
- Flow shall be calculated based on the Continuity Equation ( $Q=V \times A$ ), where  $Q$ =Flow,  $V$ =Average Velocity and  $A$ =Area.
- The range of velocity measurement shall be 0.23 to 6.10 m/s (0.75 to 20 ft/s).
- The method of depth measurement shall be ultrasonic.
- The standard operating range for depth measurement shall be 0 to 152.4 cm (0 to 60 in.) with an optional operating range of 0 to 6.1 m (0 to 20 ft.) with 43.18 cm (17 in.) deadband, temperature compensated.
- The flow meter shall have a surcharge condition velocity sensor option.
- Exterior dimensions of the sensor shall not exceed 160.5 W x 432.2 L x 297 D mm (6.32 W x 16.66 L x 11.7 D in.) or 160.5 W x 432.2 L x 387 D mm (6.32 W x 16.66 L x 15.2 D in.) with Surcharge Velocity option.
- The sensor shall be able to measure bi-directional surcharge flow.
- Optional Intrinsically Safe models available for flow monitoring in hazardous locations.
- The model shall be the Marsh-McBirney Flo-Dar Open Channel Flow Meter Sensor.

## Dimensions



*Flo-Dar Area/Velocity Radar Flow Meter*

The desiccant hub assembly includes a junction box to connect sensor cable to the desiccant and subsequently to the FL900 Logger. The desiccant can easily be replaced without need to purchase a separate desiccant module.



*Desiccant Hub Assemblies for use with portable FL900 Series Loggers and Flo-Logger.  
(Sensor cable for use with Flo-Station will not contain a desiccant hub and will have bare wires on cable end.)*

## Ordering Information

### Configure FLO-DAR Sensor to Logger (Portable)

Flo-Dar Sensor	Model 4000	-	4	X	X
<b>Flo-Dar Sensor with specified cable length</b> (need to add cable as separate line item)			4		
<b>Non Intrinsically Safe</b> <b>Surcharge Velocity Sensor Option</b> (IMPORTANT NOTE: SVS cable length MUST MATCH FloDar Sensor Cable length)				0 3	
<b>Non Extended Range</b> <b>Extended Range Option</b> —Allows use in flow depths up to 18 feet. Allow for 18" deadband. Standard unit max depth is 60". SVS Option requires Remote Extended Range below. <b>Remote Extended Range Option with 6' sensor cable</b> —Flow depths up to 18 feet. Allow for 18" deadband. Standard unit max depth is 60".					0 1 2

### Configure FLO-DAR Sensor to Flo-Station (Permanent)

Flo-Dar Sensor	Model 4000	-	9	X	X
<b>Flo-Dar Sensor with specified cable length</b> (need to add cable as separate line item)			9		
<b>Non Intrinsically Safe</b> <b>Surcharge Velocity Sensor Option</b> (IMPORTANT NOTE: SVS cable length MUST MATCH Flo-Dar Sensor Cable length)				0 3	
<b>Non Extended Range</b> <b>Extended Range Option</b> —Allows use in flow depths up to 18 feet. Allow for 18" deadband. Standard unit max depth is 60". SVS Option requires Remote Extended Range below. <b>Remote Extended Range Option with 6' sensor cable</b> —Flow depths up to 18 feet. Allow for 18" deadband. Standard unit max depth is 60".					0 1 2

### Cables

<b>FD9000CBL-XXX*</b>	FL900 Series Logger to Flo-Dar sensor. Cable w/two connectors.
<b>FDJCTBOXCBL-XXX*</b>	FL900 Series Logger to Flo-Dar sensor. Cable with connector to sensor, open end to desiccant hub, desiccant hub with connector to sensor. Includes finishing kit for potting/sealing desiccant hub. For use with conduit.
<b>6000062XX*</b>	SVS Sensor with connector for use with FL900 Series Logger.
<b>570011800-XXX*</b> <b>Model 4000-9</b>	Flo-Station to Flo-Dar sensor Cable with one connector and bare leads.
<b>6000059XX*</b>	SVS Sensor with bare leads for use with Flo-Station. *Contact customer service for product numbers.
Available Cable Lengths (in feet)	
30	125 225 400 700
60	150 250 450 800
75	175 300 500 900
100	200 350 600 1000

See Lit. No. 2709 (standard models) and Lit. No. 2711 (wireless models) for FL900 Series Flow Logger ordering information. See Lit. No. 2616 for Flo-Station ordering information.

### Mounting Hardware

<b>800016701</b>	Permanent Sensor Mount—Includes sensor frame & all mounting hardware. Portable Sensor Mounts Available (Sizes 34-107") Contact Sales.
------------------	---

### Accessories & Spares

<b>245000501</b>	Sensor Retrieval Pole - Used to place and retrieve sensor from mounting bracket. Pole extends to 7.3 m (21 ft.)
<b>510012701</b>	Sensor Retrieval Hook - Used with Sensor Retrieval Pole
<b>570011401</b>	Grounding Strap (required with Retrieval Pole and Hook when used with IS units)
<b>8755500</b>	Bulk desiccant beads (1.5 pounds)

Lit. No. 2708 Rev 2  
K11 Printed in U.S.A.

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In the interest of improving and updating its equipment, Hach Company reserves the right to alter specifications to equipment at any time.



*At Hach, it's about learning from our customers and providing the right answers. It's more than ensuring the quality of water—it's about ensuring the quality of life. When it comes to the things that touch our lives...*

*Keep it pure.*

*Make it simple.*

*Be right.*

*For current price information, technical support, and ordering assistance, contact the Hach office or distributor serving your area.*

*In the United States and all other countries except Europe, contact:*

HACH COMPANY  
4539 Metropolitan Court  
Frederick, MD 21704-9452, U.S.A.  
Telephone: 800-368-2723  
Fax: 301-874-8459  
E-mail: hachflowsales@hach.com  
[www.hachflow.com](http://www.hachflow.com)

*In Europe contact:*

Flow-Tronic  
Rue J.H. Cool 19a  
B-4840 Welkenraedt Belgium  
Telephone: +32-87-899799  
Fax: +32-87-899790  
E-mail: site@flow-tronic.com  
[www.flow-tronic.com](http://www.flow-tronic.com)



**Be Right™**

# US3 Rain Gauge

## Rain Gauge Tipping Bucket With Leaf Filter



The US3 Rain Gauge tipping bucket uses a standard tipping bucket mechanism that allows for straightforward and effective rainfall measurement. The geometry and material selection of the bucket, along with the inclusion of a leaf filter, help minimize contamination and errors in the measurement process.

The rain gauge features a 8" (200mm) diameter collector funnel. The tipping bucket device is divided into two compartments to enable the measurement of rainfall in fixed increments. The bucket is pivoted at its center and has a preset calibration to tip for a specific amount of rainfall, either 0.5 mm or 1 mm. The tipping action of the bucket magnetically opens and closes a reed switch. When the bucket is full and tips, it triggers the reed switch, generating a pulse signal. The pulse signal from the reed switch is sent to a data logger or RTU.

### Ordering information

**Code**            **US3-RGTB**

### Applications

- Water management
- Rain Measurement
- Flood Control Monitoring
- Environmental telemetry
- Intelligent Irrigation systems
- Integrates with Most Loggers/PLCs

### Technical characteristics

Item	Specification
Measurement object	Rain
Measured rainfall intensity	0-9.5 inch/hour
Sample interval	1s
Resolution	0.004 inch
Accuracy(0.08 inch/min)	±4%
Power consumption	1.6W
Supply	7-24VDC
Output	RS485, RS232, SDI-12 optional
Operating temperature	-40-+176F -40-+80°C
Main material	SS+ABS
Weight (unpacked)	1.4 lbs (0.65kg)



## **Appendix F**

### **PWC Agreement**



THIS AGREEMENT, made this 2nd day of FEBRUARY, 2004 by and between the NORCRESS WATER AND SEWER DISTRICT (hereinafter referred to as "NORCRESS"); and the PUBLIC WORKS COMMISSION of the City of Fayetteville, North Carolina (hereinafter referred to as "COMMISSION").

WITNESSETH THAT

WHEREAS, NORCRESS has contracted with COMMISSION to furnish sanitary sewer treatment service to NORCRESS as per an agreement dated October 14, 2002; and

WHEREAS, both COMMISSION and NORCRESS recognize the complexity of providing sanitary sewer utility service; and

WHEREAS, NORCRESS requests that COMMISSION operate and maintain NORCRESS's proposed sanitary sewer collection system; and

WHEREAS, COMMISSION agrees to operate and maintain said sanitary sewer collection system.

NOW THEREFORE, and in consideration of the benefits each shall derive, the parties mutually agree as follows:

I. COMMISSION will provide the following services:

A. Basic Operation and System Maintenance, to include:

- (1) Repairing damaged, deteriorated, or broken sanitary sewer mains, not to include outright system replacement of large segments (more than 500') of the sanitary sewer collection system which cannot be repaired due to structural failure, natural or manmade disasters, or were not installed with COMMISSION approved plans and specifications;
- (2) Repairing damaged, deteriorated, or broken sanitary sewer service laterals from the main to edge of road right-of-way or easement;
- (3) Routine maintenance and repair of pump station equipment, if any, not to include replacement of major components (parts and/or equipment valued over \$1,000);
- (4) Cleaning and rodding of clogged sewer mains;
- (5) Repairing of manholes, including rings and covers;
- (6) Other routine maintenance and repairs as needed;



- (7) Administrative and engineering support of above, as required;
- (8) 24 hours, 7 days per week on-call dispatch with appropriate response forces;
- (9) Responding to inquiries by existing and potential users of sanitary sewer service;
- (10) Investigating and working to resolve complaint issues;
- (11) Keeping NORCRESS abreast of changes in regulations concerning sanitary sewer utility services;
- (12) Maintaining metered electric service at pumping stations as well as chemicals associated with pump station operation. The cost of metered electric service shall be a recoverable expense to be included in the monthly billing statement;
- (13) Plan review by COMMISSION engineering staff of NORCRESS's plans and/or plans submitted to NORCRESS by others to ensure utility extensions are designed to meet COMMISSION specifications and are compatible with NORCRESS's goals and objectives for meeting overall system needs.

B. COMMISSION will provide other services, upon request, but which will be billed separately and not included in the monthly basic operation and maintenance billing. A partial list of the "other services" that may be available to NORCRESS include the following:

- (1) Sanitary sewer service lateral installation;
- (2) Promote participation agreements with other benefited parties;
- (3) Preparation and administration of utility extension contracts;
- (4) Right-of-way acquisition services for land and easement requirements to be secured in the name of NORCRESS within the limits permitted by law but not to include actions in eminent domain;
- (5) Inspection services during construction;
- (6) Meter reading and billing;
- (7) Miscellaneous services such as GIS mapping as requested.

II. OPERATION AND MAINTENANCE COST – COMMISSION shall render accurate monthly bills to NORCRESS. Such bills shall be computed by multiplying NORCRESS's sewer flow, expressed in thousand (M) gallons, by the applicable rate per thousand (M) gallons for this customer class. The rate per thousand (M) gallons shall be subject to change annually. In addition, COMMISSION shall submit an itemized statement monthly for the

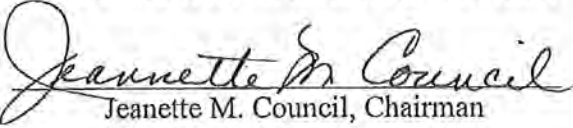
actual cost associated with metered electric service and "other services" as set forth in Paragraph I-B performed by COMMISSION, reflecting the appropriate regular hourly or overtime rate for labor, equipment, and materials (to include an amount for all direct and indirect charges plus profit at 10%).

- III. REPAIRS - COMMISSION shall not be financially responsible for any repairs or cost of repairs needed to the sanitary sewer collection system unless such repairs are due to negligence of COMMISSION or its employees. However, COMMISSION will repair or arrange for all repair services. If not covered under Basic Operation and Maintenance (Paragraph I-A), COMMISSION will seek prior approval from NORCRESS if the anticipated cost of such repairs exceeds \$1,000, unless delay in making repairs could create or prolong discontinuance of sanitary sewer utility services, or create unsafe conditions for customers, COMMISSION's employees or other persons, or create an environmental hazard.
- IV. PAYMENT - Monthly bills rendered for services as provided hereunder are payable within 10 days from their date, at COMMISSION's office, Robert C. Williams Business Center, 201 Hay Street, (28301) P.O. Box 7000, Fayetteville, NC 28302. A late charge of one percent per month from final payment date shall apply to all such bills.
- V. TERM OF AGREEMENT - NORCRESS and COMMISSION mutually agree that the term of this Agreement shall be ten years from the date of COMMISSION's execution thereof, and continuing annually thereafter until terminated by either party's written notice at least three months prior to the end of any such annual term.
- VI. TERMINATION OF AGREEMENT - If NORCRESS or COMMISSION fails to fulfill in a timely and proper manner the obligations under this Agreement, either party shall have the right to terminate this Agreement by specifying the reason for termination in written notice to the other party at least 60 days prior to the date of termination.
- VII. AMENDMENTS - This Agreement shall not be modified, amended, or changed in any respect except in a writing, duly signed by the parties hereto. Each party hereby waives any right to amend the Agreement in any other manner.
- VIII. ASSIGNMENT - This Agreement shall be binding upon and shall inure to the benefit of NORCRESS and its successors and assigns. COMMISSION may only assign this agreement with the written consent of NORCRESS.
- IX. LIABILITY - COMMISSION shall not be liable for injury or damage to NORCRESS or

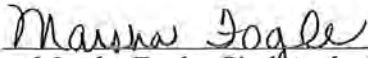
persons or property, unless such injury or damage was caused by the negligence or willful misconduct by COMMISSION or its employees. COMMISSION shall not be responsible for any injuries or damages resulting from acts, omissions, or occurrences, which occurred prior to the date COMMISSION, began operations pursuant to this Agreement. NORCRESS shall indemnify, defend, and save COMMISSION harmless against other/all liability, claims, judgments, losses, costs and expenses for injury, loss, or damage to persons or property, including fines by any federal or state agency, and also including personal injury or property damage to NORCRESS, its employees, sanitary sewer customers, and citizens on account of operation and maintenance of NORCRESS's sanitary sewer system, including any defective construction (other than by COMMISSION or its agents) or equipment of NORCRESS's sanitary sewer system, on NORCRESS's side of the point of delivery from COMMISSION's facilities or on its sanitary sewer customers' side of the service lateral. COMMISSION assumes responsibility for and shall indemnify, defend, and save NORCRESS harmless against all liability, claims, judgments, losses, costs and expenses for injury loss, or damage to persons or property, including fines by any federal or state agency, and also including personal injury or property damage to sanitary sewer customers and citizens on account of operation of NORCRESS's sanitary sewer system on the NORCRESS's side of the point of delivery of sanitary sewer service (metering point) due to the negligence or willful misconduct of COMMISSION.

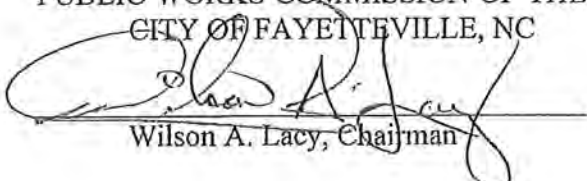
- X. ENTIRE AGREEMENT - This writing embodies the entire Agreement and understanding between the parties hereto and there are no other agreements or understandings, oral or written, with reference to the subject matter hereof that are not merged herein and superseded hereby.

IN TESTIMONY WHEREOF, NORCRESS has executed this instrument by its Chairman and COMMISSION has executed this instrument by its Chairman, each being duly authorized to execute this Agreement.

NORCRESS WATER & SEWER DISTRICT  
  
Jeanette M. Council, Chairman

ATTEST:

  
Marsha Fogle, Clerk to the Board

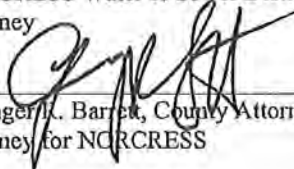
PUBLIC WORKS COMMISSION OF THE  
CITY OF FAYETTEVILLE, NC  
  
Wilson A. Lacy, Chairman

ATTEST:


  
Terri Union, Secretary

NORCRESS:

APPROVED for Legal Sufficiency  
NORCRESS Water & Sewer District  
Attorney

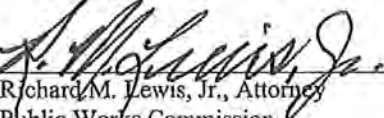
  
Grainger L. Barrett, County Attorney  
Attorney for NORCRESS

This instrument has been pre-audited in the manner  
required by the Local Government Budget and Fiscal  
Control Act.

  
Amy H. Cannon, Assistant County Manager  
Finance Officer for NORCRESS

COMMISSION:

APPROVED as to form this 14<sup>th</sup> day of  
MAY, 2004

  
Richard M. Lewis, Jr., Attorney  
Public Works Commission

This instrument has been pre-audited in the manner  
required by the Local Government Budget and Fiscal  
Control Act.

  
Dwight Miller, Chief Financial Officer  
Public Works Commission



---

NORTH CAROLINA – CUMBERLAND COUNTY

I, Anna L. Hymes, a Notary Public of said County and State do hereby certify that Marsha Fogle personally appeared before me this day and acknowledged that he/she is Clerk of NORCRESS Water and Sewer District, and that the authority duly given and as the act of said, the foregoing instrument was signed in its name by its Chairman, sealed with its corporate seal, and attested by himself/herself as its Clerk.

WITNESS my hand and Notarial Seal, this the 2nd day of Feb., 2004.

My COMMISSION Expires: 8-13-08

Anna L. Hymes  
Notary Public

---

NORTH CAROLINA - CUMBERLAND COUNTY

I, Joan D. Starling, a Notary Public of said County and State do hereby certify that TERRI WATSON, personally appeared before me this day and acknowledged that he is Secretary of The Public Works Commission, an agency of the City of Fayetteville, North Carolina, and that the authority duly given and as the act of the agency, the foregoing instrument was signed in its name by its Chairman, sealed with its seal, and attested by himself as its Secretary.  
herself

WITNESS my hand and Notarial Seal, this the 26 day of May, 2004.

My COMMISSION Expires: April 1, 2007

Joan D. Starling  
Notary Public



## **Appendix G**

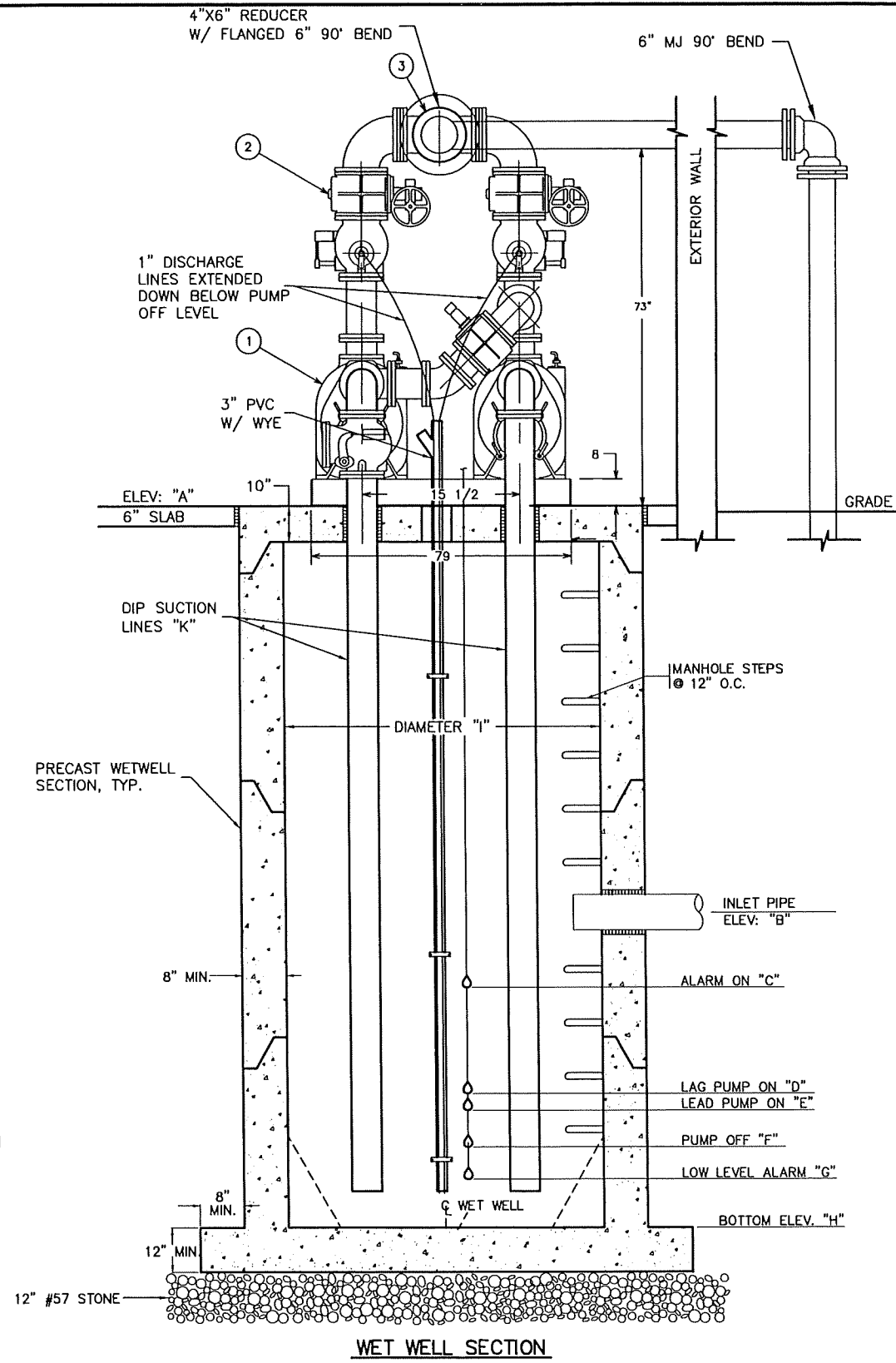
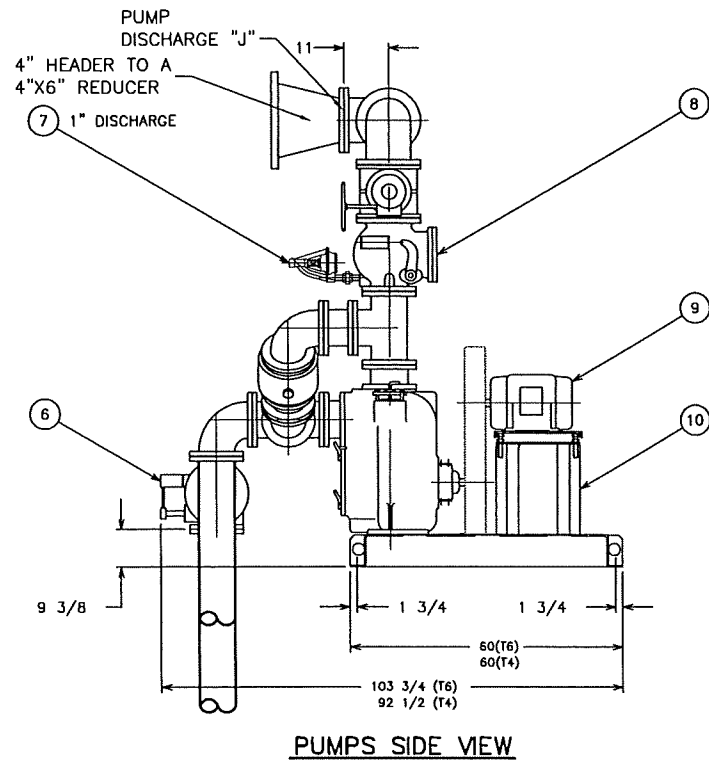
### **Lift Station Record Drawings**





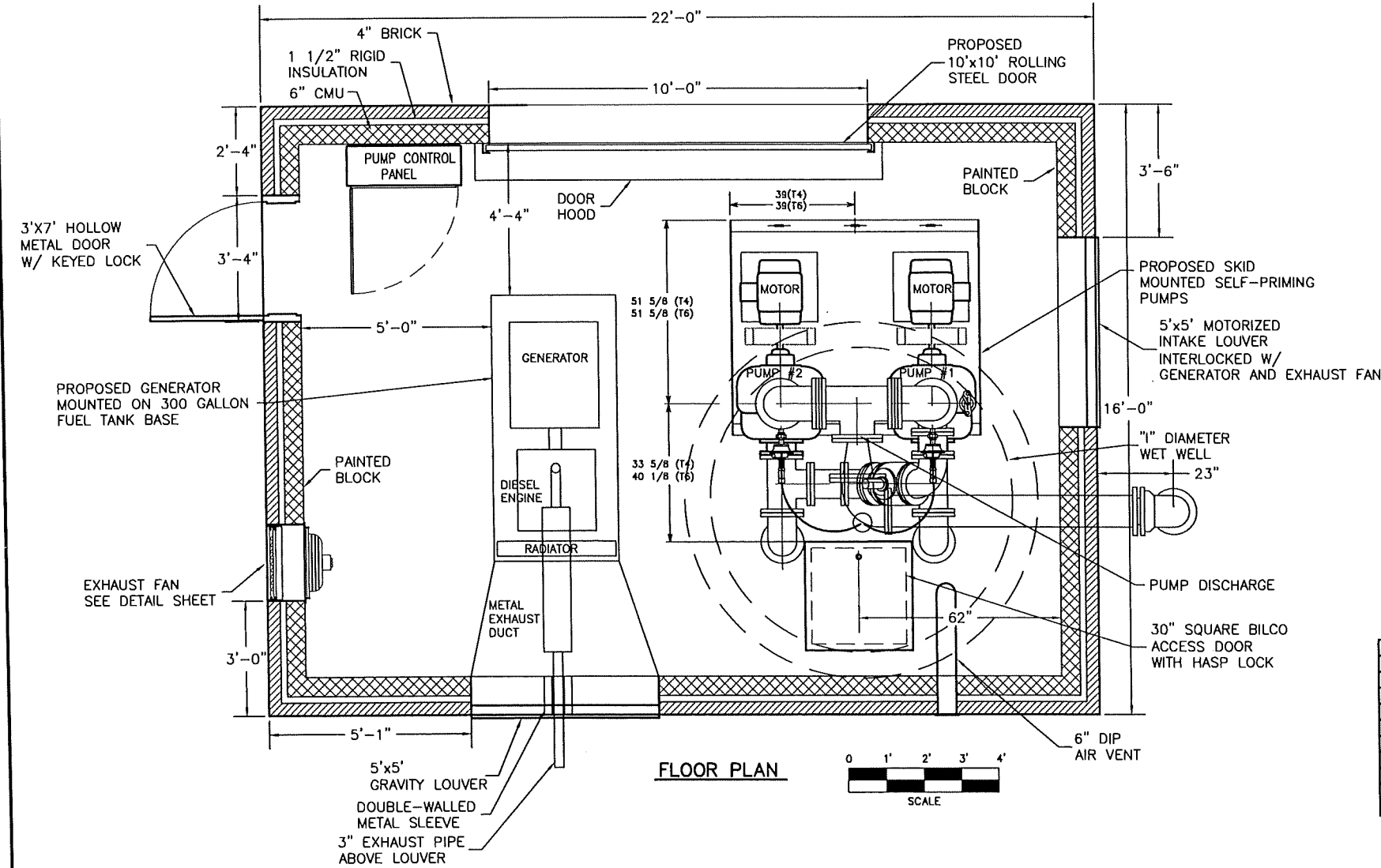


BASE BID-SELF PRIMING PUMP STATION DATA	
	PUMP STATION F-1
DESIGN FLOW	70,000 GPD
PUMP CAPACITY	350 GPM
TDH	108
FM SIZE	8 IN
FM EFFECTIVE LENGTH	18,225
FM HIGH POINT	175.5
VEL. @ PUMP RATE	2.24 FT/SEC
PUMP ON TIME	2.63 MIN
PUMP OFF TIME	16.31 MIN
SELECTED PUMP (OR EQUAL)	GORMAN RUPP T4A-B
RPM	1950
MIN HORSEPOWER	30
MIN EFFICIENCY	44%
IMPELLER	9.75
DISCHARGE	4 IN
WET WELL DIMENSIONS:	
A-RIM	125.28
B-INLET PIPE/ INVERT	EL 116.11 FT
C-HIGH WATER ALARM	EL 115.1 FT
D-LAG PUMP ON	EL 114.8 FT
E-LEAD PUMP ON	EL 113.8 FT
F-LEAD PUMP OFF	EL 111.80 FT
G-LOW LEVEL ALARM	EL 111.10 FT
H-BOTTOM WET WELL	EL 109.80 FT
I-DIAM WET WELL	8 FT
J-DISCHARGE PIPING	6 IN
K-SUCTION PIPING	6 IN

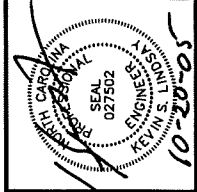


ITEM	DESCRIPTION	MATERIAL
1	PUMP	CAST IRON
2	DISCHARGE PLUG VALVE	CAST IRON
3	DISCHARGE TEE	CAST IRON
4	INTERCONNECT PLUG VALVE	CAST IRON
5	BELT GUARD ASSY	STEEL
6	SUCTION CHECK VALVE	CAST IRON
7	AIR RELEASE VALVE	CAST IRON 1" (SHIPPED LOOSE)
8	DISCHARGE CHECK VALVE	CAST IRON
9	MOTOR	CAST IRON
10	PUMP & MOTOR BASE ASSY	STEEL

**NOTE:**  
CONTROL PANELS PROVIDED BY OWNER  
ALONG WITH TELEMETRY CONTROL  
UNIT, REMOTE TERMINAL UNIT  
WITH ANTENNA, FLOATS AND  
FLOAT SUPPORTS.



REVISIONS	DATE	BY
SYMBOL	DESCRIPTION	DATE
	REVISED WITH	2011-23-04
		DFW



**Hobbs, Upchurch & Associates, P.A.**  
Consulting Engineers  
SOUTHERN PINES, NC - CHARLOTTE, NC  
MAGS HEAD, NC - RALEIGH, NC  
MYRTLE BEACH, SC - BEAUFORT, SC  
300 S.W. Broad Street, Southern Pines, North Carolina 28387  
Phone: (910) 692-5616 - Fax: (910) 692-4795



PUMP STATIONS  
FOR THE  
NORCROSS WATER AND SEWER DISTRICT  
CUMBERLAND COUNTY, NORTH CAROLINA  
SELF PRIMING PUMP STATION F1

DATE:	JAN., 2004
DESIGNED:	DFW
DRAWN:	DFW
CHECKED:	KSL
SCALE:	SCALE
SHEET NO.	58
OF:	68

H:\C010103-95\PUMP\BLOG\001\PHBLDGSrev.dwg, FLOORPLAN-FALCON, 10/20/2005 9:12:45 AM, DWG, \\exchange\HPLJ3500, 1,2

# LEGEND

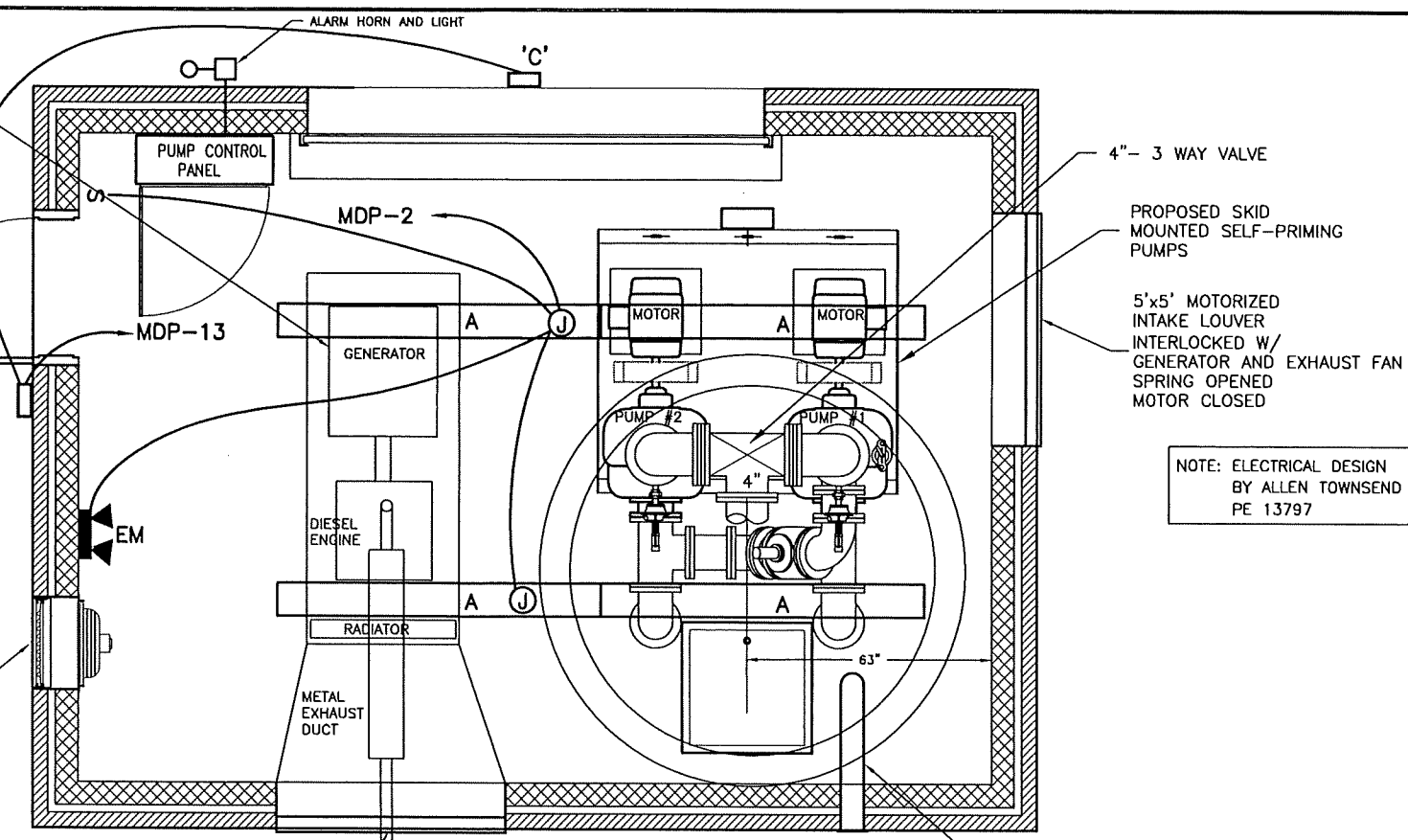
- GFI 20A, 120V, DUPLEX RECEPT, GFI
- WP WEATHERPROOF
- JUNCTION BOX
- S 20A, 120V, SINGLE POLE SWITCH
- DISCONNECT RATING AS SHOWN
- POWER PANEL
- AUTOMATIC TRANSFER SW
- FLOW TRANSMITTER

PANEL TYPE: SQ D I-LINE TYPE HCM		250 AMP MLO		PROVIDE GROUND BAR						
VOLTS: 120/240		<b>"MDP"</b>		NEMA 1 ENCLOSURE						
PHASE: 3 PHASE, 4 WIRE				30 KAIC						
W	LOAD DESCRIPTION	WIRE SIZE	BKR. SIZE	CKT. NO.	L1 L2 L3	CKT. NO.	BKR. SIZE	WIRE SIZE	LOAD DESCRIPTION	W
980	EXHAUST FAN / LOUVER	12	20	1		2		4/0	PUMP CONTROL PANEL	26600
984	LIGHTS	12	20	3		4	200	4/0	PUMP CONTROL PANEL	26600
3000	RECEPTACLES	12	20	5		6	3	4/0	PUMP CONTROL PANEL	26600
1500	GEN. BLOCK HEATER	12	20	7		8		10	UNIT HEATER	1666
400	GEN. BATTERY CHARGER	12	20	9		10	30	10	UNIT HEATER	1666
800	SCADA PANEL	12	20	11		12	3	10	UNIT HEATER	1666
300	EXTERIOR LIGHTS	12	20	13		14			SPACE	
				15		16			SPACE	
				17		18			SPACE	
				19		20			SPACE	

PROPOSED GENERATOR MOUNTED ON 300 GALLON FUEL TANK BASE

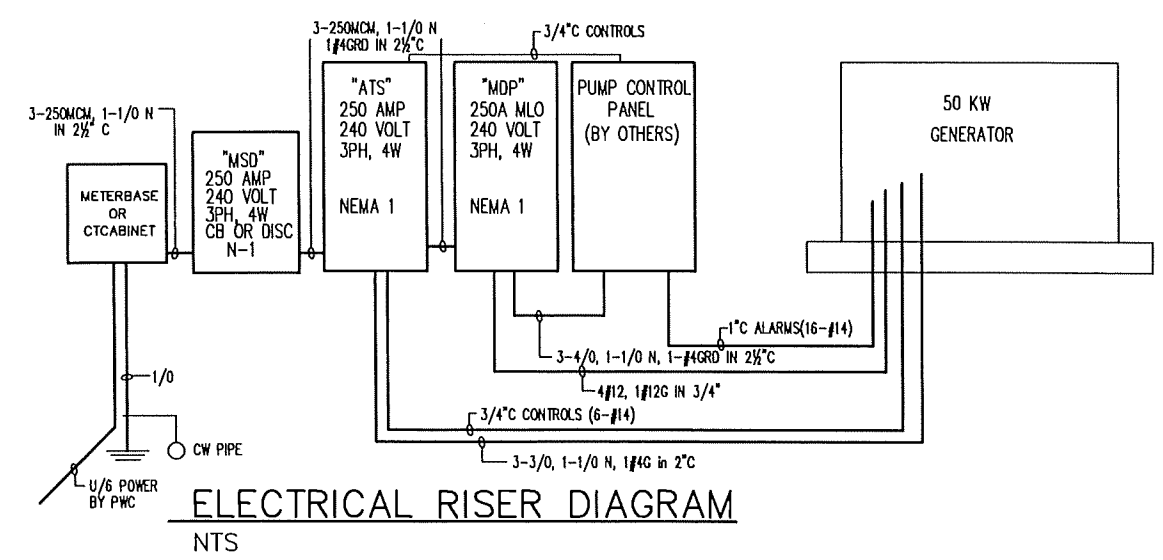
PROVIDE PHOTOCELL B IN THIS LIGHT TO CONTROL BOTH OUTSIDE LIGHT FIXTURES

EXHAUST FAN SEE DETAIL SHEET



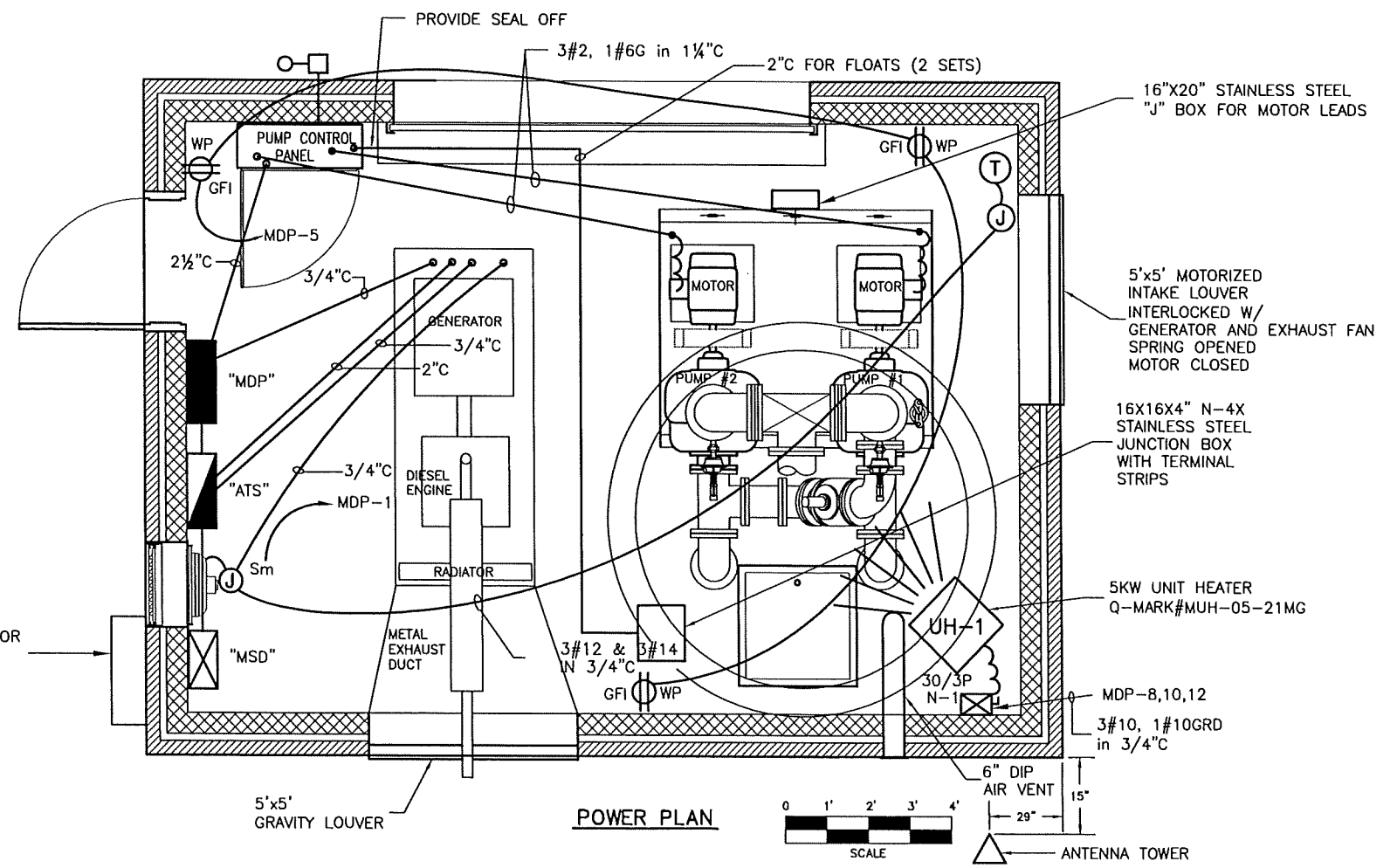
**LIGHTING PLAN**  
SCALE: 0 1' 2' 3' 4'

NOTE: ELECTRICAL DESIGN BY ALLEN TOWNSEND PE 13797



**ELECTRICAL RISER DIAGRAM**  
NTS

FIXTURE SCHEDULE				
SYMBOL	MANUF.	CAT NO.	LAMPS	REMARKS
A	COLUMBIA	LU8-296HO-120	2-F96T12HO (110 WATT)	PROVIDE SPACER BETWEEN LIGHT & CEILING
B	SPAULDING	WGS1-M100PS-MT	1-100WMH	MOUNT 10'0" AFG
C	SPAULDING	WGST-M175-MT	1-175MH	MOUNT OVER DOOR 12'0" AFG
EM	PRESCOLITE	LMP-16	2-7.2W	MOUNT 10'0" AFF



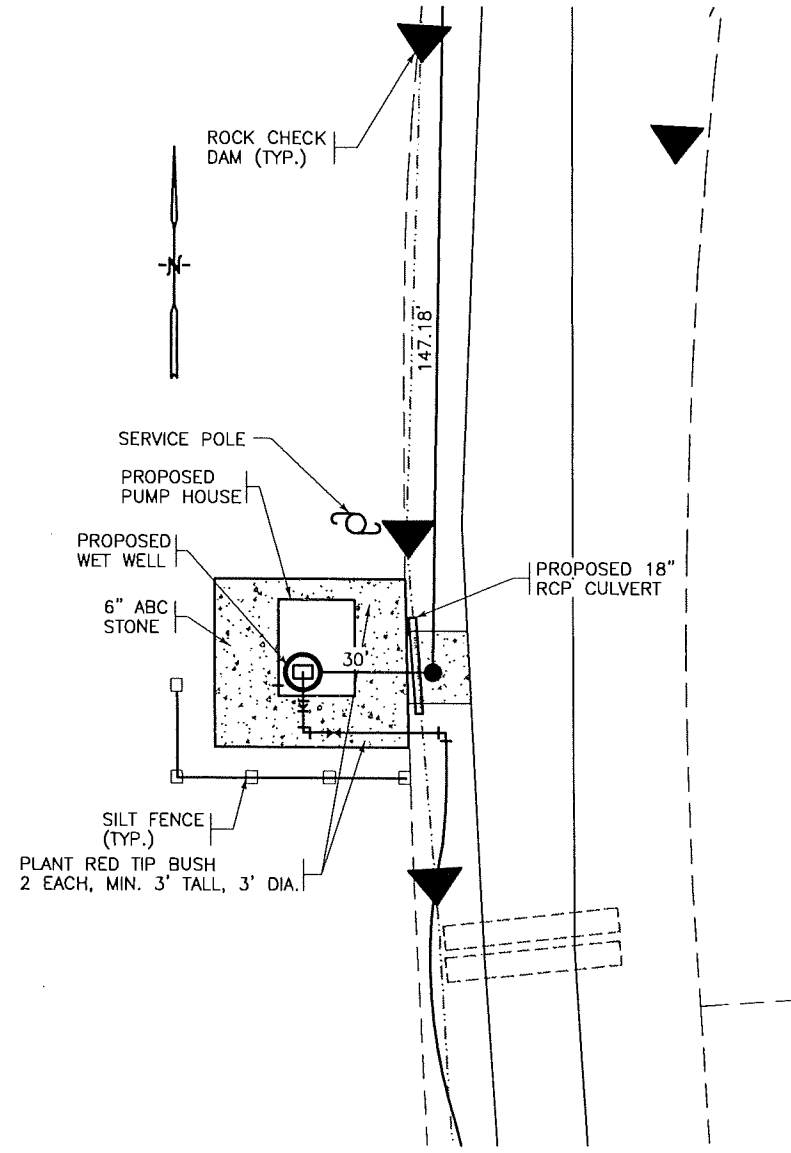
**POWER PLAN**  
SCALE: 0 1' 2' 3' 4'

RECORD DRAWINGS OCTOBER 2005

<p>REVISIONS</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>STYL.</th> <th>DESCRIPTION</th> <th>DATE</th> <th>BY</th> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table>	STYL.	DESCRIPTION	DATE	BY					<p style="text-align: center;"><b>Hobbs, Upchurch &amp; Associates, P.A.</b> Consulting Engineers</p> <p style="text-align: center;">SOUTHERN PINES, NC - CHARLOTTE, NC MAYS HEAD, NC - RALEIGH, NC MYRTLE BEACH, SC - BEAUFORT, SC</p> <p style="text-align: center;">300 S.W. Broad Street, Southern Pines, North Carolina 28387 Phone: (910) 692-5616 - Fax: (910) 692-4795</p> <div style="text-align: center;"> </div> <hr/> <p style="text-align: center;">PUMP STATIONS FOR THE NORCROSS WATER AND SEWER DISTRICT CUMBERLAND COUNTY, NORTH CAROLINA</p> <p style="text-align: center;">PUMP STATION F-1 POWER AND LIGHTING PLANS</p> <hr/> <p>DATE: DEC., 2003 DESIGNED: DFW DRAWN: DFW CHECKED: KSL SCALE: SCALE SHEET NO. <b>E1</b></p>
STYL.	DESCRIPTION	DATE	BY						

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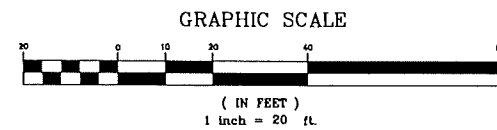
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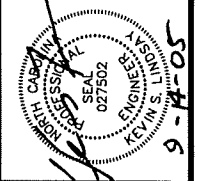
NOTE:  
CONTRACT 3 INCLUDES  
MANHOLE AND 5' STUBOUT  
FOR PUMP STATION

PROPOSED PUMP STATION G-1  
SITE PLAN

SITE ELEVATION 127.67'



SYMBOL	REVISIONS DESCRIPTION	DATE	BY



**Hobbs, Upchurch & Associates, P.A.**  
Consulting Engineers  
SOUTHERN PINES, NC - CHARLOTTE, NC  
MAYS HEAD, NC - RALEIGH, NC  
MYRTLE BEACH, SC - BEAUFORT, SC

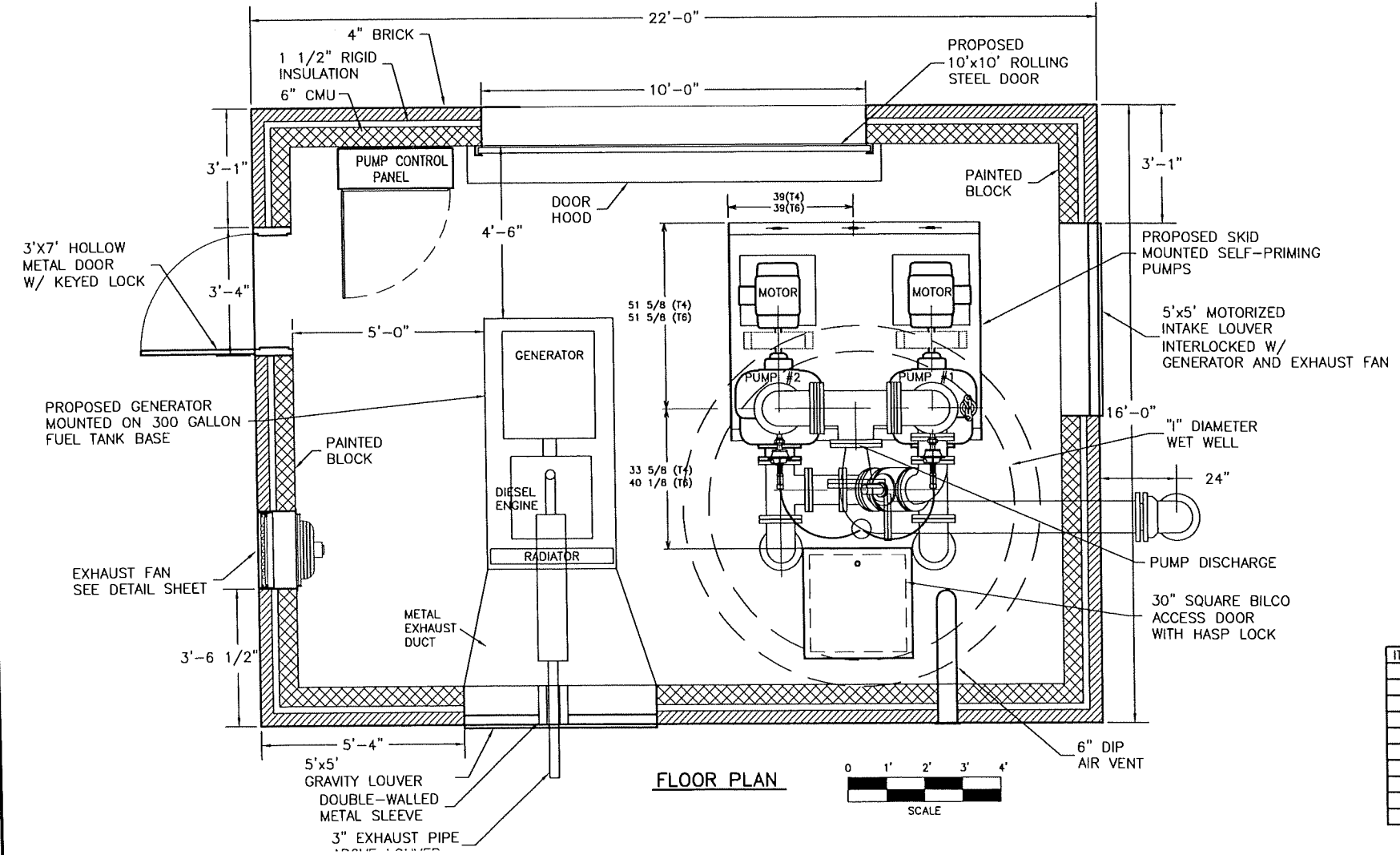
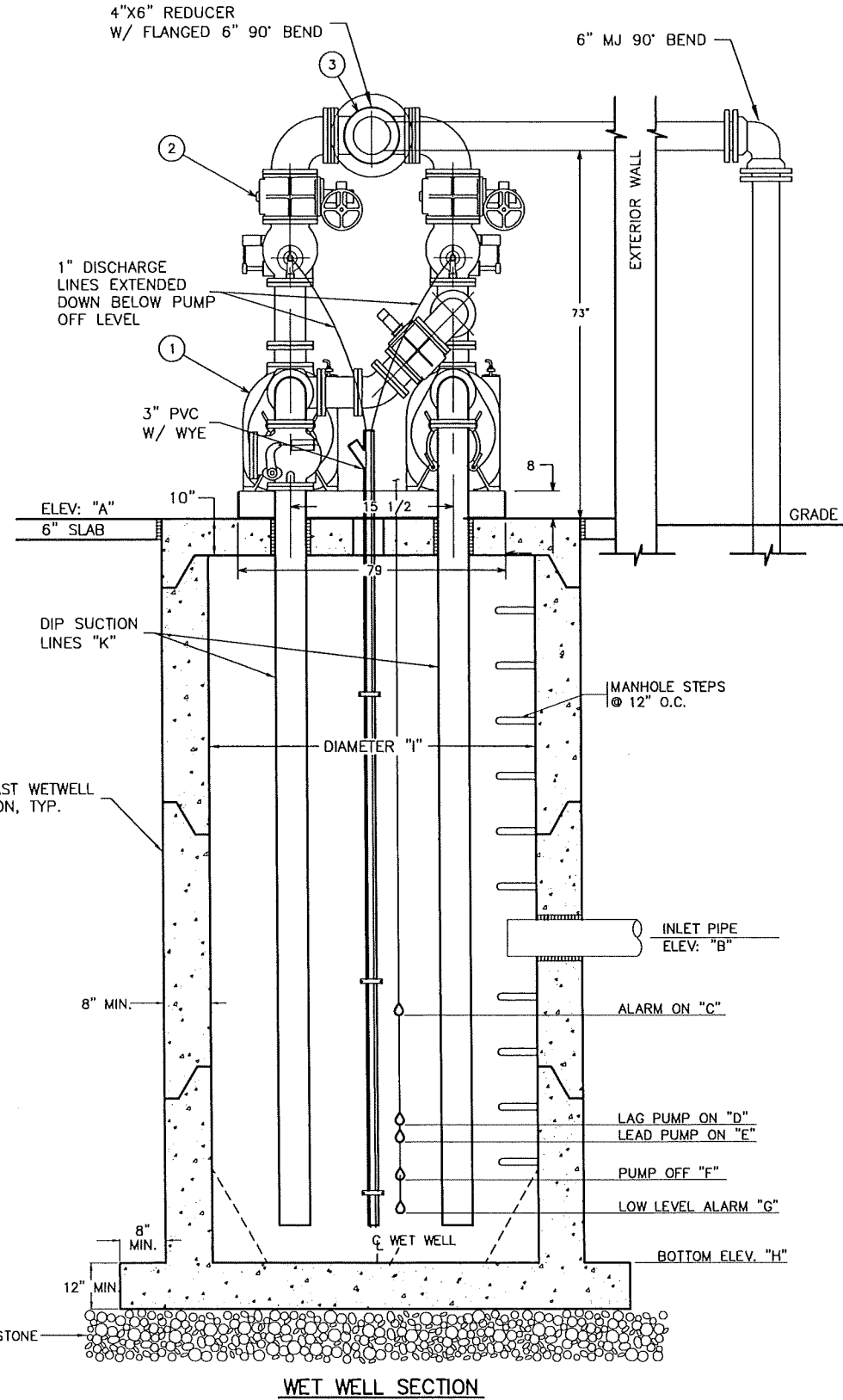
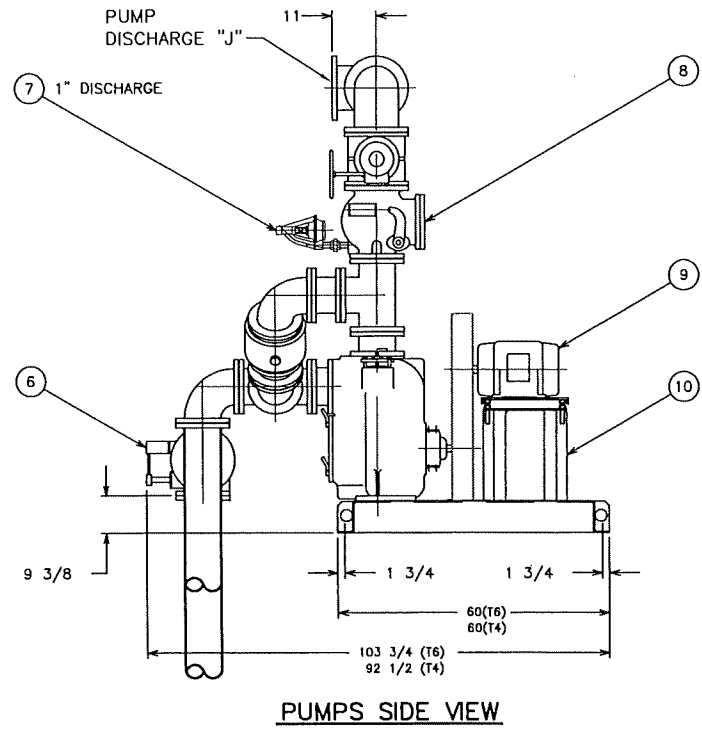
300 S.W. Broad Street, Southern Pines, North Carolina 28387  
Phone: (910) 692-5616 - Fax: (910) 692-4795

TOWN OF GODWIN SANITARY SEWER SYSTEM  
FOR THE  
NORCROSS WATER AND SEWER DISTRICT  
CUMBERLAND COUNTY, NORTH CAROLINA

LAYOUT PUMP STATION G-1

DATE:	DECEMBER, 2002
DESIGNED:	KSL
DRAWN:	HMW3
CHECKED:	KSL
SCALE:	AS SHOWN
SHEET NO.	48
OF:	59

SELF PRIMING PUMP STATION DATA	
PUMP STATION G-1	
DESIGN FLOW	10,000 GPD
PUMP CAPACITY	200 GPM
TDH	114
FM SIZE	6 IN
FM LENGTH	21,987 FT
FM HIGH POINT	151.00 FT
VEL. @ PUMP RATE	2.27 FT/SEC
PUMP ON TIME	0.55 MIN
PUMP OFF TIME	15.22 MIN
SELECTED PUMP (OR EQUAL)	GORMAN RUPP T3A3SB-B
RPM	2,200
MIN HORSEPOWER	25
MIN EFFICIENCY	36%
IMPELLER	8.75 IN
DISCHARGE	4 IN
WET WELL DIMENSIONS:	
A-RIM	127.67
B-INLET PIPE/ INVERT	12 INCH, @ EL 120.30 FT
C-HIGH WATER ALARM	EL 116.8 FT
D-LAG PUMP ON	EL 116.3 FT
E-LEAD PUMP ON	EL 115.8 FT
F-LEAD PUMP OFF	EL 115.3 FT
G-LOW LEVEL ALARM	EL 114.80 FT
H-BOTTOM WET WELL	EL 113.3 FT
I-DIAM WET WELL	6 FT
J-DISCHARGE PIPING	4 IN



SELF PRIMING PUMPS WITH PARALLEL SERIES PIPING

ITEM	DESCRIPTION	MATERIAL
1	PUMP	CAST IRON
2	DISCHARGE PLUG VALVE	CAST IRON
3	DISCHARGE TEE	CAST IRON
4	INTERCONNECT PLUG VALVE	CAST IRON
5	BELT GUARD ASSY	STEEL
6	SUCTION CHECK VALVE	CAST IRON
7	AIR RELEASE VALVE	CAST IRON 1" (SHIPPED LOOSE)
8	DISCHARGE CHECK VALVE	CAST IRON
9	MOTOR	CAST IRON
10	PUMP & MOTOR BASE ASSY	STEEL

**NOTE:**  
CONTROL PANELS PROVIDED BY OWNER ALONG WITH TELEMETRY CONTROL UNIT, REMOVE TERMINAL UNIT WITH ANTENNA, FLOATS AND FLOAT SUPPORTS.

REVISIONS	DESCRIPTION	DATE	BY
1	REVISED WIDTH 20'	11-23-04	DFW



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Consulting Engineers  
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MAGS HEAD, NC - RALEIGH, NC  
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Phone: (910) 692-5616 - Fax: (910) 692-4795



PUMP STATIONS FOR THE  
NORCROSS WATER AND SEWER DISTRICT  
CUMBERLAND COUNTY, NORTH CAROLINA  
SELF PRIMING PUMP STATION G1

DATE:	JAN., 2004
DESIGNED:	DFW
DRAWN:	DFW
CHECKED:	KSL
SCALE:	SCALE
SHEET NO.	49
OF	59

RECORD DRAWINGS SEPTEMBER 2005

H:\CUD\03-PS-PUMP\G1\001\G1\DWG\FLOORPLAN-GODWIN, 9/15/2005 8:22:15 AM, DWG, \\exchange\HP\US000, 1,2

# LEGEND

- GFI 20A, 120V, DUPLEX RECEPT, GFI
- WP WEATHERPROOF
- JUNCTION BOX
- S 20A, 120V, SINGLE POLE SWITCH
- DISCONNECT RATING AS SHOWN
- POWER PANEL
- AUTOMATIC TRANSFER SW
- FLOW TRANSMITTER

PANEL TYPE: SQ D I-LINE TYPE HCM  
 VOLTS: 120/240  
 PHASE: 3 PHASE, 4 WIRE  
 30 KAIC

225 AMP MLO  
**"MDP"**

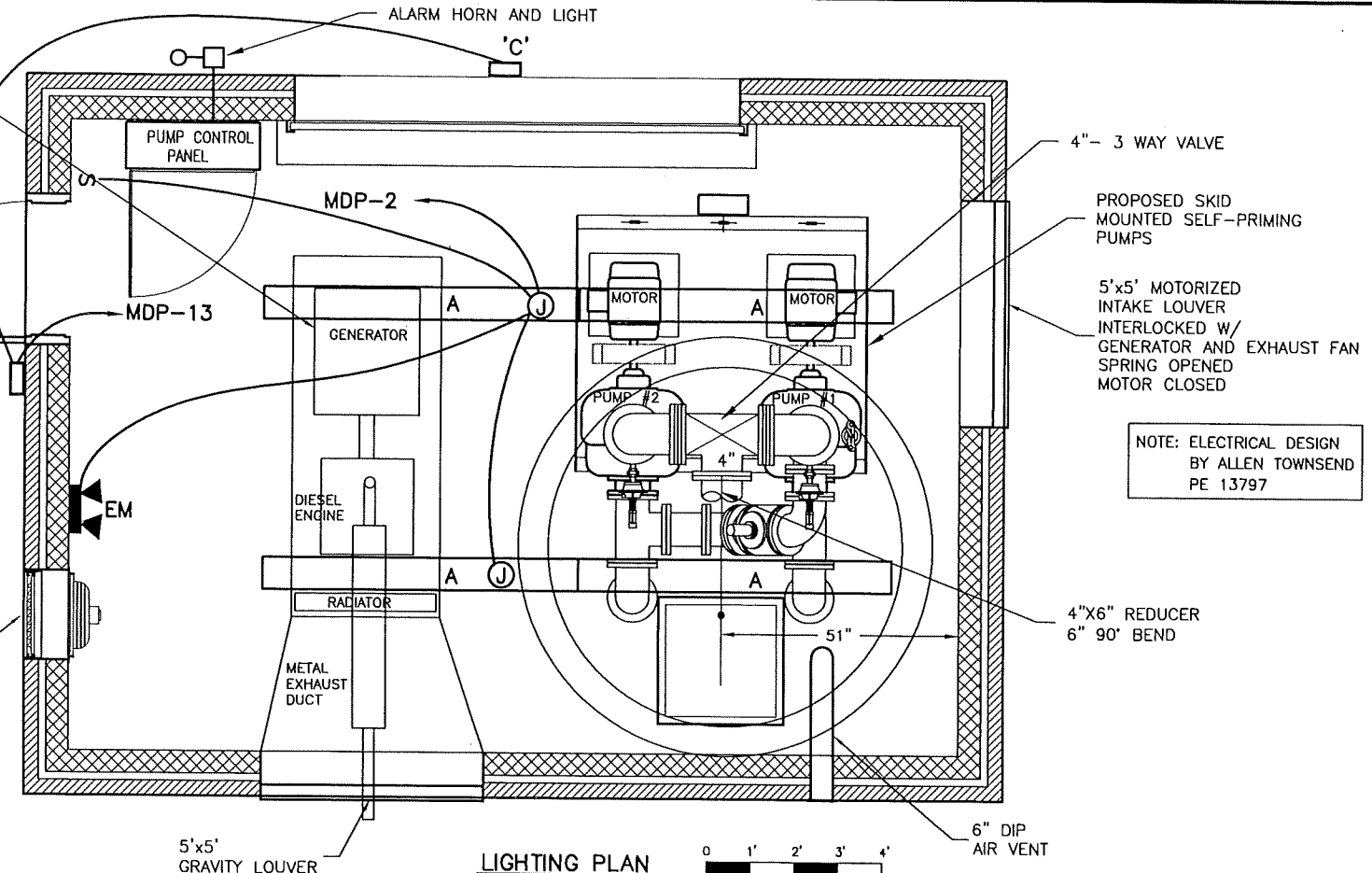
PROVIDE GROUND BAR  
 NEMA 1 ENCLOSURE

W	LOAD DESCRIPTION	WIRE SIZE	BKR. SIZE	CKT. NO.	L1	L2	L3	CKT. NO.	BKR. SIZE	WIRE SIZE	LOAD DESCRIPTION	W
980	EXHAUST FAN / LOUVER	12	20	1				2		3/0	PUMP CONTROL PANEL	22900
984	LIGHTS	12	20	3				4	175	3/0	PUMP CONTROL PANEL	22900
3000	RECEPTACLES	12	20	5				6		3/0	PUMP CONTROL PANEL	22900
1500	GEN. BLOCK HEATER	12	20	7				8		10	UNIT HEATER	1666
400	GEN. BATTERY CHARGER	12	20	9				10	30	10	UNIT HEATER	1666
800	SCADA PANEL	12	20	11				12		10	UNIT HEATER	1666
300	EXTERIOR LIGHTS	12	20	13				14				
				15				16				
				17				18				
				19				20				

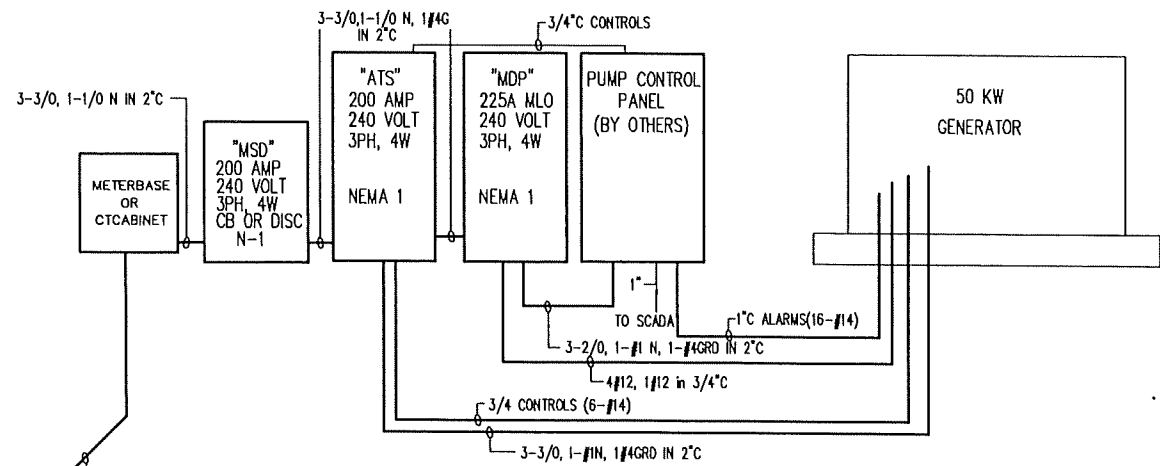
PROPOSED GENERATOR MOUNTED ON 300 GALLON FUEL TANK BASE

PROVIDE PHOTOCELL B IN THIS LIGHT TO CONTROL BOTH OUTSIDE LIGHT FIXTURES

EXHAUST FAN SEE DETAIL SHEET



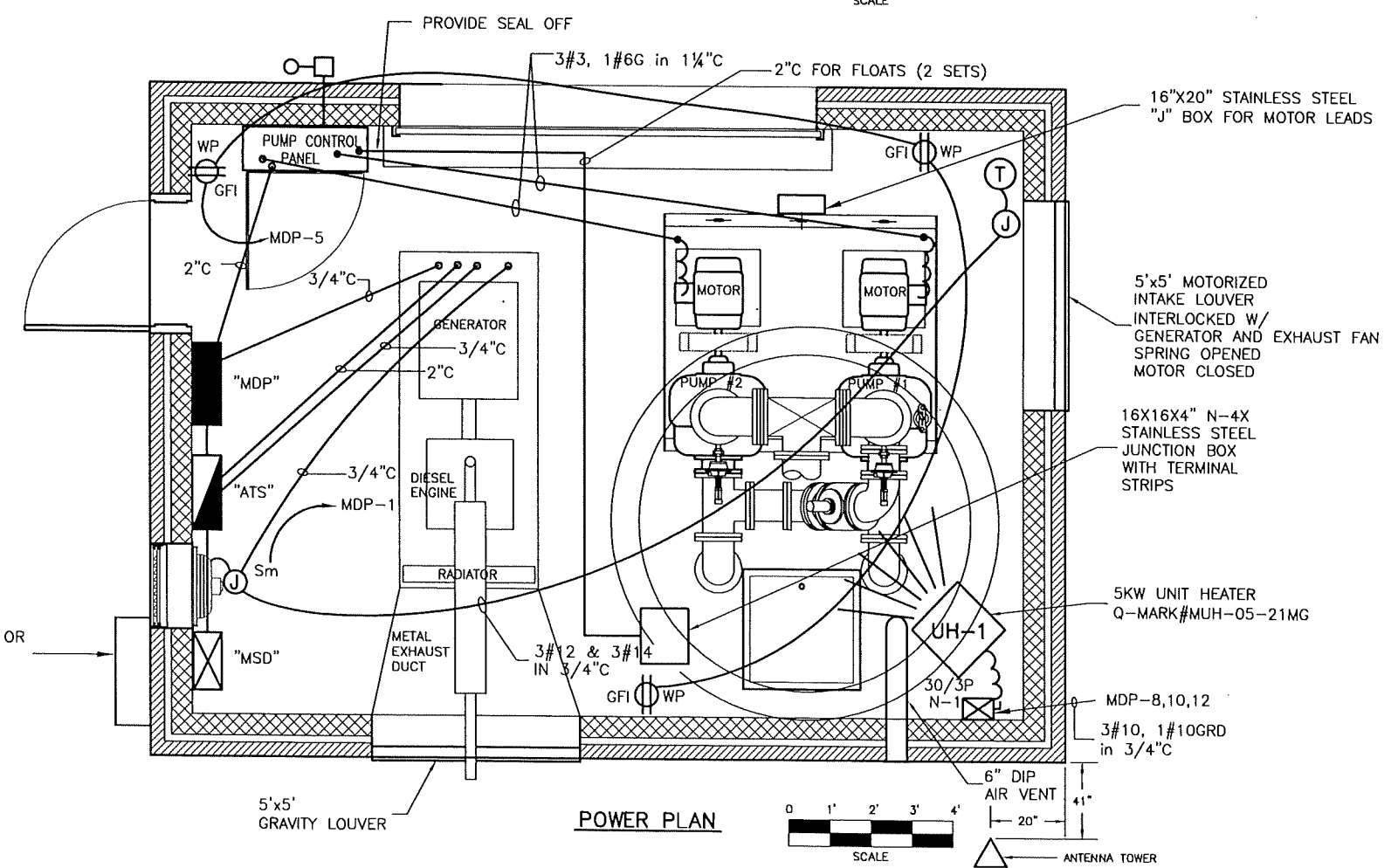
NOTE: ELECTRICAL DESIGN BY ALLEN TOWNSEND PE 13797



ELECTRICAL RISER DIAGRAM  
 NTS

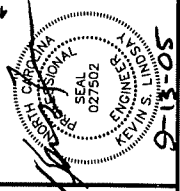
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SYMBOL	MANUF.	CAT NO.	LAMPS	REMARKS
A	COLUMBIA	LUB-296HO-120	2-F96T12HO (110 WATT)	PROVIDE SPACER BETWEEN LIGHT & CEILING
B	SPAULDING	WCSI-M100PS-MT	1-100WMH	MOUNT 10'0" AFG
C	SPAULDING	WGSI-M175-MT	1-175MH	MOUNT OVER DOOR 12'0" AFG
EM	PRESCOLITE	LMP-16	2-7.2W	MOUNT 10'0" AFF



POWER PLAN

REVISIONS	DATE	BY
SYMBOL	DESCRIPTION	DATE
1	REVISED	11-23-04
2	REVISED	11-23-04



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 Consulting Engineers  
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 NAGS HEAD, NC - RALEIGH, NC  
 MYRTLE BEACH, SC - BEAUFORT, SC  
 300 S.W. Broad Street, Southern Pines, North Carolina 28387  
 Phone: (910) 692-5616 - Fax: (910) 692-4795



PUMP STATIONS FOR THE  
 NORCRESS WATER AND SEWER DISTRICT  
 CUMBERLAND COUNTY, NORTH CAROLINA  
 PUMP STATION G-1 POWER  
 AND LIGHTING PLANS

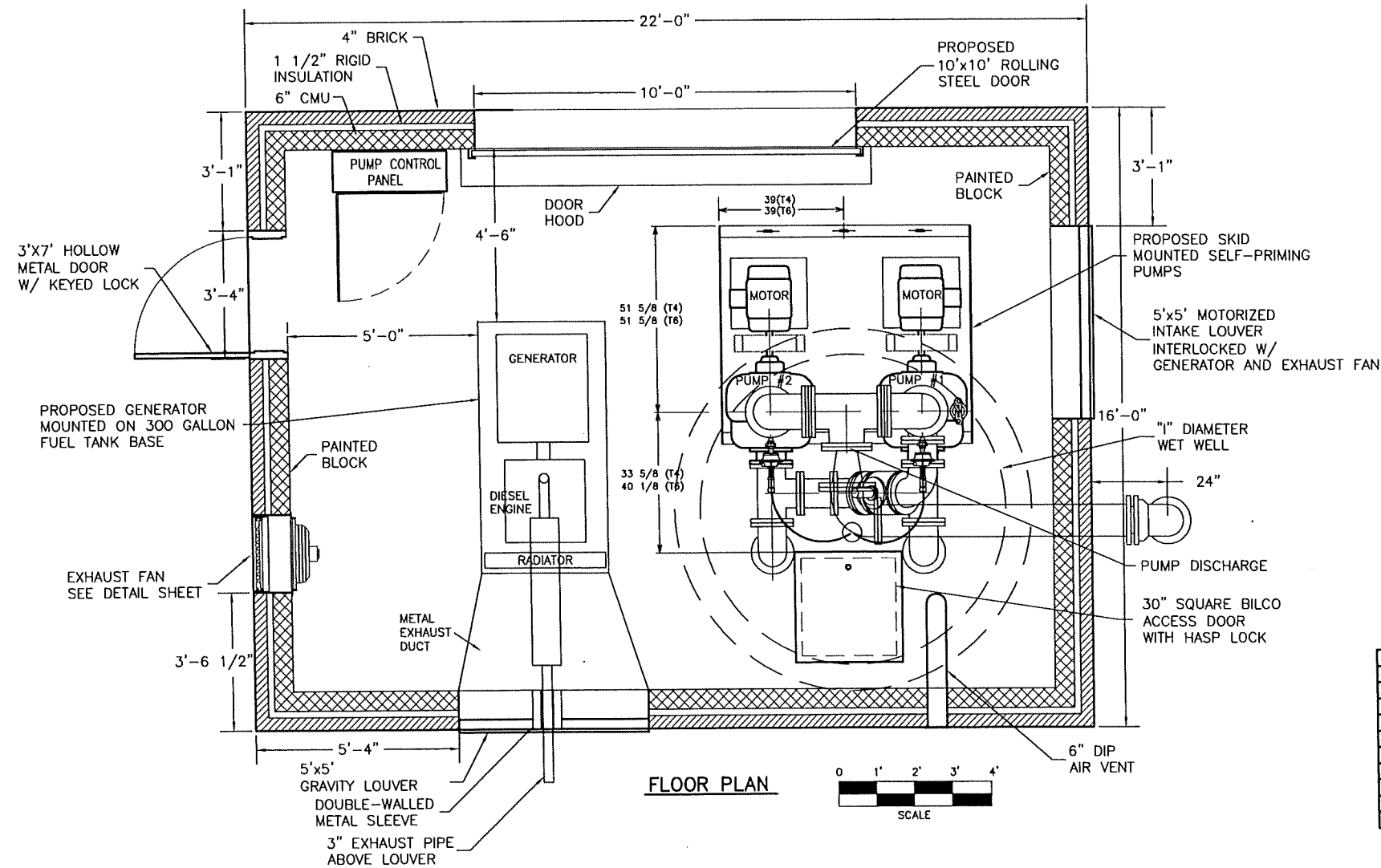
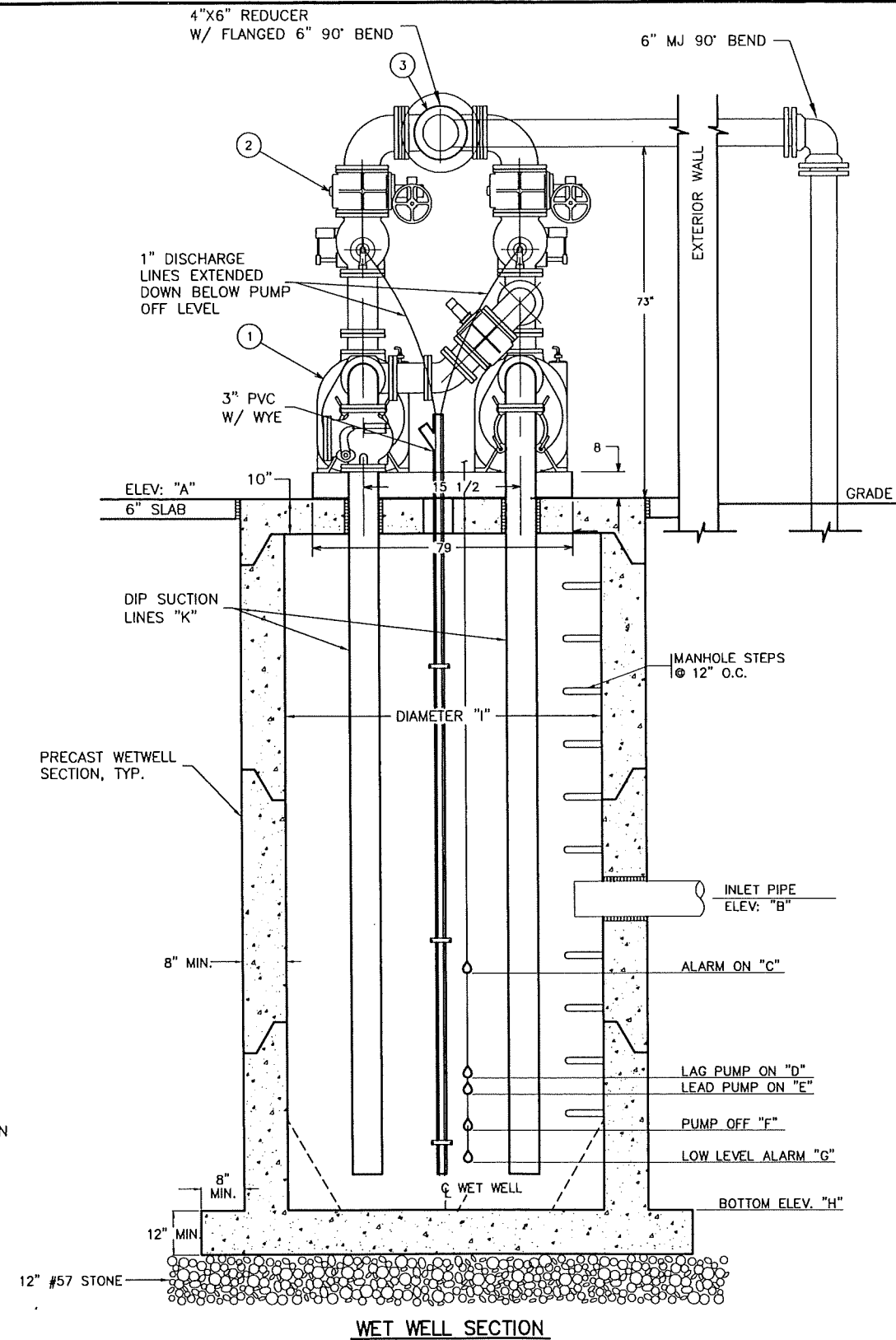
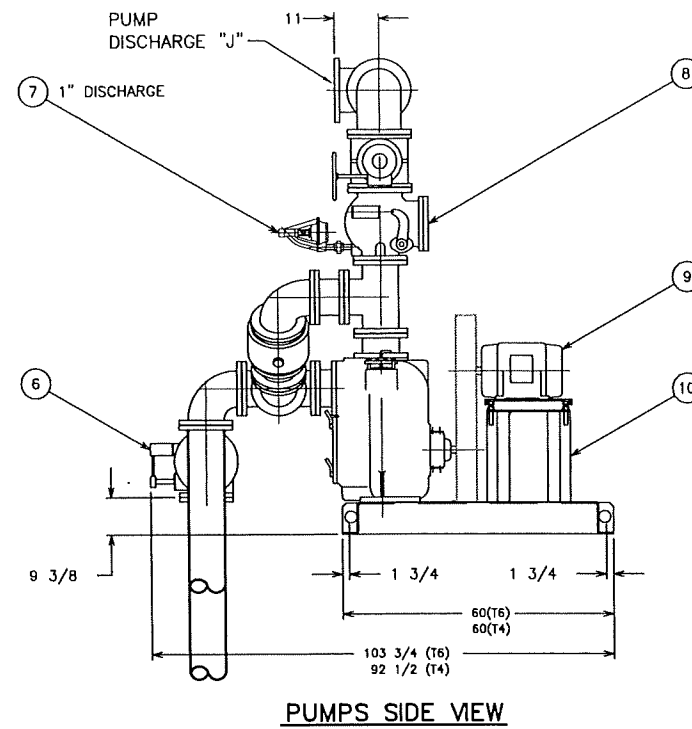
DATE:	DEC., 2003
DESIGNED:	DFW
DRAWN:	DFW
CHECKED:	KSL
SCALE:	SCALE
SHEET NO.	E1

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BASE BID--SELF PRIMING PUMP STATION DATA		
	PUMP STATION W-1	PUMP STATION W-2
DESIGN FLOW	45,000 GPD	125,000 GPD
PUMP CAPACITY	200 GPM	700 GPM
TDH	87 FT	82 FT
FM SIZE	6 IN	10 IN
FM LENGTH	6,081 FT	17,941 FT
FM HIGH POINT	147.5 FT	140.5 FT
VEL. @ PUMP RATE	2.27 FT/SEC	2.86 FT/SEC
PUMP ON TIME	2.23 MIN	1.84 MIN
PUMP OFF TIME	12.03 MIN	12.99 MIN
SELECTED PUMP (OR EQUAL)	GORMAN RUPP T4A3S-B	GORMAN RUPP T6A3S-B
RPM	1700	1400
MIN HORSEPOWER	20	40
MIN EFFICIENCY	35%	55%
IMPELLER	9.75 IN	12.375 IN
DISCHARGE	4 IN	6 IN
WET WELL DIMENSIONS:		
A-RIM	103.57	124.56
B-INLET PIPE/INVERT	12 INCH, @ EL. 91.30 FT	15 INCH, @ EL. 118.30 FT
C-HIGH WATER ALARM	EL. 90.0 FT	EL. 116.5 FT
D-LAG PUMP ON	EL. 89.5 FT	EL. 115.5 FT
E-LEAD PUMP ON	EL. 89.0 FT	EL. 115.0 FT
F-LEAD PUMP OFF	EL. 86.5 FT	EL. 112.5 FT
G-LOW LEVEL ALARM	EL. 85.5 FT	EL. 111.5 FT
H-BOTTOM WET WELL	EL. 84.5 FT	EL. 110.5 FT
I-DIAM WET WELL	8 FT	8 FT
J-DISCHARGE PIPING	4 IN	6 IN



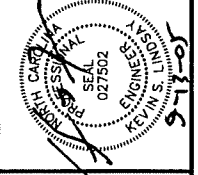
SELF PRIMING PUMPS WITH PARALLEL SERIES PIPING

ITEM	DESCRIPTION	MATERIAL
1	PUMP	CAST IRON
2	DISCHARGE PLUG VALVE	CAST IRON
3	DISCHARGE TEE	CAST IRON
4	INTERCONNECT PLUG VALVE	CAST IRON
5	BELT GUARD ASSY	STEEL
6	SUCTION CHECK VALVE	CAST IRON
7	AIR RELEASE VALVE	CAST IRON 1" (SHIPPED LOOSE)
8	DISCHARGE CHECK VALVE	CAST IRON
9	MOTOR	CAST IRON
10	PUMP & MOTOR BASE ASSY	STEEL

**NOTE:**  
CONTROL PANELS PROVIDED BY OWNER ALONG WITH TELEMETRY CONTROL UNIT, REMOTE TERMINAL UNIT WITH ANTENNA, FLOATS AND FLOAT SUPPORTS.

RECORD DRAWINGS SEPTEMBER 2005

SY. NO.	DESCRIPTION	DATE	BY
1	REVISED WIDTH 30' TO 22'	1-23-04	DFW



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Consulting Engineers

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PUMP STATIONS FOR THE  
NORCROSS WATER AND SEWER DISTRICT  
CUMBERLAND COUNTY, NORTH CAROLINA

SELF PRIMING PUMP STATION W1, W2

DATE:	JAN., 2004
DESIGNED:	DFW
DRAWN:	DFW
CHECKED:	KSL
SCALE:	SCALE
SHEET NO.	77
OF:	89



# LEGEND

- GFI 20A, 120V, DUPLEX RECEPT, GFI
- WP WEATHERPROOF
- JUNCTION BOX
- S 20A, 120V, SINGLE POLE SWITCH
- DISCONNECT RATING AS SHOWN
- POWER PANEL
- AUTOMATIC TRANSFER SW
- FLOW TRANSMITTER

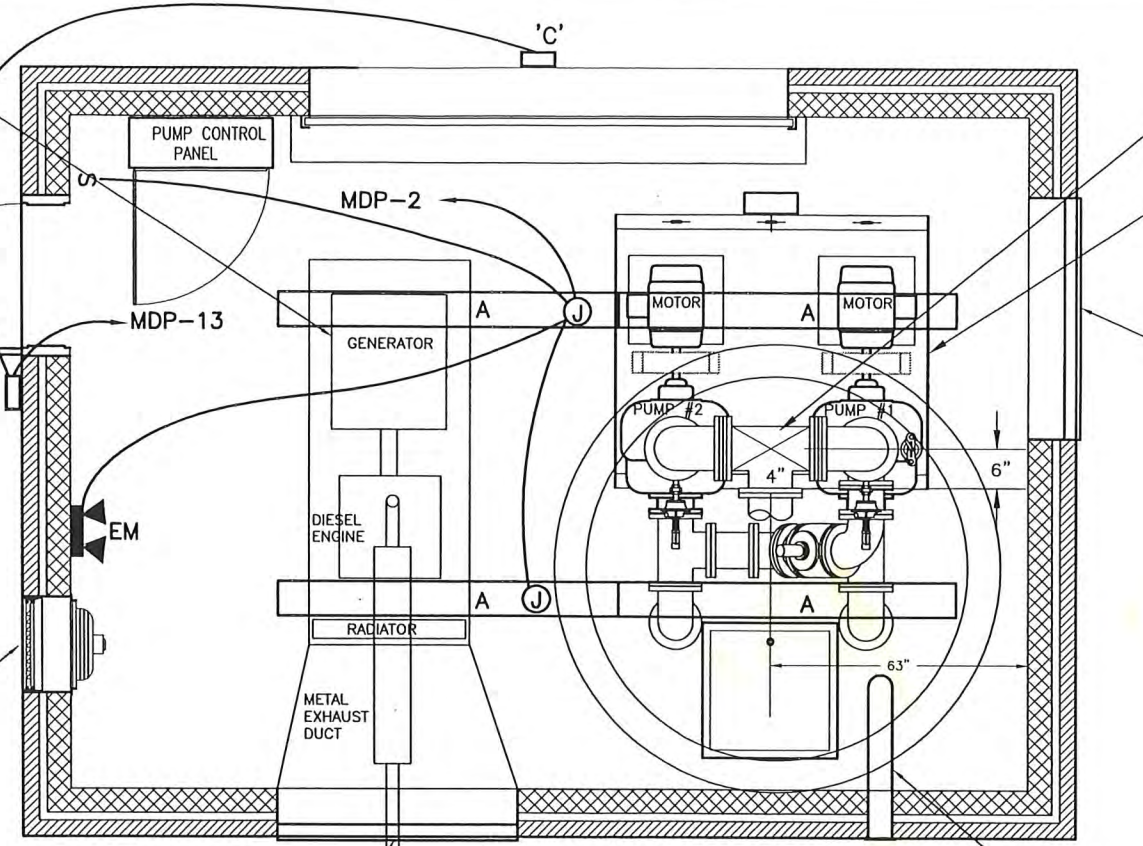
PANEL TYPE: SQ D I-LINE TYPE HCM 225 AMP MLO PROVIDE GROUND BAR  
 VOLTS: 120/240 "MDP" NEMA 1 ENCLOSURE  
 PHASE: 3 PHASE, 4 WIRE 30 KAIC

W	LOAD DESCRIPTION	WIRE SIZE	BKR. SIZE	CKT. NO.	L1	L2	L3	CKT. NO.	BKR. SIZE	WIRE SIZE	LOAD DESCRIPTION	W
980	EXHAUST FAN / LOUVER	12	20	1				2		2/0	PUMP CONTROL PANEL	18600
984	LIGHTS	12	20	3				4	150	2/0	PUMP CONTROL PANEL	18600
3000	RECEPTACLES	12	20	5				6	3	2/0	PUMP CONTROL PANEL	18600
1500	GEN. BLOCK HEATER	12	20	7				8		10	UNIT HEATER	1666
400	GEN. BATTERY CHARGER	12	20	9				10	30	10	UNIT HEATER	1666
800	SCADA PANEL	12	20	11				12		10	UNIT HEATER	1666
300	EXTERIOR LIGHTS	12	20	13				14			SPACE	
	SPACE							16			SPACE	
	SPACE							18			SPACE	
	SPACE							20			SPACE	

PROPOSED GENERATOR MOUNTED ON 300 GALLON FUEL TANK BASE

PROVIDE PHOTOCELL B IN THIS LIGHT TO CONTROL BOTH OUTSIDE LIGHT FIXTURES

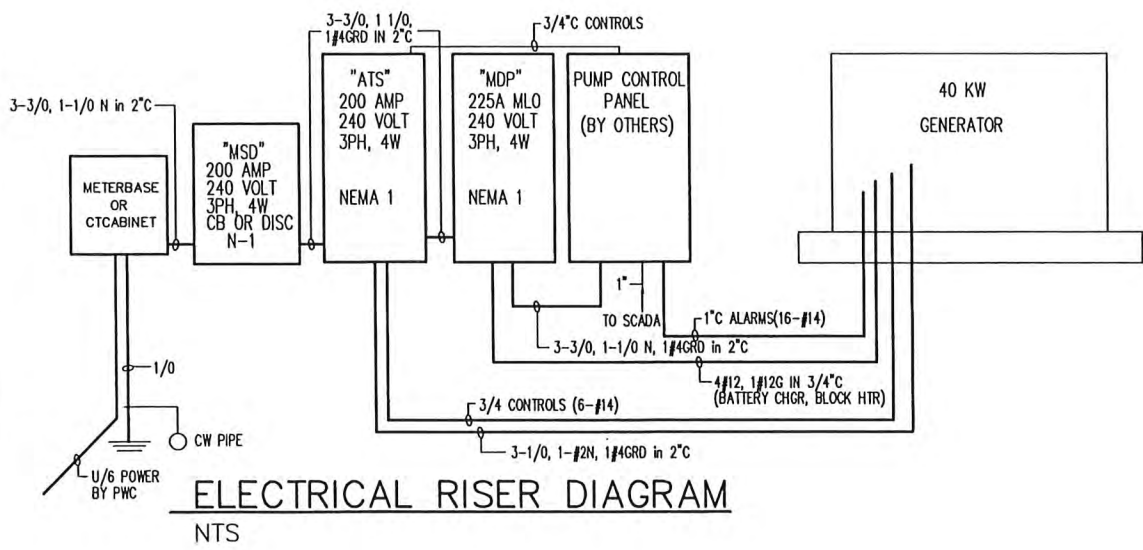
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LIGHTING PLAN



NOTE: ELECTRICAL DESIGN BY ALLEN TOWNSEND PE 13797

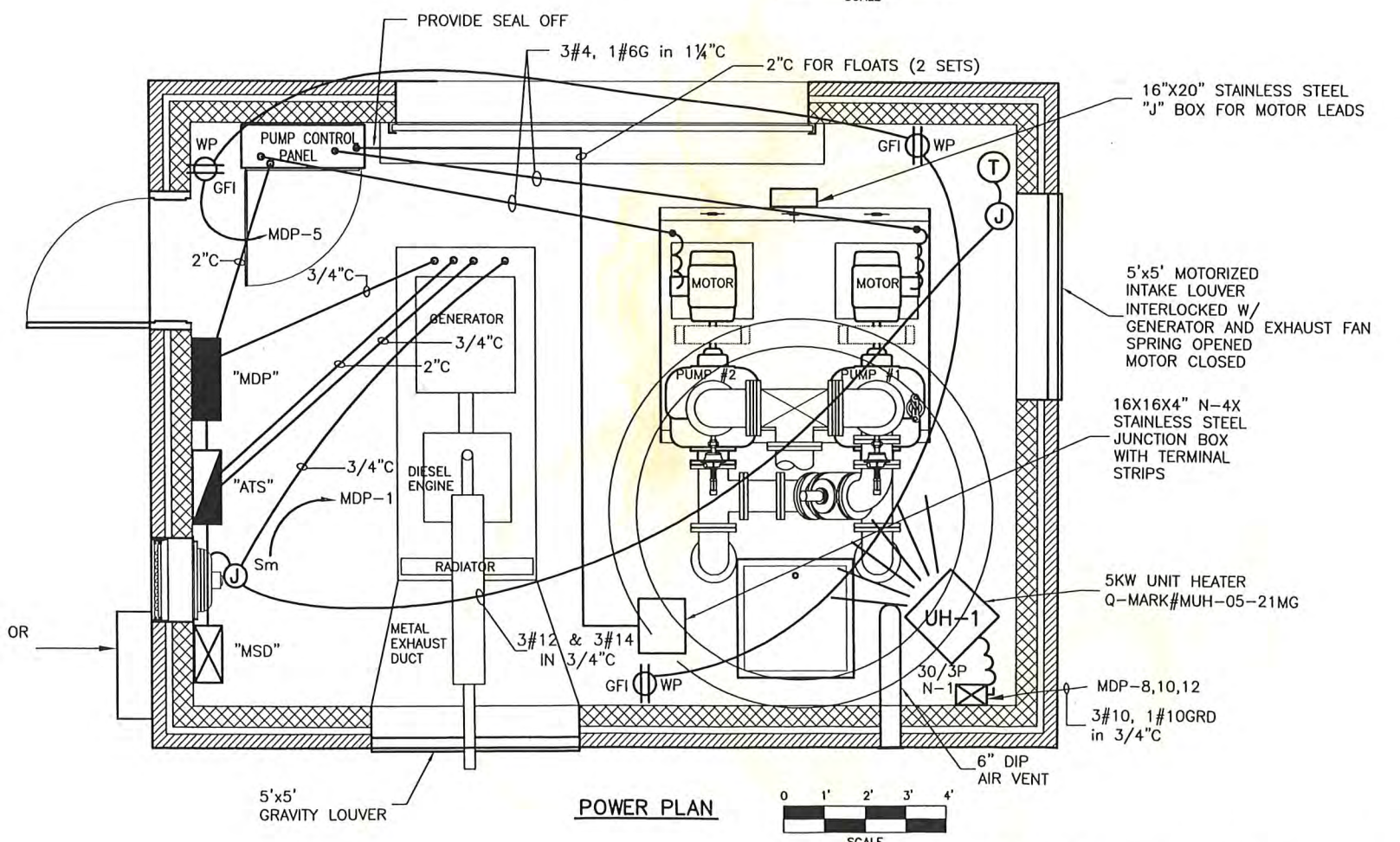


ELECTRICAL RISER DIAGRAM

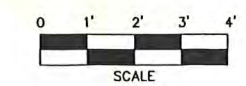
NTS

### FIXTURE SCHEDULE

SYMBOL	MANUF.	CAT NO.	LAMPS	REMARKS
A	COLUMBIA	LUB-296HO-120	2-F96T12HO (110 WATT)	PROVIDE SPACER BETWEEN LIGHT & CEILING
B	SPAULDING	WGS1-M100PS-MT	1-100WMH	MOUNT 10'0" AFG
C	SPAULDING	WGST-M175-MT	1-175MH	MOUNT OVER DOOR 12'0" AFG
EM	PRESCOLITE	LMP-16	2-7.2W	MOUNT 10'0" AFF



POWER PLAN



NO.	DESCRIPTION	DATE	BY
1	REVISED	11-23-04	DFW

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**PUMP STATIONS FOR THE NORCROSS WATER AND SEWER DISTRICT CUMBERLAND COUNTY, NORTH CAROLINA**

**PUMP STATION W-1 POWER AND LIGHTING PLANS**

DATE:	DEC., 2003
DESIGNED:	DFW
DRAWN:	DFW
CHECKED:	KSL
SCALE:	SCALE
SHEET NO.	E1

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# LEGEND

- GFI 20A, 120V, DUPLEX RECEPT, GFI
- WP WEATHERPROOF
- J JUNCTION BOX
- S 20A, 120V, SINGLE POLE SWITCH
- DISCONNECT RATING AS SHOWN
- POWER PANEL
- AUTOMATIC TRANSFER SW
- FLOW TRANSMITTER

PANEL TYPE: SQ D I-LINE TYPE HCM		400 AMP MLO		PROVIDE GROUND BAR	
VOLTS: 120/240		<b>"MDP"</b>		NEMA 1 ENCLOSURE	
PHASE: 3 PHASE, 4 WIRE					
		42 KAIC			

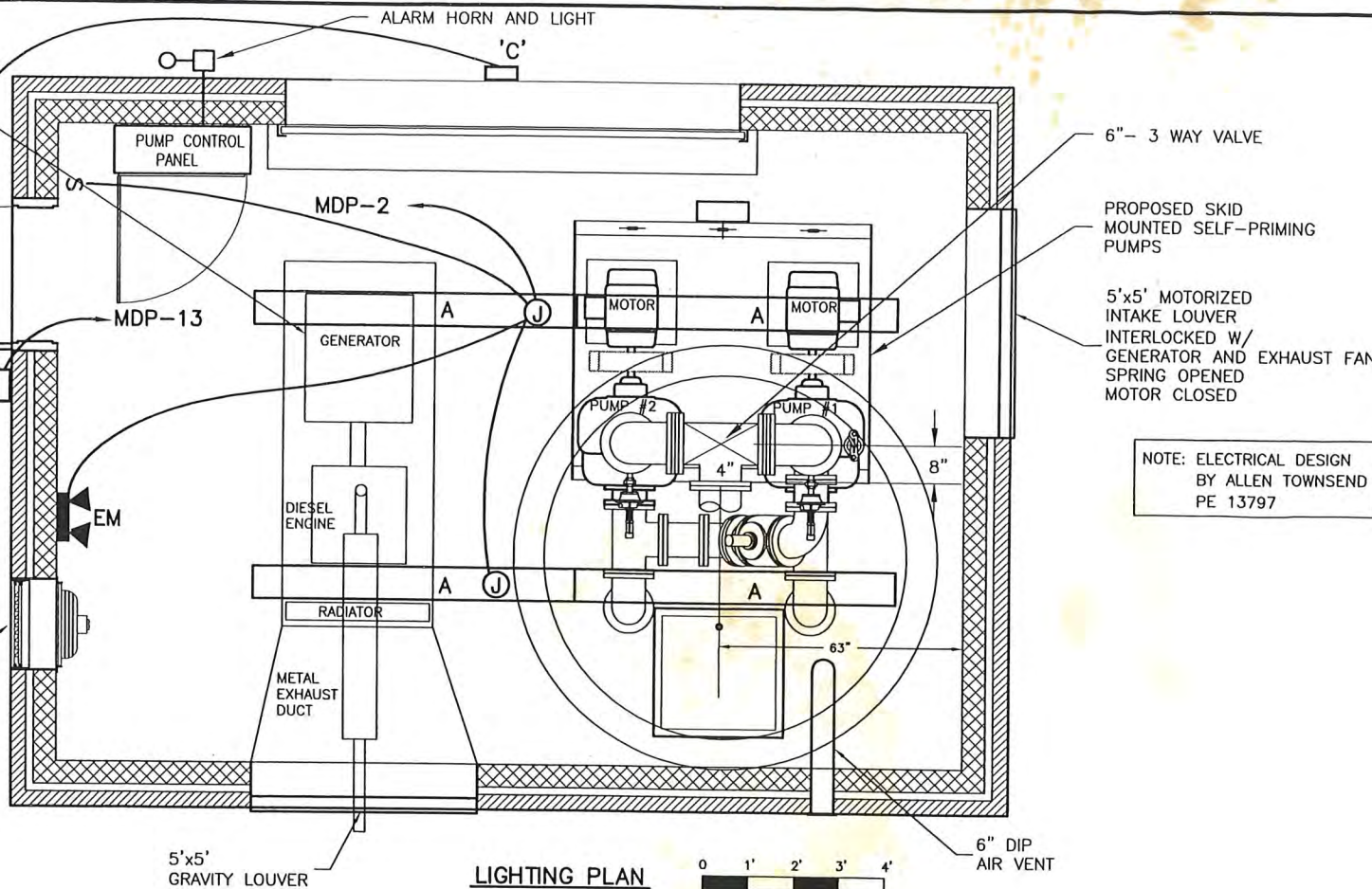
  

W	LOAD DESCRIPTION	WIRE SIZE	BKR. SIZE	CKT. NO.	L1	L2	L3	CKT. NO.	BKR. SIZE	WIRE SIZE	LOAD DESCRIPTION	W
980	EXHAUST FAN / LOUVER	12	20	1				2	250	250	PUMP CONTROL PANEL	34100
984	LIGHTS	12	20	3				4	250	250	PUMP CONTROL PANEL	34100
3000	RECEPTACLES	12	20	5				6	250	250	PUMP CONTROL PANEL	34100
1500	GEN. BLOCK HEATER	12	20	7				8	10	10	UNIT HEATER	1666
400	GEN. BATTERY CHARGER	12	20	9				10	30/3	10	UNIT HEATER	1666
800	SCADA PANEL	12	20	11				12	10	10	UNIT HEATER	1666
300	EXTERIOR LIGHTS	12	20	13				14	20	12	FLOWMETER	50
	SPACE			15				16			SPACE	
	SPACE			17				18			SPACE	
				19				20			SPACE	

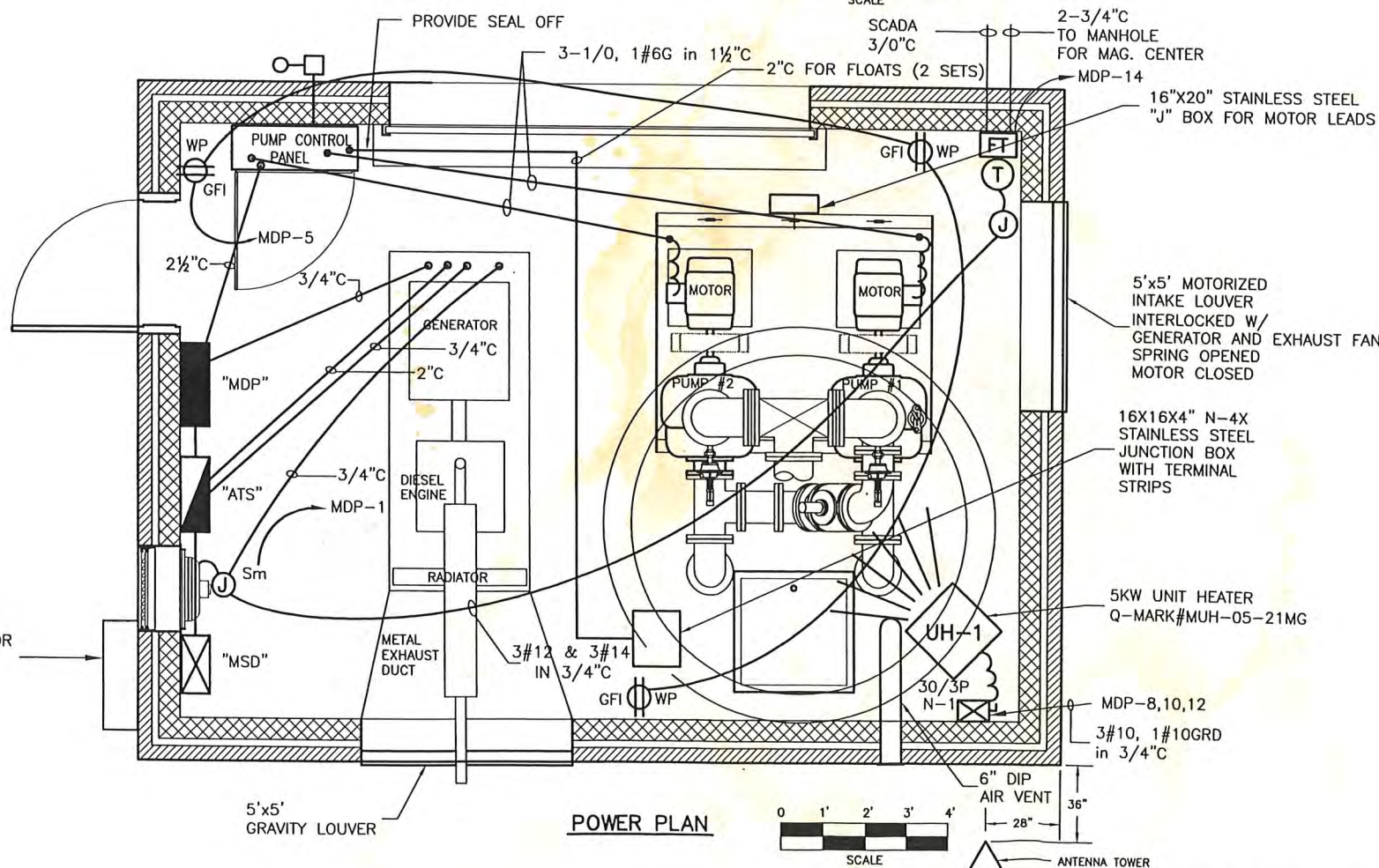
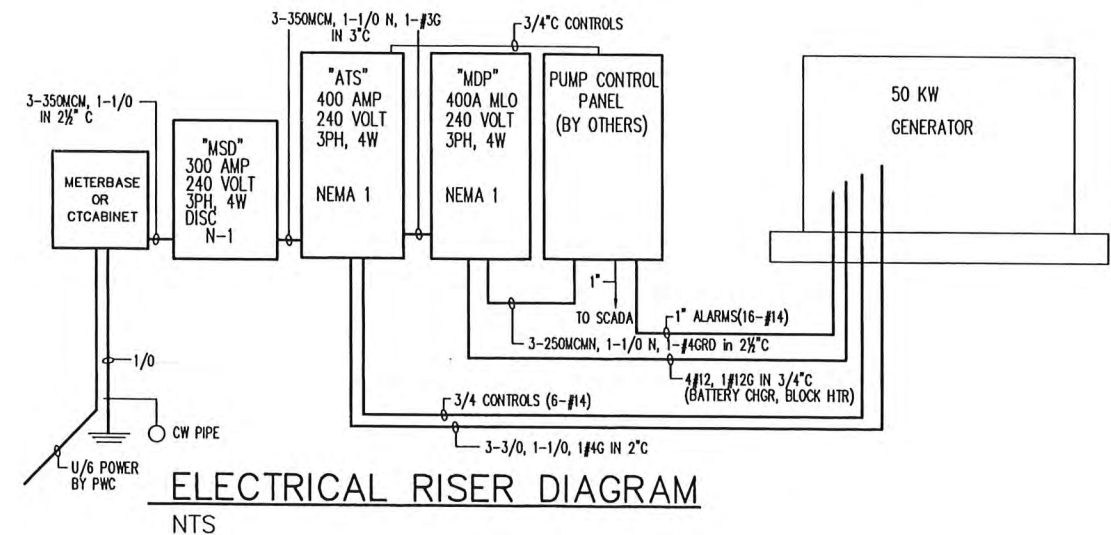
PROPOSED GENERATOR MOUNTED ON 300 GALLON FUEL TANK BASE

PROVIDE PHOTOCELL B IN THIS LIGHT TO CONTROL BOTH OUTSIDE LIGHT FIXTURES

EXHAUST FAN SEE DETAIL SHEET



NOTE: ELECTRICAL DESIGN BY ALLEN TOWNSEND PE 13797



FIXTURE SCHEDULE				
SYMBOL	MANUF.	CAT NO.	LAMPS	REMARKS
A	COLUMBIA	LUB-296HO-120	2-F96T12HO (110 WATT)	PROVIDE SPACER BETWEEN LIGHT & CEILING
B	SPALDING	WCSI-M100PS-MT	1-100WMH	MOUNT 10'0" AFG
C	SPALDING	WGST-M175-MT	1-175MH	MOUNT OVER DOOR 12'0" AFG
EM	PRESCOLITE	LMP-16	2-7.2W	MOUNT 10'0" AFF

REVISIONS	DATE	BY
REVISED	10-22-04	DFW

**Hobbs, Upchurch & Associates, P.A.**  
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PUMP STATIONS FOR THE  
 NORCRESS WATER AND SEWER DISTRICT  
 CUMBERLAND COUNTY, NORTH CAROLINA  
 PUMP STATION W-2 POWER  
 AND LIGHTING PLANS

DATE:	DEC., 2003
DESIGNED:	DFW
DRAWN:	DFW
CHECKED:	KSL
SCALE:	SCALE
SHEET NO.	E2



**SEWER ASSET MANAGEMENT PLAN**

**OVERHILLS  
WATER AND SEWER DISTRICT**

**CUMBERLAND COUNTY, NC**



PINEHURST, NORTH CAROLINA

**SEWER ASSET MANAGEMENT PLAN**

**OVERHILLS  
WATER AND SEWER DISTRICT**

**CUMBERLAND COUNTY, NC**

**MATTHEW JONES, PE**  
matthew.jones@mcgillassociates.com



5 Regional Circle, Suite A  
Pinehurst, North Carolina 28374  
910.295.3159

**AUGUST 2025**

**PROJECT NO. 20.02507**

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## **APPENDICES**

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- Appendix B – Manhole Inspection List**
- Appendix C – Overhills Spring Lake Agreement**
- Appendix D – Lift Station Record Drawings**

## **EXECUTIVE SUMMARY**

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The purpose of this Asset Management Plan (AMP) is to document the condition of the Overhills District sewer system infrastructure to assist the County with becoming more proactive in the management and financing of its sewer collection system. The Overhills Sewer District serves approximately 107 residential connections in the northern area of Cumberland County. There are 318 properties within the district are not currently connected and are paying the sewer availability fee. The District's wastewater collection system consists of approximately three miles of gravity sewer and force main with 119 manholes. Collected wastewater is pumped from the Collingwood Street Lift Station and the Brinkley Drive Lift Station, both of which are owned by Cumberland County and operated by the Town of Spring Lake. Flow generated from the district is ultimately treated at the Spring Lake Wastewater Treatment Plant (NC0030970), which is owned and operated by the Town of Spring Lake.

This asset inventory and assessment consisted of assembling data on sewer pipes, manholes, and other appurtenances in the collection system. This assessment included performing inspections of selected manholes, performing smoke testing throughout the system, and reviewing existing data with County Staff. This information was evaluated and is summarized in this document which includes the asset management plan and capital improvements plan. This process resulted in the development of a 10-year Capital Improvements Plan (CIP) to guide the District with scheduling and financing the capital projects and equipment purchases necessary to maintain and improve its wastewater collection system. Through the AMP process, no significant rehabilitation is currently needed, but additional monitoring and investigation is recommended.

The CIP includes a focused improvement to critical components within the sewer system that need rehabilitation or replacement based on existing condition, and on improvements that could improve management of the sewer system for staff. These planned projects will bring the County into a better position to serve its customers by improving the reliability of the collection system. The County should look to its CIP to guide its next

projects, and the CIP should be updated regularly as priorities change and as projects are completed. It is noted that many factors may impact the priorities including failures, and funding availability both locally and through grant and loan programs. This assessment project provides evidence for the prioritization of manhole rehabilitation and improvement projects in the CIP.

### ***System Evaluation***

All of the pipe material in the Overhills system is PVC and Ductile pipe. The collection system was first put into service in 2019, therefore the relative age of the system is low. All the piping in this system is SDR-26 PVC pipe, which is the most common material used for sewer systems today. The typical useful life for PVC pipe is anywhere from 40 to 60 years.

As part of the AMP, McGill Associates, PA (McGill) assisted the District with evaluating the condition of its sewer infrastructure to identify projects in line with these goals. The following items were included in the AMP scope:

- Identify areas to conduct smoke testing to identify potential sources of I/I into the sewer system;
- Review and analyze County-provided information for the Overhills lift station;
- Inspect selected sewer manholes within the system to establish overall system condition;
- Identify and evaluate potential sewer system improvements;
- Prioritize sewer system improvements;
- Prepare opinions of probable costs for sewer system improvements; and
- Create a Capital Improvements Plan;

### **Manhole Inspections**

All manholes in the Overhills sewer system are precast concrete based on information provided by County staff. The results of the selected manhole inspections performed as a part of this inventory were used to develop an assessment of manhole conditions in the



system. Based on the inspections performed, manholes that were inspected were assigned a condition score, and these scores were combined into an overall condition rating for each manhole- excellent, good, fair, or poor. The results of manhole inspections are summarized in Figures 8 and 9, and the full inventor is included in Appendix A.

### Lift Station Inspection

All sewer flow from the Overhills District is pumped through one of two lift stations to the Town of Spring Lake. The lift stations are on Brinkley Drive and Collingwood Street. Full inspection and assessment of the stations were not included as a part of this assessment.

### Findings and Recommendations

The system evaluation allowed McGill to assemble a list of general recommendations and high priority projects to guide the County in the next 10 years. General recommendations to the District included establishing its own flow monitoring and smoke testing programs in high priority areas to determine sewer rehabilitation needs and inspecting sewer lines and manholes with CCTV equipment during routine cleanings to track the condition of these items. McGill also recommended the County begin rehabilitation of existing manholes within the collection system in order to reduce the risk of I/I. Additionally, we made recommendations for improving the performance of the existing pumps at the Brinkley Road lift station.

Data and field investigation reporting were utilized to identify the priority projects within the collection system, focusing on manhole rehabilitation.

Table 1 summarizes projects identified during this assessment, centering around manhole rehabilitation projects. A project to install flow monitors is included to give greater control and understanding of flows from the collection system.

**Table 1: Summary of Capital Improvements Projects**

No.	Project Name	Cost
1	Manhole Rehabilitation Project 1	\$84,100.00
2	Brinkley Lift Station Improvements	\$33,100.00
3	Manhole Rehabilitation Project 2	\$84,100.00
3	Manhole Rehabilitation Project 3	\$84,100.00
<b>10-Year CIP Total Project Cost</b>		<b>\$285,400.00</b>

***Capital Improvements Plan***

The purpose of this asset inventory and assessment was to document the condition of the District’s inventoried infrastructure to assist the County with becoming proactive in the management of its wastewater system, to include capital project planning. The County does not currently have a Capital Improvements Plan (CIP) for its wastewater system. The CIP being developed from this current assessment will guide the County through its planning for projects within the 10-year window. The CIP will remain a living document and be updated in the future so that it remains current to the Districts’ highest priorities and provides accurate cost estimates. The CIP included in this assessment includes projects focused on rehabilitation of existing manholes, which have been identified to be potential sources for I/I into the system. Through discussion with County staff, field investigation, and review of existing system data, the specific defects and general problematic areas within the wastewater system have been summarized. These results were used to develop the CIP and formulate a ten-year plan.

The complete asset inventory and assessment task consisted of five parts culminating in the development of the Overhills Water and Sewer District’s CIP.

McGill developed cost estimates for all projects based on current 2024 materials and construction costs. The updated CIP is intended to be adopted by the County to guide its selection of sewer system improvement projects over the next decade. This plan also includes a budget-level recommendation for staffing associated with system operations and maintenance for all County utility districts.

### 1.1 BACKGROUND

The Overhills District is located on E. Manchester Road, just outside of the Town of Spring Lake municipal limits in Cumberland County, North Carolina. It is owned by Cumberland County and maintained by the Town of Spring Lake. The District includes a wastewater collection system that currently serves 107 residential customers as of August 2025. The collection system consists of approximately three miles of gravity sewer mains that are 8-inch in diameter and force main that is 6-inch in diameter. These gravity and force main sewer lines are constructed of PVC and were constructed in 2019. Figure 1 shows the existing sewer collection system.

Creating a Capital Improvements Plan (CIP) will allow the County to update its current rate setting model to better estimate future revenue and expenses, capital outlay, indebtedness, and overall health of the sewer system enterprise fund reserves. A model of this nature would continue to balance revenues and expenditures with a longer-term approach to rate setting and establish a financially sound framework for the County to follow.

Even with the relatively young age of the Overhills system, County staff remains cognizant that infiltration and inflow (I/I) is always a concern, particularly in a scenario where the County's operation costs are based on the gallons of flow that enter into the existing lift station. Therefore, the top challenges for the Overhills sewer system are mitigating I/I that results from deteriorating infrastructure and collecting reliable data on existing sewer flows for operations and maintenance planning. The information collected through this assessment project will help identify system deficiencies and develop improvement projects to reach these goals.

This process resulted in the development of a 10-year CIP to guide the County with scheduling and financing the capital projects and equipment purchases necessary to restore its wastewater collection system.

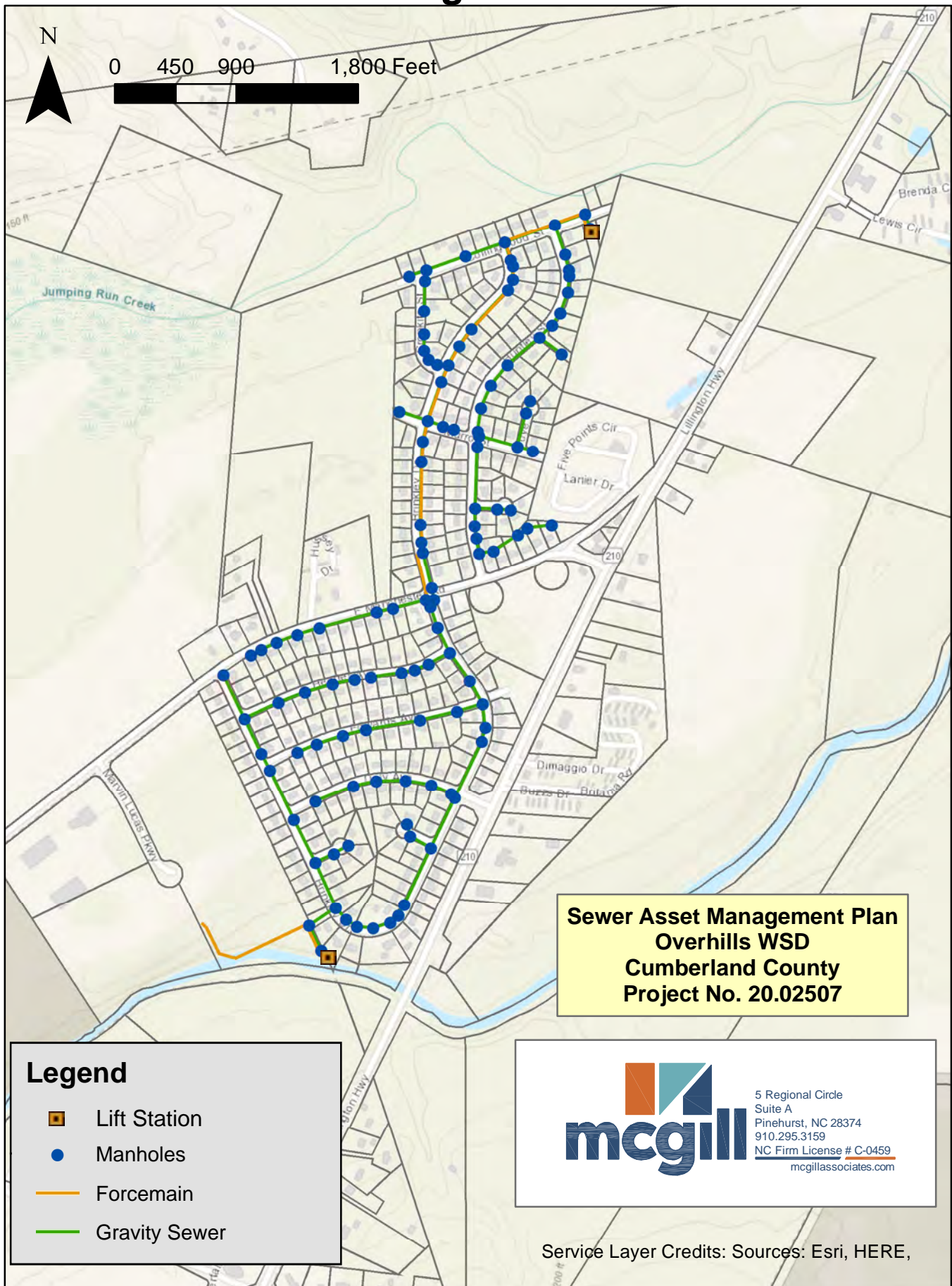
The purpose of this Asset Management Plan (AMP) is to document the condition of the Districts' inventoried infrastructure to assist the District with becoming more viable and proactive in the management and financing of its wastewater system. The District continues to look to its CIP to guide its next projects; therefore, it is vital that the CIP remains current to the Districts' highest priorities and provides accurate cost estimates. This assessment project was utilized for the prioritization of replacement of lines and improvement projects in the CIP.

**Table 2: Summary of Customers by Use**

<b>Diameter</b>	<b>Total</b>	<b>% of System</b>
<b>Flat Rate</b>	<b>107</b>	<b>100%</b>
<b>Total LF</b>	<b>107</b>	<b>100%</b>

# Overhills Overall System Map

## Figure 1



## 2.1 SMOKE TESTING

### 2.1.1 Overview

Smoke testing is one of the most cost-effective ways to locate defects in sewer mains and laterals. In this process, artificially produced non-harmful smoke is injected into the sewer line via a blower placed over a selected manhole. The pressurized smoke travels up and down the sewer line and connections and emerges at openings in the system. This visual aide allows test crews to easily identify, record, and mark locations where defects are present. If the sewer is in good condition, one should only see smoke rising from manhole lids and house roof vents. If the line has defects, such as breaks or illegal connections, the smoke will emerge at these points.

### 2.1.2 Investigation

McGill met with County staff to identify areas that would benefit most from smoke testing. Based on the size of the Overhills District, it was determined that the entire system could be smoke tested. McGill prepared a detailed map of the area based on the County's GIS database. The Fire Department and customers along the route were alerted to the upcoming testing.



### **2.1.3 Methodology**

McGill and County staff smoke tested all three miles of gravity sewer lines over a period of two days to determine locations where I/I enter the wastewater collection system. For each line to be tested, County staff recommended a centrally located manhole on which to place the blower based on the manhole's accessibility and avoidance of traffic. The manhole nomenclature used by the County was utilized and the location, configuration, and condition of each one was recorded.

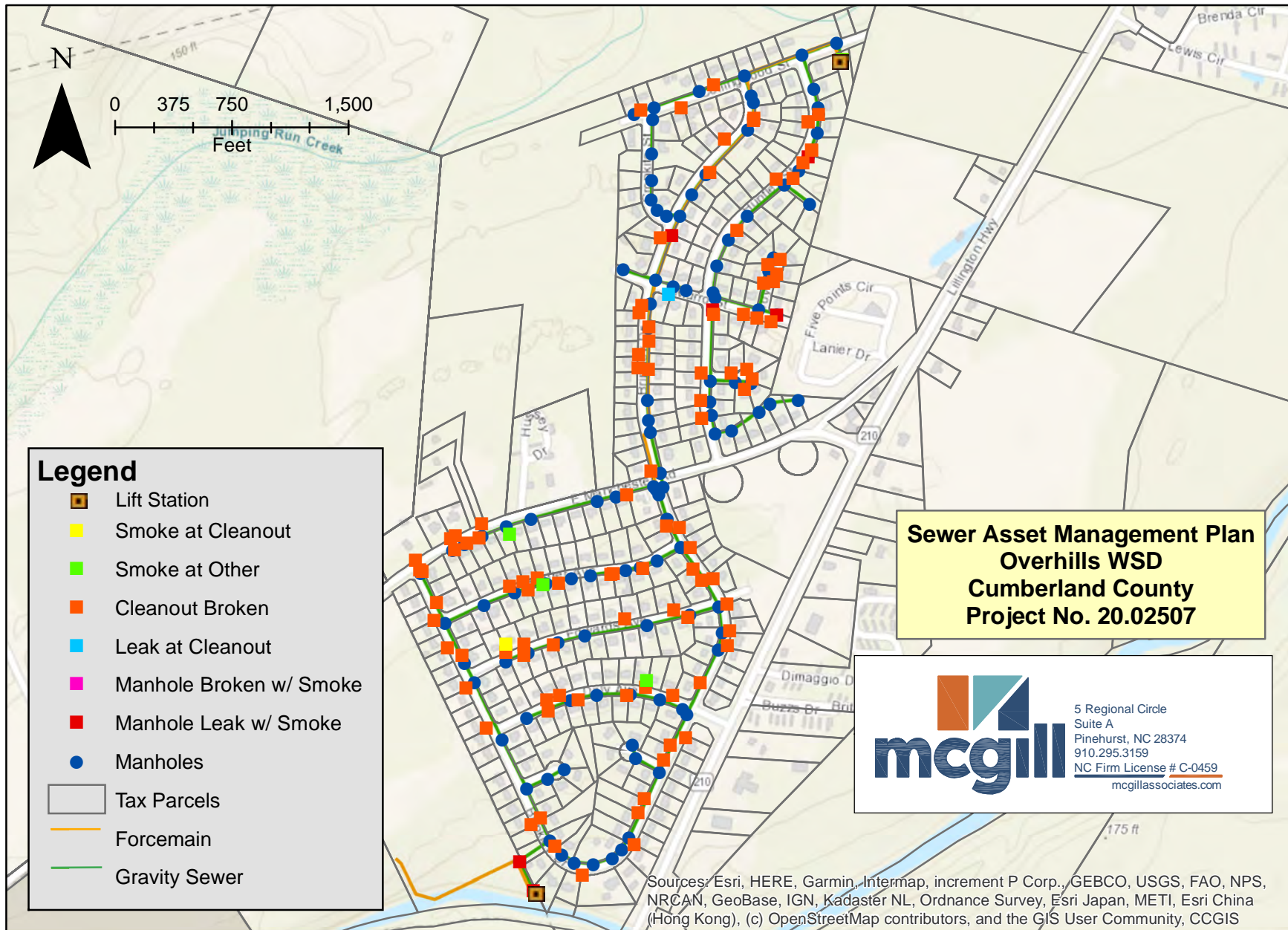
At each location, the following procedure was executed.

1. Place the blower on the manhole (with the rubber seal, if necessary).
2. Fill smoke pump up to  $\frac{3}{4}$  with liquid smoke.
3. Close all smoke pump valves.
4. Start blower and allow to warm up.
5. Open smoke pump valves.
6. Pressurize smoke pump by pumping the canister manually.
7. Once smoke begins emerging from roof vents, begin surveying for smoke emergencies indicating defects or problem areas in the pipeline.
8. For each defect, record the opening type, address, manhole identifier, and notes.
9. Additionally, mark each defect with paint.

This process continued until all visible defects were marked and recorded. Figure 2 shows some problematic system openings.

# Overhills Smoke Testing Map

## Figure 2





### **2.1.4 Results**

The crew recorded 107 abnormal smoke outlets, which divided generally into four categories.

1. **Uncapped cleanouts or elder valves:** Several cleanout and elder valve caps were missing or broken. The cumulative number of broken cleanouts in the District can contribute to significant I/I. County staff had repair caps on hand during the testing and were able to install new caps where needed. Some caps on cleanouts and elder valves were unscrewed and were able to be re-affixed during the testing.
2. **Broken Cleanouts:** Ground smoke was detected adjacent to the cleanout, which appeared to be damaged or below grade. Replacement of the cleanout assembly will be needed.
3. **Ground Smoke:** Ground smoke can be the result of broken lines, joint separation, etc. Any of these problems can cause significant I/I.
4. **Unsealed manholes:** Some manholes emitted excess smoke indicating cracked concrete or offset rings. Manholes located in ditches are the most likely to contribute I/I.

A spreadsheet describing all smoke occurrences can be found in Appendix A and all locations were documented in the mapping information in ArcGIS for the County staff's use.

## **2.2 SEWER MAINS**

### **2.2.1 Overview**

Overhills sewer mains consist of polyvinyl chloride (PVC) and ductile iron pipe. The District's existing sewer lines are 8-inches in diameter. The age of the system and system materials were confirmed by the County based on records from construction of the system in 2019. Condition was determined based on visual inspection of select manholes and smoke testing of the system.

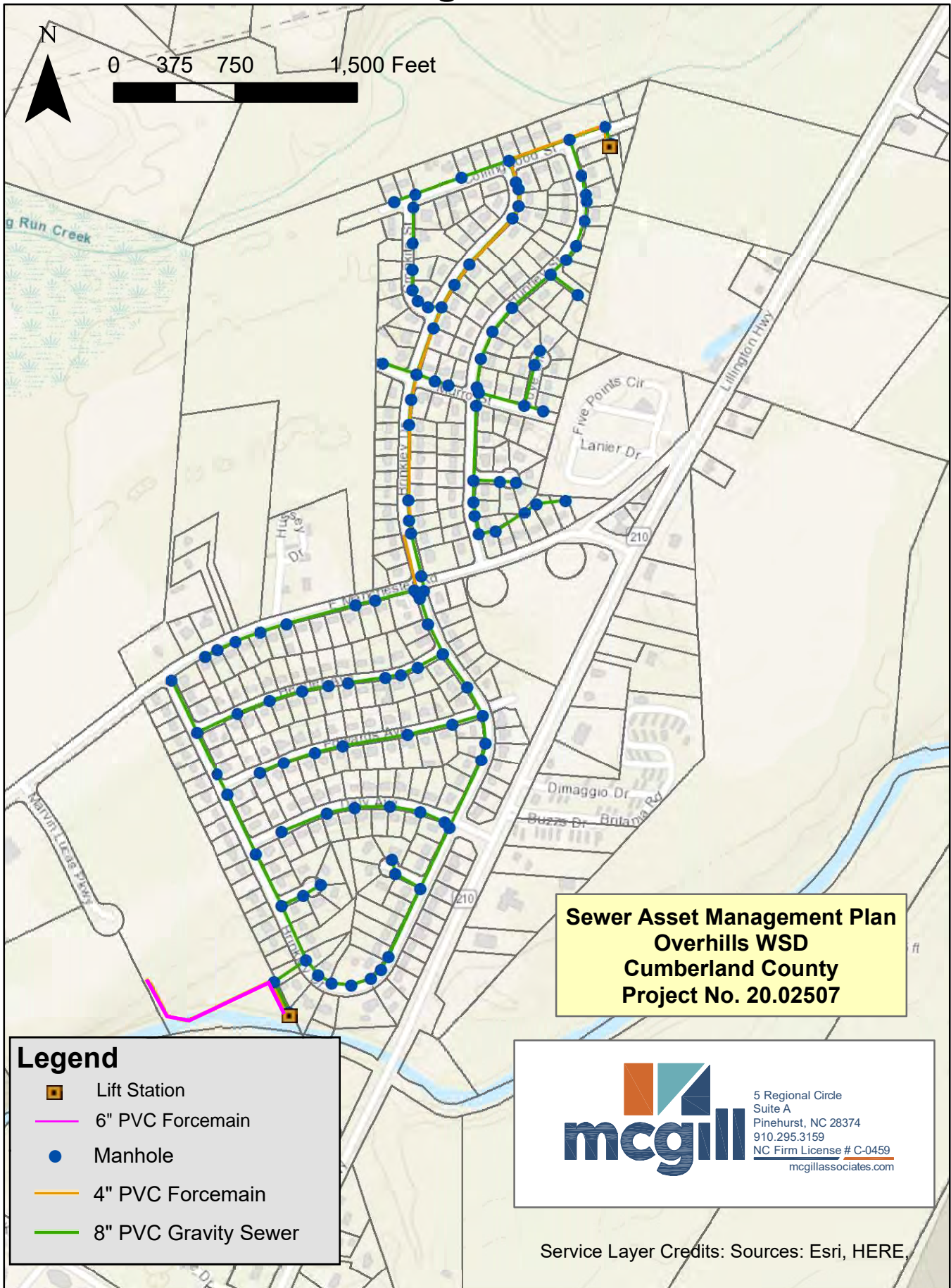
### **2.2.2 Investigation**

With District input from County staff, McGill has reviewed the district's data on the sewer mains throughout the District's collection system. The sewer main material and diameters were verified by the County and updated according to GIS records. Figure 3 shows the sewer line diameter and material in the system.

The purpose of this portion of the assessment was to create a working system inventory and then review which areas of Overhills District have system components in need of replacement or rehabilitation.

# Overhills Sewer Line Diameter Map

## Figure 3



### 2.2.3 Methodology

McGill reviewed the District's GIS data for the sewer collection system. County staff provided information on manholes where deterioration was suspected. Smoke testing was performed throughout the system. The County's GIS mapping was utilized to create maps that document the collection system by material and by diameter.

### 2.2.4 Results

The existing gravity sewer pipe in the sewer system is 8-inch in diameter based on Record Drawings for the system. All pipe diameters therefore do meet current NCDEQ minimum design standards. Based on the young age of the system, the PVC pipe installed in 2019 has not exceeded its useful life, and therefore replacement is not recommended outright. Recommendations will include planned CCTV inspections by the County of the existing piping in order to verify existing conditions and provide future updates to this AMP/CIP. Based on the age of the pipes and no documented issues from County staff, pipe in the system has been noted to be in good/excellent condition. Tables 3 through 6 show the assessment based on material and then broken out by diameter.

**Table 3: Summary of Gravity Sewer Main by Material**

<b>Material</b>	<b>Diameter Range (in)</b>	<b>Total LF</b>	<b>% of GS</b>
<b>Polyvinyl Chloride Pipe</b>	8	<b>17,420</b>	<b>100%</b>
<b>Total LF</b>	<i>N/A</i>	<b>17,420</b>	<b>100%</b>

**Table 4: Summary of Gravity Sewer Main by Diameter**

<b>Diameter</b>	<b>Total LF</b>	<b>% of System</b>
<b>8"</b>	<b>17,420</b>	<b>100%</b>
<b>Total LF</b>	<b>17,420</b>	<b>100%</b>

**Table 5: Summary of Force Main by Material**

<b>Material</b>	<b>Diameters (in)</b>	<b>Total LF</b>	<b>% of System</b>
<b>Polyvinyl Chloride</b>	<b>4, 6</b>	<b>3,948</b>	<b>100%</b>
<b>Total LF</b>	<b>N/A</b>	<b>N/A</b>	<b>100%</b>

**Table 6: Summary of Force Main Sewer Main by Diameter**

<b>Diameter</b>	<b>Total LF</b>	<b>% of System</b>
<b>4"</b>	<b>2,994</b>	<b>76%</b>
<b>6"</b>	<b>954</b>	<b>24%</b>
<b>Total LF</b>	<b>3,948</b>	<b>100%</b>

**Table 7: Summary of Force Main Sewer Main Conditions by Age**

<b>Year Put Into Service</b>	<b>Total LF</b>	<b>% of GS</b>
<b>2019</b>	<b>3,948</b>	<b>100%</b>
<b>Total LF</b>	<b>3,948</b>	<b>100%</b>

## **2.3 MANHOLE INSPECTIONS**

### **2.3.1 Overview**

Manholes are the primary access points to the sanitary sewer system and are essential for its operation and maintenance. As they allow personnel access to the sewer system, manholes are also likely culprits for allowing I/I to enter the sewer system. Manholes in low-lying areas with improperly sealed lids, manhole joints, and poor connection practices can all be sources of I/I. Storm drains or the presence of manholes in ditches and low-lying areas in Overhills frequently allow standing water to remain for hours or days after a storm event which can exacerbate inflow through manhole lids. Reports from construction of the sewer system noted that the existing water lines in the Overhills neighborhood experienced several breaks due to asbestos cement (AC) water lines that are heavily deteriorated in some areas. Additionally, during construction I/I was observed from either groundwater or leaking water lines into various manholes and wetwells in the project area.

One of the most cost-effective practices for managing this intrusion is visual manhole inspections, where the various components of the manhole are rated according to their condition. Some examples of noticeable deficiencies are benches which have deteriorated from abrasion and corrosion and rings which can be moved by traffic, soil, and the freeze/thaw cycle. Defects in any aspect of the manhole can lead to I/I, structural instability, and manhole failure.

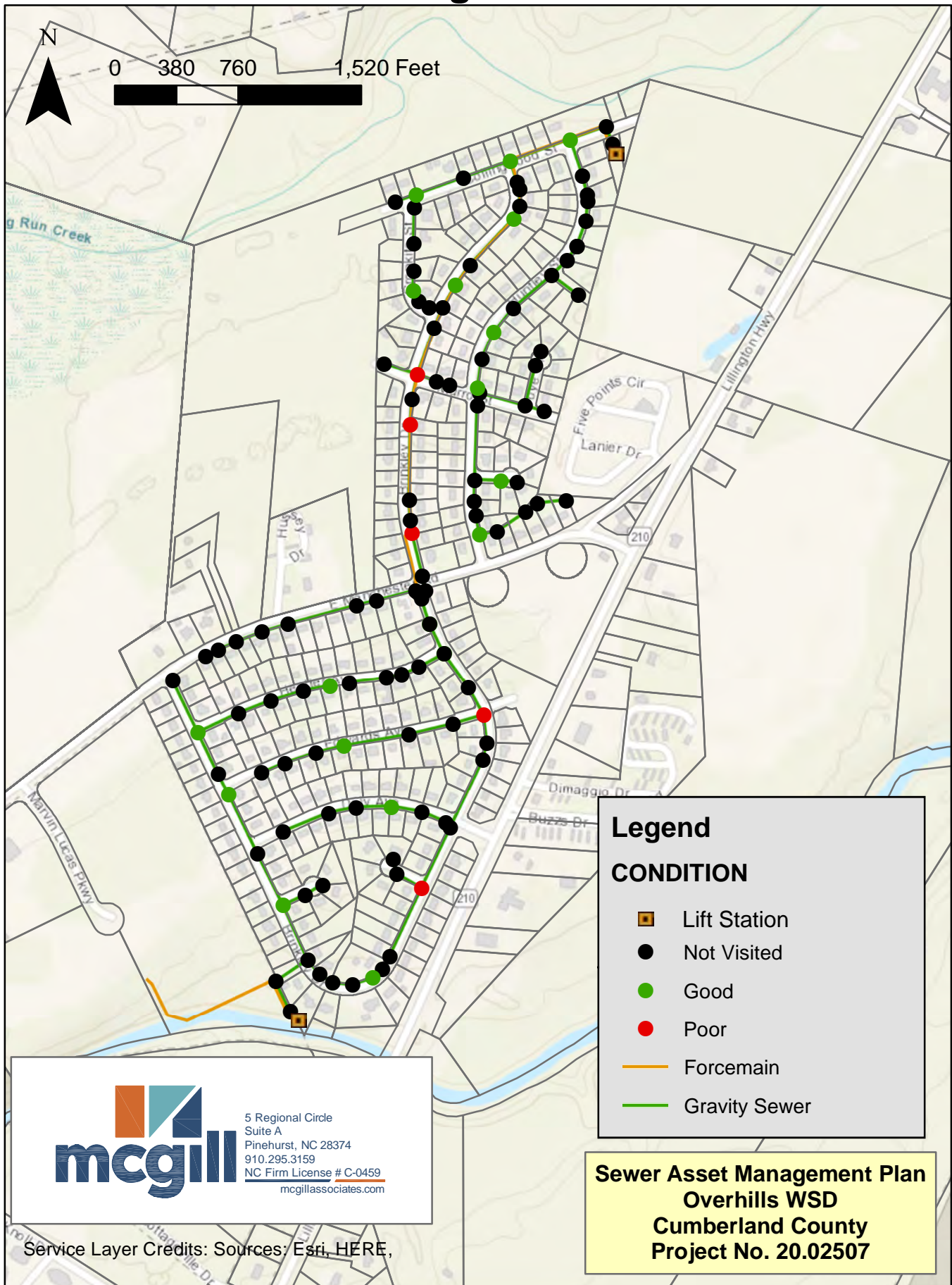
### **2.3.2 Investigation**

After the Overhills system was put into service, the GIS record was created in 2019. The purpose of this portion of the assessment was to perform selected field inspections to determine an overall system assessment. A total of one hundred and nineteen (119) manholes are currently inventoried by the District. A total of 23 manholes were inspected as a part of this inventory and assessment. The map showing which manholes were inspected is shown in Figure 4.









# Overhills Manhole Inspection Map

## Figure 4



**Legend**

**CONDITION**

-  Lift Station
-  Not Visited
-  Good
-  Poor
-  Forcemain
-  Gravity Sewer



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**Sewer Asset Management Plan**  
**Overhills WSD**  
**Cumberland County**  
**Project No. 20.02507**

Service Layer Credits: Sources: Esri, HERE,



### **2.3.3 Methodology**

The District of Overhills sewer collection system contains 119 sewer manholes. Working with County staff, McGill inspected selected manholes within the sewer system to obtain a representative condition sampling. County staff determined which manholes to inspect in each area based on manhole location and orientation. Manholes prioritized for inspection include those located in existing ditches or low-lying areas where the manhole would be susceptible to degradation and inflow from surface water. At each manhole, the inspector recorded the manhole's location, dimensions, material, and condition of its various components. All information including photographs of the interior of the manhole and top area were uploaded into the GIS mapping.

Some typical distresses include:

- Wear and asphalt paving on the cover;
- Corrosion and mud seepage on the ring and frame;
- Gas residue, corrosion, seepage, and deteriorating concrete on the cone and riser;
- Wetness, silt, root intrusion, and deteriorating concrete on the barrel;
- Dirt and corrosion on the rings;
- Silt accumulation on the bench; and
- Misaligned pipes, obstructions, trough deteriorating, standing water, and no flow in the channel.

Based on the recorded comments, each component was assigned a condition score, and these scores were combined into an overall condition rating for each manhole- excellent, good, fair, or poor. The images below depict the interiors of various condition manholes.



MH FID 30, BRINKLEY DRIVE, GOOD.



MH FID 43, BRINKLEY DRIVE, POOR.

### 2.3.4 Results

All of the 23 inspected manholes are precast manholes. Due to the relative low age of the system, County staff confirmed that all the existing manholes in Overhills are precast sewer manholes. The manholes observed were noted as poor or good to excellent condition, which is to be expected based on their age. However, evidence of I/I was observed in several manholes. Based on the condition of those observed, it is suspected that the remaining manholes not inspected would have similar condition to those observed. Tables 8 and 9 summarize the manhole materials and condition.

**Table 8: Summary of Manholes by Material**

<b>Material</b>	<b>Total</b>
<b>Precast Concrete</b>	<b>119</b>
	<b>119</b>

**Table 9: Summary of Manholes by Condition**

<b>Material</b>	<b>Total</b>
<b>Good/Excellent</b>	<b>18</b>
<b>Poor</b>	<b>5</b>
	<b>23</b>

The County maintains its collection system using the ESRI platform and includes the attribute data for each manhole. A spreadsheet including condition comments for each manhole can be found in Appendix B.

## 2.4 LIFT STATION

### 2.4.1 Overview

The Overhills sewer system includes two lift stations, one on Collingwood Street and the other on Brinkley Drive. The Collingwood Lift Station collections flow from the area north of Manchester Road and pumps to a manhole on the south side of Manchester. The Brinkley Lift Station receives all flow for the Overhills system and pumps to an manhole inside of the Spring Lake Sewer Collection System in an existing sewer easement off of Marvin Lucas Parkway.

Both lift stations include flow meters that are used for monitoring and recording flow generated by the Overhills sewer system. The monthly records from the Brinkley station are used for billing and have been used to calculate the average use per user for the system.

Collingwood Street Lift Station:

Lift Station Design Capacity	216,000 GPD
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Brinkley Drive Lift Station:

Lift Station Design Capacity	367,200 GPD
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Overhills Sewer System:

FY 2025 Estimated Average Daily Use per User*	165 GPD
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\*Note: Estimated based on FY 2025 monthly usage, metered at Brinkley Lift Station and data provided to Cumberland County by Town of Spring Lake. Average GPD for Overhills System is 17,606 GPD, with 107 customers as of June 2025.

Recommendations for various sewer system improvements to include the gravity sewer pipe and manholes in the collection system include general recommendations, high priority projects (within 10-years) and future projects (past the 10-year planning window). General recommendations are typically less costly and can be implemented more quickly, whereas high priority projects may require financial assistance and be undertaken in phases.

### **3.1 GENERAL RECOMMENDATIONS**

#### **3.1.1 *Smoke Testing***

Smoke testing is a valuable tool that can be used to locate broken pipe, cleanouts, or manholes that need repair. Any of these issues can be a source for the inflow and infiltration (I&I) of surface water into the sewer collection system. The most common repairs that result from smoke testing include replacing missing or broken cleanout caps and removing buildup from manholes. Other repairs that can be performed at this time are patching the exterior concrete or replacing the rings/lids of manholes identified to be leaking during smoke testing. These may be contributing significant I/I into the wastewater collection system. Similarly, line breaks in flooded areas should also be addressed promptly. It is also recommended that the District continue to perform regular smoke testing to monitor the system's ongoing wear and identify specific areas for improvement. However, if there is a suspected problem in a specific area the District should utilize smoke testing on a more "as needed" basis to troubleshoot possible problem areas.

#### **3.1.2 *Video Evaluations***

Based on information provided by the County, video evaluations were not performed as part of the system inventory. County staff reports that no video evaluations have been performed on the collection system to date. It is recommended that the County plan to perform video evaluation of the system as a part of O&M in order to stay vigilant concerning potential issues within the collection system.

### **3.1.3 Manhole Inspections**

Manhole inspections uncovered some infrastructure deficiencies which can be repaired immediately to improve the condition and function of the wastewater collection system. The full list of manholes and their field assessment is included in Appendix A. Manhole rehabilitation and replacement is the priority work that is targeted by the CIP. The proposed projects are divided out on an annual basis in order to include the improvements as a reasonable component of annual budgeting.

### **3.1.4 Flow Monitoring**

The District and McGill have discussed that flow monitoring is not needed at this time. Should the County begin to suspect the presence of significant I&I, they will engage with a subcontractor to perform flow monitoring to verify as needed. Both existing lift stations have 8-inch flow meters on the lift station discharge, which provide metering of flow received within the district. The flow recorded from these meters are utilized by the County to determine the monthly quantity of wastewater sent for treatment to the Town of Spring Lake.

## **3.2 PRIORITY PROJECTS**

### ***3.2.1 Manhole Rehabilitation Projects***

In these projects for the Overhills system, manholes will be lined where possible, unless a significant amount of deterioration has occurred that would necessitate replacement. The projects are scoped to be undertaken every 2 years. Each project is priority targeting any manhole deficiencies based on the results of the smoke testing performed. There are a range of issues from broken risers to cracks in the frame of the manhole that warrant various repairs. To reduce the amount of I/I that enters the system it is imperative to repair these manholes. The project will be ongoing to spread out the cost for the County over a ten-year period. With 119 manholes in the system, it is estimated that approximately 40% of the manholes in the system would benefit from rehabilitation through lining. As a result, manhole rehabilitation is broken into three projects, which are included in the CIP separately, but can be combined or modified as needed given annual budgetary considerations. The projects also include replacement of existing cleanout assemblies for select residences. The results of the smoke testing identified that some cleanouts were damaged below grade, therefore replacement of the assembly would be necessary.

This project is recommended to be pursued with a manhole rehabilitation specialty company with scopes large enough to get competitive pricing for each mobilization. The manholes proposed for rehabilitation or replacement range in depth; therefore, an average depth of 7 vertical feet (VF) was used per manhole for estimating purposes. The capital improvements plan breaks this project into 3 projects with a budget of approximately \$84,100 every 3 years over a 10-year span, as outlined in Table 10. A preliminary cost estimate for a single project is included in Table 8. The total cost of the manhole rehabilitation/replacement projects is estimated to be \$252,300.



**Table 10: Preliminary Opinion of Probable Cost for Manhole Rehabilitation Projects**

<b>Item</b>	<b>Description</b>	<b>Units</b>	<b>Quantity</b>	<b>Unit Price</b>	<b>Total Cost</b>
1	Mobilization	LS	3%	N/A	\$1,900
2	Rehabilitate Existing Manhole	VF	112	\$500	\$56,000
3	Additional Manhole Repairs	LS	1	\$10,000	\$10,000
<b>Construction Subtotal</b>					<b>\$ 67,900</b>
Construction Contingency (15%)					\$ 10,200
Engineering Assistance (If needed)					\$ 6,000
<b>Total Base Project Cost</b>					<b>\$ 84,100</b>

*\*Cost estimates are based on the knowledge of a professional engineer based on 2024 construction costs and are subject to change due to bidding environment and other factors.*

### 3.2.2 Brinkley Lift Station Improvements Project

This project includes installing a p-trap on the discharge force main line to help allow the pumps to maintain prime with consistent downstream head. The work would involve installing a 4-inch p-trap in the existing force main, as well as a ¾-inch water service line to the trap to provide a drip supply to the trap to keep it full.

The project includes one 4-inch p-trap connected to the existing force main with associated excavation, compaction and backfill. The trap will be installed on the existing force main on the current lift station site. The preliminary cost estimate for this project is \$33,100 as outlined in Table 11 below.

**Table 11: Preliminary Opinion of Probable Cost for Brinkley LS Improvements**

Item	Description	Units	Quantity	Unit Price	Total Cost
1	Mobilization	LS	3%	N/A	\$ 800
2	4-inch P-Trap	LS	1	12,000	\$ 12,000
3	¾" Service Line and Tap	LS	1	16,000	\$ 16,000
<b>Construction Subtotal</b>					<b>\$ 28,800</b>
Construction Contingency (15%)					\$ 4,300
<b>Total Base Project Cost</b>					<b>\$ 33,100</b>

*\*Cost estimates are based on the knowledge of a professional engineer based on 2024 construction costs and are subject to change due to bidding environment and other factors.*

### **3.3 CIP PROJECTS SUMMARY**

The purpose of this asset management plan was to document the condition of the Overhills sewer infrastructure to assist the County with becoming more viable and proactive in the management and financing of its wastewater system. The County intends to look to its CIP to guide its next project; therefore, it is vital that the CIP be established as an accurate depiction of current conditions and reflect the Districts' highest priorities with accurate cost estimates. The development of this AMP will serve as a positive step towards ensuring that the District can maintain its level of service agreement.

Sewer manhole rehabilitation and cleanout replacement was evaluated based on current staff input and the results of the field inspections. The existing manholes and cleanouts were divided into projects recommended for the next 10 years.

McGill prepared cost estimates for all projects based on current materials and construction costs. The 10-year CIP is intended to be adopted by the District to guide its selection of sewer system improvement projects over the next two decades. The cost summary for the 10-year CIP is shown below in Table 12.

**Table 12: CIP Cost Summary**

<b>Year<sup>1</sup></b>	<b>Manhole Rehabilitation Project 1</b>	<b>Brinkley Lift Station Improvements</b>	<b>Manhole Rehabilitation Project 2</b>	<b>Manhole Rehabilitation Project 3</b>	<b>TOTAL COST</b>
1	\$ -	\$ 33,100.00	\$ -	\$ -	\$ 33,100.00
2	\$ 84,100.00	\$ -	\$ -	\$ -	\$ 84,100.00
3	\$ -	\$ -	\$ -	\$ -	\$ -
4	\$ -	\$ -	\$ -	\$ -	\$ -
5	\$ -	\$ -	\$ 84,100.00	\$ -	\$ 84,100.00
6	\$ -	\$ -	\$ -	\$ -	\$ -
7	\$ -	\$ -	\$ -	\$ -	\$ -
8	\$ -	\$ -	\$ -	\$ 84,100.00	\$ 84,100.00
9	\$ -	\$ -	\$ -	\$ -	\$ -
10	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL ESTIMATED CIP COST<sup>2</sup></b>					<b>\$ 285,400.00</b>

*Notes:*

- 1: Considering timeline for adoption of this plan and County budget planning cycle, Year 1 is anticipated to be FY 2026
- 2: Cost estimates are based on the knowledge of a professional engineer based on 2025 construction costs and are subject to change due to bidding environment and other factors

## 4.0

## OPERATIONS AND MAINTENANCE PLAN

### 4.1 GENERAL RECOMMENDATIONS

The purpose of an Operations and Maintenance (O&M) Program is to provide an organized and cost-effective approach to ongoing maintenance, repair and replacement activities that will maintain the sewer collection system, so it performs as intended and meets the requirements of the sewer utility's System-Wide Collection System Permit, issued under North Carolina General Statutes Article 21 of Chapter 143.

This section provides a general description of proactive O&M, which can be defined as scheduled maintenance activities (preventive maintenance), performed on a regular basis in order to achieve the highest level of system performance using available resources and minimizing failures that can result in Sewer System Overflows (SSOs)

Developing an O&M Program begins with accurate records of infrastructure inventory, asset locations, and physical condition. Coupled with work records and system performance history, preventive maintenance schedules can be developed to efficiently address general system needs, from cleaning and debris removal to site-specific maintenance work such as cutting and repair work.

The following elements provide the foundation for an effective O&M program:

- Maintain up-to-date wastewater treatment plant equipment documentation, sewer collection system maps and related work history and operational data.
- Develop a routine preventive O&M program and activities for staff and contractors maintaining the sewer collection system and a system to document scheduled activities.
- Develop a rehabilitation and replacement plan identifying and prioritizing system deficiencies and implement short- and long-term actions to address the deficiencies.
- Develop and implement training programs to build technical competence and emergency preparedness.
- Develop and provide equipment and replacement part inventories, including critical replacement parts.

## **Sewer System Mapping**

Sewer system maps and related databases are typically managed using a Geographic Information System (GIS). The District currently utilizes ESRI as the GIS platform from which to manage the utility systems. This GIS mapping is supported by a database that records sewer main size, material types, and locations of manholes and clean-out connections. The platform has the ability to store more information that is currently being utilized by the County, including invert and rim elevations and other attributes of system appurtenances. If County intends to utilize the GIS platform for managing and recording maintenance performed and planned, it is recommended that the County investigate alternative software to ensure that they are utilizing a software that meets their needs with respect to budget.

The GIS database should be updated on a regular basis. Software applications such as work order systems are available to allow field staff to update GIS data as inspection and maintenance activities are completed. Other applications can also allow staff to update and edit maps. Field information that was gathered by McGill and County staff as a part of this assessment is now included in the County's GIS system database for future reference.

GIS can organize work history along with operational data, inspection records and images to provide managers, operations staff and engineers with powerful data sets to track current resource allocations and forecast short and long-term operational and capital needs. Outcomes of detailed analysis such as recommended sewer main rehabilitation work versus sewer overflows can be mapped to present the relationship visually for ease of understanding.

## **Preventive Operation and Maintenance (O&M)**

Preventive maintenance is performing routine and scheduled maintenance activities before wastewater treatment plant and lift station equipment or buried infrastructure fails, for the purpose of extending useful life, reducing overall operating costs, and increasing system reliability. This proactive approach to maintenance work is more efficient and cost effective than reactive and curative operations. Preventive maintenance activities will also help operations staff to better understand the wastewater treatment plant equipment, lift station equipment, and collection system components and how they work under various conditions. This knowledge is essential to setting maintenance priorities and developing the scope and timing of long-term rehabilitation and replacement projects.

## **Scheduled Cleaning of Sewers**

EPA recommends, at a minimum, 100% of sewer mains should be cleaned every 5 years, or 20% of the system annually. The sewer utility's Collection System Operating Permit requires 10% of the gravity sewers to be cleaned annually. High pressure jetting is the most common approach using various spray nozzles for general cleaning and debris removal. Mechanical cutters are used to address root intrusion and cleaning agents can be added to help remove fats, oils, and grease (FOG).

More frequent cleaning is scheduled for areas with a history of heavy debris, grease buildup and roots. CCTV inspections are also used to identify areas to clean more often, such as sections with minor defects such as offset joints and service taps protruding into the main line. Sewer sections near siphons are cleaned more frequently to ensure continuous and uninterrupted operation.

As part of the O&M Program, a master list of cleaning operations, priority locations and scheduling can be incorporated into GIS. Maps can be produced to define work areas, schedule resources, including contracted services, track progress and task completion. Updating GIS maintenance operations data (partial blockages found, debris quantity, etc.)



will help managers adjust cleaning frequency and area boundaries as needed to increase program efficiency, reduce sewer blockages, and avoid SSOs.

## **Routine Visual Inspections**

Routine inspections are used to assess the condition of lift stations, manholes and surface facilities, recording general conditions and evidence of possible structural problems or failures (offset structures, etc.), corrosion, surcharging, overflows and excessive Inflow and Infiltration (I&I). Work orders are generated based on inspection records to effect operational adjustments, scheduling more detailed inspections and/or making necessary repairs.

## **Manhole Inspection Program**

Manhole inspections keep the asset inventory up-to-date and are used not only to update collection system maps, but to determine structural condition. During manhole inspections, a complete inventory is taken of each manhole including construction materials, ring size, depth to invert, flow conditions and evidence of problems. The National Association of Sewer Service Companies (NASSCO) Manhole Assessment and Certification Program (MACP) may be adopted or used as a guide to ensure consistency and reliability of evaluation and ranking methodology.

The results from routine manhole inspections and monitoring are used to prioritize areas needing CCTV inspections to assess pipe condition such as manholes with evidence of slow flow or surcharging. Information is recorded and used to schedule maintenance and repairs.

## **CCTV Inspection Program**

While routine cleaning and visual inspection are used to assess the condition of surface facilities and manholes, CCTV video inspections are the primary method used to assess the condition of the sewer pipes. Using conventional defect criteria is highly recommended to provide standardization and consistency in sewer pipe condition

assessment and ranking. The NASSCO Pipeline Assessment and Certification Program (PACP) may be adopted or used as a guide to ensure consistency and reliability of evaluation and ranking methodology.

## **Maintenance Activity Records**

Detailed records and daily logs of O&M work provide valuable information to help managers evaluate the effectiveness of maintenance activities and make adjustments to optimize the use of limited resources. Equipment, manpower and other resources are tracked along with detailed descriptions of defects and/or obstructions encountered including debris, FOG, structural failures, etc. Maintenance work resulting in system modifications or extensions is required to be incorporated into record drawings and system maps. Scheduled testing of emergency and standby equipment is also a requirement of the collection system permit.

These records are required to be reviewed periodically to identify problems that cannot be resolved in a short period of time in order to develop a plan to address the problem(s). Maintaining these records for an extended period of time (5-years or more) will also provide accurate reference points of maintenance investments made over time that will track the effectiveness of operation and maintenance activities.

In the event of a sewer spill or system overflow, maintenance records will need to provide sufficient detail to satisfy reporting requirements for the event, including location(s), volume of wastewater, corrective actions, etc. This data may also be integrated into GIS to allow mapping of these events over time in order to identify patterns and/or trends that will assist with scheduling maintenance and planning rehabilitation and other capital improvements.

## **Resolution of Customer Complaints**

Customer complaints are primarily for sewer backups and odors. Sewer backups require an immediate response to diagnose and resolve the problem. These complaints can occur outside normal business hours, significantly escalating costs. Detailed records of the problems found, and the resources needed to address the failed condition, provide valuable feedback for making adjustments to the preventive maintenance program that can reduce these types of calls and help lower overall maintenance costs.

These records can also identify areas where private service laterals frequently fail. Notifying customers in these areas will allow them the opportunity to address deficiencies proactively, which will also help reduce customer “emergency” calls.

## **Capital Improvements Plan**

A Capital Improvements Plan (CIP) is required by the collection system permit to identify rehabilitation, replacement and expansion needs of the system. The CIP is required to address the short and long-term needs of the system, covering at least a 3 to 5-year planning period, and must include the estimated cost of each capital project.

CIP development incorporates maintenance activity, cleaning and inspection records, and system performance data that may include flow monitoring and hydraulic modeling to evaluate the existing system and to recommend improvements needed to correct existing deficiencies, and ensure adequate capacity is maintained throughout the system.

Capital planning includes consideration of on-going funding for rehabilitation and replacement of the collection system as it wears out, and potential upgrades for expansion as needed.

## **Training Program**

Training programs provide a mechanism for educating employees and establishing their technical competence to perform operations, maintenance, and emergency responses safely and effectively. A combination of in-house skill training and specialized training purchased or provided through state and national associations, conferences and vendor training programs are typically used to build and enhance skills for performing daily work duties. Periodic training reinforces previous efforts, as people often overlook things that are used infrequently. It also provides an opportunity to train new staff and learn about new problems, new techniques, and changes in equipment.

Emergency training educates system personnel about emergency situations and resulting effects on the wastewater system, public health, and environmental impacts. It also provides an opportunity to practice responses. Good record keeping ensures personnel are properly trained and prepared to effectively operate and maintain the collection system under any given circumstance. Regular review of training records is essential for keeping content up-to-date and maintaining proper employee awareness.

## **Equipment and Replacement Parts**

A reasonable supply of equipment and replacement parts should be maintained to fully support all operations and maintenance activities. A detailed inventory is essential to ensure availability under normal operations and emergency conditions. Specialized equipment or parts may be too costly to keep in stock, so arrangements with vendors and/or contractors may be necessary to ensure availability during non-business hours or during emergencies.

## 4.2 STAFFING RECOMMENDATIONS

Cumberland County is responsible for three wastewater collection systems and one water system: NORCRESS, Overhills, Kelly Hills, and Southpoint Water System. While each of these districts maintains its own operating budget, the Board leadership and operational management is performed solely by Cumberland County. Therefore, in consideration of the typical utility system management and operations and maintenance that is necessary for maintaining each of the systems, McGill has considered all of the four (4) utility systems cumulatively. While each system could be analyzed separately, considering the systems together is more consistent with actual management of the systems.

Typical metrics for analyzing full-time equivalent (FTE, representing quantity full-time workers) are based on either the population served by the system or by miles of utility piping (water main or sewer line) within each system. For reference, Table 13 below summarizes the customers and piping in each of the County’s utility systems.

**Table 13: Utility System Comparison**

DISTRICT	Number of Connections		Paying Avail. Fee	Pipe in System (mi.)
	Water	Sewer		
<b>Southpoint</b>	84		129	2.8
<b>Kelly Hills</b>		102	166	4.5
<b>Overhills</b>		107	318	4.0
<b>NORCRESS</b>		452	666	41.1
<b>TOTALS</b>	<b>84</b>	<b>661</b>	<b>1279</b>	<b>52.4</b>

**Table 14: Typical Population vs. Pipe Length**

<b>Population</b>	<b>Pipe in System (mi.)</b>
0-100	5
101-500	5
501-3300	21
3301-10000	62

The typical sizes of utility systems from a community system EPA study<sup>1</sup> are shown in Table 14, and are generally consistent when compared to the County’s systems. This study was selected as a basis for comparison due to its comprehensive nature, having included water systems nationwide in its breadth. NORCRESS is the exception when compared to Table 14. This is mostly likely indicative of the system serving a more rural population where the connection density is less, and resulting from the length of force main piping in the system that increases the overall length but does not contribute to population density. Overall, these metrics were found to be reasonably consistent with the County’s systems. Similarly, the data is consistent regardless of whether the utility system is a water systems or wastewater collection system.

The objective is to make budget-level staffing recommendations for the County’s utility systems based on what is typical across the industry and other utility systems of comparable size. The EPA study utilized provides typical FTE for the roles of manager, plant operator, distribution (and collection, for our purposes), and administrative functions. All of these were considered applicable to management and operation of the County’s utility systems. Note: while the County is not responsible for plant operation in any system, the lift stations in the NORCRESS and Overhills systems are the County’s responsibility, therefore this metric was used, albeit in a smaller percentage, to account for the management of those resources.

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<sup>1</sup> Analysis conducted using excerpts from US EPA document, “National Characteristics of Drinking Water Systems Serving 10,000 or Fewer People,” published July 2011.

Table 15 shows Further utilizing the EPA statistics as base for typical FTE for each of the positions, based on the system size in terms of miles of pipe main.

**Table 15: Average Community System Statistics**

Employee Category	System Size (miles of Main)		Mean	Cumberland County
	Pop. 500-3300	Pop. 3300-10000		
	21	62	41.5	51.7
<b>Manager FTE</b> per mile	0.6	1.1	0.85	1.06
	0.029	0.018	0.020	0.020
<b>Plant Operator FTE</b> per mile	0.6	1.3	0.95	1.03
	0.029	0.021	0.023	0.023
<b>Distribution FTE</b> per mile	0.8	2.5	1.65	2.06
	0.038	0.040	0.040	0.040
<b>Administrative FTE</b> per mile	0.6	1.5	1.05	1.31
	0.029	0.024	0.025	0.025

The green highlighted cells are the calculated FTEs that were applied to estimate staffing size based on the quantity of pipe across the County’s four utility systems. Those calculated FTEs are based on the size of systems managed by the County and reasonable estimate of staffing needed for these systems.

Each of the FTEs is applied to each respective employee category. McGill utilized wage information from Zip Recruiter and a benefits multiplier of 1.38 from the U.S. Bureau of Labor Statistics to develop the summary shown in Table 16.

**Table 16: Overall Salary Estimates**

Employee Category	Hourly Rate	Annual Salary	Ben. Mult.	Total	Applied FTE	Applied Budget Cost
Manager	\$38.50	\$80,080.00	1.38	\$110,510.40	1.06	\$117,000
Operator	\$24.52	\$51,001.60	1.38	\$70,382.21	1.03	\$72,700
Distribution	\$23.57	\$49,025.60	1.38	\$67,655.33	2.06	\$139,100
Administrative	\$21.33	\$44,366.40	1.38	\$61,225.63	1.31	\$80,100
<b>Total Applied Budget Cost Based FTEs</b>						<b>\$408,900</b>

Utilizing industry metrics and comparing to systems of comparable size, McGill offers the proceeding section as a general staffing recommendation. This section and these budget values are provided for preliminary planning purposes only.



Staffing levels appear to be reasonable based on the District's ability to operate and maintain the system while providing a reliable level service to its customers.

While this budget number is higher than the current budget staffing, consideration should also be given to the cumulative effect cost to the County for contracted operation and distribution support in the NORCRESS and Kelly Hills district.



# **APPENDICES**



## **Appendix A**

### **Smoke Testing Results List**



**Overhills Smoke Testing Cleanouts**

Date:		September 19th, 2024	
Facility ID	Status	Notes	
2	Broken		
3	Broken	Cap replaced	
5	Broken		
13	Broken	Smoking from c/o	
15	Broken	Smoking from c/o	
18	Broken		
23	Broken		
26	Broken	Smoking from c/o	
28	Broken		
29	Broken		
42	Broken		
48	Broken		
50	Broken		
10	Broken	No smoke but lid is broken	
53	Broken	Smoking lid needs to be replaced	
	Broken	Lateral broken, smoke around elder valve and ground	
58	Broken		
59	Broken		
66	Broken	Missing elder valve cap	
68	Broken	Both valves smoking and house	
69	Broken		
70	Broken	Cap missing on elder valve	
74	Broken	Smoking from valve	
79	Broken	Elder valve missing cap	
80	Broken		
82	Broken	Lid unscrewed	
87	Broken	Smoking, Replaced on site	
89	Broken	Smoking from c/o	
92	Broken		
94	Broken		
96	Broken	Smoking from c/o	
96	Broken		
97	Broken		
100	Broken	Smoking from valve	
101	Broken	Smoking from c/o	
107	Broken		
116	Broken	Smoking from valve and house	
119	Broken		
121	Broken	Valve and house smoking	
	Broken	Multiple clean outs smoking in yard and from house	
125	Broken		
127	Broken	Smoking from valve	
128	Broken	Smoking from valve	
129	Broken		
136	Broken	Smoking from valve and ground	
139	Broken	Smoking from house and valve	
142	Broken		
143	Broken	Smoking from c/o	
149	Broken		
150	Broken		
152	Broken	Smoking from c/o	
154	Broken	No smoke but cap broken	
157	Broken	Missing cap	
159	Broken	Cap broken no smoke	
160	Broken	Broken	
162	Broken	Broken	
163	Broken		
164	Broken	Broken valve smoking	
165	Broken		
168	Broken	Elder valve cap missing	
169	Broken		
170	Broken		
172	Broken	Lid bent	
175	Broken		
177	Broken	Lid unscrewed	
178	Broken		
180	Broken		
181	Broken		
183	Broken		
184	Broken		
187	Broken		
188	Broken		
201	Broken	Smoking from ground/co	
204	Broken		
206	Broken		
	Broken	Smoking, C/o broken and filled w/trash	
207	Broken		
208	Broken	C/o smoking	
210	Broken		
220	Broken		
225	Broken		
226	Broken	Elder valve lid	
235	Broken	Elder valve cap	
240	Broken		
243	Broken		
247	Broken	Lid loose	
260	Broken	Elder valve	
246	Broken		
266	Broken	Smoking c/o	
264	Broken		
267	Broken		
270	Broken	Smoking	
272	Broken		
273	Broken	Smoking c/o	
285	Broken	Smoking c/o replaced on site	
286	Broken	Cap missing	
317	Broken		
1112	Broken		
1512	Broken		
1513	Broken		
1514	Broken		
2712	Broken		
2713	Broken		



<b>Overhills Smoke Testing Manholes</b>		
<b>Date:</b>		<b>September 19th, 2024</b>
<b>Facility ID</b>	<b>Status</b>	<b>Notes</b>
53	Leak	
54	Leak	Smoking from MH and underneath lift station
62	Leak	
64	Leak	
73	Leak	
99	Leak	MH smoking (inside fence w/ lift station fence locked)
120	Leak	

## **Appendix B**

### **Manhole Inspection List**



# Overhills Manhole Inspection

Date: April 10th, 2024

Manhole/Facility ID	Condition	Notes
7	Good	
11	Good	
16	Good	
17	Good	
21	Good	
25	Good	
26	Good	
30	Good	
35	Poor	
43	Poor	
52	Poor	
56	Good	
60	Poor	
68	Poor	
74	Good	
80	Good	
81	Good	
86	Good	
94	Good	
96	Good	
101	Good	
104	Good	
110	Good	

Total Manhole Inspected	23
Total Good Comdition	18
Total Poor Condition	5



## **Appendix C**

### **Overhills Spring Lake Agreement**





THIS AGREEMENT made and entered into this 8<sup>th</sup> day of September, 2014 by and between the Town of Spring Lake, a North Carolina municipal corporation, (hereinafter referred to as "Spring Lake"), and the County of Cumberland, a North Carolina Body Politic, acting by and through its Overhills Park Water & Sewer District, (hereinafter referred to as "Overhills").

WITNESSETH

THAT WHEREAS, Overhills wishes to contract with Spring Lake to furnish sanitary sewer treatment and provide for the operation and maintenance of the Overhills Park Water & Sewer District in an area as shown on Exhibit "A" attached hereto; and

WHEREAS, Spring Lake has agreed to treat sanitary sewer for Overhills to include operation and maintenance of the sanitary sewer collection system installed by Overhills within the delineated service area according to the following terms and conditions:

1. The sanitary sewer collection system being constructed by Overhills shall be built in accordance with engineering plans and specifications and constructed by a contractor licensed to perform utility construction in North Carolina.

2. Overhills will be responsible for the cost of constructing the sanitary sewer collection system as sized accordingly to serve the delineated service area as approved by USDA with Spring Lake being responsible for upgrades, in materials and line sizing as it may deem necessary.

3. The cost of operation and maintenance of the sanitary sewer collection system is built into the sanitary sewer rate being charged to Overhills as shown on Exhibit "B". Spring Lake shall render accurate monthly bills to Overhills. Such bills shall be computed by multiplying Overhills' sewer flow, expressed in thousand (M) gallons, by the applicable rate per thousand (M) gallons for this customer class. The rate per thousand (M) gallons shall be subject to change annually. Routine operation and maintenance includes: (1) Repair damaged, deteriorated, or broken sewer mains; (2) Repair damaged, deteriorated, or broken sewer service laterals from the main to edge of road right-of-way or easement; (3) Routine maintenance and repair of pump station equipment; (4) Cleaning and rodding of clogged sewer mains; (5) Repair of manholes to include rings and covers; and (6) Other routine maintenance and repairs as needed; (7) Administrative and engineering support of above, as required; (8) 24 hours, 7 days per week on-call dispatch with appropriate response forces; (9) Responding to inquiries by existing and potential users of sanitary sewer service; (10) Investigating and working to resolve complaint issues; (11) Maintaining metered electric service at pumping stations, as well as, chemicals associated with pump station operation.

4. Monthly bills rendered for services as provided hereunder are payable within 30 days from their date, at Spring Lake's office, Town of Spring Lake, P.O. Box 617, Spring Lake, NC 28390.

5. Spring Lake will be responsible for the cost associated with upsizing mains within the delineated Overhills service as may be deemed necessary in order to meet Spring Lake's existing and future sanitary sewer needs which would not be otherwise required for the sanitary sewer collection system being installed by Overhills pursuant to this Agreement.

6. All sanitary sewer lines installed by Overhills that are funded with USDA loan and/or grant funds will not be charged a capacity or impact fee and shall be owned and operated by Overhills subject to Spring Lake's right to upsize such mains at its expense and to transmit sanitary sewer through such mains to areas beyond the Overhills area.

7. Overhills will acquire all rights-of-way and/or encroachments as may be needed for construction of the sanitary sewer collection system as referenced herein. Spring Lake currently controls an existing easement that was dedicated to the Town of Spring Lake for the sole purpose of constructing a lift station to serve the Overhills Park Subdivision. The Town of Spring Lake will not charge Overhills any fees for the use of the easement and Overhills will own the lift station.

8. Spring Lake reserves the right to extend or continue sanitary sewer mains from such mains as initially constructed by Overhills to points outside of the delineated Overhills service area. Future connections or main extensions that occur outside of the delineated Overhills area are not subject to this Agreement and shall be the property of Spring Lake unless the Overhills boundary is expanded by mutual agreement of the parties herein in order to serve development of contiguous properties.

9. The further extension of or connection to mains within the delineated Overhills service area will be pursuant to applicable extension and connection policies and procedures of Overhills in effect at the time a request for service is made.

10. Overhills may by resolution adopt a policy whereby future customers and/or extenders of sanitary sewer infrastructure in the Overhills service area will be subject to the then current applicable Spring Lake Policies and Procedures to simplify the application process for customers with the understanding that such customers remain responsible to Overhills for compliance with such policies and procedures.

11. Laterals not installed during the initial sanitary sewer collection system as constructed by Overhills will be subject to the applicable lateral charge and facility investment fee charged by Spring Lake. Overhills customers will not be charged a main charge by Spring Lake if located within the Overhills service area on mains installed by Overhills.

12. Annual Notification of Anticipated Usage and Restriction: (a) Spring Lake reserves the right and authority to limit the annual increase in usage by Overhills to an amount not greater than 20% of the previous calendar year's usage. However, additional limits may be imposed if an outside agency having jurisdiction over the treatment facilities requires restrictions on increases in usage on the Spring Lake's system. Consideration will be given on a case-by-case basis to address anticipated sanitary sewer needs in excess of the above stated 20% increase; (b) any limitations or restrictions on sanitary sewer usage due to situations beyond Spring Lake's control will also apply to Overhills. Overhills will be responsible to ensure the individual sanitary sewer customers on its system comply with these restrictions or limitations.

13. The term of this Agreement may be amended by written agreement between Spring Lake and Overhills. The term of this Agreement is for five years from Sept. 8, 2014, and at the end of each anniversary date of this Agreement, the termination date of the term of this Agreement shall automatically extend for an additional period of one year unless terminated by said parties giving not less than two years written notice to the other party including the initial term or by mutual consent of both parties.

14. *Severability*: It is hereby declared to be the intention of Spring Lake and Overhills that the paragraphs, sentences, clauses and phrases of this Agreement are severable. If one or more paragraphs, sections, sentences, clauses or phrases shall be declared void, invalid or otherwise unenforceable for any reason by valid and final judgment or decree of any court of competent jurisdiction, such judgment or decree shall not affect the remaining provisions of this Agreement and the same shall continue to be fully effective and enforceable on the basis that said remaining provisions would have been agreed to by Spring Lake and Overhills without the incorporation of such void, invalid or otherwise unenforceable paragraph, section, sentence, clause or phrase.

15. *Notices:* Whenever written notices are required under this Agreement, said notice shall be in writing and shall be delivered personally or shall be sent by prepaid registered or certified mail. If notice is mailed to Spring Lake, it should be addressed as follows:

Mayor, Town of Spring Lake  
P.O. Box 617  
Spring Lake, NC 28390

If notice is mailed to Overhills, it should be addressed as follows:

Chairman, Board of Governors  
Overhills Park Water & Sewer District  
P.O. Box 1829  
Fayetteville, NC 28302-1829

Either party may change its mailing address by giving written notice of the new address. Unless so changed, the addresses set forth above shall apply.

18. *Binding Effect:* This contract shall be binding upon and inure to the benefit of the parties hereto, their heirs, successors and assigns.

19. *Entire Agreement:* This contract contains the entire agreement of the parties and there are no representations, inducements or other provisions other than those expressed in writing.

20. *Governing Law:* This contract shall be governed by the laws of the State of North Carolina.



IN WITNESS WHEREOF, the parties hereto through their duly authorized officers has executed this contract as to the date and year first above written.

OVERHILLS PARK WATER & SEWER DISTRICT



By: Jeanette M. Council  
Jeanette M. Council, Chair

ATTEST:

Candice White  
Candice White, Clerk to the Board

APPROVED for Legal Sufficiency  
OVERHILLS PARK Water & Sewer District  
Attorney

Rick L. Moorefield  
Rick L. Moorefield, County Attorney  
Attorney for OVERHILLS PARK  
*it properly executed*

This instrument has been pre-audited in the manner required by the Local Government Budget and Fiscal Control Act.

Melissa Cardinali  
Melissa Cardinali, Finance Director  
Finance Officer for OVERHILLS PARK

THE TOWN OF SPRING LAKE



By: Chris V. Rey  
Chris V. Rey, Mayor

ATTEST:

Rhonda Webb  
Rhonda Webb, Town Clerk

APPROVED, as to form this 8<sup>th</sup> day of September, 2014.

Robert A. Buzzard  
Robert A. Buzzard  
Spring Lake Attorney

This instrument has been preaudited in the manner required by the Local Government Budget and Fiscal Control Act.

Tina J. West  
Allen L. Coats, Finance Director  
Financial Officer for Spring Lake  
Tina J. West, Interim Finance Director

NORTH CAROLINA - CUMBERLAND COUNTY

I, \_\_\_\_\_, a Notary Public of said County and State do hereby certify that \_\_\_\_\_ personally appeared before me this day and acknowledged that he/she is the Clerk to the Board of the OVERHILLS PARK Water and Sewer District, and that the authority duly given and as the act of said, the foregoing instrument was signed in its name by its Chairman, sealed with its corporate seal and attested by himself/herself as its \_\_\_\_\_.

WITNESS my hand and Notarial Seal, this the \_\_\_\_ day of \_\_\_\_\_, 2014.

My Commission Expires: \_\_\_\_\_

\_\_\_\_\_  
Notary Public

NORTH CAROLINA - CUMBERLAND COUNTY

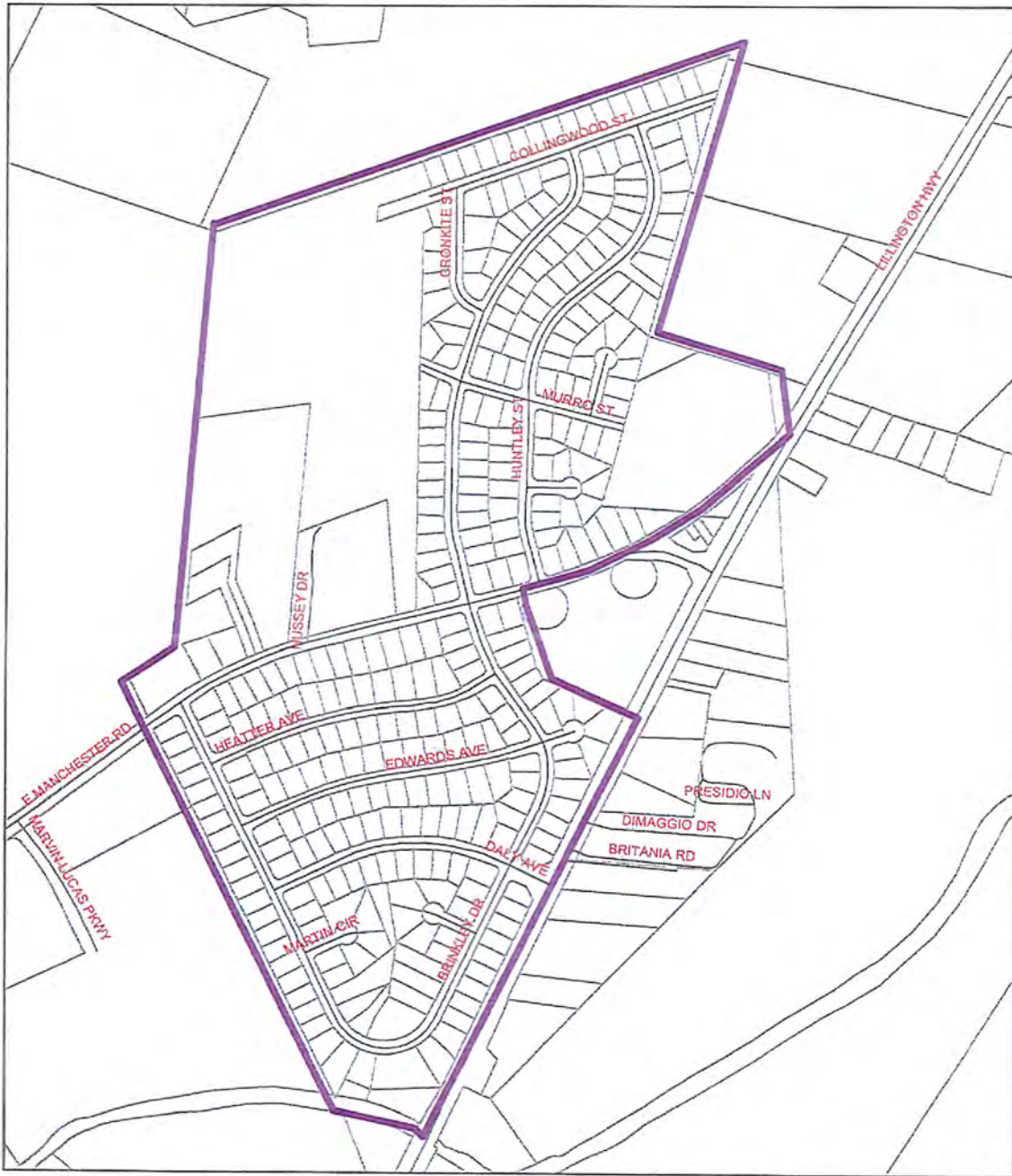
I, Patricia M. Hickman, a Notary Public of said County and State do hereby certify that Khonda D. Webb, personally appeared before me this day and acknowledged that she is Clerk of The Town of Spring Lake, North Carolina, and that the authority duly given and as the act of the agency, the foregoing instrument was signed in its name by its Mayor, sealed with its seal and attested by himself/herself as the Town Clerk.

WITNESS my hand and Notarial Seal, this the 8<sup>th</sup> day of September, 2014.

My Commission Expires:  
November 26, 2016

Patricia M. Hickman  
Notary Public  


Exhibit A



OVERHILLS PARK WATER & SEWER DISTRICT

## Exhibit B

### Rate Schedule

\$4.00 per thousand gallons

\$9.25 per tap



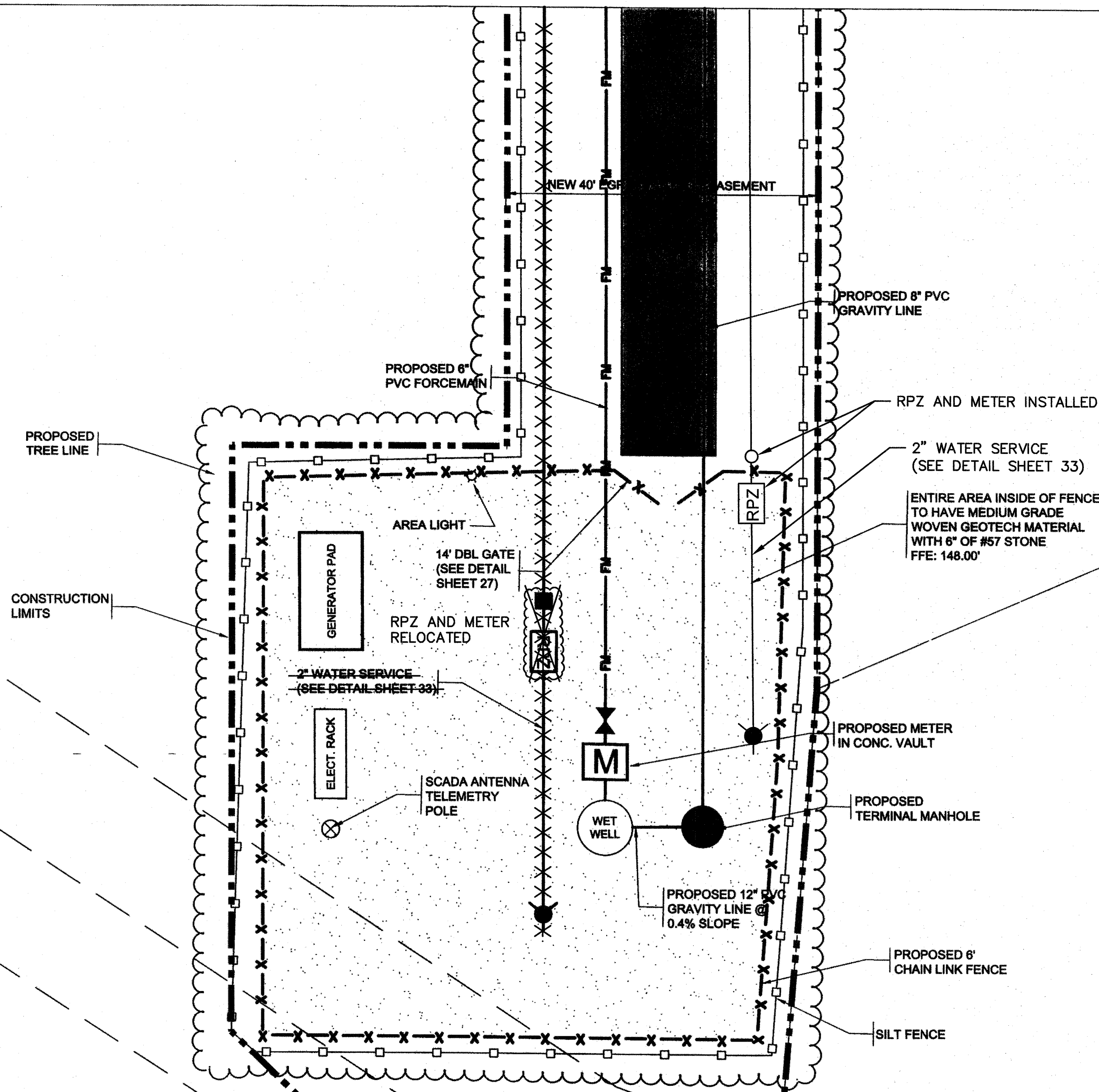


## **Appendix D**

### **Lift Station Record Drawings**



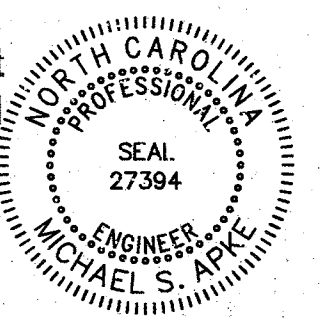
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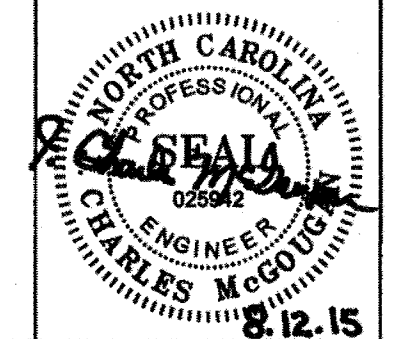
By Michael S. Apple Date 8/2/19

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LEGEND			
	NEW FORCE MAIN		WETLANDS
	NEW GRAVITY LINE		NEW ACCESS ROAD
	EASEMENT LINE		NEW 6" #57 STONE
	PROPERTY LINE		EXIST. ROAD
	WETLANDS BUFFER		NEW MANHOLE
	EXIST. WATER LINE		
	CHAIN LINK FENCE		
	NEW CONTOUR		
	EXIST. CONTOUR		

**PS-1  
BRINKLEY DRIVE PUMP STATION  
SITE PLAN**  
SCALE: 1"=10'

REVISIONS			
BY	DATE	DESCRIPTION	SYM.
JCM	6/15/15	ADDED CONST. LIMITS/CONST. ENTR. NOTES	



**MOBID CONSULTING ENGINEERS, P.A.**  
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**BRINKLEY DRIVE PUMP STATION SITE PLAN**

**OVERHILLS SUBDIVISION WASTEWATER SERVICE**  
Cumberland County, North Carolina

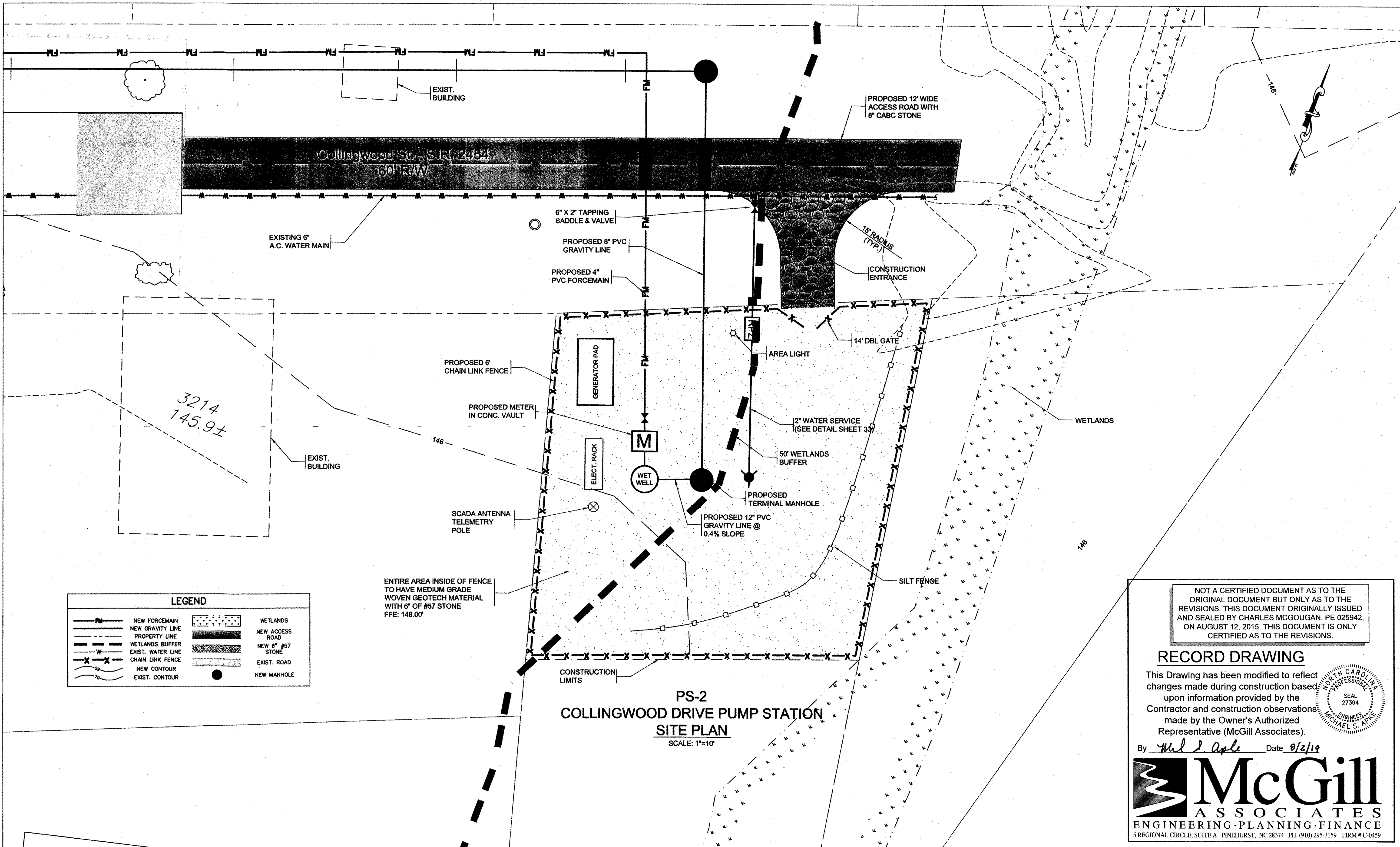
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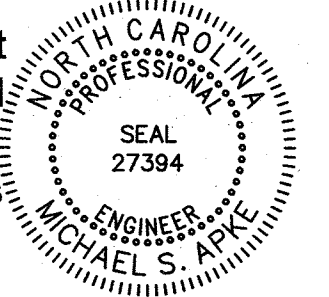
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	NEW GRAVITY LINE		NEW ACCESS ROAD
	PROPERTY LINE		NEW 6" #57 STONE
	WETLANDS BUFFER		EXIST. ROAD
	EXIST. WATER LINE		NEW MANHOLE
	CHAIN LINK FENCE		
	NEW CONTOUR		
	EXIST. CONTOUR		

**PS-2  
COLLINGWOOD DRIVE PUMP STATION  
SITE PLAN**  
SCALE: 1"=10'

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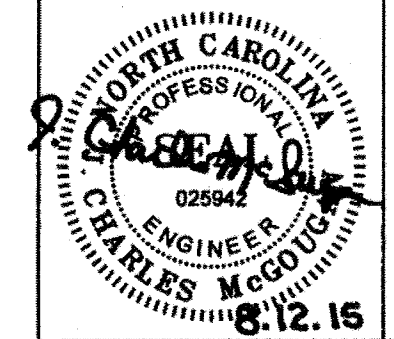
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By Michael S. Apple Date 8/2/19



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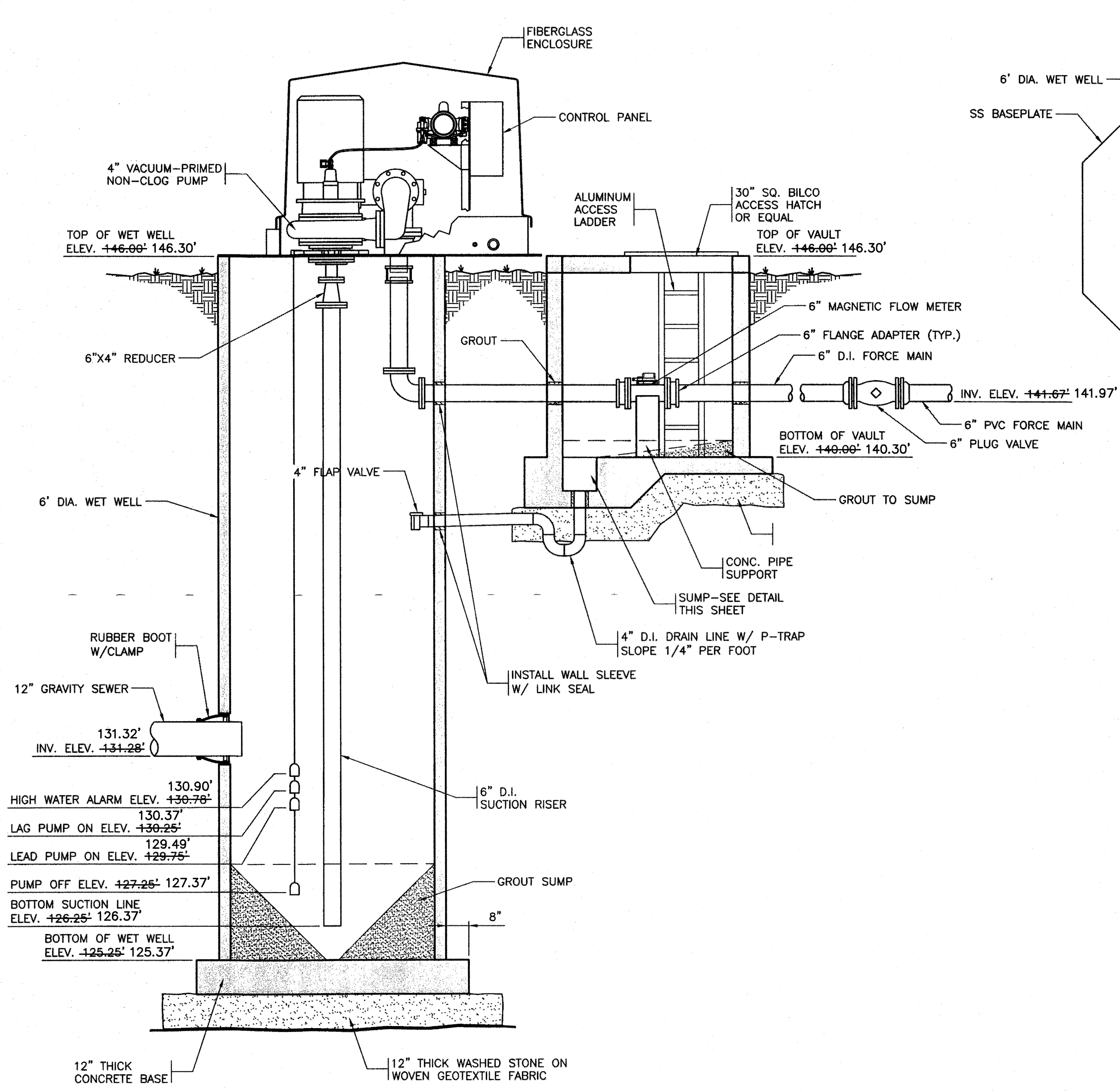


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NC License No. C-644

**COLLINGWOOD DRIVE  
PUMP STATION  
SITE PLAN**

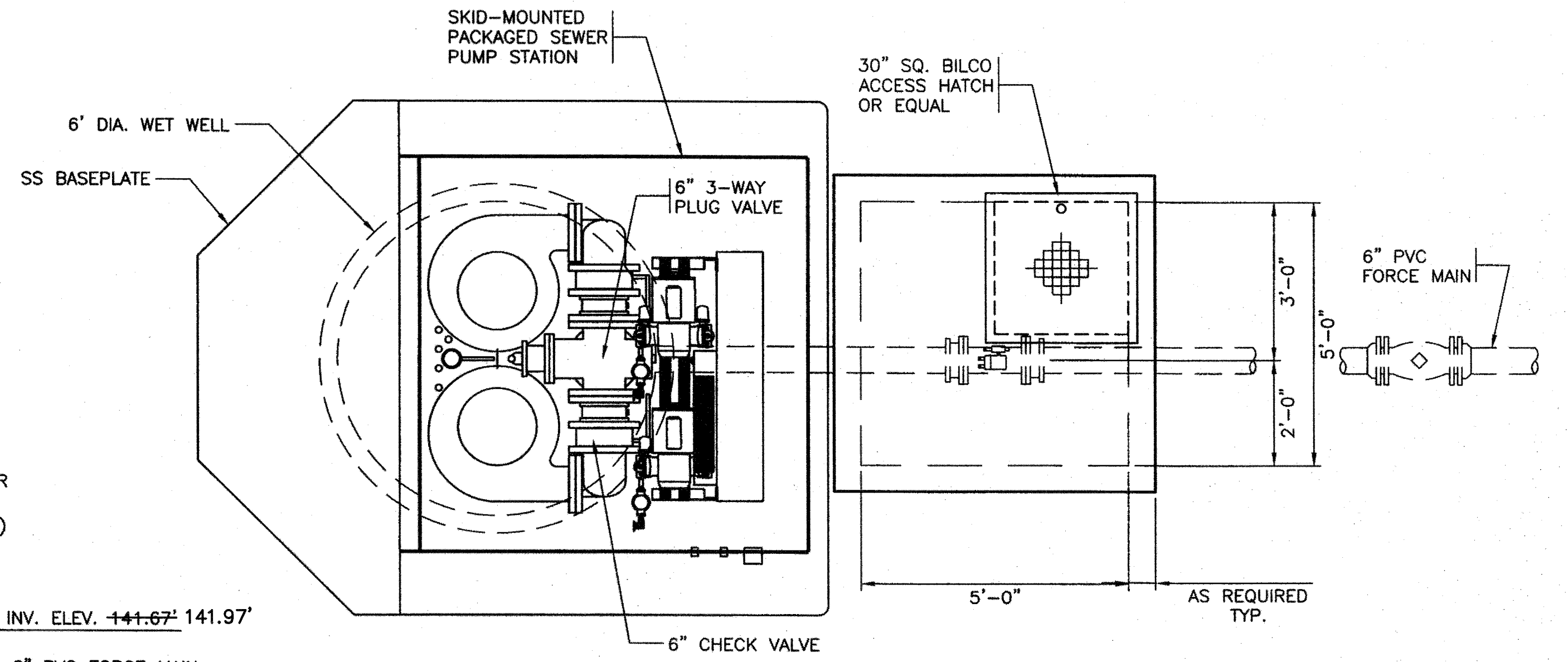
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WASTEWATER SERVICE**  
Cumberland County, North Carolina

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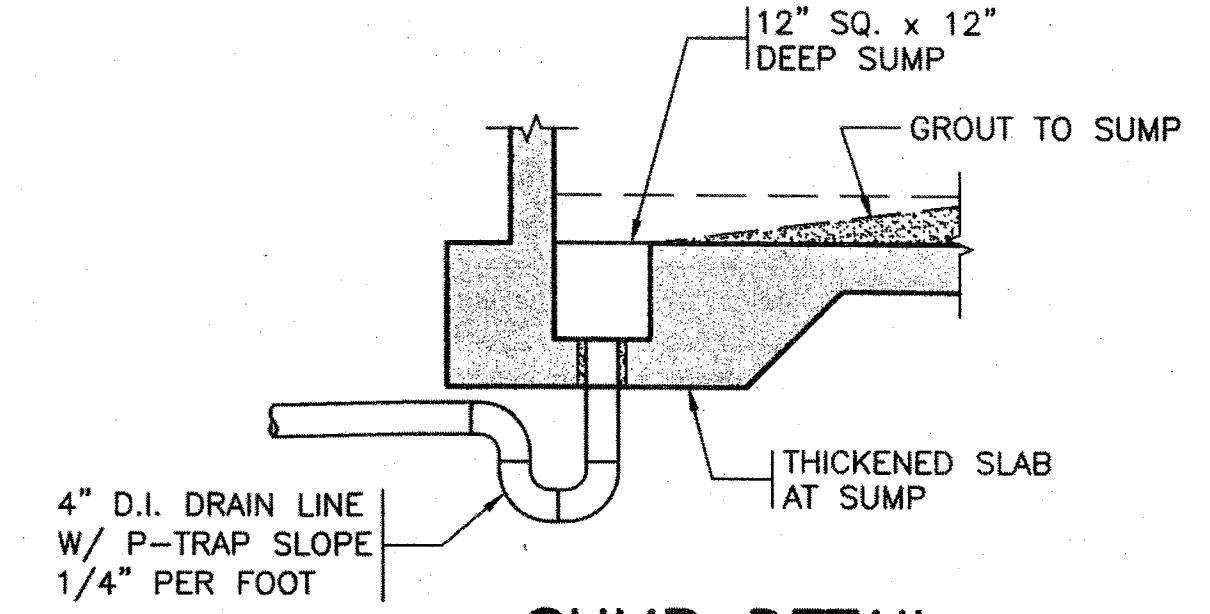


- TOP OF WET WELL ELEV. +146.00' 146.30'
- 6"x4" REDUCER
- 6' DIA. WET WELL
- RUBBER BOOT W/CLAMP
- 12" GRAVITY SEWER
- INV. ELEV. +131.28'
- 130.90'
- HIGH WATER ALARM ELEV. +130.78'
- 130.37'
- LAG PUMP ON ELEV. +130.25'
- 129.49'
- LEAD PUMP ON ELEV. +129.75'
- PUMP OFF ELEV. +127.25' 127.37'
- BOTTOM SUCTION LINE ELEV. +126.25' 126.37'
- BOTTOM OF WET WELL ELEV. -125.25' 125.37'

**COLLINGWOOD DR PUMP STATION**  
**ELEVATION VIEW**  
 SCALE: 1/2"=1'-0"



**COLLINGWOOD DR PUMP STATION**  
**PLAN VIEW**  
 SCALE: 1/2"=1'-0"



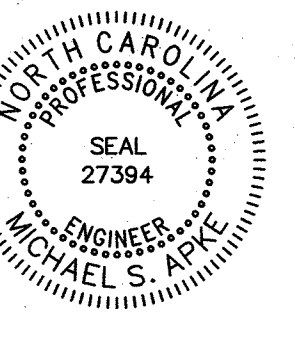
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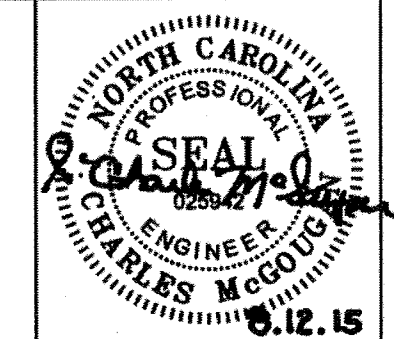
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By *Michael S. Apple* Date *8/2/19*



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BY	DATE	DESCRIPTION	SYM.



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**COLLINGWOOD DRIVE**  
**PUMP STATION**  
**PLAN & DETAILS**

**OVERHILLS SUBDIVISION**  
**WASTEWATER SERVICE**  
 Cumberland County, North Carolina

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**WATER ASSET MANAGEMENT PLAN**

**SOUTHPOINT SUBDIVISION WATER SYSTEM**  
**GRAYS CREEK WATER AND SEWER DISTRICT**

**CUMBERLAND COUNTY, NC**



PINEHURST, NORTH CAROLINA

**WATER ASSET MANAGEMENT PLAN**

**SOUTHPOINT SUBDIVISION WATER SYSTEM**  
**GRAYS CREEK WATER AND SEWER DISTRICT**

**CUMBERLAND COUNTY, NC**

**MATTHEW JONES, PE**  
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**AUGUST 2025**

**PROJECT NO. 20.02507**

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## **APPENDICES**

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<b>Appendix A – Excerpt from West Bladen County Water System SWAP</b>
<b>Appendix B – 2013 O&amp;M Plan for Cumberland County Water System</b>
<b>Appendix C – NC0309055 Well Treatment Process Summary</b>
<b>Appendix D – Hydrant Flow Test Reports</b>

## EXECUTIVE SUMMARY

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The purpose of this Asset Management Plan (AMP) is to inventory and document the condition of the water infrastructure for Southpoint Subdivision's Water System within the Gray's Creek Water and Sewer District. This will assist the County in becoming more proactive in the management and financing of its water system. The Southpoint Subdivision is a community located in Cumberland County. Cumberland County purchases potable water from the Bladen County Regional Water System and distributes the water to the Southpoint Subdivision and the adjacent community in southern Cumberland County.

The County does not have a previous Asset Management Plan for the water system, therefore this development process has resulted in the assembly of an AMP and 10-year Capital Improvements Plan (CIP) to guide the County with prioritizing capital projects and equipment purchases necessary to rehabilitate and maintain its water system.

This Asset Management Plan seeks to provide a foundation for evaluating the Southpoint Subdivision's distribution system. To address existing system deficiencies and improve overall operations, capital improvement projects are recommended for implementation within a 10-year planning period. An operation and maintenance plan is also provided to ensure long-term system efficiency and reliability. This report was prepared per NCDEQ Division of Water Infrastructure Asset Management Guidance, system operator knowledge, field work conducted by McGill Associates (McGill), Local Water Supply Plan information, and system mapping information prepared by McGill as a result of the field work.

Developing a Capital Improvements Plan (CIP) will allow the County to update its current rate setting model to better estimate future revenue and expenses, capital outlay, indebtedness, and overall health of the water distribution system enterprise fund reserves. A model of this nature would continue to balance revenues and expenditures with a longer-term approach to rate setting and establish a financially sound framework for the County to follow. This plan also includes a budget-level recommendation for staffing associated with system operations and maintenance for all County utility districts.

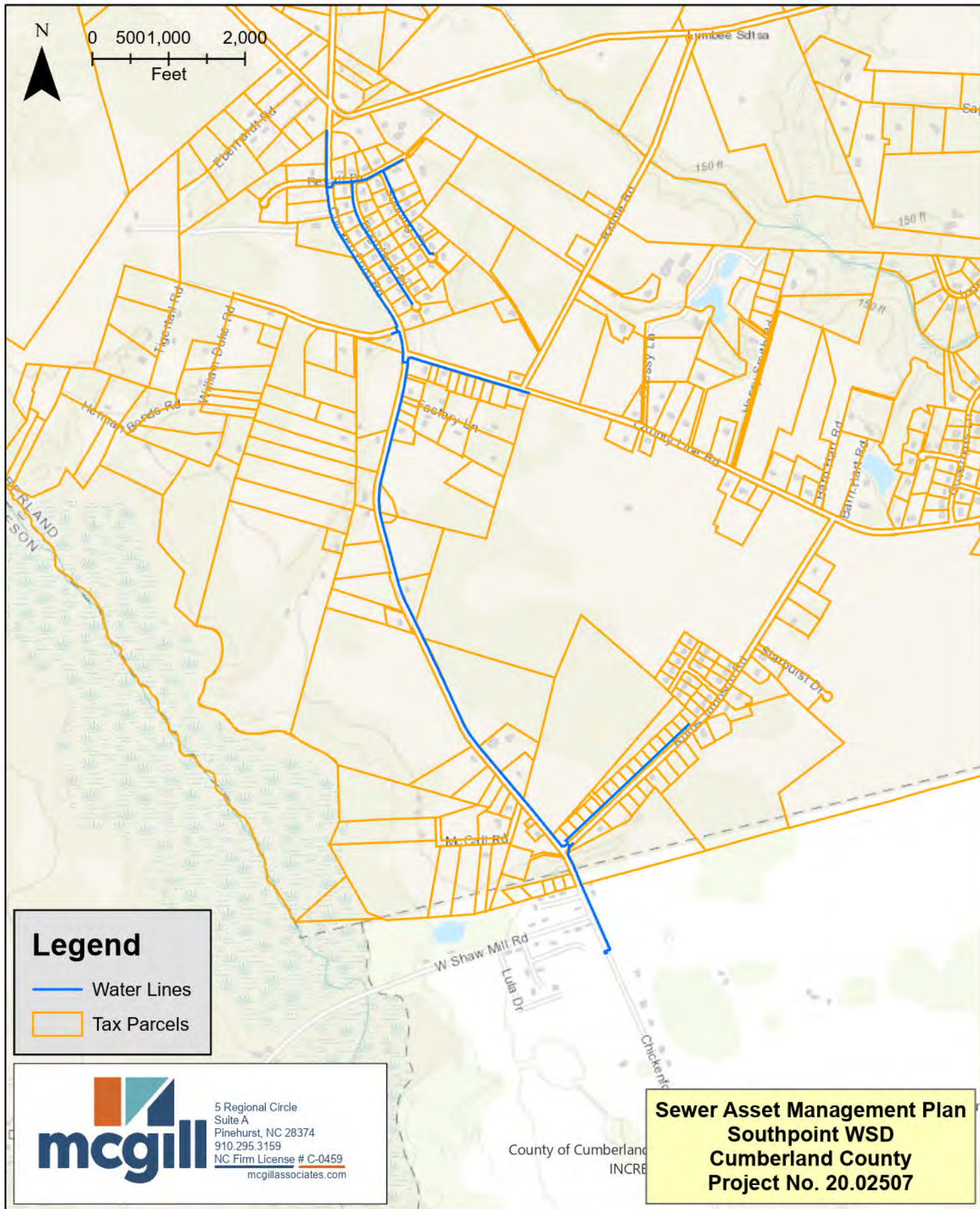
**1.1 BACKGROUND**

The Southpoint Subdivision Water System is in the Gray's Creek Water and Sewer District, located in Cumberland County, North Carolina, and is owned and operated by Cumberland County. The Southpoint Water District includes a water distribution system that currently serves 84 residential connections. Southpoint's Water Distribution System includes approximately 16,900 LF of 6-inch, 8-inch, and 12-inch water main, 12 hydrants, and 84 water meter service connections. The water mains are constructed of PVC pipe and were put into service in 2013. According to the 2022 Local Water Supply Plan (LWSP), the Southpoint community purchased a daily average of 0.0105 MGD of water from Bladen County. Figure 1 shows the current system.

The water source for the Southpoint water system is the Tobemory Well (#9) in the Bladen County Water Distribution-West Bladen water system, PWS ID 0309055. According to the Source Water Assessment Program (SWAP) Report for 2020, the well has a depth of 98 feet and yields water at 300 gallons per minute. Excerpted pages from the SWAP are included in orthophosphate used for corrosion control, Bladen County treats the water at Tobemory Well for iron through pressure sand filtration and for organics through granular activated carbon (GAC).



# Overall System Map Figure 1



## 1.2 EXISTING WATER DISTRIBUTION SYSTEM

The Southpoint water distribution system consists of 84 metered connections and approximately three miles of water distribution pipes, comprised of polyvinyl chloride, and ranging in size from 6-inches to 12-inches in diameter. Based on record drawing review and field work completed by McGill as part of this project, the system includes 12 fire hydrants and six valves. The system was put into service in 2013. The County reports no known issues with the existing system equipment.

Table 1 summarizes the existing assets within the water distribution system. Figure 2 shows the location of hydrants and valves within the system, and Figure 3 shows the diameter of existing water main.

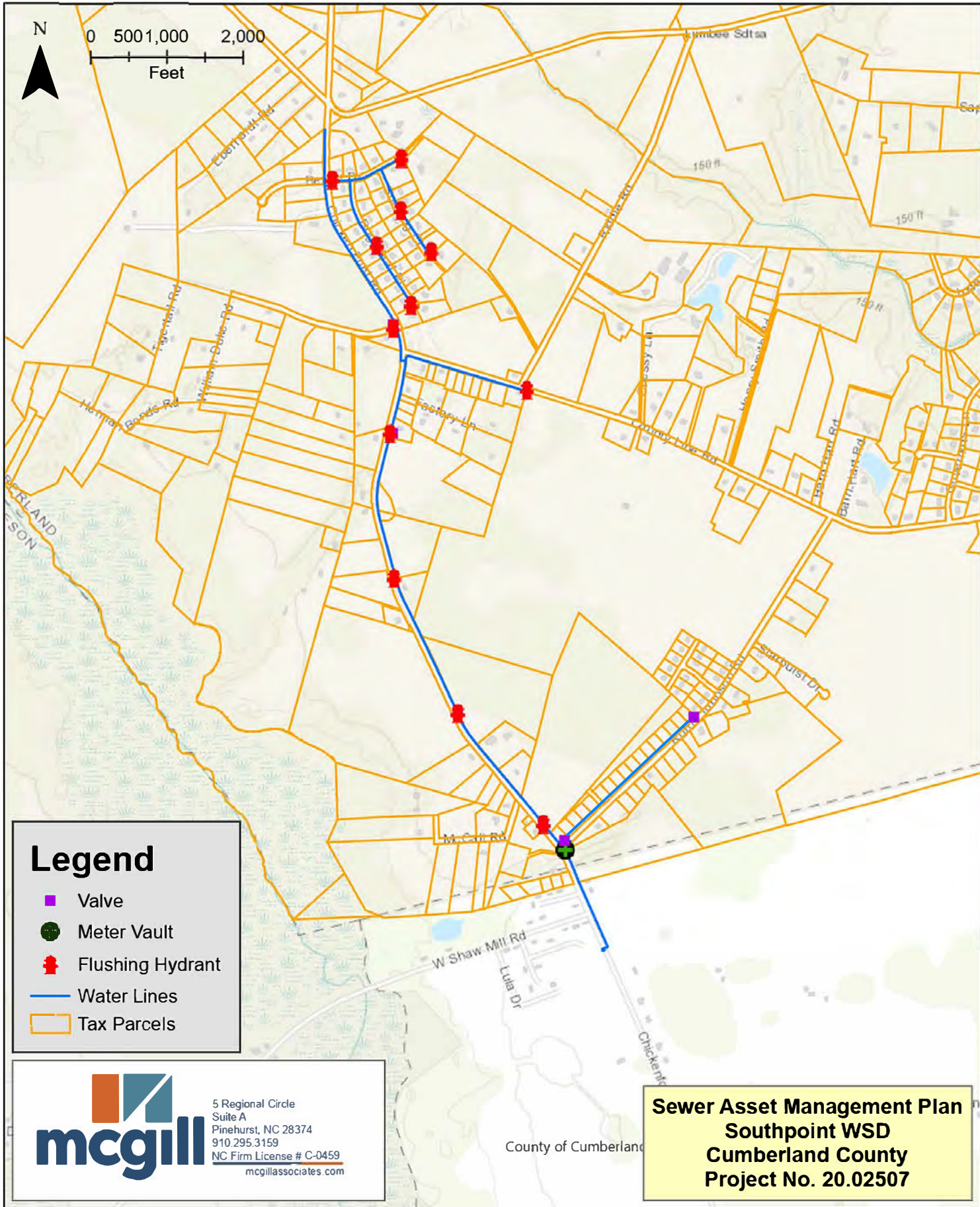
**Table 1: Water Distribution System Inventory**

<b>Asset</b>	<b>Size Range (in)</b>	<b>Estimated Length (feet)</b>
Polyvinyl Chloride Pipe	6-12	16,900
Valves	6-12	6
Fire Hydrants	N/A	12
Water Meters	N/A	81



# Hydrants and Valves Map

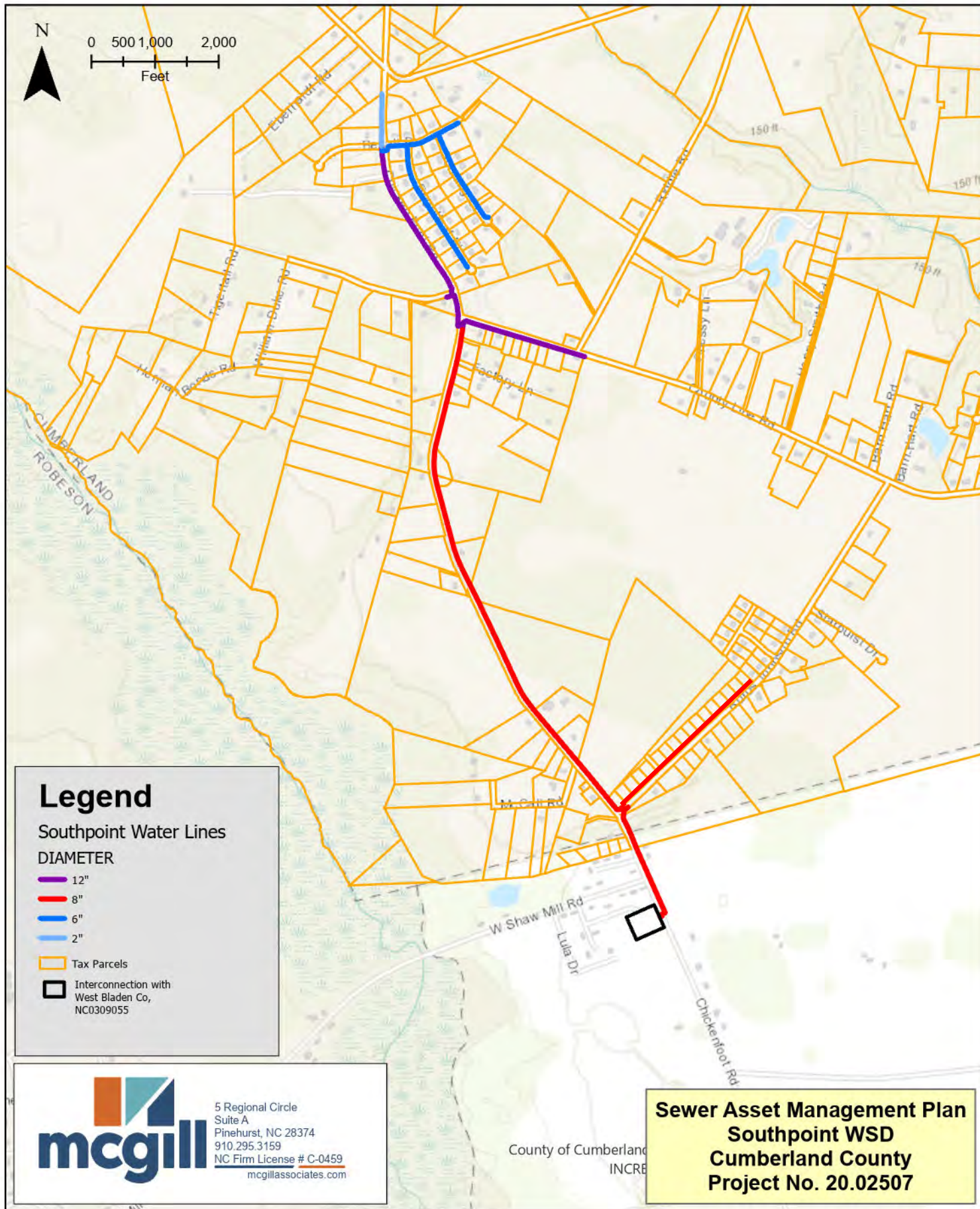
## Figure 2





# Water Line Diameter Map

## Figure 3



## 2.0

## CONDITION ASSESSMENT

### 2.1 WATER DISTRIBUTION SYSTEM

McGill Associates used a combination of water system GIS mapping, visual observations, record drawings, and operator/staff knowledge to assess the condition of the existing distribution system.

The analysis concluded that the general condition of the system is good, based on the low age of the system and primarily residential users connected to the system. The water meter condition is noted as good/fair, based on the age of the meters and the software no longer being supported.

**Table 2: Distribution System Condition Assessment**

Line Type	Size Range (in)	Quantity	% of System	Condition
PVC Pipe	6-12	16,900 LF	100%	Good
Meters	N/A	84 EA	100%	Good/Fair

**Table 3: Hydrant Condition Assessment**

Fire Hydrant Manufacturer	Average Age	Excellent	Good	Fair	Poor	Unknown	Total
American	20 years	-	12	-	-	-	12

**Table 4: Valve Condition Assessment**

Excellent	Good	Fair	Poor	Total
-	6	-	-	6

## **2.2 WATER SYSTEM HYDRAULICS AND CAPACITY**

The water system has an average pressure of 55 psi based on hydrant testing conducted by the McGill and County staff. The lowest static pressure noted during any test was 51 psi, which is still well above the minimum pressure of 30 psi for a public water system under peak flow conditions. Ground elevations within the area are relatively consistent from 160 to 165-ft above sea level.

The water system is not designed to provide fire protection. For the purposes of this report, fire hydrant flow tests were performed in the field to understand the characteristics of the system.

The Southpoint water system has 45,000 GPD of total capacity under the County's current operating agreement with Bladen County. As of March 2024, the County has approximately 10,900 GPD of remaining capacity that is currently unobligated. The County has seen a recent increase in requests from residential developers for properties that would be served by the water system. As a result, the County is interested in in-ground storage to increase its available capacities. Based on existing treatment at the source well in the Bladen County system, Cumberland County may choose to implement additional filtration ahead of proposed water storage.

The County has worked for several years to provide public water to citizens in the Gray's Creek Area, of which the Southpoint S/D water system is a part. As a part of this investigation, the County contracted with HDR to pursue funding for construction of deep wells, treatment, and distribution lines. This project would provide benefit to both the existing customers in the Southpoint S/D water system with increased hydraulic reliability and fire protection, as well as making public water available to the broader Gray's Creek area. This project with cost estimate prepared by HDR is included in the CIP for this report.

## 2.2 CONCLUSION

The existing distribution system is relatively young, and therefore the County does not face the challenge of replacing aging infrastructure at this point. Recommendations for operations and maintenance are included in this report that will serve to extend the life of the existing equipment and infrastructure in the system. Therefore, the focus of the County's needs in this system relate to other operational needs that stem from having only one full-time staff person who oversees the management of the County's three existing sewer systems and this Southpoint water system. The recommended improvements to the system are targeted at improving operational capabilities and developing resiliency within the system:

- Replacing AMR water meters with new AMI water meters and updated meter reading system
- Procure new billing software
- Construct ground-level storage tank with water filtration.

These items have been addressed in the Capital Improvements Plan.

## **3.0**

## **CAPITAL IMPROVEMENTS PLAN**

---

The fieldwork, asset inventory, review of existing documentation, and consideration of staff input provided evidence for various water system improvements including specific and general recommendations. Specific recommendations determined the imminent projects in the next few years, and general recommendations are primarily maintenance and further investigation and can be implemented at minimal cost.

### **3.1 GENERAL RECOMMENDATIONS**

#### **3.1.1 Valve Turning**

EPA recommends exercising all mainline valves in the system once per year to ensure valves can be located and opened/closed properly during emergency shut-down periods. Recording the number and direction of turns to open/close will help identify problems and need for maintenance. During valve exercising, a complete evaluation of the asset should be made including difficulty accessing the valve, excessive force needed to operate and leaking during operation. Also, when exercising, complete inventory should be taken of each valve including size, type, valve box/manhole condition, depth of cover, operating condition, and evidence of other potential problems.

#### **3.1.2 Hydrant Testing**

It is recommended to continue testing hydrants throughout the year to verify that the pressures at each hydrant in the system can meet the current fire flow requirements. Hydrant tests can also give valuable information in order to find existing or additional deficiencies in the system.



### **3.1.3 Mapping**

The mapping completed as part of the AIA has been provided to the County on ArcGIS online such that the County staff can maintain and update as needed in the future. It is recommended that the County update materials for water lines where known and as maintenance and replacements are completed. Any age information should be inserted as well as keeping the system map up-to-date and providing information for future work.

## 3.2 PRIORITY PROJECTS

### 3.2.1 Water Meter Replacement Project

This project includes replacement of existing AMR meters with AMI based water meters, as well as new meter reading equipment, installation, startup and training for the associated water meter reading software and data logging software.

**Table 5: Preliminary Opinion of Probable Cost for Water Meter Replacement Project**

Item	Description	Units	Quantity	Unit Price	Total Cost
1	AMI Residential Water Meter	EA	84	\$ 500	\$ 42,000
2	Water Meter Reading System and Startup	LS	1	\$ 20,000	\$ 20,000
<b>Construction Subtotal</b>					<b>\$ 62,000</b>
Contingency (15%)					\$ 9,300
<b>Total Base Project Cost</b>					<b>\$ 71,300</b>

*\*Cost estimates are based on the knowledge of a professional engineer based on 2024 construction costs and are subject to change due to bidding environment and other factors.*



### 3.2.2 Water Storage Tank and Filtration Project

This project includes the construction of a ground storage tank to provide additional capacity for the water system, as well as additional filtration equipment.

**Table 6: Preliminary Opinion of Probable Cost for Water Storage Tank Project**

Item	Description	Units	Quantity	Unit Price	Total Cost
1	22,500 Gallon Ground Storage Tank	LS	1	\$ 55,000	\$ 55,000
2	Greensand Iron Manganese Filter	LS	1	\$ 175,000	\$ 175,000
<b>Construction Subtotal</b>					<b>\$ 230,000</b>
Contingency (15%)					\$ 43,500
Engineering Assistance (If Needed)					\$ 30,000
<b>Total Base Project Cost</b>					<b>\$ 303,500</b>

*\*Cost estimates are based on the knowledge of a professional engineer based on 2024 construction costs and are subject to change due to bidding environment and other factors.*

### 3.2.3 Construct New Wells and Water Main

This project includes approximately 25,550 linear feet of 12-inch distribution pipeline to help reduce the contamination in private drinking water wells. This project will provide well pumps and wellheads, the transmission of raw water from production wells to a treatment unit for a variety of cleaning processes, and then to distribute the water to a maximum of 100 connections throughout Gray’s Creek.

Item	Description	Units	Quantity	Unit Price	Total Cost
1	Source (pumps and wellheads for 2 existing wells, 3,660 LF raw water main)	LS	1	\$ 2,861,732	\$ 2,861,732
2	Treatment (pre-filtration, IX, GAC, disinfection, ground storage, booster pumps)	LS	1	\$ 3,447,158	\$ 3,447,158
3	Distribution Lines (25,500 LF, 12” distribution line)	LS	1	\$ 8,203,417	\$ 8,203,417
<b>Construction Subtotal</b>					<b>\$ 14,512,307</b>
Contingency (10%)					\$ 1,451,231
Engineering Assistance (If Needed)					\$ 1,915,625
Administration Cost					\$ 1,734,974
<b>Total Base Project Cost</b>					<b>\$ 19,614,136</b>

### **3.3 CIP PROJECTS SUMMARY**

Cumberland County's goal is to provide clean, safe and economical water service to current and future customers. The customers include primarily residential households and businesses within the County. The County intends to provide and maintain a reliable and safe water supply and water distribution system in the Southpoint water system, which exceeds the standards imposed to protect the public health and the quality of the receiving waters.

Throughout the AIA process, the Southpoint water system was evaluated through visual inspections, hydrant testing, and water modeling. The highest priorities were collected and put into a 10-year capital improvements plan. In this plan, projects were prioritized based on existing conditions and providing operational benefit to the County.

A Capital Improvements Plan (CIP) is a plan and schedule of anticipated and required capital expenditures for public utility facilities with descriptions of project needs, estimated project costs, and timing of work over a planning period. Thus, a CIP is an important planning tool that allows a public utility to prepare for upcoming projects and to proactively determine how and when to fund them.

**Table 7: CIP Cost Summary**

Year	Water Meter Replacement	Ground Storage Tank and Filter	Construct New Wells and Water Main	TOTAL COST
1	\$ -	\$ -	\$ -	\$ -
2	\$ 71,300	\$ -	\$ -	\$ 71,300
3	\$ -	\$ -	\$ 19,614,136	\$ 19,614,136
4	\$ -	\$ -	\$ -	\$ -
5	\$ -	\$ 303,500	\$ -	\$ 303,500
6	\$ -	\$ -	\$ -	\$ -
7	\$ -	\$ -	\$ -	\$ -
8	\$ -	\$ -	\$ -	\$ -
9	\$ -	\$ -	\$ -	\$ -
10	\$ -	\$ -	\$ -	\$ -
<b>TOTAL ESTIMATED CIP COST</b>				<b>\$ 19,988,936</b>

**4.1 GENERAL RECOMMENDATIONS**

The purpose of an Operations and Maintenance (O&M) Program is to provide an organized and cost-effective approach to ongoing maintenance, repair and replacement activities that will maintain the water distribution system, so it performs as intended and adheres to applicable sections of the of the Water System Management Plan, set forth under North Carolina Office of Administrative Hearings, Subchapter 18c of Title 15A.

This section provides a general description of proactive O&M, that can be defined as scheduled maintenance activities (preventive maintenance), performed on a regular basis in order to achieve the highest level of system performance using available resources and minimizing failures that can result in low pressure, degraded quality, service interruptions and possible contamination.

Developing an O&M Program begins with accurate records of infrastructure inventory, asset locations and physical condition. Coupled with work records and system performance history, preventive maintenance schedules can be developed to efficiently address general system needs, from regular flushing of stagnate water to site-specific maintenance work such as leak repairs.

The following elements provide the foundation for an effective O&M program:

- Maintain up-to-date water distribution system maps and related work history and operational data.
- Develop a routine preventive O&M program and activities for staff and contractors maintaining the water distribution system and a system to document scheduled activities.
- Develop a rehabilitation and replacement plan identifying and prioritizing system deficiencies and implement short- and long-term actions to address the deficiencies.
- Develop and implement training programs to build technical competence and emergency preparedness.

- Develop and provide equipment and replacement part inventories, including critical replacement parts.

The County has an Operations and Maintenance Plan for the water system that was developed by Koonce, Noble and Associates in 2013. The plan focuses on six areas, including: Frost Prevention, Leak Detection and Repair, Meter Calibration, Flushing, Valve Exercise, and Control of Authorized Use. A copy of this plan is included in Appendix B of this report. In addition to and as an elaboration on that plan, McGill suggests the following as critical elements to proactive O&M.

### **Water System Mapping**

Water system maps and related databases are typically managed using a Geographic Information System (GIS). These maps and datasets can be viewed through a GIS desktop program (i.e. ArcGIS), or by creating digital (typically pdf format) maps and tables to be viewed on screen, exported to other software (excel) for analysis, or printed for manual markup, editing, etc. GIS mapping is supported by a database that records water main size, material types, locations of valves, meters, service connections and other attributes of system appurtenances. It can also attach images and records such as field inspections to specific asset(s) or location(s) and attach performance data such as operating pressure or fire flow to sections of the distribution system. GIS provides a powerful tool to build, organize and display the physical and operational attributes of the water distribution system.

The GIS database should be updated on a regular basis. Software applications such as work order systems are available to allow field staff to update GIS data as inspection and maintenance activities are completed. Other applications can also allow staff to update and edit maps.

GIS can organize work history along with operational data, inspection records and images to provide managers, operations staff and engineers with powerful data sets to track current resource allocations and forecast short and long-term operational and capital needs. Outcomes of detailed analysis such as recommended water main rehabilitation work versus water main break history can be mapped to present the relationship visually for ease of communicating and understanding.

### **Preventive Operation and Maintenance (O&M)**

Preventive maintenance is performing routine and scheduled maintenance activities before equipment or buried infrastructure fails, for the purpose of extending useful life, reducing overall operating costs, and increasing system reliability. This proactive approach to maintenance work is more efficient and cost effective than reactive and curative operations.

Preventive maintenance activities will also help operations staff to better understand the distribution system and how it works under various conditions. This knowledge is essential to setting maintenance priorities and developing the scope and timing of long-term rehabilitation and replacement projects.

### **Scheduled Flushing/Cleaning of Water Mains**

A regular flushing schedule for maintaining or improving water quality, primarily by raising chlorine residual, in key locations is typically developed based on the history of regular sampling and/or customer complaints. Care must be taken to flow sufficient volume to remove stagnant water at a rate of flow capable of removing sediments that contribute to degraded water quality. Monitoring chlorine residuals will provide a good indicator that water quality has reached the desired level to complete the task. Automatic flushing valves may be installed to reduce labor costs and ensure regular flushing at appropriate intervals and duration to accomplish the desired results.



More frequent flushing may be necessary during summer months when temperature will speed up degradation and possible formations of disinfectant byproducts. Unidirectional flushing should also be considered on a periodic basis to enhance sediment removal as needed. Mechanical cleaning, forcing a “pig” through the pipe network may be considered where extensive sedimentation and tuberculation occurs.

As part of the O&M Program, a master list of flushing/cleaning operations, priority locations and scheduling can be incorporated into GIS. Maps can be produced to define work areas, schedule resources, including contracted services, track progress and task completion. Updating GIS maintenance operations data (water quality monitoring, sediment quantity, etc.) will help managers adjust cleaning frequency and area boundaries as needed to increase program efficiency, maintain water quality and reduce customer complaints.

### **Routine Visual Inspections**

Routine inspections are used to assess the condition of valve structures, hydrants and other surface facilities, recording general conditions and evidence of water leaks, possible structural problems or failures (offset structures, etc.), corrosion and other damage. Work orders are generated based on inspection records to effect operational adjustments, scheduling more detailed inspections and/or making necessary repairs.

### **Valve Exercising Program**

EPA recommends exercising all mainline valves in the system once per year to ensure valves can be located and opened/closed properly during emergency shut-down periods. Recording the number and direction of turns to open/close will help identify problems and need for maintenance. During valve exercising, a complete evaluation of the asset is made including difficulty accessing the valve, excessive force needed to operate and leaking during operation.

During valve exercising complete inventory is taken of each valve including size, type, valve box/manhole condition, depth of cover, operating condition, and evidence of other potential problems.

Develop a standard form for recording information to ensure consistency of work and accuracy of records. These records are used to prioritize maintenance and repair scheduling and provide a history of condition assessments that will help develop the scope of rehabilitation and replacement work.

### **Leak Detection and Water Loss Reduction**

Proactively identifying and repairing system leaks will reduce the amount of finished water that does not reach the customer and would also increase the overall cost of water delivered to the customer. Reducing water system loss will help to contain utility costs, reduce the need and frequency of rate increases, and preserve a valuable natural resource.

Developing a water loss control program is essential to meeting these goals. Two options are the small system water audit, which was developed from the N.C. Division of Water Resources' Local Water Supply Plan (LWSP), and the American Water Works Association (AWWA) water loss control committee's free water audit. While the AWWA water audit applies to all systems, smaller systems (less than 10,000 people) with more limited resources may elect to complete a slightly less comprehensive audit. DWR has developed an alternative water audit that is available on the division's website.

## **Maintenance Activity Records**

Detailed records and daily logs of O&M work provide valuable information to help managers evaluate the effectiveness of maintenance activities and make adjustments to optimize the use of limited resources. Equipment, manpower and other resources are tracked along with detailed descriptions of defects and other repair needs encountered. Maintenance work resulting in system modifications or extensions should be incorporated into record drawings and system maps. Scheduled testing of emergency and standby equipment is also recommended.

These records should be reviewed periodically to identify problems that cannot be resolved in a short period of time in order to develop a plan to address the problem(s). Maintaining these records for an extended period of time (5 years or more) will also provide accurate reference points of maintenance investments made over time that will track the effectiveness of operation and maintenance activities.

In the event of pressure loss or boil water notice, maintenance records will need to provide sufficient detail to satisfy reporting requirements for the event, including location(s), corrective actions, testing and monitoring, etc. This data may also be integrated into GIS to allow mapping of these events over time in order to identify patterns and/or trends that will assist with scheduling maintenance and planning rehabilitation and other capital improvements.

## **Resolution of Customer Complaints**

Customer complaints are primarily for low pressure, tastes and odors. These conditions require an immediate response to diagnose and resolve the problem. These calls can occur outside normal business hours, significantly escalating costs. Detailed records of the problems found, and the resources needed to address the conditions provide valuable feedback for making adjustments to the preventive maintenance program that can reduce these types of calls and help lower overall maintenance costs.

## **Capital Improvements Plan**

A Capital Improvements Plan (CIP) identifies rehabilitation, replacement and expansion needs of the system. The CIP should address the short and long-term needs of the system, covering at least a 5 to 10-year planning period, and includes the estimated cost of each capital project.

CIP development incorporates maintenance activity, cleaning and inspection records, and system performance data that may include flow monitoring and hydraulic modeling to evaluate the existing system and to recommend improvements needed to correct existing deficiencies, and ensure adequate capacity is maintained throughout the system.

Capital planning includes consideration of on-going funding for rehabilitation and replacement of the collection system as it wears out, and potential upgrades for expansion as needed.

## **Training Program**

Training programs provide a mechanism for educating employees and establishing their technical competence to perform operations, maintenance, and emergency responses safely and effectively. A combination of in-house skill training and specialized training purchased or provided through state and national associations, conferences and vendor training programs are typically used to build and enhance skills for performing daily work duties. Periodic training reinforces previous efforts, as people often overlook things that are used infrequently. It also provides an opportunity to train new staff and learn about new problems, new techniques, and changes in equipment.

Emergency training educates system personnel about emergency situations and resulting effects on the wastewater system, public health and environmental impacts. It also provides an opportunity to practice responses. Good record keeping ensures personnel are properly trained and prepared to effectively operate and maintain the collection system under any given circumstance. Regular review of training records is essential for keeping content up-to-date and maintaining proper employee awareness.

## **Equipment and Replacement Parts**

A reasonable supply of equipment and replacement parts should be maintained to fully support all operations and maintenance activities. A detailed inventory is essential to ensure availability under normal operations and emergency conditions. Specialized equipment or parts may be too costly to keep in stock, so arrangements with vendors, contractors and other utilities (under mutual aid agreements) may be necessary to ensure availability during non-business hours or during emergencies.

## 4.2 STAFFING RECOMMENDATIONS

Cumberland County is responsible for three wastewater collection systems and one water system: NORCRESS, Overhills, Kelly Hills, and Southpoint Water System. While each of these districts maintains its own operating budget, the Board leadership and operational management is performed solely by Cumberland County. Therefore, in consideration of the typical utility system management and operations and maintenance that is necessary for maintaining each of the systems, McGill has considered all of the four utility systems cumulatively. While each system could be analyzed separately, considering the systems together is more consistent with actual management of the systems.

Typical metrics for analyzing full-time equivalent (FTE, representing quantity full-time workers) are based on either the population served by the system or by miles of utility piping (water main or sewer line) within each system. For reference, Table 6 below summarizes the customers and piping in each of the County's utility systems.

**Table 6: Utility System Comparison**

DISTRICT	Number of Connections		Paying Avail. Fee	Pipe in System (mi.)
	Water	Sewer		
<b>Southpoint</b>	84		129	2.8
<b>Kelly Hills</b>		102	166	4.5
<b>Overhills</b>		107	318	4.0
<b>NORCRESS</b>		452	666	41.1
<b>TOTALS</b>	<b>84</b>	<b>661</b>	<b>1279</b>	<b>52.4</b>

**Table 7: Typical Population vs. Pipe Length**

<b>Population</b>	<b>Pipe in System (mi.)</b>
0-100	5
101-500	5
501-3300	21
3301-10000	62

The typical sizes of utility systems from a community system EPA study<sup>1</sup> are shown in Table 7, and are generally consistent when compared to the County’s systems. This study was selected as a basis for comparison due to its comprehensive nature, having included water systems nationwide in its breadth. NORCRESS is the exception when compared to Table 7. This is mostly likely indicative of the system serving a more rural population where the connection density is less, and resulting from the length of force main piping in the system that increases the overall length but does not contribute to population density. Overall, these metrics were found to be reasonably consistent with the County’s systems. Similarly, the data is consistent regardless of whether the utility system is a water systems or wastewater collection system.

The objective is to make budget-level staffing recommendations for the County’s utility systems based on what is typical across the industry and other utility systems of comparable size. The EPA study utilized provides typical FTE for the roles of manager, plant operator, distribution (and collection, for our purposes), and administrative functions. All of these were considered applicable to management and operation of the County’s utility systems. Note: while the County is not responsible for plant operation in any system, the lift stations in the NORCRESS and Overhills systems are the County’s responsibility, therefore this metric was used, albeit in a smaller percentage, to account for the management of those resources.

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<sup>1</sup> Analysis conducted using excerpts from US EPA document, “National Characteristics of Drinking Water Systems Serving 10,000 or Fewer People,” published July 2011.



Table 8 shows Further utilizing the EPA statistics as base for typical FTE for each of the positions, based on the system size in terms of miles of pipe main.

**Table 8: Average Community System Statistics**

Employee Category	System Size (miles of Main)		Mean	Cumberland County
	Pop. 500-3300	Pop. 3300-10000		
	21	62	41.5	51.7
<b>Manager FTE</b>	0.6	1.1	0.85	1.06
per mile	0.029	0.018	0.020	0.020
<b>Plant Operator FTE</b>	0.6	1.3	0.95	1.03
per mile	0.029	0.021	0.023	0.023
<b>Distribution FTE</b>	0.8	2.5	1.65	2.06
per mile	0.038	0.040	0.040	0.040
<b>Administrative FTE</b>	0.6	1.5	1.05	1.31
per mile	0.029	0.024	0.025	0.025

The green highlighted cells are the calculated FTEs that were applied to estimate staffing size based on the quantity of pipe across the County’s four utility systems. Those calculated FTEs are based on the size of systems managed by the County and reasonable estimate of staffing needed for these systems.

Each of the FTEs is applied to each respective employee category. McGill utilized wage information from Zip Recruiter and a benefits multiplier of 1.38 from the U.S. Bureau of Labor Statistics to develop the summary shown in Table 9.

**Table 9: Overall Salary Estimates**

Employee Category	Hourly Rate	Annual Salary	Ben. Mult.	Total	Applied FTE	Applied Budget Cost
Manager	\$38.50	\$80,080.00	1.38	\$110,510.40	1.06	\$117,000
Operator	\$24.52	\$51,001.60	1.38	\$70,382.21	1.03	\$72,700
Distribution	\$23.57	\$49,025.60	1.38	\$67,655.33	2.06	\$139,100
Administrative	\$21.33	\$44,366.40	1.38	\$61,225.63	1.31	\$80,100
<b>Total Applied Budget Cost Based FTEs</b>						<b>\$408,900</b>

Utilizing industry metrics and comparing to systems of comparable size, McGill offers the proceeding section as a general staffing recommendation. This section and these budget values are provided for preliminary planning purposes only.

Staffing levels appear to be reasonable based on the District's ability to operate and maintain the system while providing a reliable level service to its customers.

While this budget number is higher than the current budget staffing, consideration should also be given to the cumulative effect cost to the County for contracted operation and distribution support in the NORCRESS and Kelly Hills district.

# **APPENDICES**



## **Appendix A**

**Excerpt from West Bladen County Water System SWAP**



**Source Water Assessment Program Report for  
BLADEN CO WTR DIST-WEST BLADEN**

*Community Water System*

**Introduction: What is a Source Water Assessment?**

The North Carolina Division of Water Resources, Public Water Supply (PWS) Section is responsible for implementing the Source Water Assessment Program (SWAP) and completing assessments for all public drinking water supplies in the state. The 1996 amendments to the Safe Drinking Water Act provided federal support and required states to conduct assessments of all public water systems. A source water assessment is a qualitative evaluation of the potential of a drinking water source to become contaminated by the identified potential contaminant sources (PCS) within the delineated area. In North Carolina there are approximately 8,000 public water supply sources that were assessed by the state. The PWS Section has gathered information for each water supply and developed a process for completing the assessments. This process is summarized in the next few pages and detailed in Section 6 of this report.

This report provides a summary of the results for the **Source Water Assessment** for your drinking water source(s).

**What is the Source of Your Drinking Water?**

Everyone wants clean, safe drinking water and we assume this natural resource will always be available to us. However, drinking water sources can be threatened by many potential contaminant sources, including underground storage tanks for gasoline, permitted wastewater discharges and other waste disposal sites, improper handling of hazardous materials, urban storm water runoff, or other types of non-point source contamination such as runoff produced by agricultural activities and land clearing for development. Your drinking water source(s) is listed in Table 1. Protecting your drinking water from becoming contaminated is a wise investment in public health and your community's future.

**Table 1. Public Water Supply System Information**

System Name	BLADEN CO WTR DIST-WEST BLADEN
City	ELIZABETHTOWN
PWS ID	NC0309055
Source Name	WELL #10 MT HOREB WELL
Source Name	WELL #11
Source Name	WELL #13
Source Name	WELL #4/ABBOTTSBURG
Source Name	WELL #5/WHITE'S XRD
Source Name	WELL #8
Source Name	WELL #9 TOBEMORY

In addition to the sources listed in Table 1 above, this water supply system has interconnections to allow for the purchase of water from the following water system(s) or "Seller" system(s):

**BLADENBORO, TOWN OF  
CLARKTON, TOWN OF  
EAST ARCADIA, TOWN OF  
ELIZABETHTOWN, TOWN OF**



## TAR HEEL WATER CORP

Please refer to the Source Water Assessment Program Report for the "Seller" system(s) to review the assessment results for the purchased water supply sources that provide drinking water for this water system.

### Assessment Report Contents

This assessment report includes the following sections:

- Section 1: Assessment Area Delineation
- Section 2: Potential Contaminant Source Inventory and Map
- Section 3: What is a Susceptibility Rating?
- Section 4: Reviewing Your SWAP Results
- Section 5: Maps, Tables and Figures for your Drinking Water Source(s)
- Section 6: North Carolina's SWAP Approach

### Section 1: Assessment Area Delineation

The area delineated for your well(s) for the purpose of this assessment is the contributing area for the well(s). When a well is pumped, it begins to influence groundwater that is flowing through the subsurface and towards the well. The pumping of the well creates a contributing area around the well that supplies water to the well. This is the area through which contaminants, if released to the environment, can be reasonably expected to move through the ground and reach the well.

### Section 2: Potential Contaminant Source Inventory and Map

The potential contaminant source inventory map shows the delineated area for your drinking water source(s). This is the area where potential contaminant sources, if released to the environment, could reasonably be expected to be a risk or a potential for contamination of your drinking water supply. A PCS in this assessment report is a facility or site regulated under a state or federal regulatory program. These facilities are identified in electronic databases that contain location information for each facility. Only databases that include statewide information were used for this source water assessment. Included in this report are:

- 1) A table of any PCS identified within the delineated assessment area; and
- 2) A map of the delineated assessment area showing PCSs, roads, jurisdictional boundaries and other pertinent information.

It is important to note that the PCSs identified in this report are only potential sources of contamination to your drinking water source. Environmental contamination is not likely to occur if harmful contaminants are managed properly.

### Section 3: What is a Susceptibility Rating?

In North Carolina the susceptibility of any drinking water source is based on two components, a contaminant rating and an inherent vulnerability rating. Your drinking water source(s) was assigned a qualitative susceptibility rating of higher, moderate or lower based on the results of the contaminant rating and inherent vulnerability rating process as described in the following paragraphs.

## Susceptibility Rating

The final susceptibility rating for your drinking water source(s) is determined by combining the contaminant rating and the inherent vulnerability rating. More detailed information on the susceptibility rating process can be found in Section 6 of this report.

### **Contaminant Rating**

The contaminant rating for your drinking water source(s) was determined based on the number and location of PCSs within the delineated area. Each PCS identified within the delineated area was assigned a risk rating of higher, moderate or lower. The number of PCSs that occur within the delineated area was determined and a contaminant rating of higher, moderate, or lower was assigned to your drinking water source(s).

### **Inherent Vulnerability Rating**

The inherent vulnerability rating of your well(s) refers to the geologic characteristics or existing conditions of the well and its delineated assessment area. These characteristics include aquifer rating, unsaturated zone rating and well integrity/well construction rating. The aquifer rating is an assessment of the water transmitting characteristics of the aquifer. The unsaturated zone rating is an assessment of the likelihood that contaminants from surface and shallow sources will follow the path of aquifer recharge and reach the water table. The well integrity/construction rating is an assessment of the quality of the construction of the well. An inherent vulnerability rating of higher, moderate or lower was assigned to your well(s).

**Table 2. SWAP Results Summary**

<b>Source Name</b>	<b>Inherent Vulnerability Rating</b>	<b>Contaminant Rating</b>	<b>Susceptibility Rating</b>
WELL #10 MT HOREB WELL	Lower	Lower	Lower
WELL #11	Lower	Lower	Lower
WELL #13	Lower	Lower	Lower
WELL #4/ABBOTTSBURG	Lower	Lower	Lower
WELL #5/WHITE'S XRD	Moderate	Lower	Moderate
WELL #8	Lower	Lower	Lower
WELL #9 TOBEMORY	Moderate	Lower	Moderate

It is important to understand that a susceptibility rating of higher does not imply poor water quality. Susceptibility is an indication of a water supply's potential to become contaminated by the identified PCSs within the assessment area.

**Table 3. Well Information**

<b>Source Name</b>	<b>Well Yield (Gallons/Min)</b>	<b>Well Depth (Feet)</b>
WELL #10 MT HOREB WELL	300	293
WELL #11	320	283
WELL #13	250	205
WELL #4/ABBOTTSBURG	500	127
WELL #5/WHITE'S XRD	390	144
WELL #8	300	188
WELL #9 TOBEMORY	300	98

## **Section 4: Reviewing Your SWAP Results**

Please review the information on your drinking water source(s) provided in this report. If you believe any of this information is incorrect please contact the Public Water Supply Section by e-mail at the following address: **SWAP@ncdenr.gov** or you may submit comments to us at:

SWAP  
Public Water Supply Section  
1634 Mail Service Center  
Raleigh, NC 27699-1634

Or you may contact the Source Water Assessment staff by phone at 919-707-9098.

## **Section 5: Maps, Tables and Figures for Your Drinking Water Source(s)**

Maps, tables and figures specific to your drinking water source(s) are included in this report in the following pages and are listed below.

Map 1. Location Map

Map 2. Delineated Area and PCS Map

Table 4. Potential Contaminant Source Attributes

Table 5. Inherent Vulnerability Rating

Table 6. Unsaturated Zone Rating Calculation or Watershed Characteristics Rating Calculation

Figure 1. Land Use / Land Cover Categories

Figure 2. Unsaturated Zone Rating or Watershed Characteristics Rating

Figure 3. Vertical Hydraulic Conductance Rating or Average Annual Precipitation Rating

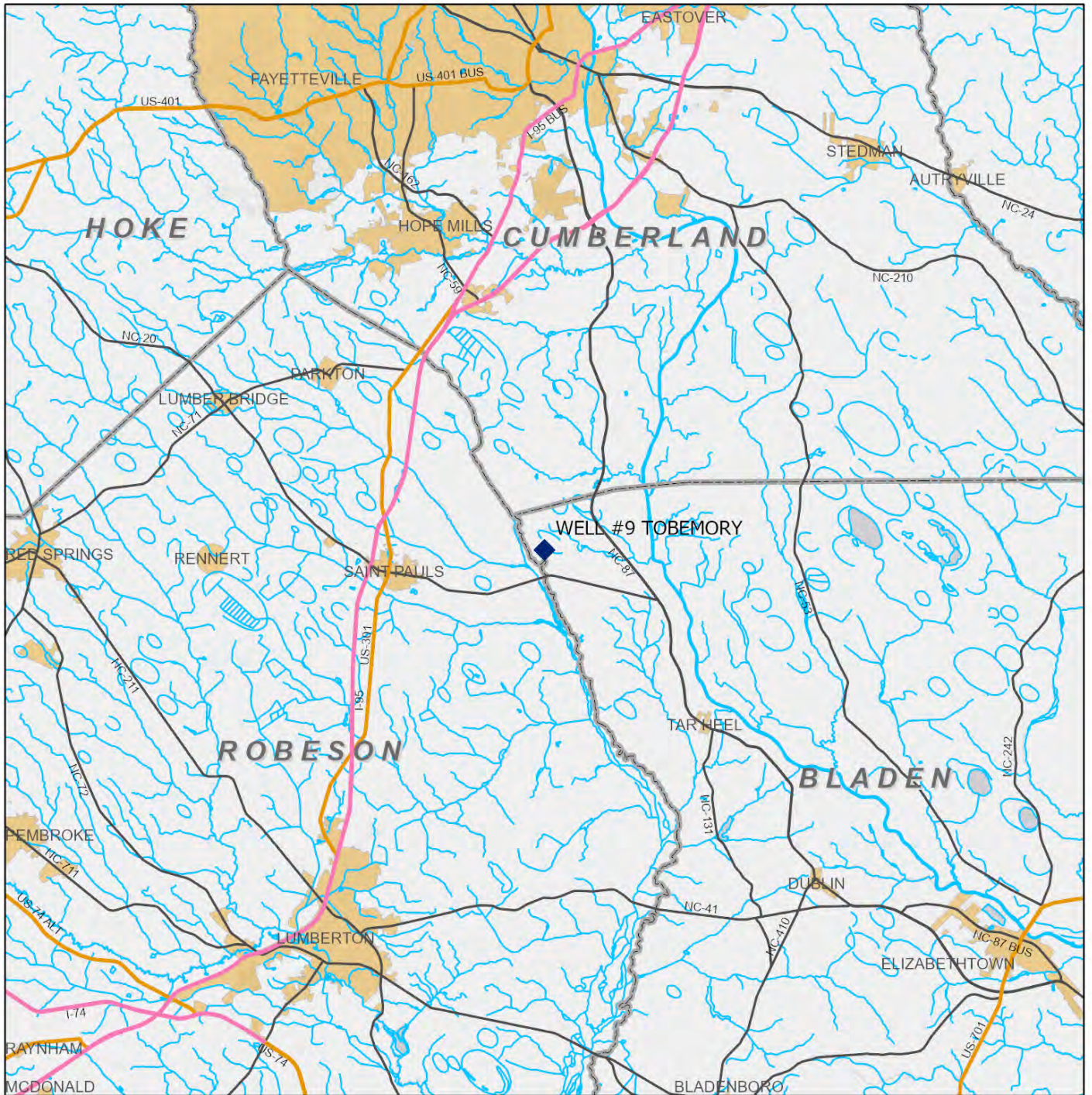
Figure 4. Land Surface Slope Rating

Figure 5. Land Use Rating

Figure 6. Land Cover Rating

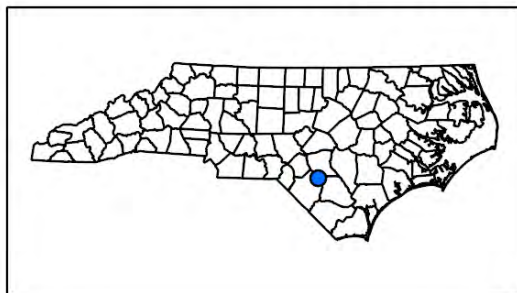
Figure 7. Ground Water Contribution Rating (only applicable to surface water sources)



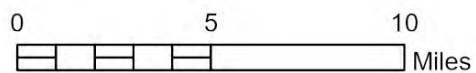


MAP 1. LOCATION MAP

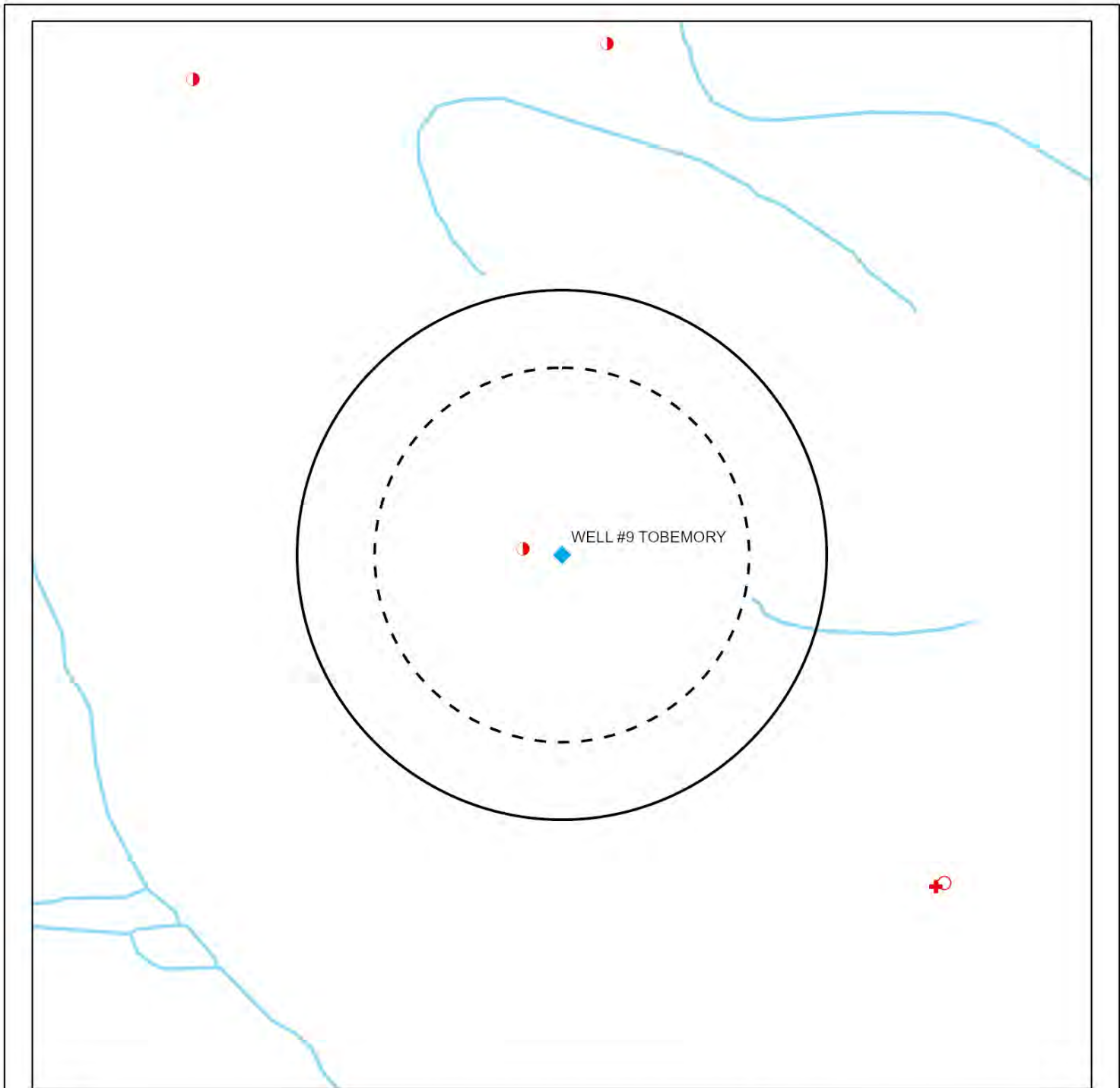
BLADEN CO WTR DIST-WEST BLADEN, PWS ID: 0309055, WELL #9 TOBEMORY



- |                    |                      |
|--------------------|----------------------|
| Major Roads        | Major Hydrology      |
| Interstate         | Municipal Boundaries |
| US Route           | County Boundaries    |
| NC Route           |                      |
| Rivers and Streams |                      |







### MAP 2. DELINEATED AREA AND PCS MAP

BLADEN CO WTR DIST-WEST BLADEN, PWS ID: 0309055, WELL #9 TOBEMORY

**PCS Types**

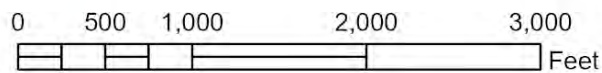
- ▣ Animal Operations
- △ CERCLA-Fed. Remediation
- Hazardous Waste Sites
- ⊕ Inactive Hazardous Waste Sites
- Non Discharge Permits
- ▲ NPDES Permits
- ⊕ PCB Sites
- Pollution Incidents

- ⬡ Septage Disposal Sites
- Soil Remediation Sites
- ✱ Solid Waste Facilities
- ✱ Tier II Sites
- ⊕ Old Landfill Sites
- ★ UIC Permits
- ⊕ UST Permits

**Major Roads**

- Interstate
- US Route
- NC Route
- Rivers and Streams
- Major Hydrology
- Municipal Boundaries

- ⬢ Ground Water Assessment Area - Delineated Area
- ⊖ Ground Water Assessment Area - Zone A



**Table 4. Potential Contaminant Source Attributes  
BLADEN CO WTR DIST-WEST BLADEN  
PWS ID: NC0309055, WELL #9 TOBEMORY**

PCS Name	PCS ID	PCS Type	PCS Risk Rating	Street Address	City	Zip	County
Tobermory Well	WQ0033325	Non-Discharge Permits	Moderate				Bladen

**Table 5. Inherent Vulnerability Rating  
BLADEN CO WTR DIST-WEST BLADEN  
PWS ID: NC0309055, WELL #9 TOBEMORY**

Ground Water Source Characteristics	Vulnerability
Aquifer Rating	Moderate
Unsaturated Zone Rating	Moderate
Well Integrity/Construction Rating	Higher

**Inherent Vulnerability Rating: Moderate**

**Table 6. Unsaturated Zone Rating Calculation  
BLADEN CO WTR DIST-WEST BLADEN  
PWS ID: NC0309055, WELL #9 TOBEMORY**

<b>Unsaturated Zone Score</b>	<b>59.7</b>
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**Notes:**

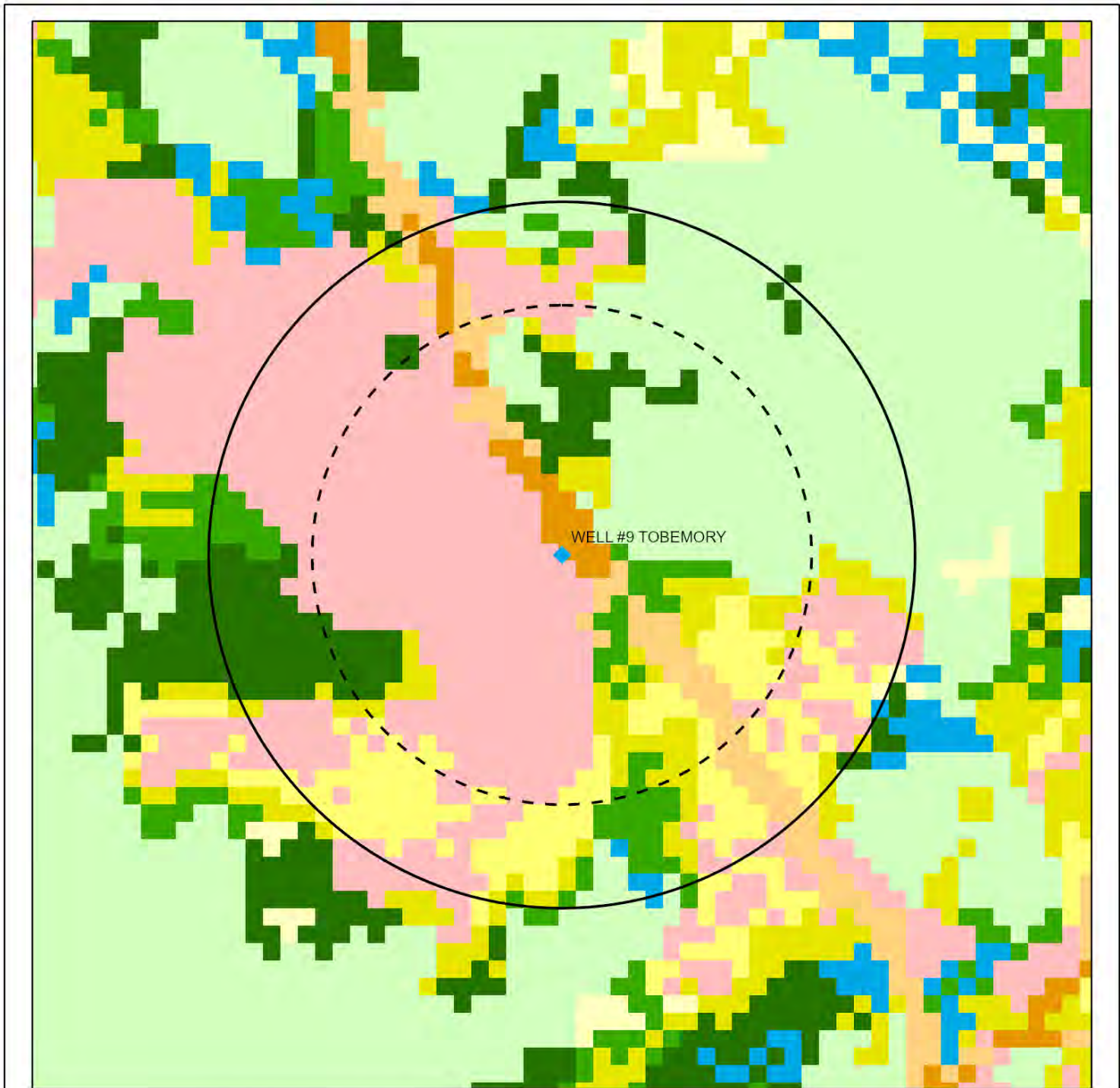
1. Unsaturated Zone Score for each cell (CS):

$$CS = [3 \times (\text{vertical hydraulic conductance score})] + [2 \times (\text{land surface slope score})] + [3 \times (\text{land use score})] + [2 \times (\text{land cover score})]$$

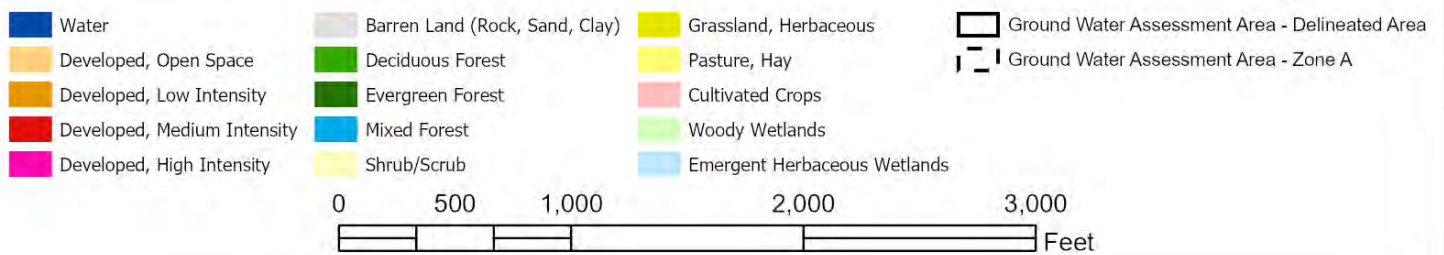
2. Unsaturated Zone Score (S) for the entire assessment area is the mean of the cell scores (CS) calculated as:

The sum of all cell unsaturated zone scores (CS) divided by the number of cells (N) within the assessment area:  $S = (\sum CS) / N$

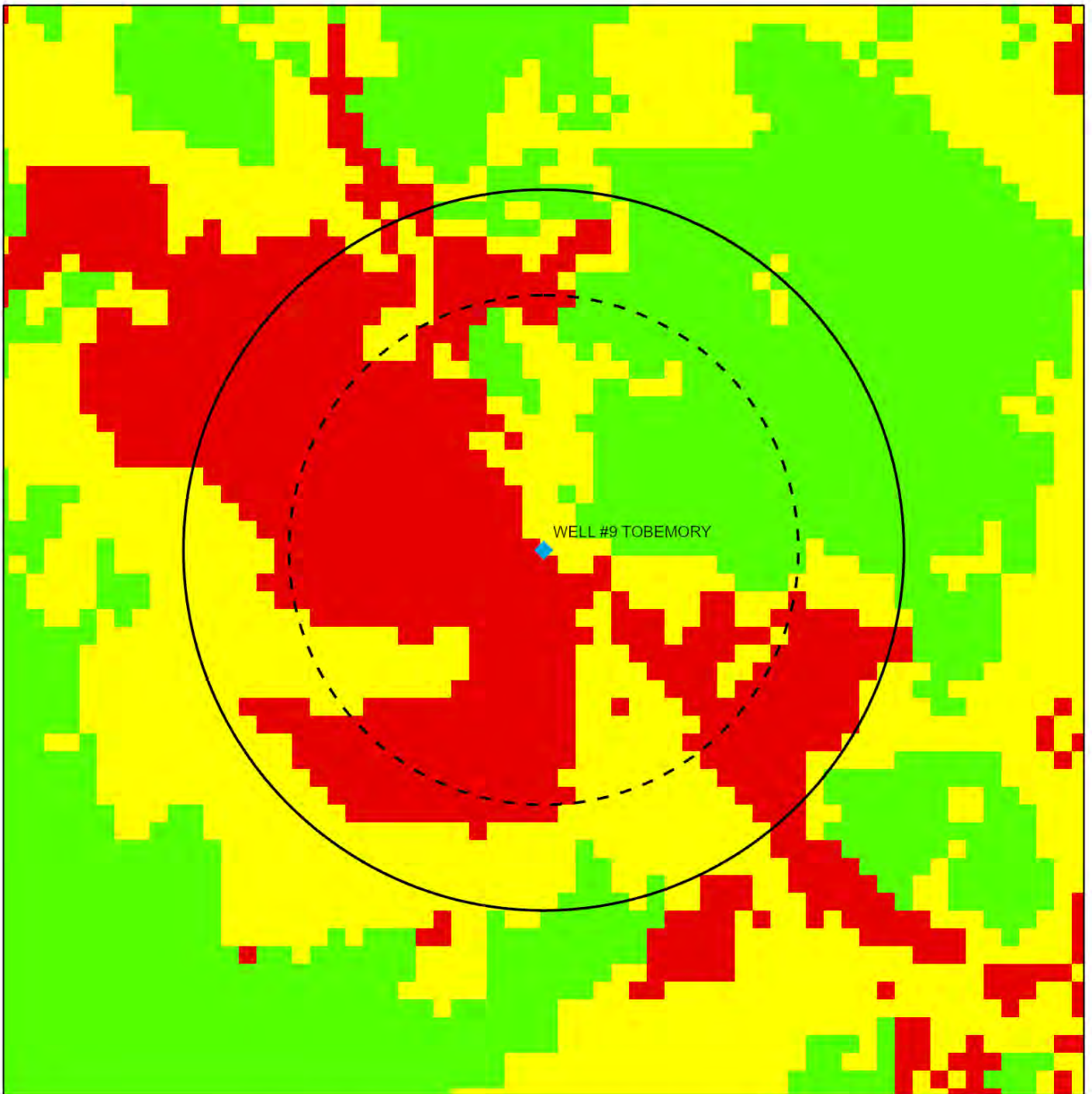
3. The USGS publication "Methods of ranking unsaturated zone and watershed characteristics of public water supplies in North Carolina", by J. L. Eimers, J. C. Weaver, S. Terziotti, and R. W. Midgette, 1999, provides a detailed discussion of the methods used to determine unsaturated zone ratings.



**FIGURE 1. LAND USE/LAND COVER CATEGORIES**  
 BLADEN CO WTR DIST-WEST BLADEN, PWS ID: 0309055, WELL #9 TOBEMORY



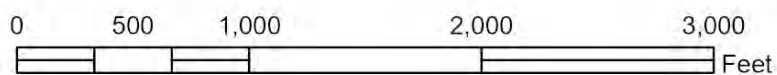




**FIGURE 2. UNSATURATED ZONE RATING**  
 BLADEN CO WTR DIST-WEST BLADEN, PWS ID: 0309055, WELL #9 TOBEMORY



- Lower  $\leq 50$
- Moderate  $> 50$  to  $65$
- Higher  $> 65$
- Ground Water Assessment Area - Delineated Area
- Ground Water Assessment Area - Zone A



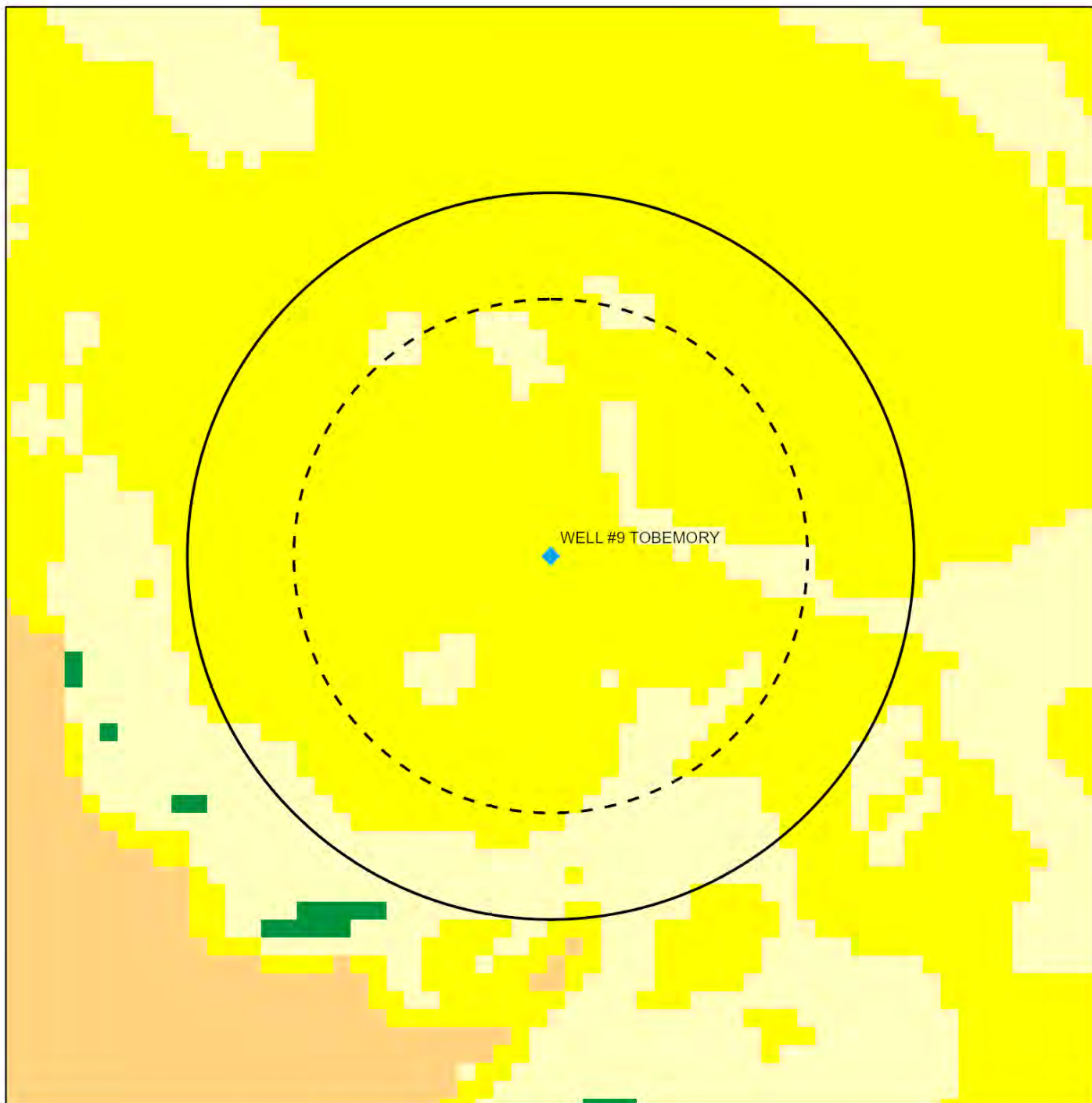
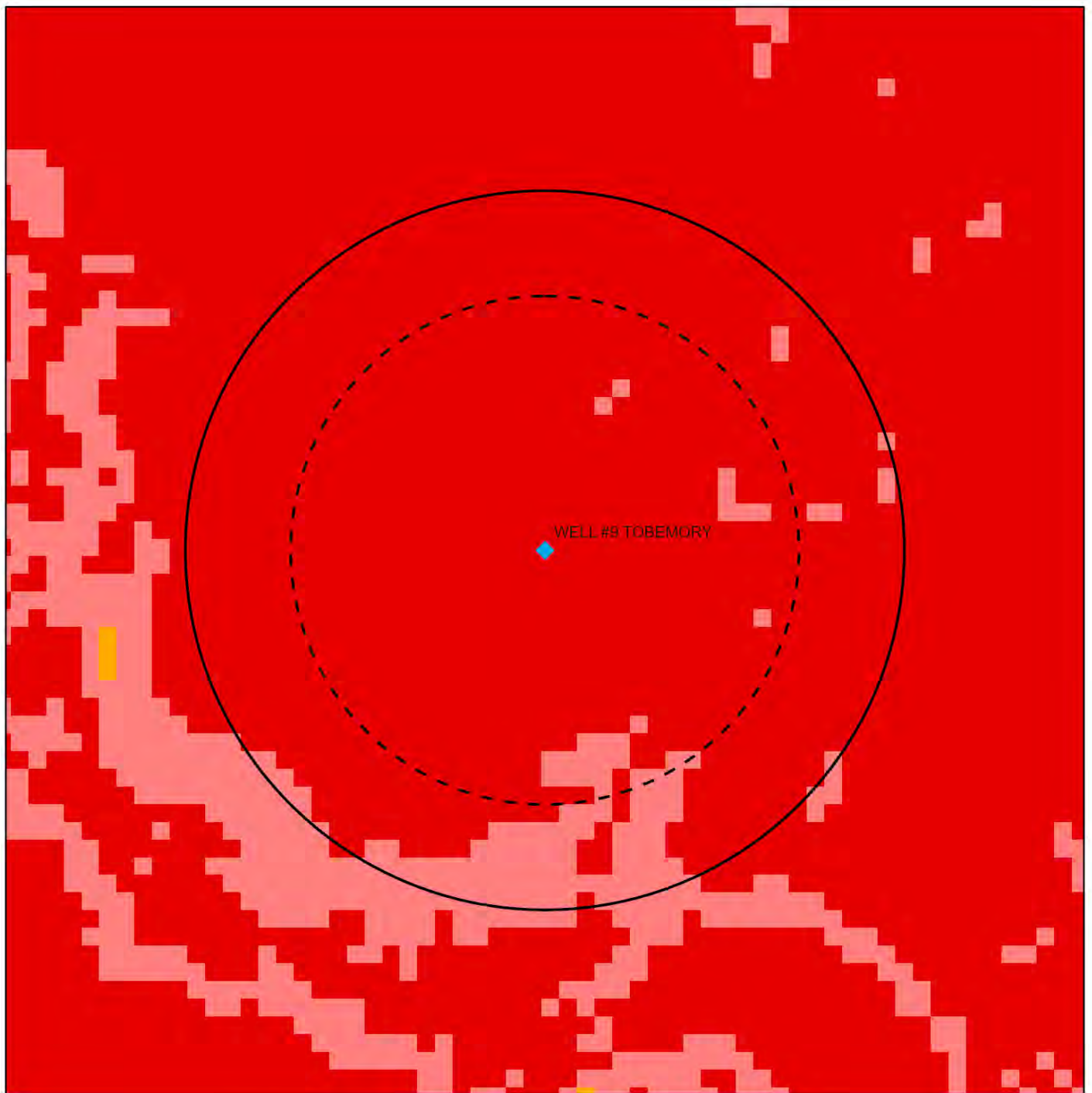


FIGURE 3. VERTICAL HYDRAULIC CONDUCTANCE RATING  
 BLADEN CO WTR DIST-WEST BLADEN, PWS ID: 0309055, WELL #9 TOBEMORY





**FIGURE 4. LAND SURFACE SLOPE RATING**  
 BLADEN CO WTR DIST-WEST BLADEN, PWS ID: 0309055, WELL #9 TOBEMORY



- |                        |                       |  |
|------------------------|-----------------------|--|
| 1 (> 50 percent)       | 7 (> 5 to 10 percent) | Ground Water Assessment Area - Delineated Area |
| 3 (> 20 to 50 percent) | 9 (> 2 to 5 percent)  | Ground Water Assessment Area - Zone A          |
| 5 (> 10 to 20 percent) | 10 (<= 2 percent)     |  |





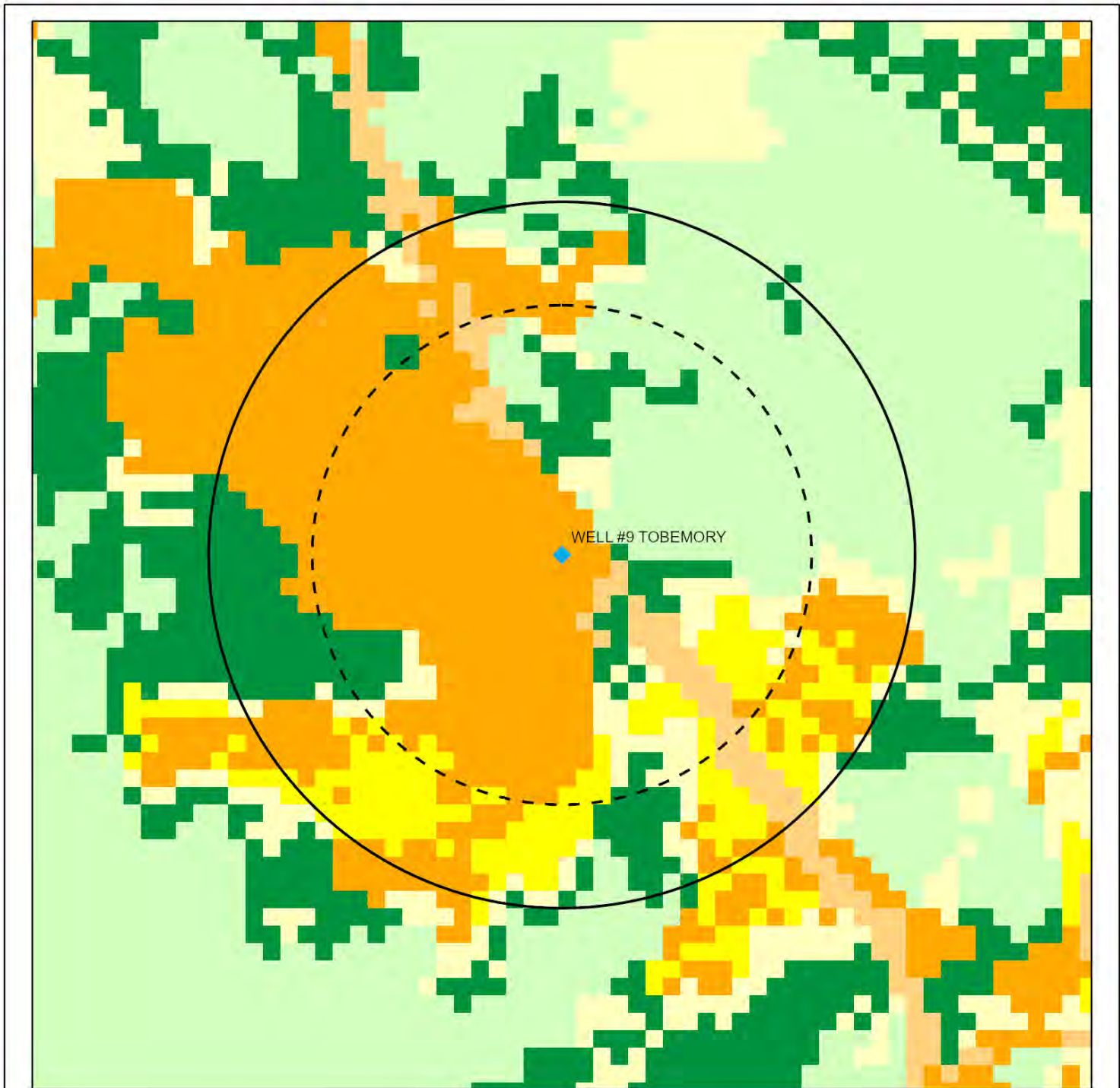
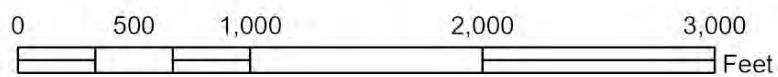


FIGURE 5. LAND USE RATING

BLADEN CO WTR DIST-WEST BLADEN, PWS ID: 0309055, WELL #9 TOBEMORY



- |   |   |   |
|---|---|---|
| <span style="color: #90EE90;">■</span> 1 Water, Wetlands (Woody and Herbaceous) | <span style="color: #FFFF00;">■</span> 5 Pasture/Hay                                | <span style="color: #FF0000;">■</span> 10 Developed, High Intensity   |
| <span style="color: #66CDAA;">■</span> 2 Barren Land (Rock/Sand/Clay)           | <span style="color: #FFDAB9;">■</span> 6 Developed, Open Space                      | <span style="border: 1px solid black; width: 15px; height: 10px; display: inline-block;"></span> Ground Water Assessment Area - Delineated Area |
| <span style="color: #008000;">■</span> 3 Forest (Deciduous, Evergreen, Mixed)   | <span style="color: #FF8C00;">■</span> 7 Developed, Low Intensity; Cultivated Crops | <span style="border: 1px dashed black; width: 15px; height: 10px; display: inline-block;"></span> Ground Water Assessment Area - Zone A         |
| <span style="color: #FFFF00;">■</span> 4 Grassland/Herbaceous; Shrub/Scrub      | <span style="color: #FFB6C1;">■</span> 8 Developed, Medium Intensity                |   |



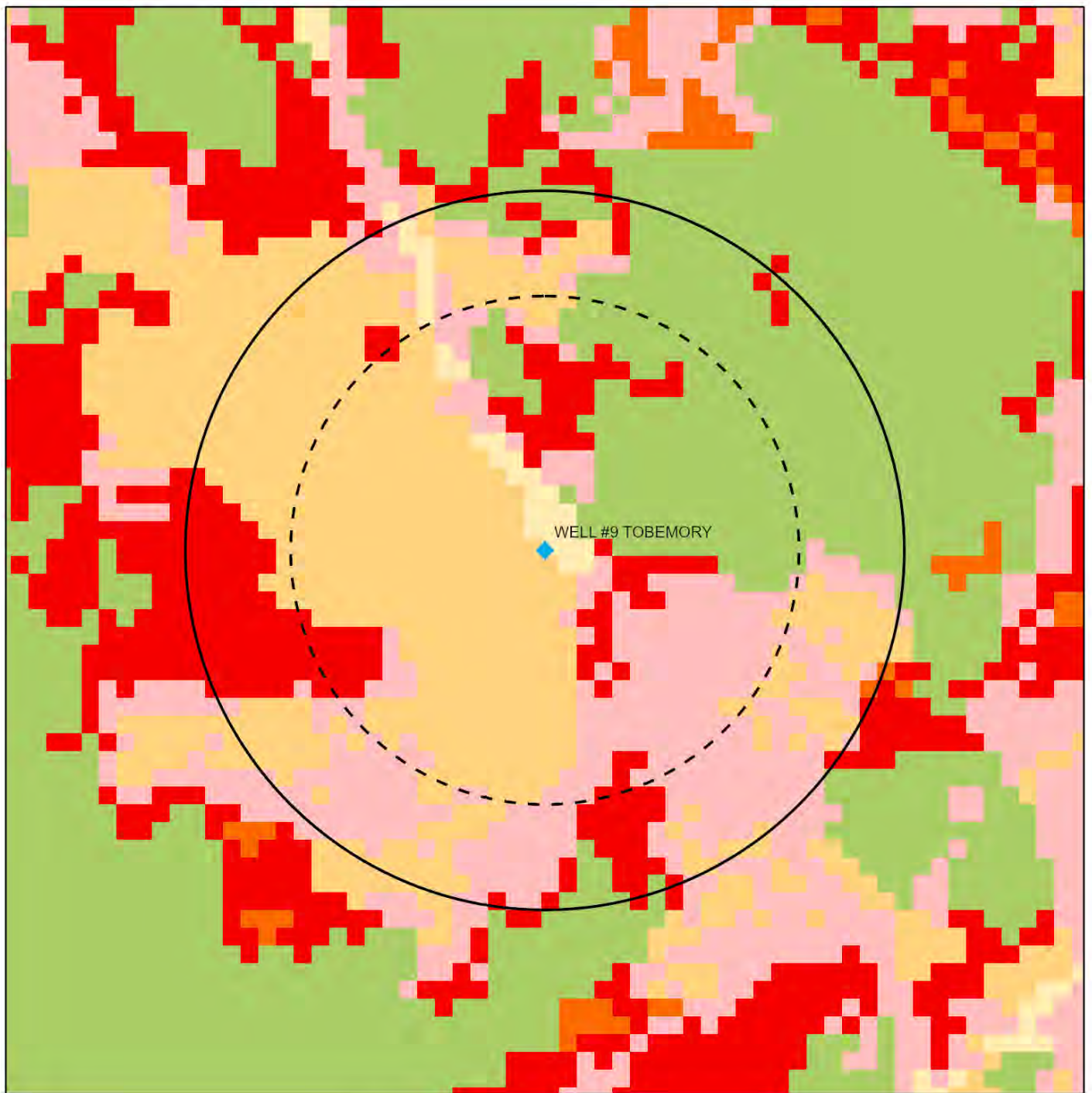


FIGURE 6. LAND COVER RATING

BLADEN CO WTR DIST-WEST BLADEN, PWS ID: 0309055, WELL #9 TOBEMORY



- |   |  |
|---|--|
| <span style="color: #90EE90;">■</span> 1 Developed, High Intensity                                | <span style="color: #FF8C00;">■</span> 9 Shrub/Scrub   |
| <span style="color: #90EE90;">■</span> 2 Water; Wetlands; Developed, Medium Intensity             | <span style="color: #FF0000;">■</span> 10 Deciduous, Evergreen and Mixed Forest                |
| <span style="color: #FFD700;">■</span> 4 Developed, Low Intensity                                 | <span style="border: 1px solid black;">□</span> Ground Water Assessment Area - Delineated Area |
| <span style="color: #FFD700;">■</span> 6 Barren Land (Rock, Sand, Clay); Cultivated Crops         | <span style="border: 1px dashed black;">□</span> Ground Water Assessment Area - Zone A         |
| <span style="color: #FFB6C1;">■</span> 8 Grassland/Herbaceous; Pasture/Hay; Developed, Open Space |  |





## **Appendix B**

### **2013 O&M Plan for Cumberland County Water System**





**OPERATION AND MAINTENANCE PLAN  
CUMBERLAND COUNTY WATER SYSTEM/  
WEST BLADEN PURCHASE SYSTEM**

**PWS I.D. NO.: 50-26-026**

**County Of Cumberland North Carolina  
130 Gillespie Street, Room 215  
Fayetteville, NC 28301**

**Cumberland County**

**Phone: 910-678-7637**

**Email: [ahall@co.cumberland.nc.us](mailto:ahall@co.cumberland.nc.us)**

**PREPARED BY:  
KOONCE, NOBLE AND ASSOCIATES, INC.  
CONSULTING ENGINEERS  
LUMBERTON, NORTH CAROLINA**

**MARCH, 2013**

**F-0103**



## CUMBERLAND COUNTY WATER SYSTEM

### Operation and Maintenance

Some problems associated with water supply systems can be alleviated if not corrected by observing proper procedures for operating and maintaining the system. Proper maintenance practices should be adhered to according to a pre-established schedule (Walski 1987b, AWWA 1987).

#### A. Frost Prevention

Severe winter conditions may warrant actions to prevent water from freezing and bursting pipes or other structures. The easiest short-term action is to keep water moving in problem pipes either by requesting that consumers run water or by bleeding water from pipes at crucial points in the system. Dead-end sections are most susceptible to freezing. Storage tanks, pump stations and meter vaults are susceptible to freezing and, therefore, are possible candidates for supplemental heating.

#### B. Leak Detection and Repair

Unless specific measures are taken to detect and repair leaks, a considerable amount of water can be lost through poor joints or cracked pipes. Leak detection techniques can uncover previously undetected leaks or pinpoint suspected ones. Most leak detection surveys use sonic equipment that allows operators to listen for the source of the leak. Experienced operators can accurately locate the leak and, in some instances, estimate the leakage rate. Leak detection surveys are often conducted by private firms that contract with the water utility, which often follows up on the survey and repairs the leaks. The cost of leak detection and repair usually is less than the value of water that would have been lost through unrepaired leaks over some reasonably short period of time (Moyer et al. 1983, Moyer 1985). Leak detection surveys can be one-time affairs or can be scheduled periodically. The value of leak detection is not realized unless the identified leaks are repaired. It is possible that extremely high leakage in one pipe segment might warrant replacement of the entire pipe segment instead of repair. Leak detection and repair will also help determine which geographic areas and types of pipe are more likely to leak. The degree to which this approach will alleviate water loss depends on the condition of the system. Leak repair might also contribute to a longer-lasting system. First, leaking water tends to erode soil surrounding and supporting a pipe. Continued leaking, therefore, might lead to a more costly break. Second, the increased soil moisture resulting from the leak can promote corrosion if stray direct current is present (because of its higher electric conductivity in wet soil). Repair may not eliminate the cause of leaks and future leakage may result. Poor joint material and corrosion (caused by direct current, bimetallic connections, poor soil, or corrosive water in unlined pipe) are possible causes

that need to be addressed to prevent recurrence of the leaks. Some leaks do not require repair but merely tightening or replacing fittings (Male, Noss and Moore 1985; Moyer et al. 1983; Brown and Caldwell 1984; Walski 1984b).

C. Meter Calibration

Master meters (connection to Bladen County) can over-register, thereby creating the appearance that more water is being used in the system than actually is. Calibration of the meter(s) will not save any water, but will contribute to better accounting practices, which in turn will lead to better operation of the existing system and better design of improvements. Master meter calibration should be a routine part of preventive maintenance. Consumer meters should also be tested and calibrated on a periodic basis. Consumer meters often tend to under-register as they age. This under-registration results in lost revenue (in cases where consumers are being billed) and an elevated assessment of unaccounted-for water. Meters can be checked on a periodic basis, and, in addition, failed meters can be identified by surveillance of billing records (Male, Noss and Moore 1985; AWWA 1986d).

D. Flushing

In some systems with turbidity problems, periodic flushing of the system will improve water quality by removing any settled material. This sediment can occasionally be resuspended and cause dirty water. Flushing assures that when the material is resuspended, it is removed from the lines. Periodic flushing is particularly useful where velocities are slow, such as in dead ends. Flushing eliminates symptoms but does not eliminate the underlying problem. When flushing in a complex grid, it is helpful to isolate individual lines to maximize velocities and hence the effectiveness of the flushing (California-Nevada AWWA 1981).

E. Valve Exercise

Regular exercising of valves is important for several reasons. First, it helps to ensure that the valves can be found and that they will operate when necessary. Second, valves may have been incorrectly left closed or partially closed, and periodic exercise will allow correct positioning. Third, valve exercise also serves as training, allowing personnel to find valves more quickly in an emergency. Records of valve exercising should be kept to determine the effectiveness of the program (e.g., number of valves found stuck), and to ensure that each valve is exercised within a reasonable time period. Valves do not need to be exercised every week but do need to be exercised every few years.

F. Control of Unauthorized Use

Utility personnel need to be on the alert for apparent theft of water. Meter readers, valve crews and construction inspectors all need to be on the alert for water theft.



## **Appendix C**

### **NC0309055 Well Treatment Process Summary**





<a href="#">County Map of NC</a>	<a href="#">Water System Search</a>	<a href="#">Public Water Supply Section Home Page</a>	
<b><u>Water System Detail Information</u></b>			
Water System No.:	NC0309055	Federal Type:	C
Water System Name:	BLADEN CO WTR DIST-WEST BLADEN	Federal Source:	GW
Principal County Served:	BLADEN	System Status:	A
Principal City Served:	ELIZABETHTOWN	Activity Date:	11-01-1989

<b>Water System Facility</b>			
Facility ID No.	P09	Type:	TP - Treatment Plant
Facility Name	TREATMENT_PLT_WELL #9	Status/Reason	A
Water Type	GW	ACTIVITY_DATE	07-01-2007

<b>Sample Points</b>		
<b>Sample Point ID</b>	<b>Location Description</b>	<b>Type</b>
E09	WELL #9	EP

<b>Water System Facility Contacts</b>		
<b>Type</b>	<b>Contact</b>	<b>Communication</b>

<b>Facility Annual Operating Period(s)</b>			
<b>Effective Begin Date</b>	<b>Effective End Date</b>	<b>Start Month/Day</b>	<b>End Month/Day</b>

<b>Treatment Plant</b>	
<b>Treatment Plant Filter Type</b>	

<b>Treatment Plant Contact Time</b>				
<b>Status</b>	<b>Status Date</b>	<b>Contact Time (Minutes)</b>	<b>Disinfection Concentration (mg/L)</b>	<b>CT Value (mg.min/L)</b>

<b>Treatment Plant Disinfection Profiling Benchmark</b>							
<b>Giardia Status</b>	<b>Giardia Inact. Log</b>	<b>Giardia Inact.</b>	<b>Giardia Status Date</b>	<b>Virus Status</b>	<b>Virus Inact Log</b>	<b>Virus Inact</b>	<b>Virus Status Date</b>

Treatment Plant Analyte Removal					
Code	Analyte Name	Removal Credited	Removal Achieved	Removal/Inact. Required	Inactivation Needed

Treatment Plant BIN Determination		
Status	BIN	Status Date

Treatment Plant Filter Backwash Recycling Rule						
Schem Stat	Schem Rec	Schem Rev	Alt Ret Loc Req Stat	Alt Ret Loc Req Stat Dt	Corr Act Req Stat	Corr Act Req Stat Dt

Treatment Units								
Type	Name	Subtype	Cont. Dis.	Aerator Type	Sludge Rem. Type	Filter Media Type	Basin Count	Subunit Count
<u>GU - Generic Unit</u>	GENERIC UNIT						0	0
<b>Treatment Objective Process Associations</b>								
	<b>Primary</b>	<b>Obj. Code</b>	<b>Objective Name</b>		<b>Proc. Code</b>	<b>Process Name</b>		
		C	CORROSION CONTROL		741	PH ADJUSTMENT, POST		
		C	CORROSION CONTROL		445	INHIBITOR, ORTHOPHOSPHATE		
		D	DISINFECTION		423	HYPOCHLORINATION, PRE		
		D	DISINFECTION		421	HYPOCHLORINATION, POST		
		F	IRON REMOVAL		742	PH ADJUSTMENT, PRE		
		F	IRON REMOVAL		344	FILTRATION, PRESSURE SAND		
		O	ORGANICS REMOVAL		121	ACTIVATED CARBON, GRANULAR		

Treatment Plant Unit Process Flows				
Train ID	Sequence ID	Supply	Receive	Connection Type

WSF Indicators		
Type	Value	Date

## **Appendix D**

### **Hydrant Flow Test Reports**







PROJECT: Cumberland County Public Utilities  
Asset Management Plan

McGill Associates, P.A.  
5 Regional Circle, Suite A  
Pinehurst, North Carolina 28374  
Phone (910-295-3159) / Fax (910-295-3647)

## Hydrant Flow Test Report

Location Southpoint Neighborhood, Cumberland County, NC Date 4/10/2024  
Test made by Demi Watkins, Dean Byrd, Amy Hall Time 3:40 PM

Conditions	Sunny, 85 degrees		
Flow Hydrant		Residual Hydrant	
No.	<u>8634 Brightleaf</u>	No.	<u>8480 Brightleaf</u>
Location	<u>Place</u>	Location	<u>Place</u>
Size nozzle	<u>2 1/2 Steamer</u>	Static	<u>54</u> psi
Inlet type	<u></u>	Residual	<u>1</u> psi
Discharge coefficient	<u></u>	Elev. (Autocad)	<u>161</u>
Pitot Pressure	<u>1</u> psi	Residual Hydrant 2 (if applicable)	
GPM	<u>168</u>	No.	<u></u>
		Location	<u></u>
		Static	<u></u> psi
		Residual	<u></u> psi

Remarks Amy was at the Residual hydrant, Dean and Demi were at the Flow hydrant.

*Disclaimer: Hydrant test results indicated are for the single point in time that the test was conducted, and are subject to variation. A number of factors may affect test results which are specific to conditions during testing. These conditions include water system demand, water tank levels, booster pump station status, valve positions, etc.*



# Cumberland County Water and Sewer Asset Inventory and Assessment







# Asset Inventory & Assessment

## **History:**

- In 2021, Cumberland County was designated as “distressed” by the Local Government Commission and the State Water Infrastructure Authority.
- County staff began working to address required steps to be removed from distressed list
- In 2023, Cumberland County contracted with McGill to develop Asset Management Plans (AMP) for each of the existing utility districts.
- Cumberland County intended to adopt CIP’s for each of the utility districts in order to perform and adopt a System Development Fee study.
- McGill utilized NCDEQ AIA guidance and industry standards to **inventory** and **assess** the County’s one water distribution system and three wastewater collection systems.



# What is an Asset Management Plan?

It is a **WORKING** plan and includes 4 key components:

- An **Inventory** of system assets:  
WATER: water main, water valves, fire hydrants, interconnections  
SEWER: sewer line, manholes, lift stations
- A summary of **Asset Conditions**
- A **Capital Improvements Plan**
- An **Operations and Maintenance and Staffing Recommendations Plan**





# Summary of NORCRESS System Assets

- Year put into service: 2005
- Active Service Connections : 452 (394 residential, 87%)
- Performed smoke testing, manhole inspections, flow monitoring

## Sewer Mains – 138,200 feet (26.2 mi)

- PVC (97%) and Ductile Iron Pipe

## Sewer Manholes – 424

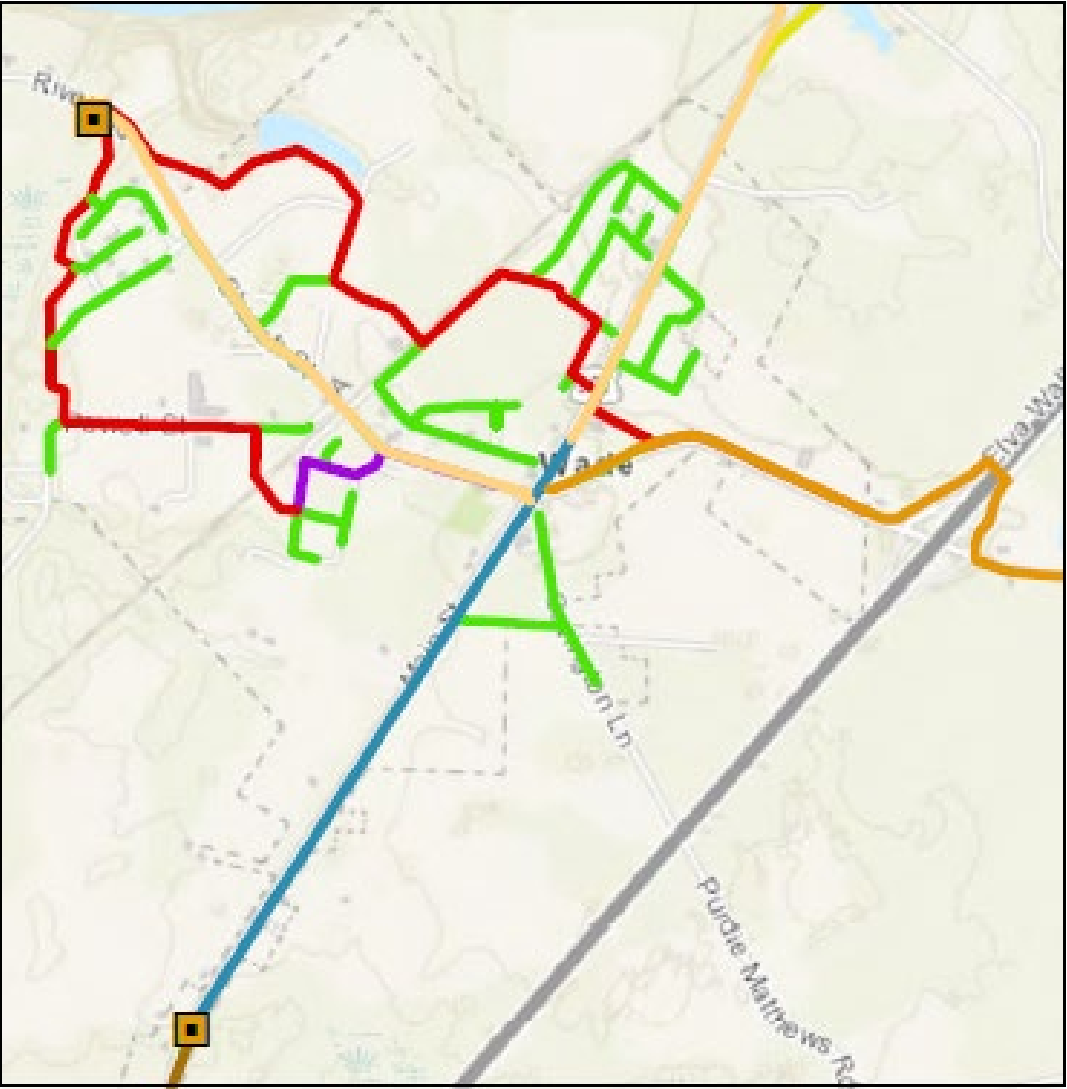
- All Precast Concrete Material
- Beginning to show some corrosion
- Generally good condition

## Lift Stations - 4

- Godwin LS, Falcon LS, Wade #1 LS, Wade #2 LS



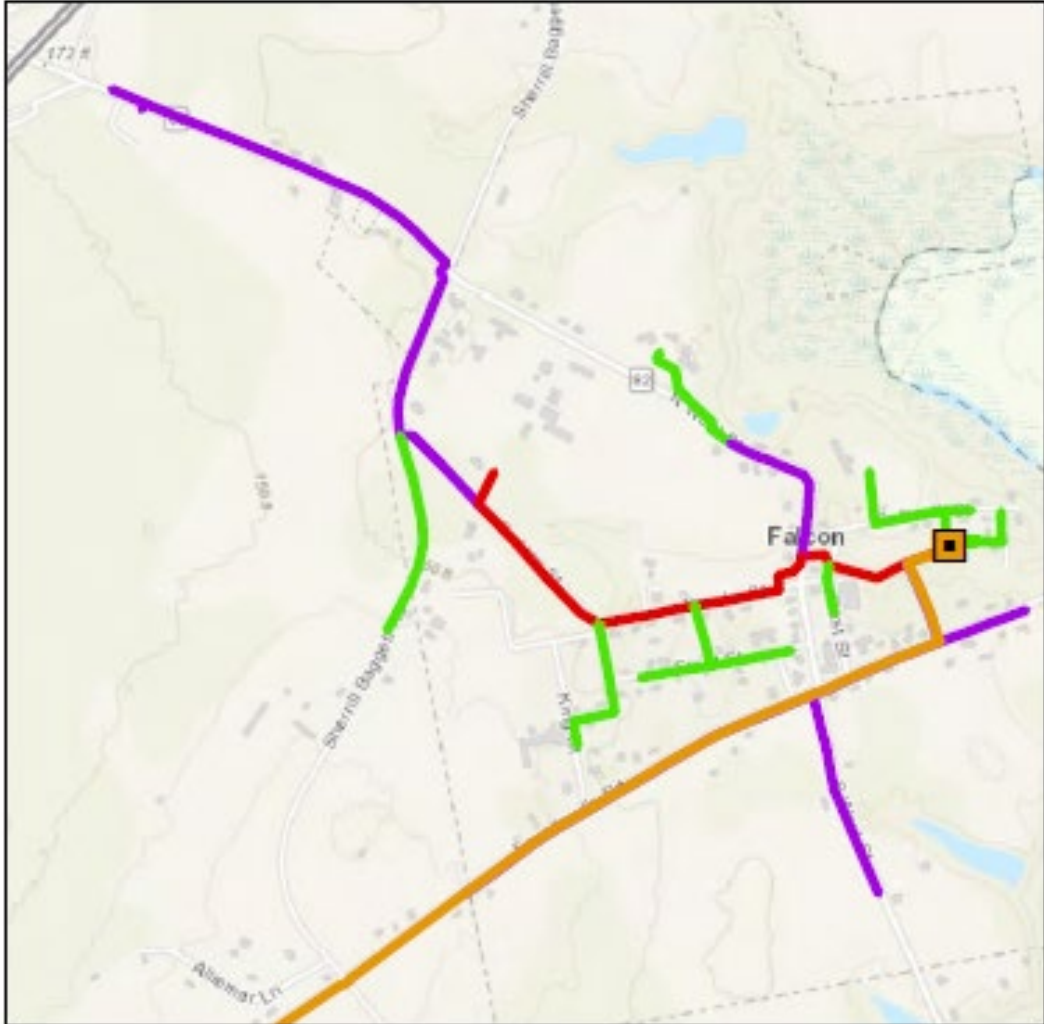
# Wade



# Godwin



# Falcon



**Legend**

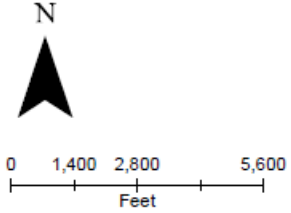
GRAVITY SEWER DIAMETER

- 8" (green line)
- 10" (purple line)
- 12" (red line)
- 15" (blue line)

FORCE MAIN DIAMETER

- 3" (yellow line)
- 6" (orange line)
- 8" (dark orange line)
- 10" (brown line)

☐ Lift Station





# NORCRESS Sewer Capital Improvement Projects

No.	Project Name	Cost
1	New Generators – All Lift Stations	\$640,000.00
2	Upgrade SCADA	\$240,000
3	Flow Meter Project	\$203,900.00
4	Flow Monitoring Study	\$25,440.00
5	Falcon Force Main and ARV Project	\$80,000.00
6	Manhole Rehabilitation Project 1	\$118,600.00
7	Manhole Rehabilitation Project 2	\$118,600.00
8	Manhole Rehabilitation Project 3	\$118,600.00
9	Manhole Rehabilitation Project 4	\$118,600.00
	<b>10-Year CIP Total Project Cost</b>	<b>\$1,714,620.00</b>



# Summary of Kelly Hills System Assets

- Year put into service: 2005
- Active Service Connections: 102 (all residential)
- Performed Smoke testing, manhole inspections

## Sewer Mains – 23,540 feet (4.4 mi)

- PVC (84%) and Ductile Iron Pipe

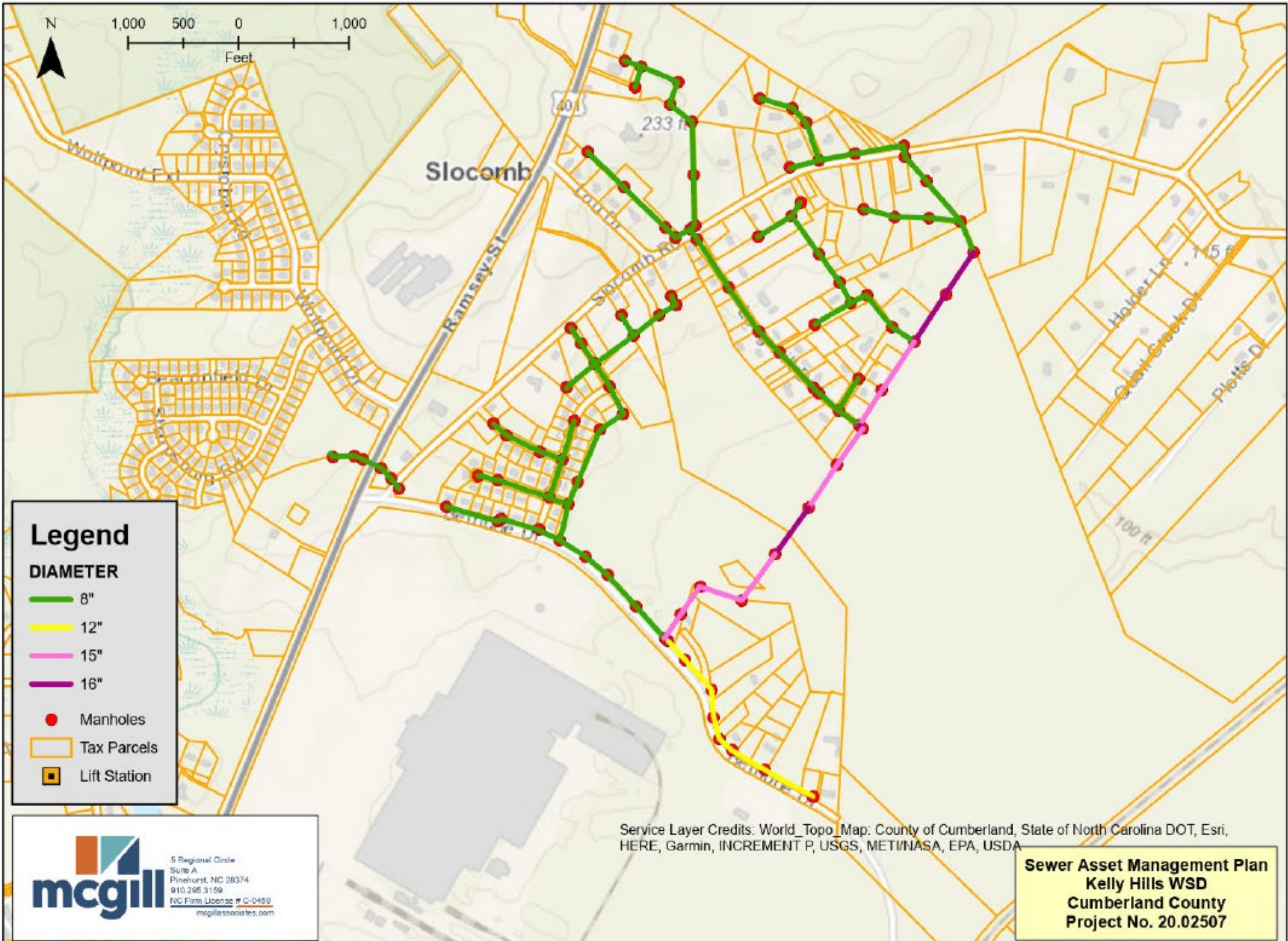
## Sewer Manholes – 100

- All Precast Concrete Material
- Beginning to show some corrosion
- Generally good condition

## Lift Station - 1

- Unobligated Capacity: 53,580 GPD (~230 res. conn.)





**Legend**

**DIAMETER**

- 8" (Green line)
- 12" (Yellow line)
- 15" (Pink line)
- 16" (Purple line)

- Manholes (Red dot)
- Tax Parcels (Orange outline)
- Lift Station (Black square)

5 Regional Circle  
Suite A  
Pinehurst, NC 28374  
910.295.3159  
I/C Firm License # G-0489  
mcgillassociates.com

Service Layer Credits: World\_Topo\_Map: County of Cumberland, State of North Carolina DOT, Esri, HERE, Garmin, INCREMENT P, USGS, METI/NASA, EPA, USDA

**Sewer Asset Management Plan**  
**Kelly Hills WSD**  
**Cumberland County**  
**Project No. 20.02507**





# Kelly Hills Sewer Capital Improvement Projects

No.	Project Name	Cost
1	Manhole Rehabilitation Project 1	\$81,000.00
2	Flow Monitoring Improvements	\$103,900.00
3	Manhole Rehabilitation Project 2	\$81,000.00
4	Manhole Rehabilitation Project 3	\$81,000.00
5	Manhole Rehabilitation Project 4	\$81,000.00
	<b>10-Year CIP Total Project Cost</b>	<b>\$427,900.00</b>



# Summary of Overhills System Assets

- Year put into service: 2019
- Active Service Connections: 107 (all residential)
- Performed Smoke testing, manhole inspections

## Sewer Mains – 17,420 feet

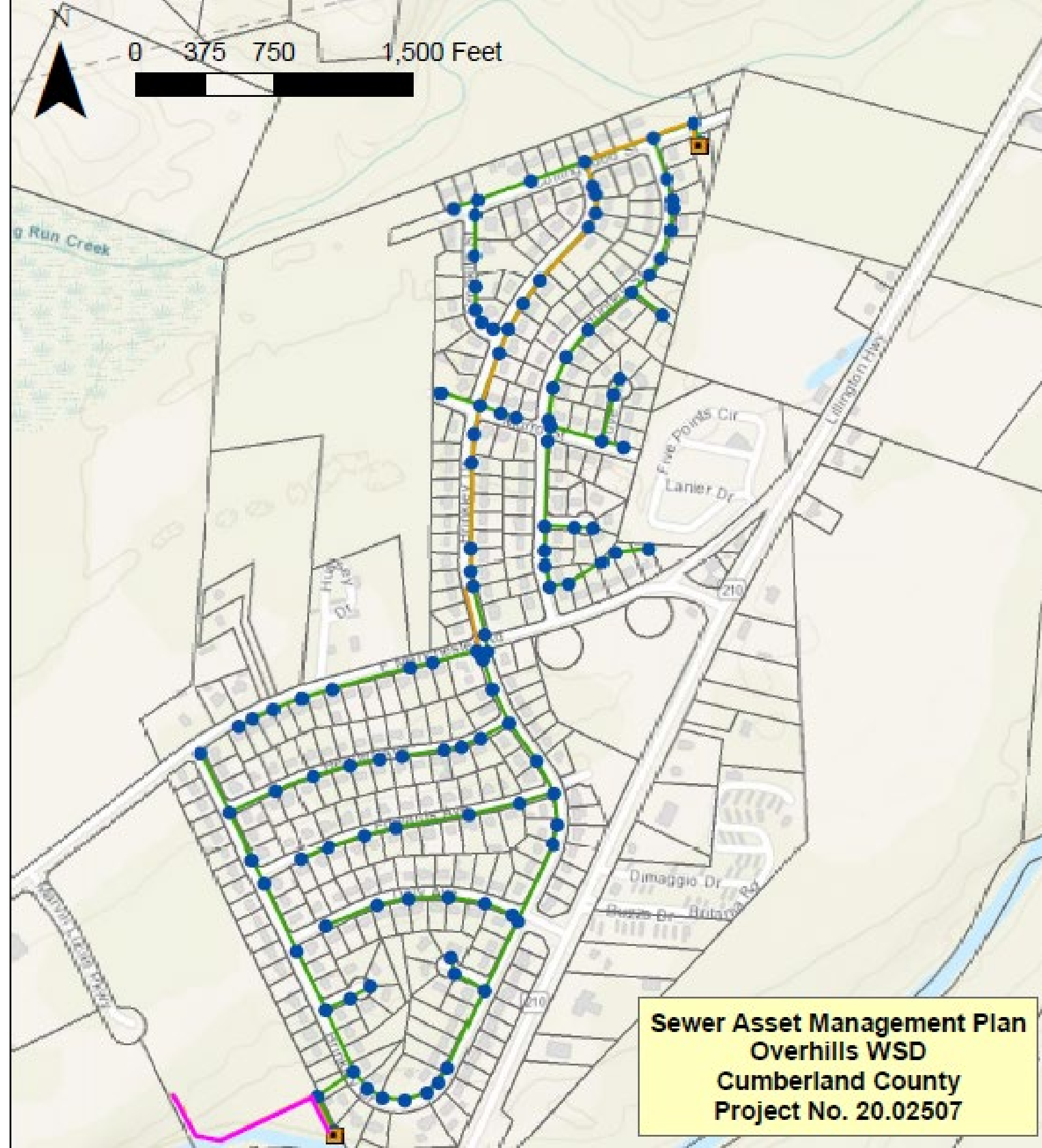
- All 8" PVC Pipe

## Sewer Manholes – 119

- All Precast Concrete Material

## Lift Stations - 2

- Collinswood LS, Brinkley LS
- FY 2025 Daily Flow Per Connection: 84 – 276 GPD



0 375 750 1,500 Feet

### Legend

- Lift Station
- 6" PVC Forcemain
- Manhole
- 4" PVC Forcemain
- 8" PVC Gravity Sewer

**Sewer Asset Management Plan  
Overhills WSD  
Cumberland County  
Project No. 20.02507**



# Overhills Sewer Capital Improvement Projects

No.	Project Name	Cost
1	Brinkley Lift Station Improvements	\$33,100.00
2	Manhole Rehabilitation Project 1	\$84,100.00
3	Manhole Rehabilitation Project 2	\$84,100.00
4	Manhole Rehabilitation Project 3	\$84,100.00
	<b>10-Year CIP Total Project Cost</b>	<b>\$285,400.00</b>



# Summary of Southpoint Water Assets

- Year Put into service: 2013
- Active Service Connections: 84 (all residential)
- Flow testing performed, 55 psi average pressure

## Water Main – 16,900 feet

- Diameters: 12-inch, 8-inch, 6-inch, 2-inch

## Valves – 6

- Condition generally good

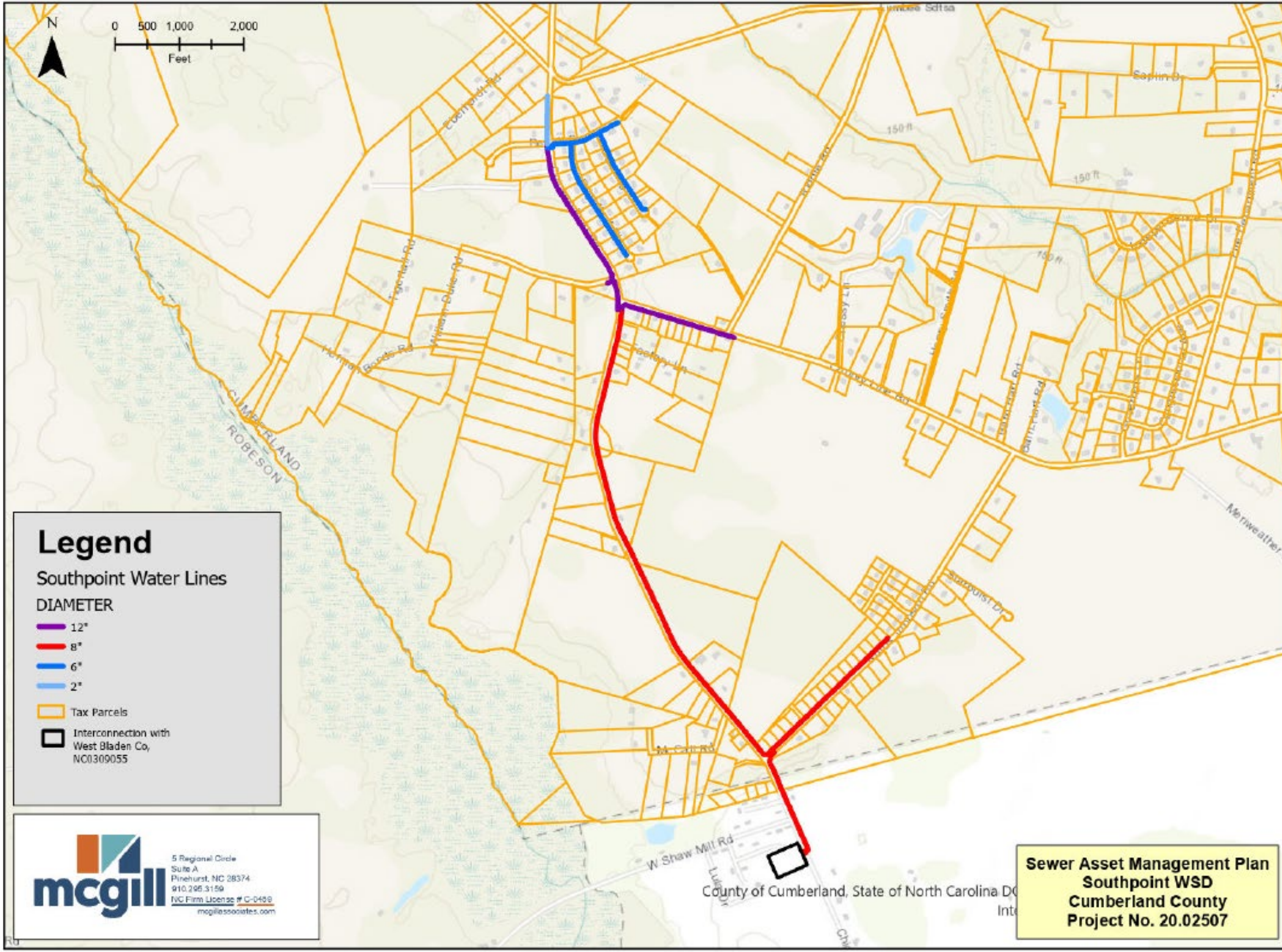
## Fire Hydrants– 12

- Condition generally good

## System Interconnection – Bladen County Water

- 45,000 GPD capacity
- 10,500 GPD average usage





### Legend

Southpoint Water Lines

DIAMETER

- 12"
- 8"
- 6"
- 2"

- Tax Parcels
- Interconnection with West Bladen Co, NC0309055

5 Regional Circle  
Suite A  
Pinehurst, NC 28374  
910.296.3159  
I/C Firm License # C-0428  
mcgillassociates.com

**Sewer Asset Management Plan**  
**Southpoint WSD**  
**Cumberland County**  
**Project No. 20.02507**

County of Cumberland, State of North Carolina





# Southpoint Water Capital Improvement Projects

No.	Project Name	Cost
1	Water Meter Replacement	\$71,300.00
2	Construction New Wells and Water Main	\$19,614,136.00
3	Ground Storage Tank and Filter	\$303,500.00
	<b>10-Year CIP Total Project Cost</b>	<b>\$19,988,936.00</b>





# Staffing Recommendations

- County is responsible for management of 3 Sewer Systems and 1 Water System
- Staffing analysis was performed based on typical staffing from EPA study
- EPA study utilizes population and pipe length to estimate staffing
- Table 19 shows calculated Full Time Equivalent (FTE) based on position type

**Table 19: Average Community System Statistics**

Employee Category	System Size (miles of Main)		Mean	Cumberland County
	Pop. 500-3300	Pop. 3300-10000		
	21	62	41.5	51.7
Manager FTE	0.6	1.1	0.85	1.06
per mile	0.029	0.018	0.020	0.020
Plant Operator FTE	0.6	1.3	0.95	1.03
per mile	0.029	0.021	0.023	0.023
Distribution FTE	0.8	2.5	1.65	2.06
per mile	0.038	0.040	0.040	0.040
Administrative FTE	0.6	1.5	1.05	1.31
per mile	0.029	0.024	0.025	0.025



# Staffing Recommendations

- Calculated FTE's were applied based on employee categories
- Wage information based on Zip Recruiter statistics and Benefits Multiplier from U.S. Bureau of Labor Statistics
- Provided for preliminary planning purposes only

**Table 20: Overall Salary Estimates**

Employee Category	Hourly Rate	Annual Salary	Ben. Mult.	Total	Applied FTE	Applied Budget Cost
Manager	\$38.50	\$80,080.00	1.38	\$110,510.40	1.06	\$117,000
Operator	\$24.52	\$51,001.60	1.38	\$70,382.21	1.03	\$72,700
Distribution	\$23.57	\$49,025.60	1.38	\$67,655.33	2.06	\$139,100
Administrative	\$21.33	\$44,366.40	1.38	\$61,225.63	1.31	\$80,100
<b>Total Applied Budget Cost Based FTEs</b>						<b>\$408,900</b>

Any questions?

Thank you!





# Additional Information as needed



# System Development Fees

- Enacted in the North Carolina Public Water and Sewer System Development Fee Act approved in 2017 (House Bill 436)
- Enables public water and sewer utilities in North Carolina to assess system development fees for utility service to new development
- The SDF Act defines new development as:
  1. Subdivision of land
  2. Construction or structural change that increases service needs, or
  3. Any use of land which increases service needs
- SDFs serve as the mechanism by which “growth pays for growth”



# System Development Fees

- Fee calculation in a written analysis prepared by a financial professional or licensed engineer employing generally accepted accounting, engineering and planning methodologies
- The analysis must be posted on the County's website and provide a means by which public comments are received for 45 days
- Comments received must be considered by the preparer of the analysis for possible adjustments to the analysis
- A public hearing must be held prior to considering adoption



## **SOLID WASTE MANAGEMENT**

### **MEMORANDUM FOR BOARD OF COMMISSIONERS AGENDA OF SEPTEMBER 15, 2025**

**TO: BOARD OF COUNTY COMMISSIONERS**

**FROM: AMANDA LEE, PE, GENERAL MANAGER FOR NATURAL RESOURCES**

**DATE: 9/10/2025**

**SUBJECT: APPROVAL OF MEMORANDUM OF UNDERSTANDING FOR WATER AGREEMENT WITH CITY OF DUNN AND HARNETT COUNTY**

#### **BACKGROUND**

At the June 5, 2025 Board of Commissioners Infrastructure Committee meeting, General Manager for Natural Resources Amanda Lee presented a Water Collaboration Summary. This summary, was also presented at the June 12, 2025 Board of Commissioners Agenda session as a Cumberland County Water and Sewer Plan.

Several of the key next steps in this plan were the following actions to explore capacity development for water and sewer.

- 1). Work with Harnett County on an MOU to provide additional flow to the northern part of the County. This MOU will include hydraulic analysis to identify improvements needed.
- 2). Continue discussions with Spring Lake, Harnett County, and the City of Dunn about merger and regionalization opportunities for water and sewer capacity.

The two attached MOUs are a next step with both Harnett County and the City of Dunn. The MOUs begin collaboration to explore next steps.

At their September 8, 2025, meeting, the Infrastructure Committee approved moving this item to the Consent Agenda of the September 15, 2025, Board of Commissioners' meeting.

#### **RECOMMENDATION / PROPOSED ACTION**

The General Manager for Natural Resources and County Management recommend approval of the MOUs to begin collaboration and explore next steps to the next appropriate meeting agenda.

#### **ATTACHMENTS:**



**Description**

Dunn MOU

Harnett Cumberland Water MOU

**Type**

Backup Material

Backup Material

NORTH CAROLINA  
CUMBERLAND COUNTY

**MEMORANDUM OF UNDERSTANDING**

THIS MEMORANDUM OF UNDERSTANDING ("MOU") entered into and made effective this the \_\_\_ day of \_\_\_\_\_, 2025, by and between City of Dunn ("Dunn"), North Carolina, a body politic and corporate pursuant to North Carolina Session Law 1969-818, and County of Cumberland, North Carolina ("Cumberland") , a body politic and corporate pursuant to G.S.§ 153A-11 or a water and sewer district governed by the Cumberland County Board of Commissioners.

WITNESSETH

WHEREAS, Dunn and Cumberland are interested in extending the Dunn water service in Cumberland County. This extension requires the preparation of an extensive feasibility study ("Project") to determine the engineering requirements and cost of such an extension; and

WHEREAS, Dunn and Cumberland will select an engineering firm (the "Expert") from a Request for Qualifications process for the Project, and Cumberland will execute with the Expert an engagement agreement that Dunn has reviewed and to which Dunn has consented. Dunn and Cumberland will jointly develop the scope and manage the completion of Project; and

WHEREAS, Cumberland shall pay the Expert for its services in accordance with the engagement agreement between Cumberland and the Expert. Dunn shall promptly reimburse Cumberland for fifty percent (50%) of the amount paid by Cumberland to the Expert. Cumberland shall not amend the Expert engagement agreement or consent to an amendment thereto without the prior written consent of Dunn; and

WHEREAS, Neither this MOU nor the Expert engagement agreement is intended to compel Dunn to extend water service in the Cumberland County area; and

WHEREAS, Dunn currently provides water service to Eastover Sanitary District (ESD) and the Town of Falcon ("Falcon"). These contracts will expire within the next 2-6 years. Dunn finances the water line that services ESD along US 301. Cumberland wishes to purchase approximately 1.8 MGD of bulk water in addition to the 1.2 MGD allocated to Falcon and ESD for a total of 3.0 MGD; and

WHEREAS, Dunn owns and operates a a water treatment plant ("WTP") permitted for 8.0 MGD which is currently limited to an operating rate of 4.0 MGD. Cumberland wants to explore purchasing capacity in Dunn's WTP. To purchase capacity in the plant, will require expansion of Dunn's WTP. A feasibility study is needed to identify the cost of improving the existing plant to provide more capacity.

WHEREAS, Dunn and Cumberland desire to enter into this MOU to memorialize their present intentions and plans to continue working together towards the execution of a series of

interlocal agreements (“ILA”), or to explore other viable options for the provision of safe and regulated drinking water to regional customers throughout Cumberland County with contaminated wells from Fayetteville Works PFAS through transmission and distribution improvements to existing infrastructure and the construction and development of the new WTP, as outlined below, and to show their support for exploring and securing a long-term solution to Dunn’s and Cumberland’s water needs.

NOW, THEREFORE, for and in consideration of the mutual promises and covenants set forth herein, Dunn and Cumberland enter into this MOU to set forth the basic agreements and the parameters of this undertaking, which shall include the following:

1. Bulk Water Purchase Agreements. Dunn will engage with Cumberland to negotiate bulk water purchase agreements where infrastructure and capacity exist to furnish safe and regulated drinking water to the northern section of Cumberland County impacted from the contamination from the Fayetteville Works PFAS.

2. Hydraulic Modeling. Dunn and Cumberland agree that Hydraulic Modeling is needed to provide a comprehensive assessment of the project’s feasibility, cost estimates, potential environmental impacts, capacity issues, and matters related to regulatory compliance. Dunn and Cumberland will mutually agree on the vendor to provide the comprehensive assessment, and Cumberland shall reimburse Dunn its fifty percent (50%) share of the cost of the study. Cumberland will reimburse Dunn within thirty (30) days upon receipt of each invoice.

3. Transmission and Distribution Improvements. Dunn and Cumberland will work together to identify solutions to increase Dunn's water distribution system's ability to deliver potable water and increase fire flow from currently available capacity through transmission and distribution improvements. Cumberland would pay any cost associated with such mutually agreed upon upgrades that are undertaken to serve Cumberland. Dunn shall own, manage, and operate any upgrades made to its water distribution system. Cumberland, or a water and sewer district governed by the Cumberland County Board of Commissioners, shall own, manage, and operate any water distribution system it develops or expands to receive water from Dunn. Dunn shall deliver water to Cumberland through the identified and completed transmission and distribution improvements which will be billed at the bulk purchase rate for non-capacity owning entities, as set by Dunn annually, until Cumberland purchases the agreed upon capacity.

4. Ownership and Capacity. Dunn is considering improvements to WTP or a new WTP. Cumberland may consider purchase of capacity with these improvements. The actual amount of capacity will be determined in a separate study and associated ILA.

5. Additional Funding Sources. Dunn and Cumberland pledge to use their best efforts and act in good faith to secure funding from the State of North Carolina and from the federal government, and from yet to be determined sources of grants, loans, or other sources of revenue that may be identified by Dunn and Cumberland together, or either of them hereafter from time to time to support such undertaking.

6. Effect of MOU. The purpose of this MOU is to reflect the present intentions of Dunn and Cumberland but not to be a binding contract. Either Dunn or Cumberland may terminate this MOU at any time by sending written notice to the other.

IN WITNESS WHEREOF, Dunn and Cumberland hereto have caused this Memorandum of Understanding to be executed as of the day and year first above written by its duly authorized officials for the purposes herein expressed.

CITY OF DUNN

By: \_\_\_\_\_  
William P. Elmore, Jr., Mayor  
Dunn City Council

ATTEST:

\_\_\_\_\_  
Melissa R. Matti, City Clerk

[SEAL]

COUNTY OF CUMBERLAND

By: \_\_\_\_\_  
Kirk deViere, Chairman  
Cumberland County Board of Commissioners

ATTEST:

\_\_\_\_\_

Andrea Tebbe, Clerk to the Board

[SEAL]

NORTH CAROLINA  
HARNETT COUNTY

## MEMORANDUM OF UNDERSTANDING

THIS MEMORANDUM OF UNDERSTANDING (“MOU”) entered into and made effective this the \_\_\_\_\_ day of \_\_\_\_\_, 2025, by and between County of Harnett (“Harnett”), North Carolina, a body politic and corporate under G.S. 153A-11, or a water and sewer district governed by the Harnett County Board of Commissioners and County of Cumberland (the “Cumberland”), North Carolina, a body politic and corporate under G.S. 153A-11 or a water and sewer district governed by the Cumberland County Board of Commissioners. Harnett and Cumberland are referred to collectively as the “Parties” and each individually as a “Party”.

### WITNESSETH

WHEREAS, Harnett is currently engaged in the public enterprise of owning, operating, and maintaining water and sanitary sewer systems; and

WHEREAS, Harnett owns and operates a 42 Million Gallons per Day (“MGD”) water treatment plant (“WTP”); and

WHEREAS, Harnett has been exploring the idea of constructing a new WTP on a new site, in partnership with Cumberland and other regional customers, to serve the collective needs as well as the future water needs of the region; and

WHEREAS, Harnett and the District recognize the need for new water distribution and transmission line improvements to serve Cumberland; and

WHEREAS, N.C.G.S. § 160A-461 et seq. authorize units of local government to enter into interlocal agreements with each other to execute any undertaking and allows the participating units to determine the reasonable duration of the agreements; and

WHEREAS, the Parties desire to enter into future interlocal agreements (“ILAs”) pursuant to § 160A-461, which will set forth detailed provisions for the ownership, management, maintenance and operation of the new WTP, transmission lines and appurtenances necessary for the provision of water treatment services to regional customers served by the Parties, including Cumberland County; and

WHEREAS, the Parties desire to enter into this MOU to memorialize their present intentions and plans to continue working together towards the execution of a series of ILAs, or to explore other viable options for the provision of potable water to regional customers throughout Cumberland County through transmission and distribution improvements to existing infrastructure and the construction and development of the new WTP, as outlined below, and to show their support for exploring and securing a long-term solution to the region’s water needs.

NOW, THEREFORE, for and in consideration of the mutual promises and covenants set forth herein, the parties enter into this MOU to set forth the basic agreements between the parties and the parameters of this undertaking, which shall include the following:

1. Bulk Water Purchase Agreements. Harnett will engage with Cumberland and municipalities within Cumberland County to negotiate bulk water purchase agreements where infrastructure and capacity exist to furnish potable water.

2. Transmission and Distribution Improvements. The Parties will work together to identify solutions to increase Harnett's water distribution system's ability to deliver potable water and increase fire flow from currently available capacity through transmission and distribution improvements. Cumberland would pay any cost associated with such mutually agreed upon upgrades that are undertaken to serve Cumberland County and municipalities within Cumberland County. Harnett shall own, manage, and operate any upgrades made to its water distribution system. Water delivered through the identified and completed transmission and distribution improvements will be billed at the bulk purchase rate for non-capacity owning entities, as set by the Harnett County Board of Commissioners annually.

3. Construction of New WTP. Harnett shall construct, manage, and operate a new WTP with an expected capacity between 8 to 15 MGD. Cumberland may purchase reserve capacity up to 6 MGD in the planned WTP, subject to change based on permitting, feasibility, actual capacity available in the WTP or the needs of Harnett customers. Cumberland has the option to purchase available additional capacity, if agreed upon by both Parties. Actual amount of reserve capacity to be purchased will be determined and memorialized in a separate ILA. Any distribution and transmission upgrades associated with delivering Cumberland its purchased reserve capacity in the WTP will be determined at a future date and the cost associated with those upgrades will be paid by the Parties based on a cost sharing arrangement to be determined at that time and memorialized in a separate ILA.

4. Ownership and Reserved Capacity. Harnett shall own, manage, and operate the new WTP and Cumberland shall have a certain level or percentage of reserve capacity. Cumberland will pay for its proportional share of construction, engineering, and professional services, based on the percentage in reserve capacity, which will be finalized at a later date, and memorialized in the ILA. It is the intent of the Parties that each Party will pay its proportionate share of costs for construction, engineering, and professional services. The ILA will contain provisions for the Parties to pay its proportionate share of any other unforeseen costs associated with plant construction.

5. Duration of Future Agreements. The duration of any ILA between Harnett and Cumberland will be equal to the service life of the new plant (including subsequent expansions, if any) or transmission and distribution infrastructure and appurtenances. The ILA will have provisions for re-negotiation and extension as needed to accommodate growth, the need for future water treatment capacity, and other unforeseen events.

6. Additional Funding Sources. The parties pledge to use their best efforts and act in good faith to secure funding from the State of North Carolina and from the federal government, and from yet to be determined sources of grants, loans, or other sources of revenue that may be identified by the parties together, or either of them hereafter from time to time to support such undertaking.



7. Effect of MOU. The purpose of this MOU is to reflect the present intentions of the Parties but not to be a binding contract. Either Party may terminate this MOU at any time by sending written notice to the other Party.

IN WITNESS WHEREOF, the parties hereto have caused this Memorandum of Understanding to be executed as of the day and year first above written by its duly authorized officials for the purposes herein expressed.

COUNTY OF HARNETT

By: \_\_\_\_\_  
Matt Nicol, Chairman  
Harnett County Board of Commissioners

ATTEST:

\_\_\_\_\_  
Melissa Capps, Clerk to the Board

[SEAL]

COUNTY OF CUMBERLAND

By: \_\_\_\_\_  
Kirk deViere, Chairman  
Cumberland County Board of Commissioners

ATTEST:

\_\_\_\_\_  
Andrea Tebbe, Clerk to the Board

[SEAL]



## **SOLID WASTE MANAGEMENT**

### **MEMORANDUM FOR BOARD OF COMMISSIONERS AGENDA OF SEPTEMBER 15, 2025**

**TO: BOARD OF COUNTY COMMISSIONERS**

**FROM: AMANDA LEE, PE, GENERAL MANAGER FOR NATURAL RESOURCES**

**DATE: 9/10/2025**

**SUBJECT: APPROVAL OF UTILITY SERVICE AGREEMENT FOR THE KELLY HILLS/SLOCOMB ROAD WATER AND SEWER DISTRICT**

#### **BACKGROUND**

The Public Utilities Department has received a request from Slocomb at Bethune, LLC to connect phased retail space to the existing Kelly Hills/Slocomb Road Water and Sewer District. The project will consist of installation of approximately 349 feet of an 8-inch sewer line with 4 individual 4-inch commercial sewer services, with all costs being paid by Slocomb at Bethune, LLC. The Utility Service Agreement is needed to set the guidelines between Slocomb at Bethune, LLC and Kelly Hills/Slocomb Road Water and Sewer District, to ensure proper installation and connection to the sewer system. Upon completion of construction of the sewer lines and written acceptance of the as-builts and certifications the said utility mains shall be the property of Kelly Hills Water and Sewer District and will be operated and maintained as part of the existing Kelly Hills sewer system.

Further information regarding the capacity available in the Kelly Hills sewer system has been requested from Fayetteville Public Works Commission due to the future connection of the Titanium plant and will be provided at the infrastructure meeting.

The County Attorney has reviewed the attached Utility Service Agreement.

At their September 8, 2025, meeting, the Infrastructure Committee approved moving this item to the Consent Agenda of the September 15, 2025, Board of Commissioners' meeting and the Kelly Hills Water and Sewer District Governing Board Consent Agenda.

#### **RECOMMENDATION / PROPOSED ACTION**

The Public Utilities Project Manager, General Manager for Natural Resources and Management recommend the approval of the Utility Service Agreement for the Kelly Hills/Slocomb Road Water and Sewer District.

**ATTACHMENTS:**

Description	Type
Meyers Engineering, PLLC Memo	Backup Material
Utility Service Agreement	Backup Material



August 27, 2025

Amy Hall  
Public Utilities Project Manager  
Cumberland County, NC

Subject: Kelly Hills Collection System

Mrs. Hall:

We have not received information about process water use and sewer discharge, so anticipated sewage discharge is based on 15A NCAC 02T .0114 Wastewater Design Flow Rates  
Factories, excluding industrial waste - **25 gpd/employee/shift x 300 employees = 7500 gpd.**

The site would discharge to an existing 15-inch gravity sewer that is tributary to the Kelly Hills Pump Station. That 15-inch gravity sewer is owned by Cumberland County and the Kelly Hills Pump Station is owned by the Fayetteville Public Work Commission (PWC).

From previous study by McGill dated October 2024:

*"The Kelly Hills Lift Station is owned and operated by Fayetteville PWC. The station includes a flow meter that is used for recording flow generated by the Kelly Hills Sewer Collection System. The monthly records from that station were provided by the County, and have used to develop an average use per user for the District. The results of the analysis are below.*

<i>Lift Station Design Capacity</i>	<i>100,000 GPD</i>
<i>Metered Average Daily Use</i>	<i>16,900 GPD</i>
<i>Permitted, Not Yet Tributary Flow</i>	<i>29,520 GPD</i>
<i>Pending Development Usage</i>	<i>41,400 GPD</i>
<b><i>Lift Station Available Capacity*</i></b>	<b><i>53,580 GPD</i></b>

*\*Does not include pending development usage. Available capacity including pending amount is 12,150 GPD."*


Based on the McGill Study information, the available capacity of the Kelly Hills Pump Station is 12,150 gpd when pending development is considered. Therefore, there is sufficient capacity in the pump station for the proposed industrial use based on 25 gallons per day per employee. Any industrial process water should be submitted for further evaluation.

The Kelly Hills collection system owned by Cumberland County, specifically the 15-inch gravity sewer line adjacent to the proposed economic development site, has more than adequate capacity to provide service for the proposed 300 employees, based on 15A NCAC02T .0114 Wastewater Design Flow Rates. The capacity of a 15-inch sewer at minimum grade flowing half full **810,765 gallons per day**.

The site may require a pump station based on topography. A proposed layout could determine if the site can be served by gravity versus a pump station.

If you need any other information, please do not hesitate to contact Meyers Engineering.

Sincerely,

  
Jay Meyers, PE  
President

**NORTH CAROLINA  
CUMBERLAND COUNTY**

**AGREEMENT FOR UTILITY SERVICE(S)**

THIS AGREEMENT, made this \_\_\_\_\_ day of \_\_\_\_\_, 2025 by and between the NORCRESS Water and Sewer District (hereinafter called "DISTRICT") and Slocomb at Bethune, LLC. (hereinafter called "APPLICANT")

**WITNESSETH**

WHEREAS, APPLICANT desires public utility services from DISTRICT as selected below. (check all that apply)

- Water and/or Sewer Utility Extension
- Water Service
- Sewer Service

NOW THEREFORE, in consideration of the premises and of the mutual agreements hereinafter set forth, the parties hereby agree and contract as follows:

**DEFINITION OF DISTRICT'S AGENTS.** Throughout this Agreement, any reference to "Agent" or "DISTRICT'S Agent" shall mean any worker, employee, official, contractor, consultant or operator of DISTRICT'S water and sewer services or systems whether employed, hired, or contracted by DISTRICT or Cumberland County on behalf of DISTRICT.

**Article 1: Water and/or Sewer Utility Extension**

As selected above, APPLICANT hereby requests installation of water and/or sanitary sewer utility services as described in Exhibit "T", Project Summary, and is subject to the following terms and conditions:

- A. APPLICANT shall perform all work necessary to accomplish the proposed utility extension including, but not limited to, design, specifications, permitting and construction. Applicant will furnish all material, perform all labor, and pay all costs to construct, by a contractor licensed to perform utilities construction in North Carolina, to DISTRICT'S rules currently in effect and approved by the DISTRICT'S governing board, all applicable local codes and ordinances, the current service provider, and State regulations and laws for those utilities. The work shall be completed in accordance with this Agreement. The DISTRICT or its Agent will review and inspect work performed by APPLICANT to assure that the work meets the purpose for which it is intended and is in compliance with all requirements and conditions contained herein. Such review and approval will not relieve APPLICANT from complying with all said conditions and requirements.
- B. Such construction shall be undertaken and completed as soon as practicable, and not later than one year from date of this agreement, unless delayed or prevented by acts of God, or other things beyond APPLICANT's control. In the event that construction is not completed one year from date of this agreement, then DISTRICT, through the Director of the Cumberland County Public Utilities Department may extend the agreement upon such terms and conditions as the Director deems necessary.
- C. Fees shall be paid by APPLICANT for services provided by DISTRICT, the service provider, or its Agent for the following:
  - (1) review and approval of plans, specifications, and necessary documents, to include final review of the required documents to assure that DISTRICT has legal title to necessary rights-of-way and easements;
  - (2) review and approval of the Bill of Sale provided by APPLICANT, and acceptance of the utility extensions by DISTRICT;

- (3) and daily inspection of the construction in progress, as needed to ensure that construction of the utility extensions are in accordance with this Agreement, the Plans and Specifications, and any other DISTRICT requirements;
  - (4) conduction of pre-flush required pressure tests, any retesting which may be necessary, and sampling of the completed extension after flushing for submittal to the State, or a certified testing laboratory, for bacteriological examination;
  - (5) conduction of required pressure tests, after flushing, and any retesting of sewer system improvement which may be necessary;
  - (6) approval of the sewer video taping schedule, supervision of video taping and revisions/approval of the completed tape and log sheets;
  - (7) final inspection of the completed extension and preparation of the inspection report, which shall set forth any deficiencies that may exist;
  - (8) reinspection of any deficient work;
  - (9) review of the water and/or sewer as-built construction drawings; and
  - (10) reinspection at the end of the one-year warranty period.
- D. Materials and equipment shall be new and shall be as specified in this Agreement, the plans and specifications, the service providers standards, or if not specified, of a quality approved by DISTRICT. All materials and equipment furnished are warranted by APPLICANT as new and in accordance with this Agreement and the approved plans and specifications, and suitable for the intended purpose. In addition, APPLICANT, shall furnish DISTRICT copies of the supplier's warranty and shall adopt the same as the warranty of APPLICANT, and shall also be liable thereon to DISTRICT.
- E. Connection to DISTRICT's water and/or sanitary sewer system of buildings constructed after the date of this agreement on parcels of land that are subject to the Cumberland County's Subdivision Ordinance shall be governed by the requirements of Cumberland County's Subdivision Ordinance.
- F. Upon satisfactory completion of construction of said water and/or sanitary sewer mains and written acceptance of such construction by DISTRICT, said utility mains shall be the property solely of DISTRICT and DISTRICT will maintain same after the one (1) year warranty set forth below has expired. To accurately value the assets being transferred, APPLICANT shall complete and submit a preliminary Statement of Project Cost Form attached as Exhibit "II" to DISTRICT at time of submittal and a final certified form at project completion.
- G. Warranty: APPLICANT shall warrant that the water and/or sanitary sewer utilities to be owned by DISTRICT shall be free from any defects in materials and workmanship. APPLICANT also warrants that it shall be solely responsible for the repair of any damage caused by its agents or employees. Said warranties shall remain in full force and effect for a period of one (1) year from the date of final acceptance of the facilities by DISTRICT. In the event it becomes necessary to repair and/or replace any of the facilities during the initial one (1) year period, such repair and/or replacement shall be at APPLICANT's sole expense and the warranty as to those items repaired and/or replaced shall continue to remain in effect for an additional period of one (1) year from the date of final acceptance by DISTRICT of those repairs and/or replacements. If DISTRICT must repair and/or replace said utilities during the warranty period due to response time requirements, DISTRICT shall bill APPLICANT for work completed and APPLICANT shall remit payment therefore within thirty (30) days of the date of the invoice.
- H. Water and/or sanitary sewer connections to structures along said utility mains from service laterals installed by APPLICANT will not be made nor will such service be activated until all work to be performed by APPLICANT has been satisfactorily completed and written acceptance of such work is given by DISTRICT. Also, if a water main is extended pursuant to this agreement, it must be tested and sterilized by APPLICANT'S contractor before activation of any water service from said water main.



- I. Water and/or sanitary sewer service will be supplied to structures now or hereafter located along said utility mains in accordance with DISTRICT's rules, regulations, and rate schedules applicable to such structures and currently in effect at the time of application for service. If all normal DISTRICT fees and charges for installation and activation of such services have been paid by applicants for said services, DISTRICT will thereafter use its best efforts to supply water to said structures at good operating pressure, but in no event shall DISTRICT be liable for failure to do so, it being understood that all such original operating fees, charges, rates, etc., are, solely at DISTRICT's discretion, subject to change by DISTRICT.
- I. Any replacements or adjustments in elevations and grades of those water and/or sanitary sewer service laterals, including water meters and boxes and sanitary sewer cleanout stacks, which were originally installed by APPLICANT'S contractor in accordance with approved plans by APPLICANT's engineer, shall be at APPLICANT's expense; and the determination of DISTRICT that such replacements or adjustments are required shall be final and binding on APPLICANT.
- J. During construction of project, APPLICANT will be responsible and pay DISTRICT as invoiced for any and all damages to DISTRICT utilities and materials except when such damages are caused by DISTRICTS forces. APPLICANT shall remit payment therefore within thirty (30) days of the date of the invoice.
- K. APPLICANT'S contractor shall be responsible for complying with any and all statutes, rules, regulations or ordinances, which may be imposed by other governmental agencies (local, state and federal), which have jurisdiction. APPLICANT shall hold harmless DISTRICT against any claims, fines or civil penalties resulting from APPLICANT'S contractor's failure to comply with said regulations.
- L. The Water and Sewer Utility Extension is further illustrated in Exhibit "IIP", Water and Sewer Utility Extension Map. APPLICANT shall be responsible for costs (engineering, materials, design, etc.) associated with major design changes that deviate from Exhibit "II" and the attached map as identified in Exhibit "IIP".

## **Article 2: General Terms and Conditions**

### **AUTHORITY:**

DISTRICT shall have general authority over the work to be accomplished under this Agreement, provided nothing contained in this Agreement shall be construed to require DISTRICT to direct the method or manner of performing any work by APPLICANT. Incident to this general authority, DISTRICT may engage engineers and contractors to observe construction, inspect, test, and evaluate any construction performed by APPLICANT's contractors and assist APPLICANT'S contractors with correcting or completing any construction if DISTRICT determines the construction by APPLICANT'S contractors creates a risk of harm to DISTRICT'S water or sewer system for which APPLICANT'S extension is permitted. APPLICANT shall be responsible for the costs incurred by DISTRICT for this purpose.

DISTRICT shall decide all questions pertaining to the interpretation of this Agreement and the approved plans and specifications prepared thereto, the quality or acceptability of materials furnished, and work performed under this Agreement on the part of APPLICANT. The decision of DISTRICT on such matters shall be final.

All work under this Agreement shall be performed to the satisfaction of DISTRICT, and the decision by DISTRICT as to whether the work has been performed in a satisfactory manner shall be final.

DISTRICT may stop work under this Agreement whenever, in its opinion, such stoppage is necessary to ensure proper performance of this Agreement. DISTRICT may also reject all work and materials which, in its opinion, do not conform to this Agreement.

### **DETERMINATION OF "OR EQUAL"**

DISTRICT or its Agent shall be the sole judge of the questions of "or equal" of any supplies, materials or equipment proposed by APPLICANT. APPLICANT shall pay to DISTRICT the costs of test and evaluations needed to determine the acceptability of alternates proposed by APPLICANT.

## **STOPPAGE OF WORK**

If APPLICANT performs any work contrary to this Agreement, laws, ordinances, rules, or regulations; or, prior to obtaining any necessary permits or other required permission, DISTRICT may order the work stopped.

## **INSPECTIONS AND TESTS**

Inspection by DISTRICT or its Agent is required for various aspects of the utility system. Such aspects include, but are not limited to: water and/or sewer main pipe laying operations, installation of sleeves, couplers and adapters on pipe, pipe bedding and backfilling, casings, concrete encasement or other special installations, repairs to water and/or sewer utilities, all water main fittings with concrete blocking, pressure testing water mains, water main purity samples after flushing, main wet taps, any cut-in's on existing water mains, hydrant installations, water service installations, vault installations and appurtenances, hole cuts on sanitary sewer pipe, manhole installations and pipe connections, manhole vacuum testing, manhole core drilling, air testing sewer main and side sewer stubs, flushing/cleaning sewer mains and CCTV inspection, grease/oil-water separators, vehicle wash and dumpster area drains, tee locations and stub markers, sewer depth at right-of-way/easement line, sewer slope, fittings and clean-outs.

Inspection of the work by DISTRICT or its Agent shall be strictly for the benefit of DISTRICT or its Agent and no other person or agency.

DISTRICT staff or its Agent, at all times, will have access to the work area for the purpose of inspecting and testing. APPLICANT shall provide facilities for safe access, inspection, and testing.

If any work is covered without the approval or consent of DISTRICT or its Agent it shall be uncovered for inspection at APPLICANT'S expense, if required by DISTRICT or its Agent.

APPLICANT shall make reasonable tests of the work at APPLICANT'S expense upon DISTRICT'S or its Agent's request and shall maintain a record of such tests.

Before a performance test is to be observed by DISTRICT or its Agent, APPLICANT shall make such preliminary tests as are necessary to assure that the material and/or equipment are in accordance with the approved plans and specifications provided. If, for any reason, the test observed is unsatisfactory, APPLICANT shall pay all costs incurred for the inspection of further testing.

Should APPLICANT elect to work more than eight hours per weekday, all costs of inspection thus entailed may be charged to APPLICANT at the overtime billing rate.

Approval is required from DISTRICT or its Agent to work nights, weekends, and holidays. After-hours inspections may not be possible due to the lack of staff availability. APPLICANT shall submit its proposed schedule to work nights, weekends, or holidays at least five days in advance (not including weekends and holidays) for review. If APPLICANT elects to work on weekends, nights or holidays, and such work schedule is approved by DISTRICT or its Agent, all costs of inspection may be charged to the APPLICANT at the overtime billing rate.

Where this Agreement, approved plans and specifications, or laws, ordinances, rules, or regulations of any governmental authority require that any work be specially tested or inspected, APPLICANT shall give DISTRICT notice that such tests or completed work is ready for inspection. APPLICANT shall notify DISTRICT of the date, time, and location of the inspection. Required certificates of inspection shall be secured by APPLICANT.

Notice of deficiencies shall be given to APPLICANT upon completion of each inspection. APPLICANT shall correct such deficiencies within seven days of the notice and before final inspection is made by DISTRICT.

A representative of APPLICANT'S contractor shall arrange a time to accompany DISTRICT or its Agent on the final inspection and subsequent reinspection, if required. DISTRICT or its Agent will not make the final inspection until the physical work, including final clean-up and all extra work ordered by the Inspector has been completed.

Deficiencies discovered during the final inspection shall be corrected within seven days of notice thereof and, in no instance, shall service be provided until the deficiencies are corrected and the utility extensions pass reinspection.

### **AVAILABILITY OF PROJECT DOCUMENTS**

APPLICANT shall keep at least one copy of the following project documents constantly available at the construction site: (1) approved construction plans and shop drawings, and (2) construction specifications.

### **MATERIALS AND EQUIPMENT LIST**

APPLICANT shall file three copies of a materials and equipment list with DISTRICT prior to commencing construction. This list shall designate the quantity, manufacturer and model number of materials and equipment to be installed under this Agreement.

The materials and equipment list will be checked by DISTRICT or its Agent for conformity with this Agreement and the approved plans and specifications provided. DISTRICT will determine the conformity of the list with reasonable promptness. APPLICANT shall make any required corrections and file two correct copies with DISTRICT within one week after receipt of the required corrections. DISTRICT'S review of the list shall not relieve APPLICANT from the responsibility of providing materials and equipment suitable for their intended purpose nor for deviations from this Agreement or the plans and specifications without written approval from DISTRICT.

### **WATER METERS**

It shall be the responsibility of APPLICANT to make application and pay any necessary fees to DISTRICT for the installation of water meters. APPLICANT shall not purchase and install water meters from a private supplier.

Single family meter applications shall not be submitted until after acceptance of the utility extensions.

### **SEWER TAPS**

It shall be the responsibility of APPLICANT to make application and pay any necessary fees to DISTRICT for the connection of sewer taps to the mains. Elder valve installations may be required in addition to sewer taps.

Single family sewer connections shall not be submitted until after acceptance of the utility extensions.

### **SAFETY:**

Safety in, on, or about the construction site is the sole and exclusive responsibility of APPLICANT. APPLICANT'S means and method of work performance, superintendent of APPLICANT'S employees and sequencing of construction are also sole and exclusive responsibilities of APPLICANT.

APPLICANT shall be responsible for the safety of any person, including but not limited to, any worker, DISTRICT'S Agent, Owner and/or Owner's representative, visitor or invitee on the site of the work at all times during the prosecution of the work, regardless of whether the individual is an employee of APPLICANT or APPLICANT'S Contractor or Sub-Contractor. APPLICANT is responsible for compliance with the rules, regulations and interpretations of the North Carolina Department of Labor relating to "North Carolina Occupational Safety and Health Standards (OSHA) for the Construction Industry" (Title 29 CFR Part 1926 and 29 CFR Part 1919 as adopted by 13 NCAC 7C.0101) and revisions as adopted by N.C.G.S. § 95-126 through 155 and additionally with normal industry safety practices or standards.

DISTRICT shall have the right to inspect the work for pay application compliance and compliance with DISTRICT'S standards and specifications but is not required to do so. DISTRICT shall further have the right to monitor the progress of the work, but no such inspection shall relieve APPLICANT of any duty or obligation it might have under the terms of this Agreement. Nothing in this Agreement shall relieve APPLICANT of any duty or obligation to direct the means and methods of the work.

**INDEMNIFICATION:**

APPLICANT shall indemnify and hold DISTRICT and DISTRICT'S Agents harmless from and against all liabilities, claims, demands, suits, losses, damages, costs, and expenses (including attorney's fees) for bodily injury to or death of any person, or damage to or destruction of any property proximately caused by the negligence of APPLICANT or any person for whom APPLICANT is legally responsible during the performance of services relative to this Agreement.

**INDEPENDENT CONTRACTOR:**

APPLICANT is an independent contractor and shall undertake performance of the services relative to this Agreement as an independent contractor. APPLICANT shall be wholly responsible for the methods, means, and techniques of performance. DISTRICT shall have no rights to supervise methods and techniques of performance employed by APPLICANT, but DISTRICT shall have the right to observe such performance.

**COMPLIANCE WITH LAWS:**

In performing services relative to this Agreement, APPLICANT shall comply with all applicable regulatory requirements including federal, state, and local laws, rules, regulations, orders, codes, criteria, and standards. APPLICANT shall be responsible for procuring all permits, certificates, and licenses necessary to allow APPLICANT to undertake activities and construction relative to this Agreement.

**FINAL SEQUENCE FOR ACCEPTANCE OF PROJECTS**

In order for DISTRICT to accept the utility extension as part of DISTRICT'S assets, APPLICANT must complete the following:

- (1) APPLICANT'S Contractor completes all utility work and makes an appointment for final inspection.
- (2) DISTRICT'S Inspector inspects, re-inspects "punch list" items, and signs off as "complete", provided there are no deficiencies.
- (3) All applicable requirements of this Agreement have been satisfied, including but not limited to, the Operation and Maintenance Manual approved and recordable, outstanding fees paid, easements verified & recordable, Bills of Sale for transfer of facilities to be owned by DISTRICT, Maintenance Bonds, if greater than original Performance Bonds, Certification of Construction Cost, and final as-builts hard copies, CAD and shapefiles received.

**NOTICE:**

Any formal notice, demand, or request required by or made in connection with this Agreement shall be deemed properly made if delivered in writing or deposited in the United States mail, postage prepaid, to the address specified below.

APPLICANT:           Name: Slocomb at Bethune, LLC  
                              Attention: Deno Hondros, Managing Member  
                              Address: 304 Courtyard Lan  
                              City, State, Zip: Fayetteville, NC 28303

DISTRICT:            Name: County of Cumberland  
                              Attention: Kelly Hills/Slocomb Road Water and Sewer District  
                              Address: P.O. Box 1829  
                              Fayetteville, NC 28302

Nothing contained in this Article shall be construed to restrict the transmission of routine communication between representatives of APPLICANT and DISTRICT.

**GOVERNING LAW:**

This Agreement shall be governed by the laws of the State of North Carolina.

**BREACH:**

APPLICANT'S failure to observe or perform any of the terms, warranties, conditions, requirements, or provisions of this Agreement shall constitute a breach of this Agreement by APPLICANT. In the event of a breach of this Agreement by APPLICANT, DISTRICT, due to such breach, shall have the right to terminate this Agreement upon which DISTRICT shall have no further obligation to perform under this Agreement and APPLICANT shall have no right to perform any further work under this Agreement.

In the event of breach of this Agreement by APPLICANT and termination of this Agreement by DISTRICT, APPLICANT hereby shall reimburse DISTRICT for all expenditures made in relation to, and in furtherance of, this Agreement.

**NONWAIVER OF BREACH:**

No breach or non-performance of any term of this Agreement shall be deemed to be waived by either party unless said breach or non-performance is waived in writing and signed by the parties. No waiver of any breach or non-performance under this Agreement shall be deemed to constitute a waiver of any subsequent breach or non-performance and, for any such breach or non-performance, each party shall be relegated to such remedies as provided by law.

**SEVERABILITY:**

The invalidity, illegality, or unenforceability of any portion or provision of this Agreement shall in no way affect the validity, legality, and/or enforceability of any other portion or provision of this Agreement. If any provision of this Agreement is held invalid, illegal, or unenforceable by a court of law with jurisdiction, then such provision shall be modified to the mutual satisfaction and agreement of the parties to reflect the parties' intent. In the event the parties cannot reach an agreement as to a modification of said provision, any invalid, illegal, or unenforceable provision of this Agreement shall be deemed severed from this Agreement, and the balance of this Agreement shall be construed and enforced the same as if the Agreement had not contained any portion or provision which was invalid, illegal, or unenforceable.

**ASSIGNMENT:**

APPLICANT shall not assign, sublet, subcontract or transfer any rights under or interest in this Agreement without the written consent of DISTRICT.

**BENEFITS LIMITED TO PARTIES:**


Nothing herein shall be construed to give any right or benefits hereunder to any third parties other than DISTRICT and APPLICANT.

IN WITNESS WHEREOF, the parties hereto through their duly authorized officers has executed this instrument as to the date and year first above written.

Slocomb at Bethune, LLC

BY:   
Deno Hondros, Managing Member

WITNESS:

  
Name, Title WITNESS

Kelly Hills/Slocomb Road Water & Sewer District

BY: \_\_\_\_\_  
Kirk deViere, Chairman

WITNESS:

\_\_\_\_\_  
Andrea Tebbe, Clerk to the Board

Approved for Legal Sufficiency  
Kelly Hills/Slocomb Road Water & Sewer District

\_\_\_\_\_  
Rickey L. Moorefield, County Attorney  
Attorney for Kelly Hills/Slocomb Road Water and Sewer District

EXHIBIT "I"

PROJECT SUMMARY

PHASE ONE - NEW RETAIL AND FLEX SPACE

Project Name: SLOCOMB AT BETHUNE

Engineer: GEORGE M. ROSE

Project Location: 133 BETHUNE DRIVE  
FAYETTEVILLE, NC 28311

Developer: SLOCOMB @ BETHUNE, LLC

Parcel Number: \_\_\_\_\_

Asset Summary

APPROXIMATELY 349 LINEAR FEET OF 8"  
SOR-26 PVC SANITARY SEWER; 4 EACH 4'  
DIAMETER MANHOLES

Project Highlights

Project description/location goes here.

PHASE ONE CONSISTS OF A 5,144 SQUARE FOOT  
RETAIL BUILDING WITH ASSOCIATED PARKING AND  
UTILITIES. FUTURE PHASE TWO IS A 14,400 FLEX  
SPACE COMMERCIAL BUILDING WITH ASSOCIATED PARKING.  
PHASE TWO WILL INVOLVE A FURTHER EXTENSION OF  
SEWER FACILITIES.



**EXHIBIT "II"**

**STATEMENT OF TOTAL PROJECT COST**

Developer/Applicant SLOCOMB@ BETHUNE, LLC Contractor \_\_\_\_\_  
 Project Name/Loc PHASE ONE - NEW RETAIL AND FLEX  
SPACE SLOCOMB@ BETHUNE Pipe Supplier \_\_\_\_\_  
133 BETHUNE DRIVE Engineer GEORGE M. ROSE, P.E.  
 Completion Date \_\_\_\_\_

**WATER**

_____	feet of _____	inch water main	
_____	feet of _____	inch water main	
_____	feet of _____	inch water main	
_____	- _____	inch domestic water lateral(s)	
		<b>Total water distribution*</b>	\$ _____
Mains greater than 12"			
_____	feet of _____	inch water main	
_____	feet of _____	inch water main	
		<b>Total water transmission *</b>	\$ _____

**SEWER**

<u>349</u>	feet of <u>8"</u>	inch sewer mains	
_____	feet of _____	inch sewer mains	
<u>42</u>	- <u>4</u>	inch sewer laterals	
		<b>Total sanitary sewer collection*</b>	\$ <u>31,500</u>
Mains greater than 12"			
_____	feet of _____	inch sewer main	
_____	feet of _____	inch sewer main	
		<b>Total sanitary sewer outfalls &amp; interceptors*</b>	\$ _____
_____	feet of _____	inch sewer force mains	\$ _____
_____	- _____	lift station (s)	\$ _____

**OFF-Site**

_____	feet of _____	inch water mains*	\$ _____
_____	feet of _____	inch sewer mains*	\$ _____

\*Value to include equipment, labor & materials (valves, fittings, fire mains & hydrants, manholes, etc.)

Other Project Costs:

Engineering	_____
<u>10</u> * Percentage of Project Cost	_____
Other (list detail)	<u>3,150</u>
<b>Total project cost</b>	<b>\$ <u>34,650</u></b>

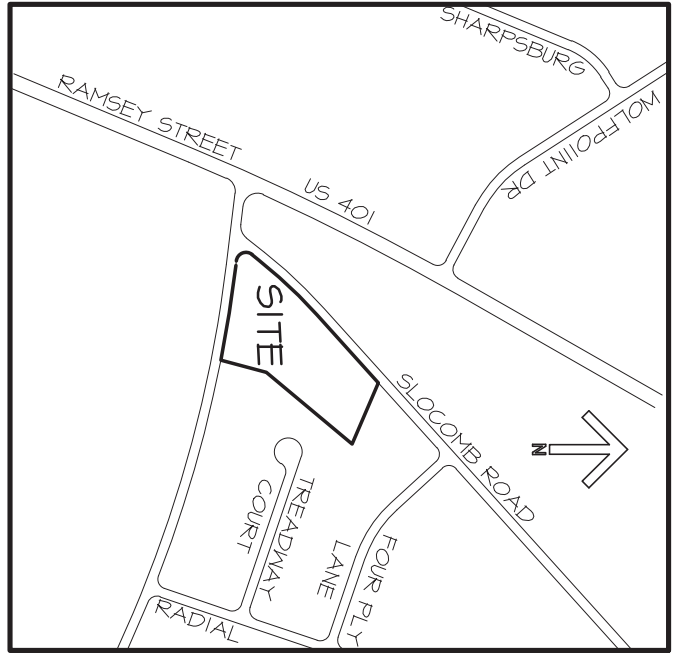
Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

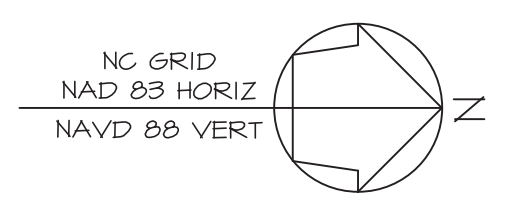
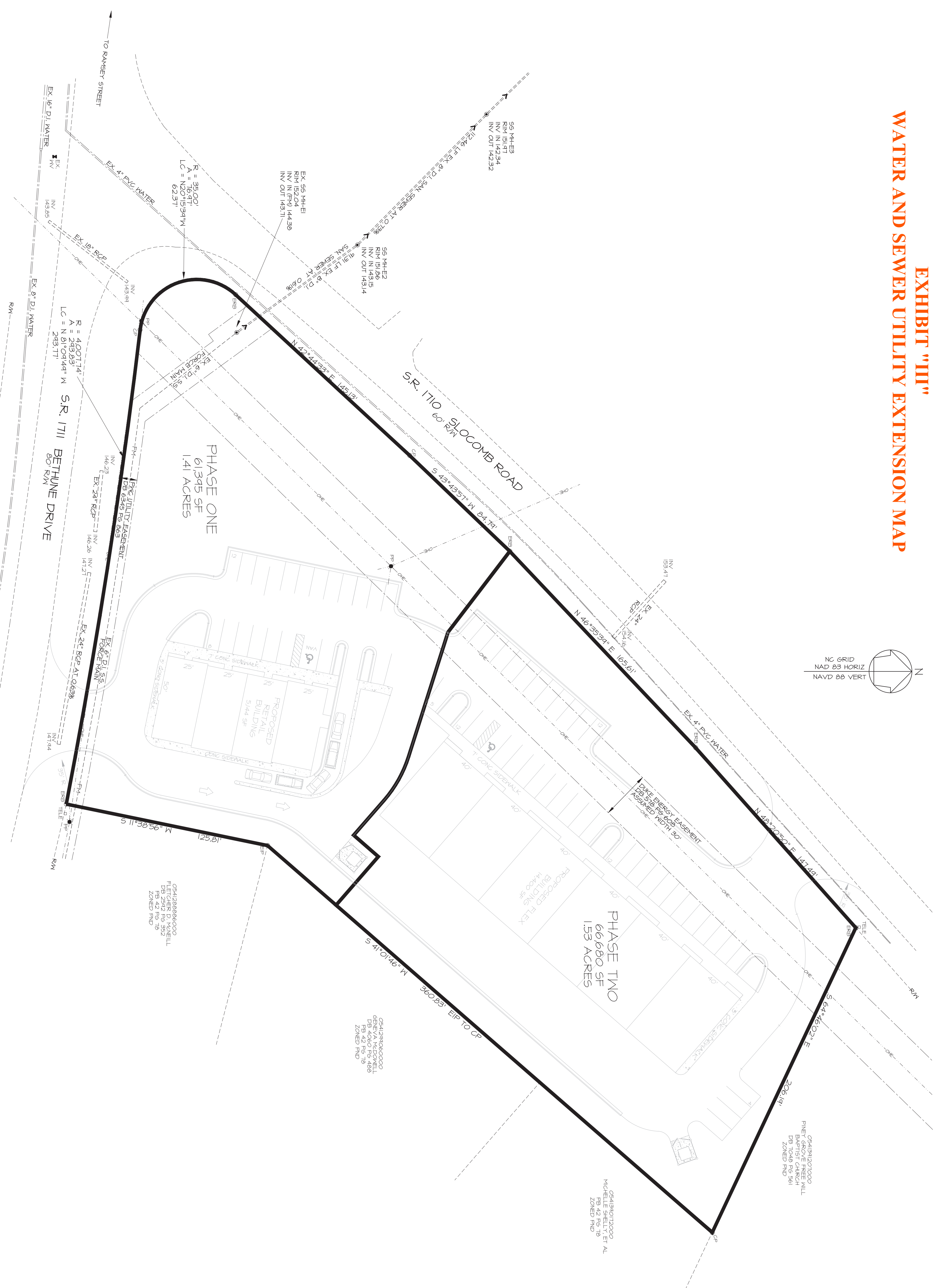
\_\_\_\_\_

# EXHIBIT "III" WATER AND SEWER UTILITY EXTENSION MAP



- LEGEND**
- ECM EXISTING CONCRETE MONUMENT (PROPERTY CORNER)
  - EBB EXIST REBAR (PROPERTY CORNER)
  - CP COMPUTED POINT (PROPERTY CORNER)
  - EIP EXIST IRON PIPE (PROPERTY CORNER)
  - LF EXIST LIGHT POLE
  - PE EXISTING POWER POLE
  - SUT--- EXISTING SIX WIRE
  - OHE--- EXISTING OVERHEAD ELECTRICAL

- NOTES**
1. TOTAL AREA IN TRACT = 182,075 SF = 244 ACRES
  2. OWNER/DEVELOPER: SLOCOMB & BETHUNE, LLC
  3. REFERENCE: DB 11768 PG 563, FB 130 PG 21
  4. REID NO. 054127074000
  5. SITE ADDRESS: 105-111 SLOCOMB ROAD, FAYETTEVILLE, NC 28311
  6. PROPERTY IS ZONED CC, CITY.
  7. TOTAL AREA IN BUILDINGS = 3144 + 14400 = 14944 SF
  8. PARKING REQUIRED = 14944/300 = 49 SPACES
  9. THERE ARE NO EXISTING INTERVIOUS SURFACES ON THIS SITE.
  10. ALL CONSTRUCTION TO BE IN ACCORDANCE WITH ALL CITY OF FAYETTEVILLE STANDARDS AND SPECIFICATIONS.
  11. THE CONTRACTOR MUST CONTACT THE NORTH CAROLINA CALL CENTER FOR INFORMATION REGARDING THE LOCATION OF ALL EXISTING UTILITIES.



**PHASING PLAN**  
SCALE 1" = 30'



DATE: JAN 2025  
DRAWN BY: GMR  
CHECKED: GMR  
SCALE: NOTED  
SHEET NO. **SP2**

PHASE ONE – NEW RETAIL AND FLEX SPACE  
**SLOCOMB AT BETHUNE**  
105-111 SLOCOMB ROAD FAYETTEVILLE, NC

**PHASING PLAN**

**GEORGE M. ROSE, P.E.**  
P.O. BOX 53441  
FAYETTEVILLE, NC 28305  
O 910-485-5822 M 910-977-5822 EMAIL george@gmrpe.com

REVISIONS





## **SOLID WASTE MANAGEMENT**

### **MEMORANDUM FOR BOARD OF COMMISSIONERS AGENDA OF SEPTEMBER 15, 2025**

**TO: BOARD OF COUNTY COMMISSIONERS**

**FROM: AMANDA LEE, PE, GENERAL MANAGER FOR NATURAL RESOURCES**

**DATE: 9/12/2025**

**SUBJECT: APPROVAL OF REQUEST FOR QUALIFICATIONS (RFQ) FOR  
ENGINEERING SERVICES FOR RHODES POND PARKING AND  
RESTROOM IMPROVEMENTS**

#### **BACKGROUND**

The County has received a North Carolina Office of State Budget and Management Grant for \$500,000 for the Rhodes Pond Improvement and Renovation Project. The project includes enhancing the park by improving the parking area and trail, as well as renovating the restroom facilities, to support overall park operations and improve visitor experience.

Following goals for improving Rhodes Pond were identified using the grant monies:

- Improve parking through increasing capacity, organizing layout, and adding ADA compliant spaces
- Renovate the current restroom facilities
- Rehabilitate Park trail

This project was presented to the Board of Commissioners on August 14, 2025, during their Board of Commissioners Regular Agenda Session with County Staff proposing to include exploring potential for a long-term lease with Wildlife Resources Commission (WRC) to discuss gameland area and area available for future park expansion, and discussions with DOT about the adjacent property that would be beneficial for the current park project.

On August 18, 2025, the Engineering Department advertised a Request for Qualifications from engineering firms that provide design, permit, and construction services for the Rhodes Pond Parking and Restroom Improvements Project. The requested services may or will include assistance with applications to Federal and/or State agencies for funding, public outreach, modeling, studies, negotiation of agreements, design, permitting, bidding, assistance with negotiating construction contracts, construction contract administration,

construction observation, and project administration. Firms had until August 29, 2025, to submit their Statement of Qualifications. Smith Gardner, Inc. was the sole bidder. Staff reviewed and scored the proposal submitted by Smith Gardner, Inc.. Following this review, staff determined that Smith Gardner, Inc. is fully qualified to provide Engineering Services for the Rhodes Pond Parking and Restroom Improvements Project.

At their September 8, 2025, meeting, the Infrastructure Committee approved moving this item to the Consent Agenda of the September 15, 2025, Board of Commissioners' meeting.

**RECOMMENDATION / PROPOSED ACTION**

The General Manager for Natural Resources and County Management recommend the following:

- 1). Accept the selection of Smith Gardner, Inc. as the best qualified firm to provide Engineering Services for the Rhodes Pond Parking and Restroom Improvements Project.
- 2.) Grant permission to enter negotiations for detailed scope of work, cost of services, and prepare contract for approval at a future Board of Commissioners meeting.

**ATTACHMENTS:**

Description	Type
RFQ Design Services for Rhodes Pond	Backup Material
RFQ Evaluation Sheet	Backup Material
Bid Response	Backup Material



## **REQUEST FOR QUALIFICATIONS (RFQ)**

### **ENGINEERING SERVICES FOR RHODES POND PARKING AND RESTROOM IMPROVEMENTS**

Cumberland County invites qualified engineering firms interested in providing design, permit, and construction services for the Rhodes Pond Parking and Restroom Improvements. The Rhodes Pond site is located at 11037 Dunn Road, Dunn, NC.

These services may or will include assistance with applications to Federal and/or State agencies for funding, public outreach, modeling, studies, negotiation of agreements, design, permitting, bidding, assistance with negotiating construction contracts, construction contract administration, construction observation, and project administration.

The design will improve parking through increasing capacity, organizing layout and adding ADA compliant spaces. Renovate the existing bathroom facility to meet ADA requirements, including enhanced aesthetics, increased functionality and code compliance.

The selected firm will be expected to provide the following services:

- Preparing complete and biddable construction documents.
- Assisting with the bidding process and contractor selection.
- Providing oversight during construction phase to ensure adherence to design and quality standards.

### **MINIMUM QUALIFICATIONS**

1. The respondent shall have a minimum of 5 years of experience in similar outdoor bathroom and parking lot improvements or projects involving accessibility upgrades and renovations.
2. Qualifications of Professional Staff – Identify the key engagement partners, managers, and other staff members who would be assigned to the project and indicate their qualifications.
3. Subcontractors – Please clearly indicate whether subcontractors will be used in fulfilling the proposal. If the firm plans to use subcontractors, please provide an overview of the firm, project involvement, qualifications of staff, and the percentage of work you anticipate them to complete.

## **SUBMITTAL REQUIREMENTS**

The submittal shall be provided on 8.5” x 11” paper with a maximum of twenty-five (25) standard typewritten pages, font size 11 or larger (not including front or back covers, table of contents and cover letter). This page limit includes tabs and other dividers. Double-sided pages will be counted as two (2) pages. The outline below shall be followed as a template for the report and the overall information that is required with each submittal:

1. Firm name, address, telephone numbers, year established and brief history of the firm.
2. Provide a copy of the firm’s licensure and Certificate(s) of Insurance.
3. The firm’s related experience in managing federally funded local projects.
4. Types of services customarily provided by the firm.
5. Name and resume of Project Manager to be assigned to this project.
6. Number of staff available for this assignment and their qualifications.
7. Identify if the firm is classified as a Disadvantaged Business Enterprise under the EPA’s criteria. Identify if any of the subcontractors are classified as a Disadvantaged Business Enterprise. Under EPA’s 8% statute (Public Law 102-389, 42 U.S.C. 4370d), an entity must establish that it is owned or controlled by socially and economically disadvantaged individuals who are of good character and citizens of the United States. The statute presumes women to be socially and economically disadvantaged individuals. Public Law 102-389, 42 U.S.C. 4370d, provides for an **8% objective** for awarding contracts under EPA financial assistance agreements to business concerns or other organizations owned or controlled by socially and economically disadvantaged individuals, including Historically Black Colleges and Universities (HBCU) and women.
8. Names of outside consultants, if any, who would be retained to provide services required for this project and the percentages of services that the sub-consultant would provide.
9. The firm’s prior experience with similar projects. Highlight and provide governmental references for past projects within the last three years. Please include a brief description of each project, original timeline to completion, final timeline to completion, original project cost estimate, final project cost, and a contact name, address, and phone number of a reference for each project listed.
10. Describe in detail the firm’s project deliverables to Cumberland County and the benefit of each and how the County can use this information moving forward.
11. List of current projects underway and the estimated cost and completion date of each.

12. The proposed time in which the firm foresees to complete the work based on the information provided in the scope of services.

Cumberland County reserves the right to request interviews of selected proposers, to make selections based on initial proposals, or to reject all proposals submitted.

**Proposals must also acknowledge that, if awarded the contract, Responder, as Contractor, shall comply with the following State contracting requirements:**

**E-VERIFY.** Contractor shall comply with the requirements of Article 2 of Chapter 64 of the General Statutes and shall require any subcontractors to do so.

**IRAN DIVESTMENT ACT CERTIFICATION.** Contractor shall certify that Contractor, and all subcontractors, are not on the Iran Final Divestment List (“List”) created by the North Carolina State Treasurer pursuant to N.C.G.S. 147-86.55-69. Contractor shall not utilize any subcontractor that is identified on the List.

**Proposals must also acknowledge that, if awarded the contract, Responder, as Contractor, shall comply with the Federal contracting requirements set forth below and on the attached Statement of Federal Terms & Conditions:**

This solicitation is for services that will be funded through a State Revolving Fund (SRF) loan and therefore all contracted consultants and subconsultants must be eligible to receive federal funds as provided by the Uniform Grant Guidance, 2 CFR Sect. 200 and must comply with Davis-Bacon Wage Requirements and American Iron and Steel Provisions.

Responder and its Principals and subcontractors must not be debarred or suspended nor otherwise on the Excluded Parties List System (EPLS) in the System for Award Management (SAM). Include verification through the [www.SAM.gov](http://www.SAM.gov) that they are not listed by enclosing a printout of the search results that includes the record date with the proposal.

Responder must provide a Statement of Conflict(s) of Interest (if any) Responder or its Principals or subcontractors may have regarding the provision of these services, and a plan for mitigating the conflict(s). Note that the County may in its sole discretion determine whether a conflict disqualifies a firm, and/or whether or not a conflict mitigation plan is acceptable.

All interested firms shall submit five (5) hard copies and one (1) USB flash drive containing a PDF of their Statement of Qualifications no later than **2:00 PM, Friday, August 29, 2025**. Late submittals will not be considered.

Qualifications packages shall be mailed or personally delivered to:

**Cumberland County Solid Waste  
Attention: Amy Hall, Public Utilities Project Manager  
698 Ann Street  
Fayetteville, North Carolina 28301**



## **EVALUATION AND AWARD OF PROJECTS**

The County will consider and evaluate Qualification Packages in accordance with N.C.G.S. 143-64.31. As part of the evaluation process, the County reserves the right to request additional information and/or interview any or all firms.

The Cumberland County Selection Committee shall review the Statements of Qualifications and shall select the best qualified individual or firm in their estimation based on the identified criteria for this project. The Committee may establish a short-list and schedule interviews with those firms if necessary. Selection criteria shall include:

- Firm Qualifications (20%)
- Relevant Experience (25%)
- Project Approach including Schedule (15%)
- Project Team Qualifications (25%) and
- Firm References (15%).

Once Cumberland County has completed their evaluation, they will rank the most qualified firms in order. Cumberland County will attempt to negotiate reasonable fees with the most qualified firm. If such negotiations are not successful Cumberland County will attempt to negotiate with the next most qualified firm until an agreement can be made.

### **QUESTIONS**

After the Request for Qualifications has been advertised, all communications between the Issuing Department and prospective Firms shall be in writing. No oral questions shall be accepted. Any inquiries, requests for interpretation, technical questions, clarifications, or additional information shall be directed to the attention of Johnny Scott, Environmental Service Project Manager, by e-mail to [ahall@cumberlandcountync.gov](mailto:ahall@cumberlandcountync.gov), no later than **2:00 PM, Thursday, August 21, 2025**. *Questions received after this date and time will not be considered for response.*

Upon receipt of questions, an Addendum will be issued if deemed necessary. A signed copy of each addendum must be included in the proposal package (the signed addendum will not be counted towards the page limit). Prospective firms are strictly prohibited from contacting County officials or employees regarding this Request for Qualifications, except in the manner described above. Violation of this provision may result in disqualification of the firm's submittal.

### **Attachments:**

- A. Execution of Proposal
- B. Certification Regarding Lobbying
- C. Noncollusion Affidavit
- D. Federal Required Contract Clauses
- E. Evaluation Sheet

# ATTACHMENT A: EXECUTION OF PROPOSAL

## EXECUTION

In compliance with this Request for Proposals (RFP), and subject to all the conditions herein, the undersigned vendor offers and agrees to furnish and deliver any or all items/services upon which prices are proposed. By executing this proposal, the undersigned vendor certifies that this proposal is submitted competitively and without collusion, that it and its principals are not presently debarred, suspended, proposed for debarment, declared ineligible from covered transactions by any Federal or State department or agency. Furthermore, the undersigned vendor certifies that it and its principals are not presently listed on the Department of State Treasurer's Final Divestment List as per N.C.G.S 147-86.55-69.

The potential Contractor certifies and/or understands the following by placing an "X" in all blank spaces:

- \_\_\_\_\_ The County has the right to reject any and all proposals or reject specific proposals with deviated/omitted information, based on the County's discretion if the omitted information is considered a minor deviation or omission. The County will not contact vendors to request required information/documentation that is missing from a proposal packet. Additionally, if the County determines it is in its best interest to do so, the County reserves the right to award to one or more vendors and/or to award only a part of the services specified in the RFP.
- \_\_\_\_\_ This proposal was signed by an authorized representative of the Contractor.
- \_\_\_\_\_ The potential Contractor has determined the cost and availability of all materials and supplies associated with performing the services outlined herein.
- \_\_\_\_\_ All labor costs associated with this project have been determined, including all direct and indirect costs.
- \_\_\_\_\_ The potential Contractor agrees to the conditions as set forth in this RFP with no exceptions.
- \_\_\_\_\_ Selection of a contract represents a preliminary determination as to the qualifications of the vendor. Vendor understands and agrees that no legally binding acceptance offer occurs until the Cumberland County Board of Commissioners, or its designee, executes a formal contract and/or purchase order.

Therefore, in compliance with the foregoing RFP, and subject to all terms and conditions thereof, the undersigned offers and agrees to furnish the services for the prices quoted within the timeframe required. Vendor agrees to hold firm offer through contract execution.

**Failure to execute/sign proposal prior to submittal shall render the proposal invalid and it WILL BE REJECTED.**

VENDOR:		
STREET ADDRESS:	P.O. BOX:	ZIP:
CITY & COUNTY & ZIP:	TELEPHONE NUMBER:	TOLL FREE TEL. NO:
PRINCIPAL PLACE OF BUSINESS ADDRESS IF DIFFERENT FROM ABOVE (SEE INSTRUCTIONS TO VENDORS ITEM #10):		
PRINT NAME & TITLE OF PERSON SIGNING ON BEHALF OF VENDOR:	FAX NUMBER:	
VENDOR'S AUTHORIZED SIGNATURE:	DATE:	EMAIL:

## **ATTACHMENT B: CERTIFICATION REGARDING LOBBYING**

Certification for Contracts, Grants, Loans, and Cooperative Agreements

**This form is required only for purchases of more than \$100,000**

The undersigned certifies, to the best of his or her knowledge and belief, that:

1. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

2. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

3. The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

The Contractor, \_\_\_\_\_, certifies or affirms the truthfulness and accuracy of each statement of its certification and disclosure, if any. In addition, the Contractor understands and agrees that the provisions of 31 U.S.C. Chap. 38, Administrative Remedies for False Claims and Statements, apply to this certification and disclosure, if any.

\_\_\_\_\_  
Signature of Contractor's Authorized Official

\_\_\_\_\_  
Name and Title of Contractor's Authorized Official

\_\_\_\_\_  
Date

# ATTACHMENT C: NONCOLLUSION AFFIDAVIT

NON-COLLUSION AFFIDAVIT  
of Cumberland

State of North Carolina County

\_\_\_\_\_, being first duly sworn, deposes and says that:

1. He/She is the \_\_\_\_\_ of \_\_\_\_\_, the proposer that has submitted the attached proposal.
2. He/She is fully informed respecting the preparation and contents of the attached proposal and of all pertinent circumstances respecting such proposal.
3. Such proposal is genuine and is not a collusive or sham proposal.
4. Neither the said proposer nor any of its officers, partners, owners, agents, representatives, employees or parties in interest, including this affiant, has in any way colluded, conspired, connived or agreed, directly or indirectly, with any other proposer firm or person to submit a collusive or sham proposal in connection with the contract for which the attached proposal has been submitted or to refrain from proposing in connection with such contract, or has in any manner, directly or indirectly sought by agreement or collusion of communication or conference with any other proposer, firm or person to fix the price or prices in the attached proposal or of any other proposers, or to fix any overhead, profit or cost element of the proposal price of the proposal of any other proposer or to secure through collusion, conspiracy, connivance or unlawful agreement any advantage against the County of Cumberland or any person interested in the proposed contract; and
5. The price or prices quoted in the attached proposal are fair and proper and are not tainted by any collusion, conspiracy, connivance or unlawful agreement on the part of the proposer or any of its agents, representatives, owners, employees, or parties in interest, including this affiant.

Signature \_\_\_\_\_

Printed Name: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

Subscribed and Sworn to Before Me,

This \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_

Notary Public \_\_\_\_\_

My Commission Expires: \_\_\_\_\_

# **ATTACHMENT D: FEDERAL REQUIRED CONTRACT CLAUSES**

**!IMPORTANT NOTE! The clauses below may not be modified or deleted under any circumstance. These are required contract clauses mandated by the Federal Government.**

This *Attachment D* is incorporated into the Service Contract between the County and the Contractor. Capitalized terms not defined in this Attachment shall have the meanings assigned to such terms in the Contract. All references to the “Contractor” or “Company” or “Vendor” or “Provider” shall be deemed to mean the Contractor.

This Contract may be funded in whole or in part with federal funding. As such, federal laws, regulations, policies and related administrative practices apply to this Contract. The most recent of such federal requirements, including any amendments made after the execution of this Contract shall govern the Contract, unless the federal government determines otherwise. The Contractor is responsible for complying with all applicable provisions, updates or modifications that occur in the future relating to these clauses.

To the extent possible, the federal requirements contained in the most recent version of the Uniform Administrative Requirements for federal awards (Uniform Rules) codified at 2.CFR Part 200, including any certifications and contractual provisions required by any federal statutes or regulation referenced therein to be included in this contract are deemed incorporated into this contract by reference and shall be incorporated into any sub-agreement or subcontract executed by the Contractor pursuant to its obligations under this Contract. The Contractor and its sub-contractors, if any, hereby represent and covenant that they have complied and shall comply in the future with the applicable provisions of the original contract then in effect and with all applicable federal, state, and local laws, regulations, and rules and local policies and procedures, as amended from time to time, relating to Work to be performed under this contract.

## **1. Drug Free Workplace Requirements**

Drug-free workplace requirements in accordance with Drug Free Workplace Act of 1988 (Pub 100-690, Title V, Subtitle D). All contractors entering into federal funded contracts over \$100,000 must comply with Federal Drug Free workplace requirements as Drug Free Workplace Act of 1988.

## **2. Contractor Compliance**

The Contractor shall comply with all uniform administrative requirements, cost principles, and audit requirement for federal awards.

## **3. Conflict of Interest**

The Contractor must disclose in writing any potential conflict of interest to the County of Cumberland or pass through entity in accordance with federal policy.

## **4. Mandatory Disclosures**

The Contractor must disclose in writing all violations of federal criminal law involving fraud, bribery, or gratuity violations potentially affecting the federal award. **Energy Conservation** The Contractor and Subcontractors agrees to comply with the mandatory standards and policies relating to energy efficiency which are contained in the state energy conservation plan issued in compliance with the Energy Policy and Conservation Act, 42 U.S.C. § 6321, et seq.

## **5. Clean Air Act and The Federal Water Pollution Control Act**

### **Clean Air Act:**

(1) The contractor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act, as amended, 42 U.S.C. § 7401 et seq.

(2) The contractor agrees to report each violation to the County and understands and agrees that the County will, in turn, report each violation as required to assure notification to the Federal Emergency Management Agency, and the appropriate Environmental Protection Agency Regional Office.

(3) The contractor agrees to include these requirements in each subcontract exceeding \$150,000 financed in whole or in part with Federal assistance provided by FEMA.

### **Federal Water Pollution Control Act:**

(1) The contractor agrees to comply with all applicable standards, orders, or regulations issued pursuant to the Federal Water Pollution Control Act, as amended, 33 U.S.C. 1251 et seq.

(2) The contractor agrees to report each violation to the County and understands and agrees that the County will, in turn, report each violation as required to assure notification to the Federal Emergency Management Agency, and the appropriate Environmental Protection Agency Regional Office.

(3) The contractor agrees to include these requirements in each subcontract exceeding \$150,000 financed in whole or in part with Federal assistance provided by FEMA.

## **6. Access to Records and Reports**

The following access to records requirements apply to this contract:

(1) The Contractor agrees to provide the County, the FEMA Administrator, the Comptroller General of the United States, or any of their authorized representatives access to any books, documents, papers, and records of the Contractor which are directly pertinent to this contract for the purposes of making audits, examinations, excerpts, and transcriptions.

(2) The Contractor agrees to permit any of the foregoing parties to reproduce by any means whatsoever or to copy excerpts and transcriptions as reasonably needed.

(3) The Contractor agrees to provide the FEMA Administrator or his authorized representatives access to construction or other work sites pertaining to the work being completed under the contract.

(4) In compliance with the Disaster Recovery Act of 2018, the County and the Contractor acknowledge and agree that no language in this contract is intended to prohibit audits or internal reviews by the FEMA Administrator or the Comptroller General of the United States.

## **7. No Obligation by Federal Government**

The Federal Government is not a party to this contract and is not subject to any obligations or liabilities to the non-Federal entity, contractor, or any other party pertaining to any matter resulting from the contract.

#### **8. Program Fraud and False or Fraudulent Statements or Related Acts**

The Contractor acknowledges that 31 U.S.C. Chap. 38 (Administrative Remedies for False Claims and Statements) applies to the Contractor's actions pertaining to this contract.

#### **9. Changes**

Any change in the contract cost, modification, change order, or constructive change must be allowable, allocable, within the scope of its funding, grant or cooperative agreement, and reasonable for the completion of project scope. All changes and/or amendments to the contract will be outlined in detail, formalized in writing, and signed by the authorized representative of each party. Contractor's failure to do so shall constitute a material breach of the contract.

#### **10. Termination**

**(1) Termination Without Cause.** The County may immediately terminate this Agreement at any time without cause by giving 30 days' written notice to the Contractor.

**(2) Termination for Default by Either Party.** By giving written notice to the other party, either party may terminate this Agreement upon the occurrence of one or more of the following events:

The other party violates or fails to perform any covenant, provision, obligation, term or condition contained in this Agreement, provided that, unless otherwise stated in this Agreement, such failure or violation shall not be cause for termination if both of the following conditions are satisfied: (i) such default is reasonably susceptible to cure; and (ii) the other party cures such default within thirty (30) days of receipt of written notice of default from the non-defaulting party; or

The other party attempts to assign, terminate or cancel this Agreement contrary to the terms hereof; or

The other party ceases to do business as a going concern, makes an assignment for the benefit of creditors, admits in writing its inability to pay debts as they become due, files a petition in bankruptcy or has an involuntary bankruptcy petition filed against it (except in connection with a reorganization under which the business of such party is continued and performance of all its obligations under this Agreement shall continue), or if a receiver, trustee or liquidator is appointed for it or any substantial part of other party's assets or properties.

Any notice of default pursuant to this Section shall identify and state the party's intent to terminate this Agreement if the default is not cured within the specified period.

**(3) Additional Grounds for Default Termination by the County.** By giving written notice to the Contractor, the County may also terminate this Agreement upon the occurrence of one or more of the following events (which shall each constitute grounds for termination without a cure period and without the occurrence of any of the other events of default previously listed):



The Contractor makes or allows to be made any material written misrepresentation or provides any materially misleading written information in connection with this Agreement, Contractor's Proposal, or any covenant, agreement, obligation, term or condition contained in this Agreement; or

The Contractor takes or fails to take any action which constitutes grounds for immediate termination under the terms of this Agreement, including but not limited to failure to obtain or maintain the insurance policies and endorsements as required by this Agreement, or failure to provide the proof of insurance as required by this Agreement.

**(4) Cancellation of Orders and Subcontracts.** In the event this Agreement is terminated by the County for any reason prior to the end of the term, the Contractor shall upon termination immediately discontinue all service in connection with this Agreement and promptly cancel all existing orders and subcontracts, which are chargeable to this Agreement. As soon as practicable after receipt of notice of termination, the Contractor shall submit a statement to the County showing in detail the services performed under this Agreement to the date of termination.

**(5) No Effect on Taxes, Fees, Charges, or Reports.** Any termination of the Agreement shall not relieve the Contractor of the obligation to pay any fees, taxes or other charges then due to the County, nor relieve the Contractor of the obligation to file any daily, monthly, quarterly or annual reports covering the period to termination nor relieve the Contractor from any claim for damages previously accrued or then accruing against the Contractor.

**(6) Obligations Upon Expiration or Termination.** Upon expiration or termination of this Agreement, the Contractor shall promptly (a) return to the County all computer programs, files, documentation, data, media, related material and any other recording devices, information, or compact discs that are owned by the County; (b) deliver to the County all Work Product; (c) allow the County or a new vendor access to the systems, software, infrastructure, or processes of the Contractor that are necessary to migrate the Services to a new vendor; and (d) refund to the County all pre-paid sums for Products or Services that have been cancelled and will not be delivered.

**(7) No Suspension.** In the event that the County disputes in good faith an allegation of default by the Contractor, notwithstanding anything to the contrary in this Agreement, the Contractor agrees that it will not terminate this Agreement or suspend or limit the delivery of Products or Services or any warranties or repossess, disable or render unusable any Software supplied by the Contractor, unless (i) the parties agree in writing, or (ii) an order of a court of competent jurisdiction determines otherwise.

**(8) Authority to Terminate.** The County Manager or their designee is authorized to terminate this Agreement on behalf of the County.

**(9) Audit.** During the term of the Agreement and for a period of one (1) year after termination or expiration of this Agreement for any reason, the County shall have the right to audit, either itself or through a third party, all books and records (including but not limited to the technical records) and facilities of the Contractor necessary to evaluate Contractor's compliance with the terms and conditions of the Agreement or the County's payment obligations. The County shall pay its own expenses, relating to such audits, but shall not have to pay any expenses or additional costs of the

Contractor. However, if non-compliance is found that would have cost the County in excess of \$5,000 but for the audit, then the Contractor shall be required to reimburse the County for the cost of the audit.

## **11. Remedies**

**(1) Liquidated Damages:** The County and the Contractor acknowledge and agree that the County may incur costs if the Contractor fails to meet the delivery times set forth in the Request for Proposal for the Products and Services. The parties further acknowledge and agree that: (a) the County may be damaged by such failures, including loss of goodwill and administrative costs; but that (b) the costs that the County might reasonably be anticipated to accrue as a result of such failures are difficult to ascertain due to their indefiniteness and uncertainty. Accordingly, the Contractor agrees to pay liquidated damages at the rates set forth in the Request for Proposal (if applicable). The parties agree that the liquidated damages set forth in the Request for Proposal shall be the County's exclusive remedy for loss of goodwill and administrative costs, attributable to a failure by the Contractor to meet such delivery times, but shall not be the remedy for the cost to cover or other direct damages.

**(2) Right to Cover:** If the Contractor fails to meet any completion date or resolution time set forth in this Agreement (including the Exhibits), and it fails to cure such default within one (1) business day after receiving written notice from the County of such failure, the County may take any of the following actions with or without terminating this Agreement, and in addition to and without limiting any other remedies it may have:

Employ such means as it may reasonably deem advisable and appropriate to perform itself or obtain the Services from a third party until the matter is resolved and the Contractor is again able to resume performance under this Agreement; and

Deduct any and all reasonable expenses incurred by the County in obtaining or performing the Services from any money then due or to become due the Contractor and, should the County's reasonable cost of obtaining or performing the services exceed the amount due the Contractor, collect the difference from the Contractor.

**(3) Right to Withhold Payment.** If the Contractor materially breaches any provision of this Agreement, the County shall have a right to withhold all payments due to the Contractor with respect to the services that are the subject of such breach until such breach has been fully cured.

**(4) Specific Performance and Injunctive Relief.** The Contractor agrees that due to the potential impact on public health, monetary damages may not be an adequate remedy for the Contractor's failure to provide the Services required by this Agreement, and monetary damages may not be the equivalent of the performance of such obligation. Accordingly, the Contractor hereby agrees that the County may seek an order granting specific performance of such obligations of the Contractor in a court of competent jurisdiction in Cumberland County, North Carolina. The Contractor further consents to the County seeking injunctive relief (including a temporary restraining order) to assure performance in the event the Contractor breaches the Agreement in any material respect.

**(5) Setoff.** Each party shall be entitled to setoff and deduct from any amounts owed to the other party pursuant to this Agreement all damages and expenses incurred as a result of the other party's breach of this Agreement, following any applicable cure periods, and provided such party has given notice of its intention to apply a setoff prior to making the payment deduction, together with documentary evidence demonstrating that such party has actually incurred the damages and/or expenses being setoff.

**(6) Other Remedies.** Except as specifically set forth in the main body of this Agreement, the remedies set forth above shall be deemed cumulative and not exclusive and may be exercised successively or concurrently, in addition to any other available remedy

## **12. Debarment and Suspension**

**(1)** This contract is a covered transaction for purposes of 2 C.F.R. pt. 180 and 2 C.F.R. pt. 3000. As such, the contractor is required to verify that none of the contractor's principals (defined at 2 C.F.R. § 180.995) or its affiliates (defined at 2 C.F.R. § 180.905) are excluded (defined at 2 C.F.R. § 180.940) or disqualified (defined at 2 C.F.R. § 180.935).

**(2)** The contractor must comply with 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C, and must include a requirement to comply with these regulations in any lower tier covered transaction it enters into.

**(3)** This certification is a material representation of fact relied upon by the County. If it is later determined that the contractor did not comply with 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C, in addition to remedies available to County, the Federal Government may pursue available remedies, including but not limited to suspension and/or debarment.

**(4)** The bidder or proposer agrees to comply with the requirements of 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C while this offer is valid and throughout the period of any contract that may arise from this offer. The bidder or proposer further agrees to include a provision requiring such compliance in its lower tier covered transactions.

## **13. Equal Employment Opportunity**

During the performance of this contract, the Contractor agrees as follows:

**(1)** The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin. The contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to the following:

Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

(2) The contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, or national origin.

(3) The contractor will not discharge or in any other manner discriminate against any employee or applicant for employment because such employee or applicant has inquired about, discussed, or disclosed the compensation of the employee or applicant or another employee or applicant. This provision shall not apply to instances in which an employee who has access to the compensation information of other employees or applicants as a part of such employee's essential job functions discloses the compensation of such other employees or applicants to individuals who do not otherwise have access to such information, unless such disclosure is in response to a formal complaint or charge, in furtherance of an investigation, proceeding, hearing, or action, including an investigation conducted by the employer, or is consistent with the contractor's legal duty to furnish information.

(4) The contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

(5) The contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.

(6) The contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

(7) In the event of the contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated, or suspended in whole or in part and the contractor may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

(8) The contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (1) through (8) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance:

Provided, however, that in the event a contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering agency,

the contractor may request the United States to enter into such litigation to protect the interests of the United States.

The applicant further agrees that it will be bound by the above equal opportunity clause with respect to its own employment practices when it participates in federally assisted construction work: *Provided*, That if the applicant so participating is a State or local government, the above equal opportunity clause is not applicable to any agency, instrumentality or subdivision of such government which does not participate in work on or under the contract.

The applicant agrees that it will assist and cooperate actively with the administering agency and the Secretary of Labor in obtaining the compliance of contractors and subcontractors with the equal opportunity clause and the rules, regulations, and relevant orders of the Secretary of Labor, that it will furnish the administering agency and the Secretary of Labor such information as they may require for the supervision of such compliance, and that it will otherwise assist the administering agency in the discharge of the agency's primary responsibility for securing compliance.

The applicant further agrees that it will refrain from entering into any contract or contract modification subject to Executive Order 11246 of September 24, 1965, with a contractor debarred from, or who has not demonstrated eligibility for, Government contracts and federally assisted construction contracts pursuant to the Executive Order and will carry out such sanctions and penalties for violation of the equal opportunity clause as may be imposed upon contractors and subcontractors by the administering agency or the Secretary of Labor pursuant to Part II, Subpart D of the Executive Order. In addition, the applicant agrees that if it fails or refuses to comply with these undertakings, the administering agency may take any or all of the following actions: Cancel, terminate, or suspend in whole or in part this grant (contract, loan, insurance, guarantee); refrain from extending any further assistance to the applicant under the program with respect to which the failure or refund occurred until satisfactory assurance of future compliance has been received from such applicant; and refer the case to the Department of Justice for appropriate legal proceedings.

#### **14. Davis-Bacon Requirements**

(1) All transactions regarding this contract shall be done in compliance with the Davis-Bacon Act (40 U.S.C. 3141-3144, and 3146-3148) and the requirements of 29 C.F.R. pt. 5 as may be applicable. The contractor shall comply with 40 U.S.C. 3141-3144, and 3146-3148 and the requirements of 29 C.F.R. pt. 5 as applicable.

(2) Contractors are required to pay wages to laborers and mechanics at a rate not less than the prevailing wages specified in a wage determination made by the Secretary of Labor.

(3) Additionally, contractors are required to pay wages not less than once a week.

#### **15. Copeland "Anti-Kickback" Act**

(1) **Contractor.** The contractor shall comply with 18 U.S.C. § 874, 40 U.S.C. § 3145, and the requirements of 29 C.F.R. pt. 3 as may be applicable, which are incorporated by reference into this contract.

(2) **Subcontracts.** The contractor or subcontractor shall insert in any subcontracts the clause above and such other clauses as FEMA may by appropriate instructions require, and also a clause

requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all of these contract clauses.

**(3) Breach.** A breach of the contract clauses above may be grounds for termination of the contract, and for debarment as a contractor and subcontractor as provided in 29 C.F.R. § 5.12.”

#### **16. Contract Work Hours and Safety Standards Act (40 U.S.C. 3701-3708)**

Where applicable, all contracts awarded in excess of \$100,000 that involve the employment of mechanics or laborers must be in compliance with 40 U.S.C. 3702 and 3704, as supplemented by Department of Labor regulations (29 CFR Part 5).

**(1) Overtime requirements.** No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

**(2) Violation; liability for unpaid wages; liquidated damages.** In the event of any violation of the clause set forth in paragraph (b) (1) of this section the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (b) (1) of this section, in the sum of \$26 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (b) (1) of this section.

**(3) Withholding for unpaid wages and liquidated damages.** The Owner shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (b)(2) of this section.

**(4) Subcontracts.** The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (b)(1) through (4) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (b)(1) through (4) of this section.

#### **17. Rights to Inventions Made Under a Contract or Agreement**



## ***Patent and Rights in Data***

Contracts involving experimental, developmental, or research work.

The term "subject data" used in this clause means recorded information, whether or not copyrighted, that is delivered or specified to be delivered under the contract. The term includes graphic or pictorial delineation in media such as drawings or photographs; text in specifications or related performance or design-type documents; machine forms such as punched cards, magnetic tape, or computer memory printouts; and information retained in computer memory. Examples include, but are not limited to, computer software, engineering drawings and associated lists, specifications, standards, process sheets, manuals, technical reports, catalog item identifications, and related information. The term "subject data" does not include financial reports, cost analyses, and similar information incidental to contract administration.

**Rights in Data** - The following requirements apply to each contract involving experimental, developmental or research work:

The following restrictions apply to all subject data first produced in the performance of the contract to which this Attachment has been added:

(1) Except for its own internal use, the Purchaser or Contractor may not publish or reproduce subject data in whole or in part, or in any manner or form, nor may the Purchaser or Contractor authorize others to do so, without the written consent of the Federal Government, until such time as the Federal Government may have either released or approved the release of such data to the public; this restriction on publication, however, does not apply to any contract with an academic institution. In accordance with 49 CFR § 18.34 and 49 CFR § 19.36, the Federal Government reserves a royalty-free, non-exclusive and irrevocable license to reproduce, publish, or otherwise use, and to authorize others to use, for "Federal Government purposes," any subject data or copyright described in subsections (2)(b)(i) and (2)(b)(ii) of this clause below. As used in the previous sentence, "for Federal Government purposes," means use only for the direct purposes of the Federal Government. Without the copyright owner's consent, the Federal Government may not extend its Federal license to any other party.

(2) Any subject data developed under that contract, whether or not a copyright has been obtained; and

(3) Any rights of copyright purchased by the Purchaser or Contractor using Federal assistance in whole or in part.

(4) When federal assistance is awarded for experimental, developmental, or research work, it is the general intention to increase knowledge available to the public rather than to restrict the benefits resulting from the work to participants in that work. Therefore, unless determined otherwise, the Purchaser and the Contractor performing experimental, developmental, or research work required by the underlying contract to which this Attachment is added agree to make available to the public, either the license in the copyright to any subject data developed in the course of that contract or a copy of the subject data first produced under the contract for which a copyright has not been obtained. If the experimental, developmental, or research work, which is the subject of the



underlying contract, is not completed for any reason whatsoever, all data developed under that contract shall become subject data as defined in subsection (a) of this clause and shall be delivered as the Federal Government may direct. This subsection (c), however, does not apply to adaptations of automatic data processing equipment or programs for the Purchaser or Contractor's use whose costs are financed in whole or in part with Federal assistance.

(5) Unless prohibited by state law, upon request by the Federal Government, the Purchaser and the Contractor agree to indemnify, save, and hold harmless the Federal Government, its officers, agents, and employees acting within the scope of their official duties against any liability, including costs and expenses, resulting from any willful or intentional violation by the Purchaser or Contractor of proprietary rights, copyrights, or right of privacy, arising out of the publication, translation, reproduction, delivery, use, or disposition of any data furnished under that contract. Neither the Purchaser nor the Contractor shall be required to indemnify the Federal Government for any such liability arising out of the wrongful act of any employee, official, or agents of the Federal Government.

(6) Nothing contained in this clause regarding rights in data shall imply a license to the Federal Government under any patent or be construed as affecting the scope of any license or other right otherwise granted to the Federal Government under any patent.

(7) Data developed by the Purchaser or Contractor and financed entirely without the use of Federal assistance that has been incorporated into work required by the underlying contract to which this Attachment has been added is exempt from the requirements of subsections (b), (c), and (d) of this clause, provided that the Purchaser or Contractor identifies that data in writing at the time of delivery of the contract work.

(8) Unless determined otherwise, the Contractor agrees to include these requirements in each subcontract for experimental, developmental, or research work financed in whole or in part with Federal assistance.

(9) Unless the Federal Government later makes a contrary determination in writing, irrespective of the Contractor 's status (i.e., a large business, small business, state government or state instrumentality, local government, nonprofit organization, institution of higher education, individual, etc.), the Purchaser and the Contractor agree to take the necessary actions to provide those rights in that invention due the Federal Government as described in U.S. Department of Commerce regulations, "Rights to Inventions Made by Nonprofit Organizations and Small Business Firms Under Government Grants, Contracts and Cooperative Agreements," 37 CFR Part 401.

(10) The Contractor also agrees to include these requirements in each subcontract for experimental, developmental, or research work financed in whole or in part with Federal assistance.

**Patent Rights** - The following requirements apply to each contract involving experimental, developmental, or research work:

(1) General - If any invention, improvement, or discovery is conceived or first actually reduced to practice in the course of or under the contract to which this Attachment has been added, and that

invention, improvement, or discovery is patentable under the laws of the United States of America or any foreign country, the Purchaser and Contractor agree to take actions necessary to provide immediate notice and a detailed report to the party at a higher tier.

(2) Unless the Federal Government later makes a contrary determination in writing, irrespective of the Contractor's status (a large business, small business, state government or state instrumentality, local government, nonprofit organization, institution of higher education, individual), the Purchaser and the Contractor agree to take the necessary actions to provide those rights in that invention due the Federal Government as described in U.S. Department of Commerce regulations, "Rights to Inventions Made by Nonprofit Organizations and Small Business Firms Under Government Grants, Contracts and Cooperative Agreements," 37 CFR Part 401.

(3) The Contractor also agrees to include the requirements of this clause in each subcontract for experimental, developmental, or research work financed in whole or in part with Federal assistance.

### **18. Procurement of Recovered Materials**

(1) In the performance of this contract, the Contractor shall make maximum use of products containing recovered materials that are EPA-designated items unless the product cannot be acquired:

- Competitively within a timeframe providing for compliance with the contract performance schedule.
- Meeting contract performance requirements.
- At a reasonable price.

(2) Information about this requirement, along with the list of EPA-designated items, is available at EPA's Comprehensive Procurement Guidelines web site, <https://www.epa.gov/smm/comprehensive-procurement-guideline-cpg-program>.

(3) The Contractor also agrees to comply with all other applicable requirements of Section 6002 of the Solid Waste Disposal Act."

### **19. Safeguarding Personal Identifiable Information:**

Contractor will take reasonable measures to safeguard protected personally identifiable information and other information designated as sensitive by the awarding agency or is considered sensitive consistent with applicable federal, state, and/or local laws regarding privacy and obligations of confidentiality.

### **20. Buy USA - Domestic Preference for certain procurements using federal funds.**

Contractor should, to the greatest extent practicable under a Federal award, provide a preference for the purchase, acquisition, or use of goods, products, or materials produced in the United States (including but not limited to iron, aluminum, steel, cement, and other manufactured products). The requirements of this section must be included in all subawards including all contracts and purchase orders for work or products under this award. For purposes of this section: (1) "Produced in the United States" means, for iron and steel products, that all manufacturing processes, from the initial

melting stage through the application of coatings, occurred in the United States. Page 4 of 5 (2)  
“Manufactured products” means items and construction materials composed in whole or in part of non-ferrous metals such as aluminum; plastics and polymer-based products such as polyvinyl chloride pipe; aggregates such as concrete; glass, including optical fiber; and lumber.

**21. Byrd Anti-Lobbying Amendment**

**Contractors who apply or bid for an award of \$100,000 or more shall file the required certification.** Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, officer or employee of Congress, or an employee of a Member of Congress in connection with obtaining any Federal contract, grant, or any other award covered by 31 U.S.C. § 1352. Each tier shall also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Such disclosures are forwarded from tier to tier up to the recipient who in turn will forward the certification(s) to the awarding agency.

**22. Compliance with Federal Law, Regulations, and Executive Orders**

This is an acknowledgement that FEMA financial assistance will be used to fund all or a portion of the contract. The contractor will comply with all applicable Federal law, regulations, executive orders, FEMA policies, procedures, and directives.





# SMITH+GARDNER

PURPOSE:



CLIENT:

CUMBERLAND COUNTY,  
NORTH CAROLINA

PREPARED IN RESPONSE TO:

REQUEST FOR QUALIFICATIONS  
ENGINEERING SERVICES FOR  
RHODES POND PARKING AND RESTROOM  
IMPROVEMENTS



**CUMBERLAND**  
**COUNTY**

NORTH CAROLINA



CORPORATE ADDRESS  
14 N. Boylan Ave., Raleigh, NC 27603

TELEPHONE  
919.828.0577

FAX  
919.828.3899

August 20, 2025

Ms. Amy Hall  
Public Utilities Project Manager  
Cumberland County Solid Waste  
698 Ann Street  
Fayetteville, NC 28301

**RE: Request for Qualifications (RFQ)  
Engineering Services for Rhodes Pond Parking and Restroom Improvements  
Cumberland County, North Carolina**

Dear Ms. Hall:

Smith Gardner, Inc. (S+G) is pleased to submit the enclosed Statement of Qualifications (SOQ) for Design, Permit, and Construction Services for the Rhodes Pond Parking and Restroom Improvements project to Cumberland County. As highlighted below and in our SOQ, our group of licensed professionals, subconsultants, and individual/collective expertise highly qualifies our firm to serve the County in providing design, permitting, and construction services for the Rhodes Pond Parking and Restroom Improvements project.

**Why Select Smith Gardner, Inc.** - There are many reasons to choose S+G but they boil down to one thing: our staff. The experience our staff brings to our projects leverages our capacity in solving complex issues and balancing the often-competing interests of need and budget.

**Proven Experience** - S+G has focused on solid waste and environmental industries for over 30 years providing consulting, engineering, and construction CQA services that align with the County's current needs. From our design, engineering, and permitting experience to our expertise in environmental compliance we have a group of professionals ready to partner with the County.

We are pleased to partner with Gontram Architecture, Inc. (Gontram) for this project. Gontram brings over 30 years of architectural design experience to Cumberland County. Gontram has designed hundreds of facilities including general/commercial offices, physician specific offices, government buildings, and industrial buildings.

If S+G is awarded the contract, we certify that we, and our sub-contractors, will comply with the E-Verify requirements.


S+G, nor our subcontractors, are on the Iran Final Divestment List. The EPLS for SAM is attached at the end of this qualifications package in Appendix B.

S+G also certifies that the firm, and sub-contractors, are eligible to receive federal funds as provided by the Uniform Grant Guidance, 2 CFR Sect. 200 and must comply with Davis-Bacon Wage Requirements and American Iron and Steel Provisions.


Based upon our understanding of the County's program and our forecasted workload, S+G and Gontram will be available to begin work with the County immediately upon notification and has the staffing capacity available to meet the County's anticipated needs. S+G and Gontram appreciate the opportunity to submit our SOQ and we welcome the opportunity to discuss our qualifications. Should you have any questions, please contact us at (919) 828-0577.

Sincerely,

SMITH GARDNER, INC.

Signed by:  
  
3369FBA008BB445...

Stacey A. Smith, P.E.  
President, Senior Engineer, x 127  
stacey@smithgardnerinc.com

DocuSigned by:  
  
FB3A03AE318C4E4...

Eddie Gontram, AIA  
Gontram Architecture, Inc.  
eddie@gontramarchitecture.com



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COVER LETTER

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# SECTION 1 - FIRM INFORMATION / DBE INFORMATION

## RESOURCE MANAGEMENT

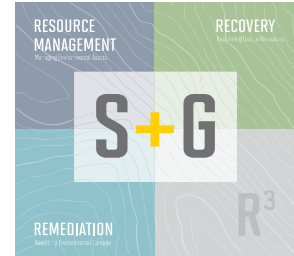
- Solid, Hazardous, and Industrial Waste
- Pre-Project Due Diligence and Planning
- Site Characterization and Site Studies
- Facility Design and Permitting
  - Landfills; New Cells, Expansion Cells
  - Transfer Stations, Convenience Centers
- Operations Support
- Education and Training
- Peer Review/ Expert Witness
- Project Procurement and Construction
  - Bid Procurement
  - Construction Administration & CQA
- Budgeting, Feasibility and Financial Modeling
- Facility Closure and Post-Closure



### SMITH GARDNER, INC.

Stacey A. Smith, P.E.  
President

14 N. Boylan Ave., Raleigh, NC 27603  
Telephone: (919) 828-0577  
stacey@smithgardnerinc.com



## RECOVERY

- Renewable Energy
  - Biomass
  - Solar
  - Landfill Gas
  - Compost Materials
- Facilities Design, Permitting, Construction and CQA
- Feasibility Studies & Implementation:
  - Compost Facility
  - Material Recovery Facility
  - LFG Systems for Beneficial Use
- Site Redevelopment
- Waste Characterization
  - Auditing
  - Waste Reduction
- Solid Waste Facility Mining

## REMEDATION

- Environmental Site Assessment
  - Phase I and Phase 2 ESAs
  - Water Quality
- Environmental Monitoring and Compliance
  - Monitoring System Design and Permitting
  - Groundwater and Surface Water
  - Methane Gas
- Risk Management
- Remedial Design and Implementation
  - Permitting
  - Groundwater and Surface Water
  - Methane Gas
- Remediation System Operations and Optimization
- Air Quality Permitting and Compliance
- Asbestos Management and Compliance

**Smith Gardner, Inc. (S+G)** is an employee owned firm specializing in the solid waste and environmental consulting industry. Since our incorporation in 1991, we have focused on providing innovative, cost effective solutions to solid waste challenges throughout the US for a variety of clients. During this time, our team has grown to over 50 professionals, who can provide our clients with the resources needed to address any challenge. With many of these staff having over two decades of experience in the industry, we also ensure our clients have the consistency and leadership needed to identify and implement the appropriate solutions.

Our commitment to the solid waste and environmental industry is evident in everything we do including our involvement with the Environmental Research & Education Foundation (EREF), National Waste and Recycling Association (NWRA), and the Solid Waste Association of North America (SWANA). These associations, along with their membership, work to advance the solid waste industry, and continually improve environmental practices. Our active participation, including leadership positions, in these organizations ensures that we are not only informed of, but are part of the latest advances.

S+G is proud to partner with **Gontram Architecture, Inc. (Gontram)** for this project. Gontram was established in 1998 in Raleigh, NC to provide clients with a more flexible delivery of architectural services, emphasizing cost control, contract administration and design excellence. They provide services that meet schedules, and design projects within budget. Gontram is experienced in all types of project delivery services, including the traditional design/bid/build. They often participate in the increasingly-popular design/build project delivery services with general contractors.

Gontram possesses vast and extended experience in many different areas of architectural design. Their office in Raleigh, North Carolina gives them access to projects throughout North Carolina, South Carolina, Virginia, and other states along the eastern seaboard. Edmund J. Gontram, III, AIA holds architectural licenses in North Carolina, South Carolina, Georgia, Tennessee, Virginia, West Virginia, and Louisiana. Gontram is NCARB certified which allows them license reciprocity in 47 states.

## SECTION 1 - FIRM INFORMATION / DBE INFORMATION



## GONTRAM ARCHITECTURE

Founded in 1998, Gontram Architecture was created to offer clients a more flexible and responsive approach to architectural services—one that prioritizes cost control, effective construction contract administration, and design excellence. Our commitment is to deliver projects on schedule and within budget, always aligning our goals with those of our clients. Ultimately, we strive to create results that everyone involved can take pride in.

We understand that the most significant cost in any project lies in construction. While this may seem self-evident, we keep construction costs—and strategies to minimize them—at the forefront of every project. Our team is experienced in a wide range of project delivery methods, including the traditional design-bid-build model.

We also frequently collaborate with general contractors on design-build projects, a delivery method that continues to grow in popularity. Edmund J. Gontram III, AIA, our founder, is not only a licensed architect but also a licensed general contractor. Through our affiliated company, Ten Penny Construction, Inc., we offer comprehensive design-build services, providing clients with a seamless, single-source solution led by the architect when applicable.

Whether through traditional or design-build methods, we tailor our approach to meet each client's unique needs. With the resources and expertise to exceed expectations, Gontram Architecture is your trusted partner from concept to completion.

Gontram Architecture, Inc. possesses vast and extended experience in many different areas of architectural design. Our office in Raleigh, North Carolina gives us access to projects throughout North Carolina, South Carolina, Virginia, and other states along the eastern seaboard. Edmund J. Gontram, III, AIA holds architectural licenses in North Carolina, South Carolina, Tennessee, Georgia, West Virginia, Virginia, and Louisiana. We are NCARB certified which allows us license reciprocity in 47 states.

## DISADVANTAGED BUSINESS ENTERPRISE

Smith Gardner, Inc. is not classified as a DBE.

Gontram Architecture, Inc. is not classified as a DBE.

As a small business, Smith Gardner, Inc. understands the value of effective partnerships to provide our clients with disciplines our employees do not specialize in, and we are committed to providing opportunities to historically disadvantaged communities. We have routine partners that have worked with us on many projects and also for our corporate administration. As a continuation of this practice, we have included a DBE on our team for this project. Ross Linden Engineers PC is a woman-owned business that will provide structural engineering. S+G has worked on numerous projects with Ross Linden at a variety of sites.

## SECTION 2 - RELATED EXPERIENCE WITH FEDERALLY FUNDED PROJECTS

### OUR MISSION

S+G's mission is to provide our clients with innovative, yet sensible solutions by being highly responsive, detail-oriented, and employing effective communications.



### RELATED EXPERIENCE WITH FEDERALLY FUNDED PROJECTS

S+G has worked with Cumberland County in preparation of a preliminary engineering report for a proposed RO (Reverse Osmosis) Treatment System as well as design and bid documents for ammonia removal in stormwater and on treatment conditioning of the direct use landfill gas project for SRF funding involving reporting, extensions, and compliance with the North Carolina clean water state revolving fund.

S+G is prepared to continue our assistance in the development of new grant proposals while managing compliance and reporting with current awards. Most recently, S+G has assisted with proposals for FEMA BRIC Grants, NC DOT LAPP Grants, ARP 4 Grants, and NC DEQ Greenhouse Grants.

In addition to our grant assistance, S+G has provided services to the states of North Carolina, South Carolina, New Mexico, the U.S. Virgin Islands, EPA, and the U.S. Department of Justice.



## SECTION 3 - SERVICES PROVIDED

### OUR PROMISE

The right environmental solutions delivered through innovation and efficiency for a better tomorrow. We accomplish this by leveraging our knowledge, experience, passion and commitment.



### S+G SERVICES

S+G specializes in providing comprehensive engineering and environmental services focused on Solid Waste and Environmental projects. These services include building design, permitting and construction:

- Solid Waste Support Infrastructure (Offices, Scales, and Guardhouses)
- Transfer Station Design, Permitting, and Construction
- Convenience Center Design, Permitting, and Construction
- Materials Recovery Facility Design
- Site Characterization, Design, and Permitting
- Construction Administration and Construction Quality Assurance
- Feasibility Studies
- Economic Planning and Forecasting
- Operations Support

#### Convenience Centers, Transfer Stations, and MRFs

S+G provides turnkey design and construction oversight for Solid Waste Infrastructure Transfer Stations, Convenience Centers and MRFs across the Southeast. Our work with transfer stations has included teaming with NC State University to study<sup>1</sup> floor life and strategies for floor optimization. At every opportunity, where practical, we will add material recovery aspects to our design to increase recycling. Our work has included evaluating and permitting of material recovery process options to maximize recycling for C&D, MSW, LCID and tire recycling facilities. Services provided also include design, bid preparation, contract, and construction administration.

#### Master Planning, Economic Modeling, and Forecasting

S+G has worked with many of our clients to assist in short and long-term planning and forecasting. This includes construction option cost-estimating and evaluations, economic and project alternative analyses, as well as rate studies and preparation of vendor RFPs and negotiation of agreements. We have also prepared solid waste management plans, assisted in evaluating equipment purchases, and assessing and designing alternative landfill covers.

S+G has developed estimates for financial assurance compliance and evaluated enterprise funds to determine short and long-term solvency, developed financial pro-forma models to assist our clients in projecting future expenditures and revenues and evaluated the financial strength of their enterprise structure in comparison to projected program modifications.

#### Construction Administration and Quality Assurance

An integral part to solid waste management is Contract Administration and Construction Quality Assurance. S+G has administered over \$80 Million in solid waste management contracts over the past five years. Our Quality Assurance role includes geotechnical oversight to meet construction specifications, as well as stormwater system construction oversight. We use subcontracted laboratories for soil testing as needed. Our primary focus is on facilities that we have designed/permited and includes MSW facilities, transfer stations, convenience centers, MRFs, and compost facilities.

1. Pour-Ghaz, Mohammad; Design of Waste Transfer Station Concrete Overlays Against Premature Deterioration; North Carolina State University, 2018

## SECTION 3 - SERVICES PROVIDED

### OUR FOCUS

As specialists in resource recovery, we strive to offer our clients ways to utilize items that may be considered by others to be waste. Further we try to engineer our projects to turn negatives into positives for the long-term benefit of the site and the client.



### PROJECT MANAGEMENT

The same individuals who are principals and senior staff in our firm and have the most experience will have key roles on the County project. S+G uses a variety of project management tools to allow our principals to be deeply involved in project work for our clients. It is through this expertise that we strive to bring advances to the solid waste industry and support an internal continual improvement process.

Our firm engages in regular company meetings which allow the project managers to schedule staff on their projects in a collaborative way. We invite all employees to these meetings so they might be better informed on upcoming work and the needs of everyone in the company.

Additionally, prior to any scheduled work, the project manager will meet with staff to review everyone's role and what expectations are for the project. Typically, this includes providing written and verbal instructions with a question/answer period.

### QUALITY CONTROL & ASSURANCE PROCESS

S+G has a long history of managing design and construction projects for the solid waste industry. Our management approach is simple: communicate effectively so all parties understand their role in the project and the client understands exactly what they will receive through the project. Managing expectations ensures satisfaction. S+G has developed an internal Quality Control/Quality Assurance Manual to ensure all employees know their role in the QC/QA process and to empower all employees to ask questions and make suggestions for the betterment of a project. All deliverables are reviewed by senior staff prior to submittal.

S+G has a formal program for internal quality control and quality assurance (QC/QA) of all of our work. The objectives of S+G's QC/QA program are to provide a high level of quality, value, and service for each client and produce deliverables (reports, plans, calculations, etc.) that:

- Are free of errors and omissions
- Contain all necessary elements to be complete and thorough
- Conform to relevant regulations, rules, and policies
- Are consistent with company and industry standards and guidelines
- Clearly define sources of information
- Clearly convey the desired information
- Result in constructible plans having limited changes during construction (as applicable)
- Are stored and protected for future use and reference

Our program also ensures we perform services which:

- Are performed safely, effectively, efficiently, and courteously
- Result in complete and accurate collection of data and information
- Support the preparation of quality deliverables

Finally, our program supports a continual process for improvement.

## SECTION 3 - SERVICES PROVIDED



### GONTRAM ARCHITECTURE SERVICES

Gontram provides architectural services to a wide spectrum of industry. They provide a more flexible delivery of architectural services, emphasizing cost control, construction contract administration and design excellence. We provide services that meet schedules, and design projects within budget. From beginning design phases to the final stages at the end of construction, we make sure our projects provide a solid foundation for our clients. Our services include:

- Programming: zoning, geological, thermal, and code issues.
- Site Understanding: detailed site measurements, client interviews, proper documentation.
- Schematic Design
- Design Development
- Construction Documentation
- Bidding/Negotiation
- Construction Administration
- Final Walkthrough and Punchlist Inspection
- Sustainable Design (LEED)

### GONTRAM ARCHITECTURE - QUALITY CONTROL

We maintain and periodically update a written procedures manual. This document is referred to during each project to ensure quality project delivery and document preparation. Accuracy and completeness of the documents are of utmost concern. Prior to sending out any document, an internal review is conducted to assure accuracy.

### GONTRAM ARCHITECTURE - COST CONTROL

Cost estimates are developed at the completion of each design stage to verify project budgets. We utilize RS Means guidebooks, industry references, and actual subcontractor pricing to maintain accurate estimates. If at any time during design, the estimate should exceed the Owner's available funds, we can suggest alternatives to bring the project's cost back within an acceptable range.

Cost control during construction is extremely important and can only be accomplished by careful preparation of the construction documents and attentiveness during the construction phase. All proposed change orders are meticulously examined prior to approval. Costs are researched and verified. No additional costs are approved without careful review and documentation.



# SECTION 4 - PROJECT TEAM & EXPERIENCE

## EMPLOYEE OWNED

One major difference with our firm is that the staff that comprise the experience demonstrated in this proposal package are primarily the owners and officers of our firm and are the same professionals that will work directly with you.



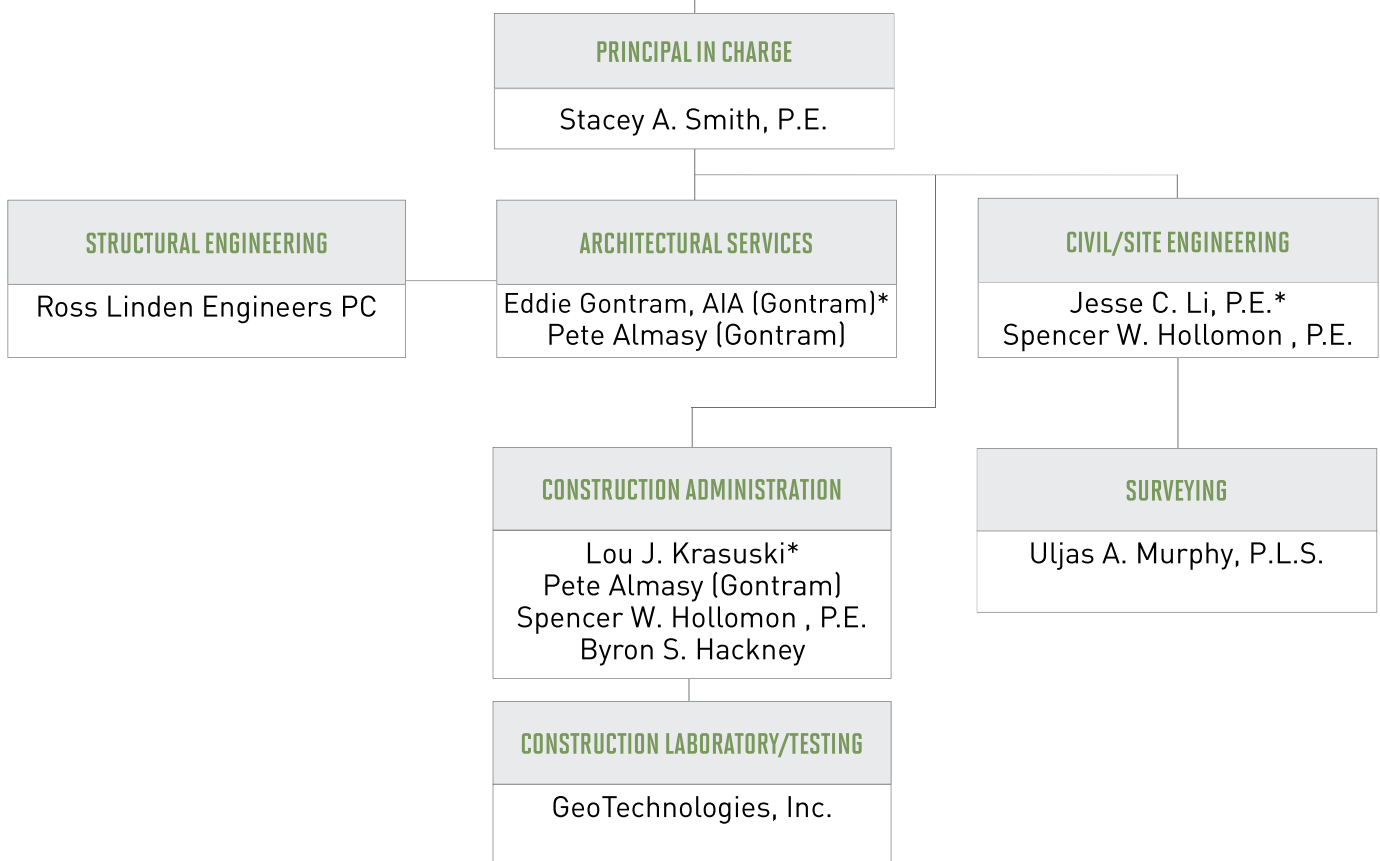
## PROJECT TEAM

S+G’s dedication to the solid waste consulting industry and the commitment of our staff to our clients has created an unequalled firm for solid waste solutions. We are proud of the relationships that we hold with our clients and the rapport we foster with the regulatory community.

Below is our organizational chart outlining key personnel for each area of expertise. Mr. Stacey A. Smith, P.E. will serve as Principal In Charge for the County.



\*Task Leader



## SECTION 4 - PROJECT TEAM &amp; EXPERIENCE

**Academic Credentials:**

B.S. Civil Engineering (Construction), 1992  
North Carolina State University, Raleigh, NC  
M.C.E. Civil Engineering (Geotechnical), 2004  
North Carolina State University, Raleigh, NC

**Duties:**

2006 - Present – President  
2000 - Present – Board of Directors

**Professional Credentials:**

Professional Engineer – AR, CT, DC, FL, GA, IL, IA, LA, MD,  
MI, MO, NC, OK, PA, SC, TN, TX,  
USVI, VA, WI, NCEES & USCEIP

**Employment Record:**

1996 - Present – Smith Gardner, Inc. (formerly G.N.  
Richardson & Associates, Inc.)  
1995 - 1996 – S.T. Wooten Corporation (STW)  
1992 - 1995 – Hazen & Sawyer, P.C.  
1991 - 1992 – G.N. Richardson & Associates, Inc. (GNRA)

**Principal Areas of Expertise:**

Solid Waste Landfill Siting and Design  
Renewable Energy Development  
Landfill Gas Collection System Design & Management  
Environmental Remediation  
Construction Management and Administration

**Professional Activities:**

American Society of Civil Engineers (ASCE)  
Professional Engineers of North Carolina (PENC)  
Solid Waste Association of North America (SWANA)  
North Carolina Board of Examiners for Engineers &  
Surveyors (Emeritus)  
Environmental Research and Education Foundation  
(EREF)  
NC State University Industry Advisory Board (Past  
Chair)

**Selected Publications & Presentations:**

Smith, Stacey A., "Responsible Charge" The North  
Carolina Bulletin, October 2016, North Carolina  
Board of Examiners for Engineers and Surveyors.  
Richardson, G.N., Smith, Stacey A. and Scheer, Pieter  
K., "Active LFG Gas Control: An Unreliable Aid  
to Stability", Proceedings from the First Pan  
American Geosynthetics Conference 2-5 March  
2008, Cancun, Mexico; SC SWANA Conference  
18-20 May 2016  
Smith, Stacey A. and Smyth, Joan A., "Passive Aquifer  
Mining for Landfill Expansion". North Carolina  
Section Annual Meeting, 26 Sept. 2006, American  
Society of Civil Engineers

**STACEY A. SMITH, P.E.**

Senior Engineer - Raleigh, NC



Mr. Smith brings a career of design, construction and operational experience in all aspects of solid waste management and remediation. He specializes in unique challenges of waste recovery, special construction, renewable energy systems, and containment systems. His work includes siting, design, permitting, construction, operations and closure services.

Mr. Smith has demonstrated throughout his career a bottom-up approach, beginning as a technician with GNRA and then advancing to managing partner with now, Smith Gardner.

He has provided services for public and private clients throughout the industry both locally and nationally. Mr. Smith has managed solid waste facility elements such as containment systems, leachate management and recirculation, site infrastructure, final cover systems, landfill gas collection and control, groundwater recovery, compost systems, and special waste applications. Mr. Smith has been integral to our company for his ability to design and permit these elements as well as providing "hands-on" field assistance during implementation.

Mr. Smith strives to bring a technical competency to projects for the clients benefit. This is demonstrated in the Sampson County Landfill Gravity Groundwater Intercept (GGI) project. The GGI system recognized, and took advantage of, medium to coarse sand veins throughout the site to implement a large scale (200 Acre) dewatering project. The GGI system lowered the site base grades by 20 feet, providing necessary soil resources, improved stability, and increased site volume.

Mr. Smith has been active in the development of numerous waste material recovery and re-utilization projects. These include excavation of older LCID landfills for wood waste recovery and processing, a Superfund landfill project in Columbia, SC that won EPA's Excellence in Site Reuse Award, compost material enhancement on landfill covers, utilizing waste paint in alternate daily cover, and has completed numerous landfill gas to energy and solar projects. Resource recovery is at the forefront of his project development.

He continues to assist the needs of our industry through advancement of research, technology and innovation. Most recently, he is participating as the engineering representative on NC's 2022 Statewide Mapping Advisory Committee reference frame working group, NC's On-Site Wastewater Task Force Committee, and works with N.C. State University on research to improve transfer station tipping floors.

Mr. Smith strives to be a leader in industry through active involvement with organizations and institutions such as the Environmental Research and Education Foundation (EREF) Research Council, and assistance with the NC State University Department of Civil, Construction, and Environmental Engineering Industry Advisory Board. He maintains an active collaboration with the students and department to advocate research in the industry. He also does committee work with NCEES and is an Emeritus member of the NC Board of Examiners for Engineers and Surveyors.

## SECTION 4 - PROJECT TEAM &amp; EXPERIENCE

**Academic Credentials:**

- B.S. Environmental Design in Architecture, 1989  
North Carolina State University, Raleigh, NC
- B.S. Architecture, 1991  
North Carolina State University, Raleigh, NC

**Professional Credentials:**

- Licensed Architect – NC, SC, VA, TN, GA, LA, WV  
Licensed General Contractor – NC

**Employment Record:**

- 1998 - Present – Gontram Architecture, Inc.  
1997 - 1998 – Kurt F. Eichenberger/Architect - AIA  
1994 - 1997 – Quick Associates, PA  
1992 - 1994 – Isley Architects, Inc.

**Principal Areas of Expertise:**

- Architectural Design  
Project Management  
Quality/Cost Control

**Professional Activities:**

- American Institute of Architects, National Association  
American Institute of Architects, North Carolina Chapter  
American Institute of Architects, Triangle Chapter  
US Green Building Council LEED Accredited Professional

**EDMUND J. GONTRAM III, AIA**

Architect - Gontram Architecture, Inc. - Raleigh, NC



Mr. Gontram brings over 30 years of architectural design, project management, construction and operational experience in all aspects of architectural design management. He specializes in the LEED (Leadership in Energy and Environmental Design) framework for designing and constructing cost-saving buildings.

Edmund (Eddie) J. Gontram III, AIA, LEED AP, is a member of the National, State and local chapters of the American Institute of Architects. Eddie is also a U.S. Green Building Council LEED® Accredited Professional. He possesses a certificate with the National Council of Architectural Registration Boards (NCARB). He received his Bachelor of Environmental Design in Architecture from North Carolina State University in 1989 and a Bachelor of Architecture degree in 1991.

Eddie has experience in a wide variety of architectural projects ranging from single-family residential to multi-million dollar publicly and privately-funded projects. In addition to being a licensed architect, he is a licensed general contractor and participates in construction projects through Ten Penny Construction, Inc.

In 2007, Edmund Gontram received accreditation as a LEED Accredited Professional (AP) from the U.S. Green Building Council. Since that time, Gontram Architecture has injected sustainable design elements into traditional projects, educated clients on the benefits of green construction, and worked to reduce waste in the built environment. Gontram Architecture continues this endeavor on a daily basis. Several proposed LEED projects are currently in design, and other non-LEED projects are benefiting from that experience. He also utilizes REVIT and AutoCAD software, and office software from Microsoft, making it easy and efficient to exchange data with clients and consultants.

## SECTION 4 - PROJECT TEAM & EXPERIENCE

### Academic Credentials:

B.S. Environmental Design in Architecture, 1988  
North Carolina State University, Raleigh, NC

### Professional Credentials:

LEED Accredited Professional

### Employment Record:

2014 - Present - Contram Architecture, Inc.  
2009 - 2014 - Olive Architecture, PLLC  
2005 - 2009 - Centrepont Architecture, PA  
1999 - 2005 - Kurt Eighenberger/Architect, AIA  
1998 - 1999 - Ellinwood Design Associates PA, Ltd.  
1995 - 1998 - H.S. Annis Architect, AIA  
1988 - 1995 - NCDOT Facilities Management

### Areas of Expertise:

Architectural Design  
Architectural Management  
Project Management  
Construction Administration

### PETER ALMASY, LEED AP

Project Manager - Gontram Architecture, Inc. - Raleigh, NC



Mr. Almasy has over 35 years experience in architectural project design and management. He has an excellent background in project management, construction administration, building information modeling and LEED Documentation.

Mr. Almasy is the Studio Director and Senior Project Manager for Gontram Architecture, Inc. He manages proposal preparation, oversees production of construction documents, coordinates with engineering consultants, manages bidding, and conducts progress meetings.

His design experience includes industrial buildings/sites, commercial buildings, government buildings/complexes, and major renovations. He has a background using AutoCAD, DataCad, and Revit Architectural programs.

### Academic Credentials:

B.S. Civil Engineering, 2014  
North Carolina State University, Raleigh, NC  
M.C.E Civil Engineering, 2016  
North Carolina State University, Raleigh, NC

### Professional Credentials:

Professional Engineer - NC, SC, GA  
OSHA 40 Hour Hazardous Waste Operations  
Landfill Gas (LFG) Systems  
Leachate Management Systems  
Stormwater Management  
Permitting  
Civil/Site Analysis

### Employment Record:

2013 - Present - Smith Gardner, Inc.

### Areas of Expertise:

Civil Site Analysis  
Construction Quality Assurance (CQA)  
Waste Characterization  
Leachate Management  
Stormwater Management  
Site Permitting

### SPENCER W. HOLLOMON, P.E.

Senior Engineer - Raleigh, NC



Mr. Hollomon has experience in landfill permitting and design, construction bidding and administration, on-site construction quality assurance and preparation of CQA reports. Mr. Hollomon also has experience with civil site analysis, leachate collection system design, closed landfill inspection and waste characterization studies. His environmental experience includes landfill gas extraction system well field management, landfill gas and water quality monitoring.

Mr. Hollomon's design work is mainly focused around landfills, including design, permitting, facility evaluation, leachate management, stormwater management, and landfill gas management.

He has also provided support for compost facilities, convenience centers, transfer stations, industrial facilities, and general site development for facilities throughout North Carolina, South Carolina, and Georgia.



## SECTION 4 - PROJECT TEAM & EXPERIENCE

### Academic Credentials:

B.S. Environmental & Ecological Engineering, 2018  
Purdue University, West Lafayette, IN  
M.S. Civil Engineering, 2019  
Purdue University, West Lafayette, IN

### Professional Credentials:

Professional Engineer - NC  
OSHA 30 Hour Construction Safety and Health  
Training

### Employment Record:

2019 - Present - Smith Gardner, Inc.

### Areas of Expertise:

Construction Quality Assurance (CQA)  
Stormwater Modeling and Design  
Leachate Management System Design  
Environmental Compliance

### JESSE C. LI, P.E.

Project Engineer - Raleigh, NC



Mr. Li has experience in stormwater management and design, which includes preparing erosion and sedimentation control plans and stormwater compliance monitoring. He also has experience designing and permitting landfills and mines. His field experiences include on-site construction quality assurance, stormwater discharge sampling, landfill gas monitoring, and BMP inspections.

Mr. Li has experience preparing bid and construction issue documents as well as providing operational support and on-site construction quality assurance (CQA) monitoring of construction activities at transfer stations and landfills.

Mr. Li's design work is mainly focused around landfills, including design, permitting, leachate management, stormwater management, landfill gas management, and facility evaluation. He also provides design, permitting and compliance support for convenience centers, transfer stations, industrial facilities, and general site development for facilities throughout North Carolina.

### Academic Credentials:

B.S. Environmental Technology & Management, 2014,  
North Carolina State University,  
Raleigh, NC

### Professional Credentials and Certifications:

OSHA 40 Hour HAZWOPER  
OSHA 30 Hour Certification  
40 Hour Advanced Radiation Protection Training  
Visible Emission Method 9 Certified  
Certified Erosion Presentation and Sediment Control  
Inspector (CEPSCI)

### Employment Record:

2020 - Present - Smith Gardner, Inc.  
2014 - 2020 - Rock Tenn/WestRock

### Areas of Expertise:

Environmental Compliance  
Stormwater Sampling  
Construction Quality Assurance (CQA)  
Erosion and Stormwater Management  
Transfer Station Design and Permitting

### LOUIS J. KRASUSKI

Project Manager - Raleigh, NC



Mr. Krasuski has experience in water sample collection, construction QA/QC, environmental restoration, surface water, waste transfer facilities, compost and mulch facilities, and sustainable waste programs. He also has experience in stormwater management and design, which includes preparing erosion and sedimentation control plans, stormwater pollution prevention plans, and stormwater compliance monitoring.

Mr. Krasuski is an environmental engineer with experience in water sample collection, solid waste programs, and environmental restoration. He also prepares permit applications, site specific operation manuals, closure plans, spill prevention control and countermeasure plans, and stormwater pollution and prevention plans for solid waste facilities.

Mr. Krasuski has provided design and permitting services for landfills, transfer stations, and mine sites in North Carolina. He has experience preparing bid and construction issue documents as well as providing operational support and on-site construction quality assurance (CQA) monitoring for several solid waste related projects.

## SECTION 4 - PROJECT TEAM & EXPERIENCE

### Academic Credentials:

A.A.S. Survey Technology, 2001  
Fayetteville Technical Community College,  
Fayetteville, NC

### Professional Training:

OSHA 40 Hour Hazardous Waste Operations Training  
OSHA 30 Hour Safety and Health Training  
OSHA Confined Space Training  
OSHA Excavation & Trenching "Competent Person"  
Transportation of Dangerous Goods Training  
(HM181-126F-215B & IATA)  
Inspector Initial Training Course (24hr/3 day)

### Employment Record:

2001 - Present - Smith Gardner, Inc.  
2000 - 2001 - Catlin Engineers and Scientists  
1990 - 1998 - Burkehead & DeVane Printing  
Company

### Principal Areas of Expertise:

Construction Quality Assurance (CQA) for:  
Earthworks  
MSW, C&D and Industrial Landfills  
Geosynthetic Closure Systems  
LFG Collection Systems  
Construction Administration  
Geotechnical Drilling

### Academic Credentials:

A.S. Surveying Technology, 2010  
White Mountains Community College,  
Berlin, NH  
B.S. Geography, 2013  
Appalachian State University, Boone, NC

### Professional Credentials and Certifications:

Professional Land Surveyor - NC, SC, TN, VA, GA, ME  
Certified Floodplain Surveyor  
FAA Remote Pilot Certificate with Small Unmanned  
Aerial Systems (sUAS) Rating

### Employment Record:

2022 - Present - Smith Gardner, Inc.  
2021 - 2022 - Draper Aden Associates  
2010 - 2021 - Municipal Engineering  
2008 - 2010 - Thaddeus Thorne

### Principle Areas of Expertise:

Boundary Surveying  
Volumetric Surveys  
Construction Surveys & Inspection  
Monitoring Surveys

### BYRON S. HACKNEY

Field Services Manager - Raleigh, NC



Mr. Hackney has over 25 years' experience in general industry and now specializes in Construction Quality Assurance (CQA) of geosynthetic liner and final cover systems as well as other solid waste management projects. Mr. Hackney is a GCI Certified Inspector for compacted clay liners and geosynthetic materials. Mr. Hackney formerly served the United States Army in the 82nd Airborne Division.

Mr. Hackney has over 25 years' of progressive experience involving Construction Quality Assurance (CQA), environmental monitoring, and site investigation activities for municipal and industrial landfills and other solid waste management facilities.

He has served as field services manager for CQA activities during construction of numerous lined municipal solid waste (MSW), construction and demolition debris (C&D), and industrial landfill expansions including projects for the Davidson County, City of High Point, IP-Reigelwood Mill, Johnston County, Robeson County, and Sampson County Disposal landfills in North Carolina, the CMC Steel landfill in South Carolina, and the Grady Road and Taylor County landfills in Georgia.

### ULJAS A. MURPHY, PLS

Senior Surveyor - Raleigh, NC



Mr. Murphy has worked with municipal and private landfill owners to find solutions to drainage, access, and many other issues necessary to maintain orderly and compliant operations. In addition to surveying tasks including, boundary, volumetric, and topographical surveys, he has provided detailed inspection services during fused-liner and leachate installation. He has also performed environmental services including groundwater and gas sampling.

Mr. Murphy coordinates and manages land surveying projects and is responsible for the scheduling of survey field and office personnel. His 15 years of experience includes boundary and construction surveying with a strong focus on engineering support. His construction experience includes solid waste volumetric surveys, movement monitoring, multi-level building construction, dams monitoring, and general stakeout.

Mr. Murphy has performed monitoring surveys on numerous buildings and structures, some of which have spanned multiple years. His expertise in statistical analysis and field surveying protocols helped him detect subsidence of less than one-sixteenth of an inch across a three-hundred thousand square foot, \$3-billion pharmaceutical manufacturing building in Clayton, NC.

## SECTION 5 - OUTSIDE CONSULTANTS

## PARTNERS

S+G is excited to partner with Gontram Architecture, Ross Linden Engineers PC, and GeoTechnologies, Inc. S+G regularly collaborates with these firms for architectural design, structural support, and geotechnical engineering. This familiarity between teams benefits the County by enhancing project efficiency and ensuring a coordinated workflow.



**Gontram Architecture** was established in 1998 to provide clients with a more flexible delivery of architectural services, emphasizing cost control, contract administration and design excellence. They are experienced in all types of project delivery services, including the traditional design/bid/build.

Percentage of of services provided - 50%

**Eddie Gontram, AIA, LEED AP**

Gontram Architecture  
Architecture Design  
5100 Unicon Dr., Suite 103  
Wake Forest, NC 27587  
919-876-5331



**Ross Linden Engineers** is an engineering firm based in Raleigh, North Carolina that focuses on structural engineering. Mr. Ross has over 20 years of experience in the design of structures for a wide range of project types, including steel-framed office building, industrial facilities, utility building and concrete support structures and fire station. Mr. Ross will be the lead structural engineer for this project, with time planned for design and field support for the project and will be involved in all major project decisions.

Percentage of of services provided - 15%

**Brian M. Ross, P.E.**

Ross Linden Engineers, PC  
Structural Engineering  
709 W. Jones St.  
Raleigh, NC 27603  
919-823-5680



**GeoTechnologies, Inc.** is a full service, employee owned, geotechnical engineering firm that provides quality assurance/control and inspection of construction materials during the construction phase of projects. GeoTechnologies has extensive experience in the testing and inspection of soil, concrete, masonry, aggregates, asphalt, spray-on fireproofing, and structural steel both during and after construction.

Percentage of of services provided - 5%

**Mark R. Potratz, P.E.**

3200 Wellington Ct., Ste 108  
Raleigh, NC 27615  
919-954-1514



## SECTION 6 - PRIOR EXPERIENCE WITH SIMILAR PROJECTS



The following similar projects have been completed by Gontram Architecture.

### PROJECT LIST - INDUSTRIAL

**Cumberland County Ann Street Attendant Bldg.**  
**Cumberland County Assembly Court Maintenance Bldg.**  
**Cumberland County Adaptive Reuse Schematic Design**  
**Cumberland County Transfer Station, Fayetteville, NC**  
**Cumberland County Parkton Facility Attendant Bldg.**  
 South Wake Rochem Facility, Holly Springs, NC  
 SR&R Solidification Facility, Wilmington, NC  
 SR&R Expansion, Wilmington, NC  
 Faulkner Flex Building, Fuquay-Varina, NC  
 Dillon County Transfer Station, Dillon, SC  
 Braven Environmental Expansion, Zebulon, NC  
 Next Century Distillery, Zebulon, NC  
 IMS Electrical Service, Garner, NC  
 CED Warehouse/Distribution Renovation, Raleigh, NC  
 Tops & Trends Fitup, Raleigh, NC  
 Michael Jordan Collision Center, Durham, NC  
 Group 2000 Test & Measurement, Apex, NC  
 GBUSA Facility, Monroe, NC  
 Whole Foods Bakehouse, Morrisville, NC  
 Neomonde Bakery, Morrisville, NC  
 Central Concrete Building, Raleigh, NC  
 Waste Industries Renovation & Addition, Raleigh, NC  
 Waste Industries Transfer Station, Durham, NC  
 Waste Industries Transfer Station, Greensboro, NC  
 Waste Industries Transfer Station, Sanford, NC  
 Line-X Applicatoin Bay, Raleigh, NC

### PROJECT LIST - COMMERCIAL / OFFICE

Brain Balance, Cary, NC  
 Hammer & Nails, Raleigh, NC  
 Hammer & Nails, Chapel Hill, NC  
 Raleigh Police Department Generator, Raleigh, NC  
 Knightdale Council Chambers, Knightdale, NC  
 315 N Academy Renovation, Cary, NC  
 Sigma Nu Center for Excellence, Lexington, VA  
 Amelia Station Office Building, Clayton, NC  
 AECOM/URS/NCTA Turnpike Office, Morrisville, NC  
 AECOM/URS/NCTA Turnpike Office, Monroe, NC  
 NC Retail Merchants Assoc Renovation, Raleigh, NC  
 Terramor Homes Renovation, Raleigh, NC  
 Red Dog Associates Office Building, Raleigh, NC  
 Crossroads Nissan Dealership, Wake Forest, NC  
 NCSBA Office Renovation, Raleigh, NC  
 NCSBA Board Room Renovation, Raleigh, NC  
 NC Turnpike Authority Renovation, Morrisville, NC  
 Cypress Semiconductor Renovation, Raleigh, NC  
 RoundRock Office Park, Raleigh, NC  
 Pentair Water Addition, Sanford, NC  
 Pure Body Fitness, Charlotte, NC  
 Pure Body Fitness, Cary, NC  
 Pure Body Personal Training, Cary, NC  
 PCI Training Room Renovation, Raleigh, NC  
 NC School Boards Association Renovation, Raleigh, NC  
 JM Thompson Flex Building, Cary, NC  
 Uptown Biz Mixed Use Building, Raleigh, NC  
 Gresham View Flex Building, Raleigh, NC  
 Ten-Ten Properties Building, Apex, NC  
 Group 2000 Office and Laboratory Fitup, Apex, NC  
 Wellspring Bakehouse, Morrisville, NC  
 Whole Foods Gluten-Free Bakehouse, Morrisville, NC  
 Generations Salon & Day Spa, Raleigh, NC  
 Family Auto Reconstruction, Durham, NC  
 Rowland Building, Raleigh, NC  
 Cypress Semiconductor Offices, Raleigh, NC  
 Tanas Salon and Office Building, Cary, NC  
 Tanas Salon and Day Spa, Raleigh, NC  
 Crawford & Company Office Fitup, Raleigh, NC  
 SouthBridge Office Fitup, Raleigh, NC  
 Xilinx Office Fitup, Raleigh, NC  
 eCentric Concepts Fitup, Holly Springs, NC  
 Ayscue, Inc. Fitup and Alteration, Apex, NC  
 OnSport Office Fitup, Raleigh, NC

SECTION 6 - PRIOR EXPERIENCE WITH SIMILAR PROJECTS



**Red Dog Associates Office Building**

*Raleigh, NC*



The Red Dog Office Building is proposed for a site in northeast Raleigh, NC. The existing site was previously developed and occupied by a private swim club that has reached the end of its useful lifespan. To that end, this office building seeks to remove an intense water user from the ecosystem and replace it with an environmentally-sensitive, energy-efficient building that will provide a suitable buffer between growing commercial retail development and the adjacent residential areas.

The Owners intend to construct the building compliant with U.S. Department of Energy's Energy Star program and LEED



Silver (minimum) requirements of the U.S. Green Building Council. The project will incorporate energy-saving, water-conserving strategies, including solar power, rain-water capture system, low-flow plumbing fixtures, high performance thermal envelope, and many more environmentally-friendly features.



**Red Dog Associates, LLC** *Owner*

**Alpha & Omega Group** *Civil Engineers*

**Steel Technology** *Structural Engineers*

**Atlantec Engineers** *PME Engineers*

**undetermined** *General Contractor*

**22,000** *Square Feet*

**\$3,500,000** *Project Cost*

**undetermined** *Completion*



SECTION 6 - PRIOR EXPERIENCE WITH SIMILAR PROJECTS



**Connor Properties Laboratory and Office Building**  
 Durham, NC

Gontram Architecture, Inc. acted as architect-of-record for this project, coordinating all aspects of its design. We also oversaw the rezoning and site plan approval processes. As a licensed general contractor, Mr. Gontram’s construction company, Ten Penny Construction, Inc. built the project. Mr. Gontram acted as project manager, on-site superintendent, general laborer and book-keeper.

Background: Connor Properties LLC and Gontram Architecture searched for three years to find the perfect site for the Owner’s first project – a 20,000 square-foot multi-tenant, flexible use wet laboratory and office building. The beautiful 5.6-acre site that they found – complete with a 1-acre pond, and beautiful hardwoods – was well worth the wait. Situated just north of RTP, it sits on Ellis Road between GlaxoSmithKline and Reichhold Chemicals.



Relationship to Surroundings: Gontram Architecture determined at an early stage that the pond was a unique element of the property – a focal point. Consequently, all design decisions were made with this premise in mind. From the earliest moments of planning, every effort was made to maintain the beauty of the site. The Architect went to great lengths to save the pond and the trees, and to develop the land in an environmentally conscious manner. Several expensive changes were made to preserve trees, including increasing the building elevation and re-routing the entrance. The effort was successful – in the end, the 1-acre pond and more than two acres of natural area remained unscathed.

During re-zoning and site-plan approval, Durham County commissioners praised the development team for its conscientious development effort. They gave additional accolades for the group’s effort to ensure that neighbors would accept the site plan and be pleased with the changes to the area necessitated by the new building.

Functionality: The floor plan of the building was designed for multiple lab-related tenants such that each tenant has access to an impressive set of common areas: lobby, conference room, rest rooms, break area. A shower room was included as a common area amenity so that employees returning from a workout or working late can freshen up.



<b>Connor Properties, LLC</b>	<i>Owner</i>
Thompson Associates	<i>Civil Engineers</i>
Neville Engineering	<i>Structural Engineers</i>
Crenshaw Consulting Engineers	<i>PME Engineers</i>
Ten Penny Construction, Inc.	<i>General Contractor</i>
20,000	<i>Square Feet</i>
\$2,700,000	<i>Project Cost</i>
2001	<i>Completion</i>

SECTION 6 - PRIOR EXPERIENCE WITH SIMILAR PROJECTS

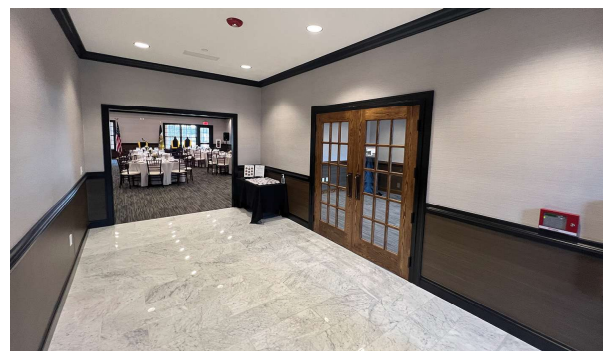


**Sigma Nu Center for Excellence**  
*Sigma Nu National Headquarters, Lexington, VA*



Upon completion of a fundraising campaign, Sigma Nu National Headquarters commissioned Gontram Architecture to complete the design documents for their new Spears Family Epsilon Epsilon Center for Excellence building for their 12 acre campus in historic Lexington, VA. The new building houses up to 80 visitors who will be visiting the property for various reasons, including pilgrimages, leadership conferences and any number of other events. The building contains dormitory space, formal and informal gathering spaces, two small kitchenettes, and other functions typical of a conference center.

The project was recently completed in December, 2022.



<b>Sigma Nu Fraternity</b>	<i>Owner</i>
Perkins & Orrison	<i>Civil Engineers</i>
Harris Structural Design	<i>Structural Engineers</i>
Atlantec Engineers	<i>PME Engineers</i>
Kjellstrom & Lee	<i>General Contractor</i>
9,060	<i>Square Feet</i>
\$3,500,000	<i>Project Cost</i>
2022	<i>Completion</i>



SECTION 6 - PRIOR EXPERIENCE WITH SIMILAR PROJECTS



**First Bank Building - Hanover Center**  
*Wilmington, NC*

First Bank commissioned Gontram Architecture to design a major renovation and addition to an inherited, existing bank branch building in the Hanover Center in Wilmington, NC.

The existing branch, originally constructed in 1969, was severely out-dated and in desperate need of a facelift. Additional office and employee spaces were badly needed.



<b>First Bank</b>	<i>Owner</i>
<b>Blakely Design Group</b>	<i>Civil Engineers</i>
<b>Harris Structural Design</b>	<i>Structural Engineers</i>
<b>Atlantec Engineers, PA</b>	<i>PME Engineers</i>
<b>Thomas Construction Group</b>	<i>General Contractor</i>
<b>2,330</b>	<i>Square Feet</i>
<b>\$600,000</b>	<i>Project Cost</i>
<b>2011</b>	<i>Completion</i>

SECTION 6 - PRIOR EXPERIENCE WITH SIMILAR PROJECTS



**Amelia Station Medical Office Building**  
Clayton, NC



A new medical office shell building was recently completed by Gontram Architecture. The 10,000 speculative medical office building was built in the town of Clayton, NC, just blocks away from the new hospital. The new building completes a development owned by the Client that mixes residential, retail and medical office.

The building is constructed of conventional steel, steel studs and brick veneer. Energy-efficient aluminum storefront with thermal breaks and low-e glazing accents the façade. Projecting aluminum canopies mark the entrances.

A tenant mix of dental and medical general practitioners is anticipated. The building was designed to have the flexibility to add a drive-thru for a future pharmacy, if needed.

<b>Triangle Real Estate</b>	<i>Owner</i>
<i>not applicable</i>	<i>Interior Designer</i>
<b>Harris Structural Design</b>	<i>Structural Engineers</i>
<b>Atlantec Engineers</b>	<i>PME Engineers</i>
<b>Rufy-Peden</b>	<i>General Contractor</i>
<b>10,000</b>	<i>Square Feet</i>
<b>unavailable</b>	<i>Project Cost</i>
<b>2017</b>	<i>Completion</i>



# SECTION 6 - PRIOR EXPERIENCE WITH SIMILAR PROJECTS

The following similar projects have been completed by S+G. With the exception of allowable delays due to weather and site conditions, the projects were completed on schedule.

## CUMBERLAND COUNTY LANDFILL



### PROJECT SPECIFIC EXPERIENCE INCLUDES:

- » Title V Compliance
- » LFG Monitoring
- » Groundwater Monitoring and Management
- » Transfer Station Option Evaluation
- » Transfer Station Design and Permitting
- » Water Quality Remediation
- » Solid Waste Permitting

### RESOURCE MANAGEMENT

FAYETTEVILLE, NORTH CAROLINA / 2020 – PRESENT

**Description** - The Cumberland County Solid Waste facilities include an active MSW unit, a closed balefill unit, an LCID landfill, a compost facility, a closed MSW unit with C&D interred over it, convenience centers, a proposed transfer station, and closed pre-regulatory landfill units.

**Solid Waste Services** - S+G is assisting the County with compliance services, solid waste planning and future development of the Ann Street landfill, convenience sites, and the Wilkes Road compost facility.

**\*Transfer Station Design, Bidding and Procurement Assistance** - To ensure the County’s long-term disposal interests are met, S+G permitted a transfer station to decrease the disposal rate at the site and allow the facility time to purchase necessary land, mine a portion of the existing landfill and construct a cell for future expansion.

**Convenience Center Sites** - S+G is assisting the County in developing improvements to existing citizens convenience sites and development of new sites including local zoning approval, utility connections, and building and site infrastructure.

\*Transfer Station Permit - 4 Months                      Final Timeline - 4 Months

Original Project Cost Estimate - \$50,000              Final Cost - \$50,000

**Client Reference:** Cumberland County Landfill  
 Ms. Amanda Bader, P.E.  
 Solid Waste Director  
 910.321.6920  
 abader@cumberlandcountync.gov

## AVERY COUNTY LANDFILLS/TRANSFER STATION



### PROJECT SPECIFIC EXPERIENCE INCLUDES:

- » Transfer Station Permitting
- » Solid Waste Feasibility Study
- » Site Remediation
- » Recycling System Design
- » Solid Waste Permitting
- » Construction Administration and CQA
- » Solid Waste Management Plan

### RESOURCE MANAGEMENT

INGALLS, NORTH CAROLINA / 2007 – PRESENT

**Description** – Avery County has two landfill facilities on two properties. The Avery County C&D landfill is an active facility with a transfer station for MSW waste. The closed Avery County MSW landfill is located on a separate property. Our services to the County include the following:

**\*Transfer Station Permitting** – S+G completed the five year renewal and Life of Site Request of the Avery County MSW Transfer Station Permit which included updates to the Operations Manual, Site Drawings, and the inclusion of various supporting recycling operations such as glass, aluminum, cardboard, and white goods. More specifically, S+G included the streamlining of the existing facility permits, manuals, drawings, and supporting documents into a single Solid Waste Permit for the Transfer Station, C&D landfill, and various recycling activities.

Transfer Station Permit - 4 Months                      Final Timeline - 4 Months

Original Project Cost Estimate - \$28,5000              Final Cost - \$28,500

**Client Reference:** Avery County  
 Mr. Eric Foster, Solid Waste Director  
 828.737.5420  
 avery.sw@averycountync.gov



# SECTION 6 - PRIOR EXPERIENCE WITH SIMILAR PROJECTS

## HALIFAX COUNTY LANDFILL



**PROJECT SPECIFIC EXPERIENCE INCLUDES:**

- » Transfer Station Option Evaluation
- » Transfer Station Design and Permitting
- » Construction Administration and CQA
- » Landfill Closure
- » Landfill Gas Management
- » Solid Waste Management Plans
- » Convenience Center Design
- » Groundwater Assessment and Remediation
- » Landfill Operations Assistance
- » Financial Studies
- » Stormwater Compliance

RESOURCE MANAGEMENT

RECOVERY

REMIEDIATION

**Client Reference:**

Halifax County Public Utilities  
 Mr. Chris Williams -  
 Director  
 252.583.1451  
 williamscm@halifaxnc.com

LITTLETON, NORTH CAROLINA / 1991 – PRESENT

**Description** - The Halifax County Landfill facility consists of an closed lined ash monofill landfill, an active C&D landfill which is located on top of an unlined MSW landfill and a transfer station. S+G has provided many services to Halifax County over our longterm relationship. These services include the following:

**MSW Transfer Station Design, Bidding and Construction Management**

- S+G has designed and permitted a transfer station for Halifax County. This transfer station was designed for a maximum throughput of 200 tons/day. S+G also incorporated a citizen’s convenience area into the transfer station design. S+G prepared all bid documents for the transfer station and is providing construction management and engineering services during construction.

**Enfield Convenience Center Design and Construction Administration -**

S+G designed, conducted the bidding process, and provided construction services for a new solid waste convenience site located near the Town of Enfield in 2010-2011. The site had previously been used as a lumber mill and had several abandoned vehicles and piles of scrap tires that had collected over the years. The site design, which was modeled after a similar site Smith Gardner designed near the Town of Scotland Neck in 2003, included a 6 to 9 foot high reinforced concrete retaining wall and associated reinforced concrete slabs, paving, fencing, and drainage features. This convenience site has been successfully used by the citizens of Halifax County since 2011.

**\*Transfer Station Siting/Design/Permitting/Construction (2011-13) -**

S+G assisted the County with site selection and in providing information on the proposed facility to local citizens. Once the optimal site was selected, S+G performed the initial design and permitted the transfer station through the NCDEQ. Upon completion of permitting, S+G prepared the bid documents and managed the bid procurement process. The resulting bids were in line with the established construction budget and construction began in September 2012. During construction, S+G performed contract administration and engineering services including routine inspections. Despite wetter than normal conditions during construction, the project was completed and ready for use by the July 2013 deadline. Throughout the project, S+G worked with the County to establish the necessary budgets and schedules for performance of all activities.

**Transfer Station Life of Site Permitting (2018-19) -**

S+G prepared and submitted a permit application which resulted in the County being issued life of site approval for operations of the transfer station in 2019.

**Transfer Station Assessment (2021) -**

In 2021, S+G performed a Transfer Station Assessment in accordance with NCDEQ requirements to assess current conditions of the facility and provide recommendations for compliance with applicable rules. S+G also conducts periodic reviews of the condition of the transfer station upon request by the County.

\*Original Timeline - Nov. 2011 to July 2013      Final Timeline - Operational on July 1, 2013

Original Project Cost Estimate - \$110,000      Final Cost - \$110,000

## SECTION 7 - PROJECT SCOPE OF SERVICES & DELIVERABLES



### ANTICIPATED PROJECT SCOPE OF SERVICES

**Project Location:** The Project Area is limited to the main entrance area of the Rhodes Pond facility located at 10785 Dunn Road, Dunn, NC 28334. An abandoned restroom building currently exists on the property. The restrooms were left uncompleted.

**Project Scope of Services:** The Architect shall visit the site to verify and document the existing conditions as necessary to produce the preliminary drawings necessary. Schematic floor plans, elevations and renderings will be produced as necessary to convey design intent. The Architect shall meet with the Owner to present the schematic design scheme(s) and gain Owner approval. Upon approval, the project will proceed to Construction Documents where engineers will be engaged. Drawings will be produced for the purposes of permitting and bidding. Services shall include Architectural design, Structural engineering, Plumbing/Mechanical/Electrical engineering.

### DELIVERABLES

The Architect and its Consulting Engineers shall provide the following:

**Schematic Design:** Floor plans, elevations, renderings (to help visualize the project) of the schematic design shall be provided to the Owner in electronic (PDF, JPG, PNG) format.

**Construction Documents:** This phase produces the detailed drawings and specifications needed for construction, including plans, elevations, sections, details, and material schedules. Drawings and specifications shall be provided by the Architect, Structural engineer, and Plumbing/Mechanical/Electrical engineers. These documents are used for bidding and construction.

**Bidding/Negotiation:** Architects may assist with the bidding process, reviewing bids and negotiating contracts with contractors.

**Construction Administration:** This phase involves observing the construction process, reviewing shop drawings, making site visits (as necessary) and responding to requests for information. This can also include reviewing Contractor's monthly pay applications, change order proposals, etc.

## SECTION 8 - CURRENT PROJECTS

**GONTRAM ARCHITECTURE, INC. - CURRENT PROJECTS**

Gontram has worked on a variety of design projects in the past 20+ years. Below is a list of current design projects underway with estimated cost and completion date:

**Duke Renovation - Durham, NC:**

Estimated Cost: \$250,000

Project Completion: August, 2025

**First Bank Office Renovation - Florence, SC**

Estimated Cost: \$450,000

Project Completion: August, 2025

**Sampson Co. RO Facility - Sampson Co., NC**

Estimated Cost: \$3,000,000

Project Completion: 2026

**Smith-Gardner: Yard Waste Repairs - Durham, NC**

Estimated Cost: \$1,250,000

Project Completion: 2026

**York Co. Landfill Break Room Renovation - York, SC**

Estimated Cost: \$350,000

Project Completion: 2026

**Atlantec: First Baptist Church Office-Elevator Renov - Ahoskie, NC**

Estimated Cost: \$300,000

Project Completion: 2026

**BPG: Capital Electric Supply - Presidential Dr - Durham, NC**

Estimated Cost: \$750,000

Project Completion: November 2025

**RHG Apartments - Roanoke Rapids, NC**

Estimated Cost: \$3,500,000

Project Completion: 2026

**Wagbar - Holly Springs, NC**

Estimated Cost: \$500,000

Project Completion: December 2025

## SECTION 8 - CURRENT PROJECTS

### OUR VISION

As an employee-owned company, Smith Gardner, Inc. strives to continually improve efficiencies, services, and solutions to help our clients achieve the greatest returns on their investments. We achieve this vision through teamwork, respect, accountability, integrity, and innovation. These values power everything we do.



### S+G. - CURRENT PROJECTS

S+G is continually working on current and new projects. Below is a list of current projects underway with estimated cost and completion date:

**Cumberland County R.O Treatment Facility Design Study:**

Estimated Cost: \$1,500,000

Project Completion: June, 2026

**Cumberland County Solid Waste Convenience Center Construction Projects - Assembly Court and Parkton Rd.:**

Estimated Cost: \$2,000,000

Project Completion: 2026

**Cumberland County Ann Street Landfill Stormwater Pond Improvements Project:**

Estimated Cost: \$3,400,000

Project Completion: 2026

**Cumberland County Wilkes Road Maintenance Shed Construction:**

Estimated Cost: \$500,000

Project Completion: End of 2025

**Red Rock Disposal C&D Landfill - Phase 3B-1 Construction:**

Estimated Cost: \$1,000,000

Project Completion: End of 2025

**Pender County Transfer Station Repairs:**

Estimated Cost: \$725,000

Project Completion: January, 2025

**Cumberland County Fire Suppression System:**

Estimated Cost: \$900,000

Project Completion: 2026

**Cumberland Stormwater Compliance/Basin Improvements:**

Estimated Cost: \$15,000

Project Completion: Ongoing

**Sampson County R.O. Treatment Facility Design:**

Estimated Cost: \$250,000

Project Completion: January, 2025

**Durham Yardwaste Facility Improvements:**

Estimated Cost: \$500,000

Project Completion: April, 2026



# SECTION 9 - WORK TIMELINE

## OUR VALUES

Smith Gardner, Inc. strives to continually improve efficiencies, services, and solutions to help our clients achieve the greatest returns on their investments.

We achieve this through

- Teamwork
- Respect
- Accountability
- Integrity
- Innovation
- Involvement

These values power everything we do.



## S+G WORK TIMELINE

S+G is prepared to begin work immediately upon approval by the County. Our estimate of the time to complete the project is detailed below. Please understand that we cannot control regulatory review times but we will respond to requests for information as quickly as possible.

### Design:

- Geotechnical Investigation: 4 weeks (If a new location is required)
- Survey: 3 weeks (Concurrent with Geotechnical Investigation)
- Civil Site Design: 6 weeks (Concurrent with other design tasks)
- Architectural Design: 6 weeks (Concurrent with other design tasks)
- Structural Design: 6 weeks (Concurrent with other design tasks)
- MEP Design: 6 weeks (Concurrent with other design tasks)

### Permitting:

- Local Permitting: 6 weeks (assumed)

**Procurement:** (County) 4 - 6 Months

**Construction:** 6 Months (estimated)

**Certifications:** 4 weeks

**Permit to Operate:** 6 weeks

## GONTRAM ARCHITECTURE WORK TIMELINE

From the time Gontram Architecture is awarded the Work, and has received Authorization to Proceed, it will take approximately 2 weeks to begin Work.

We anticipate Schematic Design services (without engineering) to be complete within 4 weeks.

Upon approval of Schematic Design services, we anticipate being ready to submit the drawings for permitting and/or bidding within 6-8 weeks.

These timeframes are subject to change depending on the length of owner review required, availability of site information, etc.

# APPENDIX A - LICENSURE & INSURANCE



## NORTH CAROLINA BOARD OF EXAMINERS FOR ENGINEERS AND SURVEYORS

4601 Six Forks Rd Suite 310  
Raleigh, North Carolina 27609

Smith Gardner, Inc.  
14 N Boylan Avenue  
Raleigh, NC 27603

### This is to Certify that:

Smith Gardner, Inc. is licensed with the North Carolina Board of Examiners for Engineers and Surveyors, and is authorized to practice **engineering and land surveying** under the provisions of Chapter 89C and 55B of the General Statutes of North Carolina.

This authorization must be renewed annually, and **expires on June 30, 2025**

License No. : F-1370



## THE NORTH CAROLINA BOARD OF EXAMINERS FOR ENGINEERS AND SURVEYORS

Executive Director

### POST IN PLACE OF BUSINESS

Issued 06/12/2024

Telephone  
(919) 791-2000

FAX  
(919) 791-2012

EMAIL Address  
ncbels@ncbels.org

WEB Site  
www.ncbels.org

# APPENDIX A - LICENSURE & INSURANCE



## CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)  
05/28/2024

**THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.**

**IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).**

PRODUCER INSURE PO Box 31508 Raleigh, NC 27622	CONTACT NAME: Tracy Meadows		
	PHONE (A/C, No, Ext): (919) 781-1115 FAX (A/C, No): (919) 783-6427		
INSURED  Smith Gardner Inc 14 N Boylan Avenue Raleigh, NC 27603	E-MAIL ADDRESS: tmeadows@insure-nc.com		
	INSURER(S) AFFORDING COVERAGE		NAIC #
	INSURER A: Travelers Indemnity Company of Connecticut	25682	
	INSURER B: Travelers Property Casualty Company of America	25674	
	INSURER C: Travelers Indemnity Company of America	25666	
	INSURER D: Continental Casulaty Company	20443	
INSURER E:			
INSURER F:			

**COVERAGES** CERTIFICATE NUMBER: COI 2024-2025 REVISION NUMBER:

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS
A	<input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: <input checked="" type="checkbox"/> POLICY <input type="checkbox"/> PRO-JECT <input type="checkbox"/> LOC <input type="checkbox"/> OTHER:			680-1J560231	06/01/2024	06/01/2025	EACH OCCURRENCE \$ 1,000,000 DAMAGE TO RENTED PREMISES (Ea occurrence) \$ 1,000,000 MED EXP (Any one person) \$ 5,000 PERSONAL & ADV INJURY \$ 1,000,000 GENERAL AGGREGATE \$ 2,000,000 PRODUCTS - COMP/OP AGG \$ 2,000,000 \$
A	AUTOMOBILE LIABILITY <input type="checkbox"/> ANY AUTO <input type="checkbox"/> OWNED AUTOS ONLY <input checked="" type="checkbox"/> SCHEDULED AUTOS NON-OWNED AUTOS ONLY <input checked="" type="checkbox"/> HIRED AUTOS ONLY			680-1J560231	06/01/2024	06/01/2025	COMBINED SINGLE LIMIT (Ea accident) \$ 1,000,000 BODILY INJURY (Per person) \$ BODILY INJURY (Per accident) \$ PROPERTY DAMAGE (Per accident) \$ \$
B	<input checked="" type="checkbox"/> UMBRELLA LIAB <input checked="" type="checkbox"/> OCCUR <input type="checkbox"/> EXCESS LIAB <input type="checkbox"/> CLAIMS-MADE DED \$ RETENTION \$			CUP-2A316636	06/01/2024	06/01/2025	EACH OCCURRENCE \$ 5,000,000 AGGREGATE \$ 5,000,000 \$
C	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	Y/N N	N/A	UB-5K522297	06/01/2024	06/01/2025	<input checked="" type="checkbox"/> PER STATUTE <input type="checkbox"/> OTH-ER E.L. EACH ACCIDENT \$ 500,000 E.L. DISEASE - EA EMPLOYEE \$ 500,000 E.L. DISEASE - POLICY LIMIT \$ 500,000
D	Professional Liability/ Pollution Incident Liability			EEH133335262	08/21/2023	08/21/2024	Each Claim: \$5,000,000 Aggregate: \$5,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

<p>CERTIFICATE HOLDER</p> <p>FOR INFORMATION ONLY</p>	<p>CANCELLATION</p> <p>SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.</p> <p>AUTHORIZED REPRESENTATIVE</p> <p><i>Tracy Meadows</i></p>
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## **SOLID WASTE MANAGEMENT**

### **MEMORANDUM FOR BOARD OF COMMISSIONERS AGENDA OF SEPTEMBER 15, 2025**

**TO: BOARD OF COUNTY COMMISSIONERS**

**FROM: AMANDA LEE, PE, GENERAL MANAGER FOR NATURAL RESOURCES**

**DATE: 9/10/2025**

**SUBJECT: APPROVAL OF CONTRACT AMENDMENT ITEMS FOR CROWN COLISEUM DOOR REPLACEMENT**

#### **BACKGROUND**

At the August 25, 2025, Board Meeting the Issuance of a Field order was approved by the Board. Wooten has responded to the field order request with the following:

The Wooten Company will agree to pay for the remaining \$46k for the new 7-10 door slabs on 3 conditions:

1. The County agrees to release Wooten from any and all remaining design-related issues related to the project. This is a renovation project, not new construction, and all existing conditions could not have been anticipated during the design phase. Per your email below, it is our understanding that all previously raised issues have been addressed. And no new RFIs have been submitted by the Contractor.
2. The County agrees to execute a design services amendment in the amount of \$9,352.00 covering labor and expenses for additional construction services provided to the County by Wooten through project closeout. The original Signed Letter Agreement (January 3, 2023) had an estimated 10-week construction services phase with a fee of \$25,570.00. Incurred to date, construction administration phase services total \$54,480.00 covering the 14-month duration beginning in July 2024. Moving forward, Wooten anticipates an additional \$8,500.00 in labor and expenses to be incurred prior to close out in early November 2025 for a total of \$62,980. Our request represents 25% of the difference between \$25,570 and \$62,980.
3. The County agrees to direct the Contractor to deliver the 7-0 door slabs in new, unused condition to The Wooten Company's Raleigh office or agrees to store them securely until they can be picked up by a Wooten representative. The Contractor has stated they intend to dispose of the doors because they cannot be restocked.

This item was recommended to proceed to the Finance Committee by the Infrastructure Committee at their September 8, 2025, meeting. At their September 8, 2025, meeting, the Finance Committee approved adding this as an item of Consent to the agenda of the September 15, 2025, Board of Commissioners' regular meeting.

**RECOMMENDATION / PROPOSED ACTION**

The General Manager for Natural Resources recommends following:

1. Agree to release Wooten from any and all remaining design-related issues related to the project.
2. Negotiate a design services amendment for \$9,352.00.
3. Agree to release the 7-0 door slabs to Wooden Company.
4. Prepare a final adjustment change order to include \$4,175 to cover cost for hollow frame and hardware changes.

**ATTACHMENTS:**

Description	Type
Offer email	Backup Material
Detail of construction services effort from Wooten	Backup Material

## Amanda Lee

---

**From:** Gary Hartong <ghartong@thewootencompany.com>  
**Sent:** Wednesday, September 3, 2025 1:52 PM  
**To:** Amanda Lee  
**Cc:** Russell Pearlman; Thomas Madre; Donna Griffin Rice; Faith Phillips; Rick Moorefield  
**Subject:** Re: Crown Coliseum - Door Reorder  
**Attachments:** 2877-L\_BG001\_Ph06 1.pdf

**CAUTION:** This email originated from outside of the County. Do not open attachments, click on links, or reply unless you trust the sender or are expecting it.

Good afternoon Ms. Lee -

Attached is the labor detail showing the number of hours for R. Pearlman, T. Madre, B. Egan and D. Statevicus totaling 250 hours. The labor report totals \$56,109 and hours are broken down below. Please note the remaining difference of \$15,234 (\$56,109 - \$40,875) is related to consultant fees (\$14,564) and reimbursable expenses (\$670).

- Russell Pearlman, 164 hours
- Thomas Madre, 75 hours
- Bob Egan, 7 hours
- Derek Statkevicius, 4 hours

The additional services related to design errors that you mention below (and highlighted in the attachment) total 27.0 hours by Russell Pearlman for the door issue. This is equivalent to \$4,860 of the \$56,109 total. There is no overlap between our request for \$9,352 and any previous work to resolve the design issue.

Original Contract	\$25,570
Incurred to Date	<u>\$56,109</u>
Overrun to Date	[\$30,539]
Ant. Closeout	[\$8,500]
Ant. Closeout Total	[\$39,039]
Door Error Credit	\$4,860
County Request	<u>\$9,352</u>
Adj. Closeout Total	[\$24,827]

The Adjusted Closeout Total of \$24,827 is additional design related services that Wooten has provided to Cumberland County, aside from the change order issue, for which Wooten is not requesting reimbursement.

Please let me know if you have any other questions. Thanks.

GDH

**Gary D. Hartong, PE, FACEC**

*President*

(919) 828-0531 x802 • Office  
(252) 916-6230 • Mobile  
120 N. Boylan Ave.  
Raleigh, NC 27603

**Wooten**

---

**From:** Gary Hartong

**Sent:** Friday, August 29, 2025 9:13 AM

**To:** Amanda Lee <alee@cumberlandcountync.gov>

**Cc:** Russell Pearlman <rpearlman@thewootencompany.com>; Thomas Madre <tmadre@thewootencompany.com>; Donna Griffin Rice <drice@cumberlandcountync.gov>; Faith Phillips <fphillips@cumberlandcountync.gov>; Rick Moorefield <rmoorefield@cumberlandcountync.gov>

**Subject:** Re: Crown Coliseum - Door Reorder

Yes, we will provide that information to you early next week. Please keep in mind that the requested amount basically carries us forward through project closet. Thank you.

GDH

Sent from my iPhone

On Aug 29, 2025, at 9:02 AM, Amanda Lee <alee@cumberlandcountync.gov> wrote:

For item 2 can you please send itemized billing in support of the request?

We need to be mindful of the additional services associated with design errors. They should not be included in the request.

---

**From:** Gary Hartong <ghartong@thewootencompany.com>  
**Sent:** Thursday, August 28, 2025 4:11 PM  
**To:** Amanda Lee <alee@cumberlandcountync.gov>  
**Cc:** Russell Pearlman <rpearlman@thewootencompany.com>; Thomas Madre <tmadre@thewootencompany.com>; Donna Griffin Rice <drice@cumberlandcountync.gov>; Faith Phillips <fphillips@cumberlandcountync.gov>; Rick Moorefield <rmoorefield@cumberlandcountync.gov>  
**Subject:** Re: Crown Coliseum - Door Reorder

**CAUTION:** This email originated from outside of the County. Do not open attachments, click on links, or reply unless you trust the sender or are expecting it.

Good afternoon Ms. Lee -

After one week of discussion with CMC Building, The Wooten Company and CMC Building are unable to reach financial resolution of the door issue for the hospitality suite. While the Construction Contract General Conditions clearly state that the Contractor has responsibility to field verify all measurements before fabrication, this did not occur per comparison of the dates of RFIs and the materials order. The Contractor holds steadfast to the position that the 7-0 doors do indeed fit within the 7-10 frames. As previously noted, we strongly disagree with their position and quite honestly think it is an incorrect but convenient position for them to hold.

Nonetheless, in order to facilitate resolution of this issue, The Wooten Company will agree to pay for the remaining \$46k for the new 7-10 door slabs on 3 conditions:

1. The County agrees to release Wooten from any and all remaining design-related issues related to the project. This is a renovation project, not new construction, and all existing conditions could not have been anticipated during the design phase. Per your email below, it is our understanding that all previously raised issues have been addressed. And no new RFIs have been submitted by the Contractor.
2. The County agrees to execute a design services amendment in the amount of \$9,352.00 covering labor and expenses for additional construction services provided to the County by Wooten through project closeout. The original Signed Letter Agreement (January 3, 2023) had an estimated 10-week construction services phase with a fee of \$25,570.00. Incurred to date, construction administration phase services total \$54,480.00 covering the 14-month duration beginning in July 2024. Moving forward, Wooten anticipates an additional \$8,500.00 in labor and expenses to be incurred prior to close out in early November 2025 for a total of \$62,980. Our request represents 25% of the difference between \$25,570 and \$62,980.



3. The County agrees to direct the Contractor to deliver the 7-0 door slabs and hardware in new, unused condition to The Wooten Company's Raleigh office or agrees to store them securely until they can be picked up by a Wooten representative. The Contractor has stated they intend to dispose of the doors because they cannot be restocked.

Please advise if this proposal is acceptable to Cumberland County. Thank you.

GDH

**Gary D. Hartong, PE, FACEC**

*President*

<image001.png>

(919) 828-0531 x802 • Office  
(252) 916-6230 • Mobile  
120 N. Boylan Ave.  
Raleigh, NC 27603  
<image002.png>

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**From:** Amanda Lee <[alee@cumberlandcountync.gov](mailto:alee@cumberlandcountync.gov)>

**Sent:** Monday, August 18, 2025 6:47 AM

**To:** Gary Hartong <[ghartong@thewootencompany.com](mailto:ghartong@thewootencompany.com)>

**Cc:** Donna Griffin Rice <[drice@cumberlandcountync.gov](mailto:drice@cumberlandcountync.gov)>; Faith Phillips <[fphillips@cumberlandcountync.gov](mailto:fphillips@cumberlandcountync.gov)>; Rick Moorefield <[rmoorefield@cumberlandcountync.gov](mailto:rmoorefield@cumberlandcountync.gov)>; Russell Pearlman <[rpearlman@thewootencompany.com](mailto:rpearlman@thewootencompany.com)>; Thomas Madre <[tmadre@thewootencompany.com](mailto:tmadre@thewootencompany.com)>

**Subject:** Re: Crown Coliseum - Door Reorder

Are you aware of the contract amendment approved with the contract that was necessary for the following?

1. Omission of an architectural demolition sheet.
2. Installation of new acoustical tiles because the wrong diameter can lights were specified.
3. Addition of drywall because the existing finishes were not suitable for the new acoustical panel installation.

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---

**From:** Gary Hartong <[ghartong@thewootencompany.com](mailto:ghartong@thewootencompany.com)>

**Sent:** Sunday, August 17, 2025 10:41 AM

**To:** Amanda Lee <[alee@cumberlandcountync.gov](mailto:alee@cumberlandcountync.gov)>

**Cc:** Donna Griffin Rice <[drice@cumberlandcountync.gov](mailto:drice@cumberlandcountync.gov)>; Faith Phillips <[fphillips@cumberlandcountync.gov](mailto:fphillips@cumberlandcountync.gov)>; Rick Moorefield <[rmoorefield@cumberlandcountync.gov](mailto:rmoorefield@cumberlandcountync.gov)>; Russell Pearlman <[rpearlman@thewootencompany.com](mailto:rpearlman@thewootencompany.com)>; Thomas Madre <[tmadre@thewootencompany.com](mailto:tmadre@thewootencompany.com)>

**Subject:** Re: Crown Coliseum - Door Reorder

**CAUTION:** This email originated from outside of the County. Do not open attachments, click on links, or reply unless you trust the sender or are expecting it.

Good morning Ms. Lee -

As follow-up to my email responses of August 8<sup>th</sup> and 14<sup>th</sup>, and the two voice mails that I left for you on August 7<sup>th</sup>, The Wooten Company seeks resolution of this door size issue to allow Cumberland County to complete the project successfully and within the intended timeframe. Note this email to you does not include the Contractor (CMC Building). It appears that The Wooten Company and CMC Building are interpreting the responsibilities and obligations of the construction contract from two different lenses, and we reaffirm that The Wooten Company is not responsible for the full cost of the change order.

As previously noted, the design agreement of \$111,090 represents 6.1% of the \$1,828,890 construction agreement. In context of the proposed change order for \$50,028.90, The Wooten Company is willing to contribute its pro rata share of \$3,051 towards its cost. The remainder of the change order cost may be requested from CMC Building, secured from the construction contract retainage, or other available sources.

Alternately, should the County elect to move forward with the less expensive \$4,175 option for metal studs and GWB using the ordered doors, The Wooten Company would agree to contribute this same amount towards its implementation. From what we understand, this does not impact operations for the County other than lowering the arms for the scissor lift to access the room. There are no life safety mechanisms incorporated into the existing doors nor the proposed replacement doors. I believe that The Wooten Company and CMC Building come could to quick agreement for this option.

In consultation with Mr. Moorefield, please let us know the County's position moving forward. Thank you.

GDH

**Gary D. Hartong, PE, FACEC**

*President*

<image001.png>

(919) 828-0531 x802 • Office  
(252) 916-6230 • Mobile  
120 N. Boylan Ave.  
Raleigh, NC 27603

<image002.png>

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**From:** Gary Hartong <[ghartong@thewootencompany.com](mailto:ghartong@thewootencompany.com)>  
**Sent:** Thursday, August 14, 2025 1:36 PM  
**To:** [alee@cumberlandcountync.gov](mailto:alee@cumberlandcountync.gov) <[alee@cumberlandcountync.gov](mailto:alee@cumberlandcountync.gov)>  
**Cc:** Donna Griffin Rice <[drice@cumberlandcountync.gov](mailto:drice@cumberlandcountync.gov)>; Thomas D'Amico <[tdamico@cmcbuildinginc.com](mailto:tdamico@cmcbuildinginc.com)>; Faith Phillips <[fphillips@cumberlandcountync.gov](mailto:fphillips@cumberlandcountync.gov)>; Rick Moorefield <[rmoorefield@cumberlandcountync.gov](mailto:rmoorefield@cumberlandcountync.gov)>; [ljacobs@cmcbuildinginc.com](mailto:ljacobs@cmcbuildinginc.com) <[ljacobs@cmcbuildinginc.com](mailto:ljacobs@cmcbuildinginc.com)>; [bpresnell@cmcbuildinginc.com](mailto:bpresnell@cmcbuildinginc.com) <[bpresnell@cmcbuildinginc.com](mailto:bpresnell@cmcbuildinginc.com)>; Russell Pearlman <[rpearlman@thewootencompany.com](mailto:rpearlman@thewootencompany.com)>; Thomas Madre <[tmadre@thewootencompany.com](mailto:tmadre@thewootencompany.com)>  
**Subject:** Re: Crown Coliseum - Door Reorder

Good afternoon Ms. Lee -

The Wooten Company does not agree to cover the full costs for the door change order. Therefore, The Wooten Company will not prepare a Change Order in the amount of \$0.00 for the Contractor to proceed forward with the scope of work.

Cumberland County may issue a Field Change Directive directly to the Contractor if the County wishes to proceed forward immediately with the door order. This will keep the schedule on track with the option to negotiate financial responsibility at a later date.

Thank you.

GDH

**Gary D. Hartong, PE, FACEC**

*President*

<image001.png>

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(252) 916-6230 • Mobile  
120 N. Boylan Ave.  
Raleigh, NC 27603  
<image002.png>

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**From:** Amanda Lee <[alee@cumberlandcountync.gov](mailto:alee@cumberlandcountync.gov)>  
**Sent:** Thursday, August 14, 2025 12:33 PM  
**To:** Thomas D'Amico <[tdamico@cmcbuildinginc.com](mailto:tdamico@cmcbuildinginc.com)>  
**Cc:** Donna Griffin Rice <[drice@cumberlandcountync.gov](mailto:drice@cumberlandcountync.gov)>; Faith Phillips <[fphillips@cumberlandcountync.gov](mailto:fphillips@cumberlandcountync.gov)>; Rick Moorefield <[rmoorefield@cumberlandcountync.gov](mailto:rmoorefield@cumberlandcountync.gov)>; LaShanda Jacobs <[ljacobs@cmcbuildinginc.com](mailto:ljacobs@cmcbuildinginc.com)>; Bruce Presnell <[bpresnell@cmcbuildinginc.com](mailto:bpresnell@cmcbuildinginc.com)>; Russell Pearlman <[rpearlman@thewootencompany.com](mailto:rpearlman@thewootencompany.com)>; Thomas Madre <[tmadre@thewootencompany.com](mailto:tmadre@thewootencompany.com)>  
**Subject:** RE: Crown Coliseum - Door Reorder

Russell –

Please prepare a change order in the amount of \$0 for the door reorder. Please include language that the cost is to be borne by architect. We need the signed change order by 5:00 tomorrow so that we can include in our package for the next Board meeting.

---

**From:** Thomas D'Amico <[tdamico@cmcbuildinginc.com](mailto:tdamico@cmcbuildinginc.com)>  
**Sent:** Thursday, August 14, 2025 12:09 PM  
**To:** Amanda Lee <[alee@cumberlandcountync.gov](mailto:alee@cumberlandcountync.gov)>  
**Cc:** Donna Griffin Rice <[drice@cumberlandcountync.gov](mailto:drice@cumberlandcountync.gov)>; Faith Phillips <[fphillips@cumberlandcountync.gov](mailto:fphillips@cumberlandcountync.gov)>; Rick Moorefield <[rmoorefield@cumberlandcountync.gov](mailto:rmoorefield@cumberlandcountync.gov)>; LaShanda Jacobs <[ljacobs@cmcbuildinginc.com](mailto:ljacobs@cmcbuildinginc.com)>; Bruce Presnell <[bpresnell@cmcbuildinginc.com](mailto:bpresnell@cmcbuildinginc.com)>;

Russell Pearlman <[rpearlman@thewootencompany.com](mailto:rpearlman@thewootencompany.com)>; Thomas Madre <[tmadre@thewootencompany.com](mailto:tmadre@thewootencompany.com)>

**Subject:** Crown Coliseum - Door Reorder

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Amanda,

CMC is proceeding with the door reorder to keep the project on track. Please see attached letter regarding same. Thank you

Respectfully,

**Thomas D'Amico**

**CMC Building, Inc.**

**Project Manager**

**Cell: 910-228-4807**

**[tdamico@cmcbuildinginc.com](mailto:tdamico@cmcbuildinginc.com)**

-

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		Total Hours	Billing
<b>Phase Number: 06 Construction Administration</b>			
<b>Labor and Overhead</b>			
0002 Architect I			
NC North Carolina			
9126	Madre, Thomas 4/28/2025	2.00	270.00
9126	Madre, Thomas 5/8/2025	1.00	135.00
9126	Madre, Thomas 5/9/2025	1.00	135.00
9126	Madre, Thomas 5/13/2025	1.00	135.00
9126	Madre, Thomas 6/3/2024	2.00	208.00
9126	Madre, Thomas 6/4/2024	1.00	104.00
9126	Madre, Thomas 6/18/2024	1.00	104.00
9126	Madre, Thomas 6/26/2024	1.00	104.00
9126	Madre, Thomas 6/27/2024	1.00	104.00
9126	Madre, Thomas 6/28/2024	2.00	208.00
9126	Madre, Thomas 7/1/2024	2.00	208.00
9126	Madre, Thomas 7/9/2024	1.00	104.00
9126	Madre, Thomas 7/19/2024	2.00	208.00
9126	Madre, Thomas 7/22/2024	1.00	104.00
9126	Madre, Thomas 7/26/2024	2.00	208.00
9126	Madre, Thomas 8/8/2024	4.00	604.00
9126	Madre, Thomas 8/13/2024	3.00	453.00
9126	Madre, Thomas 8/14/2024	2.00	302.00
9126	Madre, Thomas 3/17/2025	2.00	270.00
9126	Madre, Thomas 3/18/2025	1.00	135.00
9126	Madre, Thomas 3/21/2025	1.00	135.00
9126	Madre, Thomas 4/2/2025	1.00	135.00
9126	Madre, Thomas 4/3/2025	1.00	135.00
9126	Madre, Thomas 4/4/2025	1.00	135.00
9126	Madre, Thomas 4/9/2025	2.00	270.00
9126	Madre, Thomas 4/14/2025	1.00	135.00
Total for 9126		<b>40.00</b>	<b>5,048.00</b>
9242	Statkevicius, Derek 5/12/2025	.50	52.50
9242	Statkevicius, Derek 5/14/2025	3.50	367.50
Total for 9242		<b>4.00</b>	<b>420.00</b>
Total for North Carolina		<b>44.00</b>	<b>5,468.00</b>
Total for Architect I		<b>44.00</b>	<b>5,468.00</b>
0003 Architect II			
NC North Carolina			
6540	Pearlman, Russell 5/9/2025	1.00	180.00
6540	Pearlman, Russell 5/13/2025	2.50	450.00
6540	Pearlman, Russell 5/14/2025	6.00	1,080.00
6540	Pearlman, Russell 5/19/2025	2.00	360.00
6540	Pearlman, Russell 5/21/2025	1.50	270.00
6540	Pearlman, Russell 5/22/2025	5.00	900.00
6540	Pearlman, Russell 5/27/2025	1.50	270.00
6540	Pearlman, Russell 5/30/2025	2.00	360.00
6540	Pearlman, Russell 6/10/2025	5.00	900.00
6540	Pearlman, Russell 6/16/2025	3.00	540.00
6540	Pearlman, Russell 6/17/2025	1.50	270.00
6540	Pearlman, Russell 7/8/2025	1.00	180.00
6540	Pearlman, Russell 7/22/2025	6.00	1,080.00
6540	Pearlman, Russell 7/24/2025	7.50	1,350.00
6540	Pearlman, Russell 8/5/2025	3.00	540.00
6540	Pearlman, Russell 8/11/2025	4.00	720.00
6540	Pearlman, Russell 8/12/2025	6.00	1,080.00
6540	Pearlman, Russell 8/15/2025	4.00	720.00
6540	Pearlman, Russell 8/18/2025	1.50	270.00
6540	Pearlman, Russell 8/20/2025	2.50	450.00
6540	Pearlman, Russell 6/3/2024	1.00	151.00
6540	Pearlman, Russell 6/4/2024	1.00	151.00
6540	Pearlman, Russell 6/5/2024	5.00	755.00

6540	Pearlman, Russell	6/19/2024	7.00	1,057.00
6540	Pearlman, Russell	6/28/2024	2.00	302.00
6540	Pearlman, Russell	7/1/2024	5.00	755.00
6540	Pearlman, Russell	7/11/2024	3.00	453.00
6540	Pearlman, Russell	8/9/2024	1.50	270.00
6540	Pearlman, Russell	9/4/2024	4.00	720.00
6540	Pearlman, Russell	9/27/2024	3.00	540.00
6540	Pearlman, Russell	12/3/2024	2.50	450.00
6540	Pearlman, Russell	12/6/2024	2.50	450.00
6540	Pearlman, Russell	12/17/2024	5.50	990.00
6540	Pearlman, Russell	1/9/2025	1.50	270.00
6540	Pearlman, Russell	1/14/2025	2.50	450.00
6540	Pearlman, Russell	1/17/2025	2.50	450.00
6540	Pearlman, Russell	2/5/2025	3.00	540.00
6540	Pearlman, Russell	2/21/2025	1.00	180.00
6540	Pearlman, Russell	3/11/2025	8.00	1,440.00
6540	Pearlman, Russell	3/13/2025	3.00	540.00
6540	Pearlman, Russell	3/25/2025	2.00	360.00
6540	Pearlman, Russell	3/26/2025	.50	90.00
6540	Pearlman, Russell	4/2/2025	1.00	180.00
6540	Pearlman, Russell	4/4/2025	2.50	450.00
6540	Pearlman, Russell	7/14/2025	6.00	1,080.00
6540	Pearlman, Russell	7/17/2025	4.00	720.00
6540	Pearlman, Russell	7/21/2025	3.50	630.00
6540	Pearlman, Russell	7/28/2025	2.50	450.00
6540	Pearlman, Russell	7/31/2025	2.00	360.00
6540	Pearlman, Russell	8/8/2025	2.50	450.00
6540	Pearlman, Russell	8/14/2025	2.00	360.00
6540	Pearlman, Russell	8/19/2025	3.00	540.00
6540	Pearlman, Russell	8/21/2025	1.50	270.00
Total for 6540			<b>164.00</b>	<b>28,824.00</b>
9126	Madre, Thomas	5/19/2025	2.00	270.00
9126	Madre, Thomas	5/20/2025	1.00	135.00
9126	Madre, Thomas	5/27/2025	2.00	270.00
9126	Madre, Thomas	5/30/2025	2.00	270.00
9126	Madre, Thomas	6/2/2025	2.00	270.00
9126	Madre, Thomas	6/5/2025	2.00	270.00
9126	Madre, Thomas	6/6/2025	3.00	405.00
9126	Madre, Thomas	6/18/2025	2.00	270.00
9126	Madre, Thomas	7/7/2025	1.00	135.00
9126	Madre, Thomas	7/10/2025	2.00	270.00
9126	Madre, Thomas	7/11/2025	2.00	270.00
9126	Madre, Thomas	7/14/2025	5.00	675.00
9126	Madre, Thomas	7/21/2025	2.00	270.00
9126	Madre, Thomas	7/22/2025	1.00	135.00
9126	Madre, Thomas	7/28/2025	3.00	405.00
9126	Madre, Thomas	7/30/2025	1.00	135.00
9126	Madre, Thomas	8/14/2025	2.00	270.00
Total for 9126			<b>35.00</b>	<b>4,725.00</b>
Total for North Carolina			<b>199.00</b>	<b>33,549.00</b>
Total for Architect II			<b>199.00</b>	<b>33,549.00</b>
0010 Engineer V				
NC North Carolina				
4450	Egan, Robert	8/6/2024	2.00	520.00
4450	Egan, Robert	8/28/2024	2.00	520.00
4450	Egan, Robert	10/30/2024	2.00	520.00
4450	Egan, Robert	12/3/2024	1.00	298.00
Total for 4450			<b>7.00</b>	<b>1,858.00</b>
Total for North Carolina			<b>7.00</b>	<b>1,858.00</b>
Total for Engineer V			<b>7.00</b>	<b>1,858.00</b>
<b>Total for Labor and Overhead</b>			<b>250.00</b>	<b>40,875.00</b>
<b>Expenses</b>				



**Direct Expenses****Consultants**

## 65140 CONTRACT FEES (NON-BILLABLE)

AP 23574 9/6/2024	Invoice: 256545, 8/31/2024 / IA Interior Architects, Inc.	2,035.00
AP 23705 10/7/2024	Invoice: 255817, 7/31/2024 / IA Interior Architects, Inc.	3,052.50
AP 24000 12/17/2024	Invoice: 260565, 11/30/2024 / IA Interior Architects, Inc.	2,035.00
AP 24103 1/10/2025	Invoice: 257881, 9/30/2024 / IA Interior Architects, Inc.	1,320.00
AP 24104 1/10/2025	Invoice: 258998, 10/31/2024 / IA Interior Architects, Inc.	1,732.50
AP 24237 2/6/2025	Invoice: 261858, 12/31/2024 / IA Interior Architects, Inc.	2,035.00
AP 24265 2/12/2025	Invoice: 262642, 1/31/2025 / IA Interior Architects, Inc.	1,628.00
AP 24395 3/10/2025	Invoice: 264039, 2/28/2025 / IA Interior Architects, Inc.	726.00

Total for 65140

**14,564.00****Total for Consultants****14,564.00****Total for Direct Expenses****14,564.00****Reimbursable Expenses****Expenses**

## 51200 AUTO (NON-COMP. BILLABLE)

EX 11804 7/24/2025 / Pearlman, Russell / Visit Crown Coliseum 98.00

## 51220 AUTO (COMPANY) BILLABLE

UN 119 5/14/2025 Ral Comp Car Mileage / Car 78 - Meet with Users and Contractor / 140.0 Co Vehicle @ 0.70 98.00

UN 119 5/14/2025 Ral Comp Car Mileage / Car 78 - Meeting with Contractor / 134.0 Co Vehicle @ 0.70 93.80

UN 173 7/14/2025 Ral Comp Car Mileage / Car 79 - Discuss door sizes / 140.0 Co Vehicle @ 0.70 98.00

UN 170 8/12/2025 Ral Comp Car Mileage / Car 83 - Construction Progress Meeting / 140.0 Co Vehicle @ 0.70 98.00

UN 158 8/12/2024 Ral Comp Car Mileage / Car 78 - On site meeting with Owner, User, and Contractor / 140.0 Co Vehicle @ 0.625 87.50

UN 188 3/11/2025 Ral Comp Car Mileage / Car 76 - Visit warehouse to review electrical and flooring materials / 138.0 Co Vehicle @ 0.70 96.60

Total for 51220

**571.90****Total for Expenses****669.90****Total for Reimbursable Expenses****669.90****Total for Expenses****15,233.90****Total for 06****250.00 56,108.90**



**OFFICE OF THE COUNTY ATTORNEY**

**MEMORANDUM FOR BOARD OF COMMISSIONERS AGENDA OF SEPTEMBER 15,  
2025**

**TO: BOARD OF COUNTY COMMISSIONERS**

**FROM: COUNTY ATTORNEY**

**DATE: 9/11/2025**

**SUBJECT: APPROVAL OF TRANSFER OF GOVERNANCE OF THE FACVB TO  
THE TDA**

**BACKGROUND**

At its meeting June 6, 2025, the board of directors of the Fayetteville Area Convention and Visitors Bureau, Inc., d/b/a Distinctly Fayetteville, (the "FACVB") adopted the attached amendments to its articles of incorporation and bylaws to dissolve the FACVB's board of directors and replace it with the governing board of the Cumberland County Tourism Development Authority effective July 1, 2025. The minutes of that meeting are attached. The last section of the current bylaws, entitled "Amendments," states that Article IV and the Amendments section cannot be amended without the approval of the board of county commissioners. Although this section references Article IV, the board of commissioners does not exercise any authority in Article IV. The authority of the board of commissioners to appoint five of the members of the board of directors is in Article III. The current bylaws are also attached.

The board of commissioners created the FACVB as a nonprofit corporation in 1997 to take on the duties of the county department that was then providing the services undertaken by the FACVB as a nonprofit corporation. The board's Policy Committee recommended the FACVB's original bylaws to the board of commissioners by action February 20, 1997. The board of commissioners approved the Policy Committee's recommended bylaws March 17, 1997, but the bylaws that were approved by the board were not included in the minutes. The original bylaws could not be found by the county attorney or the clerk to the board.

**RECOMMENDATION / PROPOSED ACTION**

At its Agenda Session September 11, 2025, by unanimous vote the board recommended acceptance and approval of the amendments to the FACVB's Articles of Incorporation and bylaws to make the members of

the Cumberland County Tourism Development Authority the members of the Board of Directors of the Fayetteville Area Convention and Visitors Bureau, Inc., d/b/a Distinctly Fayetteville, effective July 1, 2025, as requested by the action of the board of directors of the FACVB June 6, 2025, to be placed on the consent agenda of the September 15, 2025, regular meeting.

**ATTACHMENTS:**

Description	Type
FACVB MINUTES JUNE 6, 2025	Backup Material
Amendment to Articles of Incorporation	Backup Material
Amendment to Bylaws	Backup Material
Bylaws June 6, 2025	Backup Material



## **Board of Directors Special Meeting Minutes**

June 6, 2025, 12:00 PM

Via GoTo Meeting & Teams Video Conference

### **Roll Call**

#### **Voting Board Members Present:**

- Manish Mehta
- Seth Benalt
- Sally Shutt
- Byron McNeill
- Sheba McNeil
- Michelle Williams
- RaShawn Moore
- Lily Schmidt
- Jodi Phelps

#### **Voting Board Member Not Present:**

- Nathan Ernst – Proxy Vote Submitted and attached
- Michelle Skinner

#### **Ex-Officio Members Present:**

- Nat Robertson
- Renee Lane

#### **Others Present:**

- Staff - Devin Heath
- Diane Rice, Cumberland County

### **Call to Order**

Ms. McNeil called the DistiNCtly Fayetteville Board of Directors Meeting to order at 12:09 pm. A quorum was met with nine voting members present.

### **Old Business**

Ms. McNeil recapped that the order of business was to correct the previously made motion at the May 21, 2025 meeting.

Ms. McNeil requested the board “To move to amend the bylaws and articles of incorporation to obtain the organizational transition of DistiNCtly Fayetteville, legally known as the Fayetteville Area Convention

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& Visitors Bureau, Inc. to the Tourism Development Authority at midnight on June 30, 2025. This action will give the Cumberland County Tourism Development Authority, known as the TDA legal control of the DistiNctly Fayetteville organization and it's operations and all assets."

Mr. Benalt motioned to approve, and Mr. Moore seconded the motion. The motion received 8 votes in favor with votes from Ms. McNeil, Mr. Benalt, Ms. Shutt, Mr. Mehta, Mr. Moore, Ms. Phelps, Ms. Williams, and Mr. Ernst (by proxy). There was 1 vote against the motion by Mr. McNeill and 1 unavailable to vote, Ms. Schmidt. The motion passed at 8 votes in favor and 1 vote against the motion.

Ms. McNeil requested a separate action, "To amend the bylaws and articles of incorporation to dissolve the current DistiNctly Fayetteville Board of Directors, legally known as the Fayetteville Area Convention and Visitors Bureau and replace it with the Board of Directors of the Tourism Development Authority, with the transition on June 30th, 2025. I would also ask the board to allow myself as chair to work with Mr. Heath and their attorneys and the TDA board to ensure a smooth transition of the organization."

Mr. Benalt motioned to approve, and Mr. Moore seconded the motion. The motion received 9 votes in favor with votes from Ms. McNeil, Mr. Benalt, Ms. Shutt, Mr. Mehta, Mr. Moore, Ms. Phelps, Ms. Williams, Mr. McNeil, and Mr. Ernst (by proxy). There was 1 unavailable to vote, Ms. Schmidt. The motion passed unanimously.

## **Adjournment**

Mr. Benalt motioned to adjourn the meeting at 12:25, and Ms. Williams seconded. All approved, and the Board Meeting was adjourned at 12:26 pm.

Attachment: Nathan Ernst Proxy Form

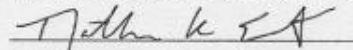
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**Proxy Form**  
**Fayetteville Area Convention and Visitors Bureau, Inc.**  
**(the "Company")**

---

The undersigned hereby irrevocably constitutes and appoints SHEBA MCNEIL their attorney-in-fact and proxy for the sole purpose of casting the vote allocated to the undersigned as a member of the Board of Directors of the Company (the "Board") on all matters submitted to vote at the Meeting of the Board on the 6 day of JUNE, 2025.

This the 6 day of JUNE, 2025.



Print Name: NATHAN K. ERNST

**FIRST AMENDMENT TO THE ARTICLES OF INCORPORATION  
OF THE FAYETTEVILLE AREA CONVENTION & VISITORS BUREAU, INC.  
(THE “CORPORATION”)**

This First Amendment to the Articles of Incorporation of the Fayetteville Area Convention & Visitors Bureau, Inc. D/B/A Distinctly Fayetteville (the “Corporation” or “FACVB”) is made and effective as of the date set forth below.

WHEREAS, the Corporation is a non-profit corporation organized and existing under the laws of the State of North Carolina; and,

WHEREAS, the Corporation desires to amend its Articles of Incorporation as set forth herein; and,

WHEREAS, the Corporation’s Board of Directors approved this Amendment on June 6, 2025, by affirmative vote of two-thirds (2/3) of the Board of Directors, with eight (8) of the eleven (11) Board Members voting in favor, as reflected by the Board’s meeting minutes and as confirmed by the signature of the Corporation’s Chairperson of the Board of Directors below; and,

WHEREAS, this Amendment was approved by the Cumberland County Board of Commissioners on \_\_\_\_\_, 2025, as reflected by the Board of Commissioners’ meeting minutes and as confirmed by the Chairperson of the Board of Commissioners below.

NOW, THEREFORE, the Articles of Incorporation of the Corporation are hereby amended as follows, effective as of the date set forth below.

1. Paragraph number 5, and each of its subparts, is deleted in its entirety, and replaced as follows:  

“5. The directors of the corporation shall be composed of the same directors as those who occupy the Cumberland County Tourism Development Authority (“TDA”) Board of Directors.
2. Paragraph number 9 is deleted in its entirety.

This Amendment is effective as of the date set forth below.

Approved as of the \_\_\_ day of \_\_\_\_\_, 2025.

\_\_\_\_\_  
Sheba McNeil, Chairperson  
FACVB Board of Directors

\_\_\_\_\_  
Kirk deViere, Chairman  
Cumberland County Board of Commissioners



**FIRST AMENDMENT TO BYLAWS**  
**OF THE FAYETTEVILLE AREA CONVENTION & VISITORS BUREAU, INC.**  
**D/B/A DISTINCTLY FAYETTEVILLE**  
**(THE “CORPORATION”)**

This First Amendment to Bylaws of the Fayetteville Area Convention & Visitors Bureau, Inc. D/B/A Distinctly Fayetteville (the “Corporation” or “FACVB”) is made and effective as of the date set forth below.

WHEREAS, the Corporation is a non-profit corporation organized and existing under the laws of the State of North Carolina; and,

WHEREAS, the Corporation desires to amend its Bylaws as set forth herein; and,

WHEREAS, the Corporation’s Board of Directors approved this Amendment on June 6, 2025, by affirmative vote of two-thirds (2/3) of the Board of Directors, with eight (8) of the eleven (11) Board Members voting in favor, as reflected by the Board’s meeting minutes and as confirmed by the signature of the Corporation’s Chairperson of the Board of Directors below; and,

WHEREAS, this Amendment was approved by the Cumberland County Board of Commissioners on \_\_\_\_\_, 2025, as reflected by the Board of Commissioners’ meeting minutes and as confirmed by the Chairperson of the Board of Commissioners below.

NOW, THEREFORE, the Bylaws of the Corporation are hereby amended as follows, effective as of the date set forth below.

1. Article III, Directors, is deleted in its entirety, and replaced as follows:

**Article III**

**Directors**

- Section 1.**     **General Powers:** The business of the Corporation shall be managed by its Board of Directors.
- Section 2.**     **Composition:** The Board of Directors for the Corporation shall be composed of the same Board Members as those Board Members who occupy the Cumberland County Tourism Development Authority (“TDA”) Board of Directors.
- Section 3.**     **Term:** Each Member shall serve a term as established by the TDA at the time of their appointment. The term may not exceed three (3) years. No Member shall serve more than two (2) consecutive terms.

**Section 4. Board Member Responsibilities:** While at Board meetings and functions representing the Corporation, Board Members have a duty to subordinate personal and professional interests to the welfare of the Corporation and Cumberland County. All Board Members should seek to avoid any conflict between their respective personal and professional interests and the interest of the Corporation in all actions taken by them on behalf of the Corporation.

Approved as of the \_\_\_\_\_ day of \_\_\_\_\_, 2025.

\_\_\_\_\_  
Sheba McNeil, Chairperson  
FACVB Board of Directors

\_\_\_\_\_  
Kirk deViere, Chairman  
Cumberland County Board of Commissioners

CUMBERLAND COUNTY, NC

~~FAYETTEVILLE~~

CONVENTION AND VISITORS BUREAU

**DISTINCTLY**  
**FAYETTEVILLE**

**By-Laws**

245 Person Street  
Fayetteville, North Carolina 28301

www.distinctlyfayettevillencVisitFayettevilleNC.com

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## Article I

### OFFICE

- Section 1.** **Name:** This Corporation shall be known as the Fayetteville Area Convention and Visitors Bureau, Inc., [doing business as DistiNctly Fayetteville.](#)
- Section 2.** **Principal Office:** The principal office of the Corporation shall be located at 245 Person Street, Fayetteville, North Carolina 28301.
- Section 3.** **Registered Office:** The registered office of the Corporation required by law to be maintained in the State of North Carolina may be, but need not be, identical to the principal office. Until otherwise changed by the Board of Directors, the registered office shall be 245 Person Street, Fayetteville, North Carolina 28301.

## Article II

### PURPOSE

To position Cumberland County as a destination for conventions, tournaments, and individual travel and to engage in any lawful act or activity for which non-profit corporations may be organized under Chapter 55A of the North Carolina General Statutes. In so doing, the Corporation shall have all powers granted under Chapter 55A of the North Carolina General Statutes.

## Article III

### DIRECTORS

- Section 1.** **General Powers:** The business affairs of the Corporation shall be managed by its Board of Directors.
- Section 2.** **Number of Board Members:** The number of members constituting the Board of Directors shall be eleven (11). The Board of Directors shall also have 8 non-voting ex-officio members.
- Section 3.** **Composition:** Said Board of Directors shall be comprised of the following individuals:
- (a) the County Manager or **his/her** designee,
  - (b) the City Manager of the City of Fayetteville or his/her designee,

- (c) the Director of the Crown Complex or his/her designee,
- (d) one representative nominated by hotels and motels within the County of Cumberland which have fewer than 100 rooms and appointed by the County Commissioners,
- (e) one representative nominated by hotels and motels within the County of Cumberland, which has in excess of 100 rooms and appointed by the County Commissioners,
- (f) one business representative within the County of Cumberland operating an attraction, restaurant, or other local business affected by the Tourism Industry elected by the County Commissioners,
- (g) two at-large members, appointed by the County Commissioners which are representative of one or more of the following groups:
  - (1) arts/cultural community,
  - (2) business community,
  - (3) military and has a demonstrated interest in travel and tourism in the County,
  - (4) business affected by tourism industry
- (h) one representative with hotels and motels within the County of Cumberland which has rooms subject to Occupancy Taxes and with meeting space excess of 6,000 square feet which shall be elected by the Board of Directors, [by removing the cap of meeting space, this opens the seat up to other hotels in Cumberland County].
- ~~(i) one representative of a hotel or motel within the County of Cumberland which has rooms subject to Occupancy Taxes and shall be elected by the Board of Directors.~~
- ~~(j)~~ (i) ~~one~~ two business representatives within the County of Cumberland operating an attraction, restaurant, or other local business affected by the Tourism Industry elected by the Board of Directors,
- ~~(k)~~ (i) Ex-officio positions require reciprocal board positions. Non-voting ex-officio positions are:
  - Tourism Development Authority Liaison
  - President of the Fayetteville Area Hospitality Association
  - President of the Greater Fayetteville Chamber of Commerce

President of the Cool Spring Downtown District

President of the Airborne and Special Operations Museum [this needs to be added to the By-Laws, seat is currently an ex-officio position].

President of the Fayetteville Cumberland County Economic Development Corporation

Past Chair of the Corporation

One (1) position at the Board of Director's discretion.

~~(l) The County Commissioners shall designate a Commissioner Liaison to a non-voting position.~~

**Section 4. Appointment:**

a. Board of Directors appointed positions can be appointed for 2 – three-year terms, but subject to re-appointment after the first term,

~~(m)~~ b. Board of Directors appointed positions can be reappointed after completion of their 2 – three-year terms after a minimum of two years has passed.

~~(n)~~ c. no hotel/motel or corporation or business group owning or managing several motels/hotels in the County of Cumberland shall have more than two members on the Board of Directors at any one time,

~~(o)~~ d. in making selections to the Board of Directors, particular attention should be made to enhancing the ethnic and gender diversity of the Board of Directors,

~~(p)~~ e. members of the Board of Directors do not need to be members of the Corporation,

~~(q)~~ f. vacancies on the Board of Directors will be filled within sixty (60) days of the vacancy by the appropriate body as outlined in Article IV of these By-Laws,

~~(r)~~ g. Members of the Board of Directors shall be owners, general managers, or top executives

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**Section 5. Board Member Responsibilities**

While at board meetings and functions representing the Fayetteville Area Convention & Visitors Bureau, Board Members have a duty to subordinate personal interests to the welfare of the Corporation and Cumberland County. Conflicting interests may be financial, personal relationships, status, or power. All Board Members should seek to avoid any conflict between their respective personal and financial interests (including professional or other business interests) and the interests of the Corporation in any and all actions taken by them on behalf of the Corporation in their respective capacities.

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**Article IV**  
**MEETINGS**

- Section 1. Annual Membership Meeting:** An annual meeting of the members of the Corporation, shall be held in January-September each year or at such other time as the Board of Directors may designate.
- Section 2. Annual Meeting of the Board of Directors:** An annual meeting of the Board of Directors shall be held during the month of January-May each year at a date, time, and place to be decided upon by the Board of Directors or, in the absence of action by the Board of Directors, at the principal office of the Corporation.
- Section 3. Regular and Special Meetings:** The Board of Directors shall have regular meetings quarterly on the fourth Wednesday on the third Wednesday of every other month (starting in January) unless there is not sufficient business to warrant a meeting. Special meetings of the Board of Directors may be called by or at the request of the President, Chairman, Vice-Chairman, Secretary, Treasurer, or any two directors. Such meetings shall be held at the corporate office within the County of Cumberland or at such place as may be from time to time approved by the Board of Directors. Meetings of the Board of Directors or any committee thereof may be conducted by conference telephone, videoconference or other electronic communication that supports visible displays identifying those participating, identifying those seeking recognition to speak, showing (or permitting the retrieval of) the text of pending motions, and showing the results of votes. These electronic meetings of the Board of Directors shall be subject to all rules adopted by the Board of Directors, to govern them, which may include any reasonable limitations on and requirements for Board of Directors' participation.

**Section 4. Notice of Meetings:** Annual or regular meetings of the Board of Directors may be held upon five (5) days' notice. The person or persons calling a special meeting of the Board of Directors shall, at least twenty-four (24) hours before the meeting, give notice thereof by the usual means of communication. Such notice of a special meeting shall specify the purpose for which the meeting is being called.

**Section 5. Waiver of Notice:** Any Director may waive notice of any meeting. The attendance by a Director at a meeting shall constitute a waiver of notice of such meeting, except where a Director attends a meeting for the express purpose of objecting to the transaction of any business because the meeting is not lawfully called or convened.

**Section 6. Quorum:** A majority of the number of persons serving as Directors, ~~of a majority of Executive Committee members~~ at any time, shall constitute a quorum for the transaction of business at any meeting of the Board of Directors.

**Section 7. Manner of Acting:** Except as otherwise provided in these By-Laws, action by a majority of the Directors present at a meeting in which a quorum is present shall be an act of the Board of Directors.

**Section 8 Executive Committee.** The Executive Committee shall be comprised of the Chairman of the Board, Vice Chairman, Secretary, and Treasurer. The Chairman of the Board will serve as Chairman of the Executive Committee. The Executive Committee coordinates the activities of the Board of Directors, evaluates the President's performance, ~~and exercises the authority of the Board of Directors when a quorum of board members cannot be established for a regular or specially called meeting.~~ Any actions taken by the Executive Committee shall be reported to the full board at the next board meeting. The Executive Committee will not have authority to:

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- (a) rescind any action taken by the Board of Directors,
- (b) amend or repeal Articles of Incorporation or By-Laws,
- (c) merge, consolidate, or voluntarily dissolve the Corporation,
- (d) sell, lease, exchange, mortgage, pledge, or otherwise dispose of property,
- (e) select or remove the President, or
- (f) obligate the Corporation to any contract or expenditure of funds in excess of \$10,000.

## Article V

### OFFICERS

**Section 1. Officers of the Corporation:** The officers of the Corporation shall consist of the Chairman of the Board, Vice Chairman, Secretary, Treasurer, and such other officers as the Board of Directors may, from time to time, elect. Officers of the Corporation must be members of the Board of Directors.

**Section 2. Election and Term:** The officers of the Corporation shall be elected by the Board of Directors at the ~~April-May~~ meeting for a term of one year commencing on July 1 of the ~~following-current~~ year ~~and may be subject to re-appointment for one additional year after their first term-~~

- Section 3. Removal:** Any Director shall be dropped for excess absences from the Board if s/he has three unexcused absences from the Board meetings in a ~~calendar~~ fiscal year. Any officer or Director elected or appointed by the Board of Directors may be removed by the Board of Directors when, in the judgment of the Board of Directors, the best interests of the Corporation will be served by the affirmative vote of two-thirds of the Board of Directors. Any officer or Director may resign at any time by delivering a written resignation to the President or the Secretary.
- Section 4. Vacancies:** Vacancies among officers of the Corporation may be filled by a vote of a majority of the Board of Directors at any annual, regular, or special meeting of the Board of Directors.
- Section 5. Chairman:** The Chairman of the Board shall, when present, preside at all meetings of the Board of Directors. He/She shall sign with any proper officer instruments which may be lawfully executed on behalf of the Corporation, except where required or permitted by law to be otherwise signed and executed, and except where the Board of Directors shall delegate the signing and execution thereof to some other officer or agent. In general, he/she shall perform all duties incident to the office of the Chairman and such other duties as may be prescribed by the Board of Directors from time to time.
- Section 6. Vice-Chairman:** The Vice-Chairman shall, in the absence or disability of the Chairman of the Board of Directors, perform the duties and exercise the powers of that office. In addition, he/she shall perform such duties and have such other powers as the Board of Directors shall prescribe.
- Section 7. Secretary:** The Secretary shall be responsible for keeping accurate records of the acts and proceedings of all meetings of the Board of Directors. He/She shall be responsible for giving all notices required by law and by these By-laws. He/She shall have general care of all corporate books and records. He/She shall sign such documents as may require his signature and, in general, perform all duties incident to the office of Secretary and such other duties as may be assigned him/her from time to time by the Chairman or by the Board of Directors.
- Section 8. Treasurer:** The Treasurer shall oversee the financial aspects of the Corporation without having direct custody of funds and securities belonging to the Corporation, provided that the Board of Directors may appoint a custodian or a depository for any such funds or securities and the Board of Directors may designate those persons upon whose signatures or authority such funds may be disbursed or transferred.



Section 9. President and CEO: The President and CEO shall oversee the day-to-day operations of the Corporation and its employees in accordance with these By-Laws. The President and CEO is authorized to enter into contracts, sign financial and tax documents, serve as a spokesperson, and other legal tasks except as outlined in these By-Laws as authority resting with the Board of Directors.

## Article VI

### MISCELLANEOUS

- Section 1.** **Contracts:** The President and CEO may approve contracts that would obligate the Corporation for under \$100,000 or three (3) years or less. The Board of Directors may authorize any officer or officers, agent or agents, to enter into any contract or execute and deliver any instrument on behalf of the Corporation, and such authority may be general or confined to specific instances.
- Section 2.** **Loans:** No loans shall be contracted on behalf of the Corporation unless approved by the Board of Directors.
- Section 3.** **Checks and Drafts:** All checks, drafts or other orders for the payment of money issued in the name of the Corporation shall be signed by such officer or officers, agent or agents of the Corporation and in such manner as shall from time to time be determined by resolution of the Board of Directors.
- Section 4.** **Deposits:** All funds of the Corporation not otherwise employed shall be deposited from time to time to the credit of the Corporation in such depositories as the Board of Directors shall direct.
- ~~**Section 5.** **Seal:** The corporate seal of the Corporation shall consist of two concentric circles between which is the name of the Corporation and in the center of which is inscribed "SEAL", and such seal, as impressed on the margin hereof, is hereby adopted as the seal of the Corporation.~~
- Section 65.** **Committees:** The Chairman of the Board shall, subject to the Board of Directors' approval, appoint any committees to consist of as many persons as he/she deems advisable.
- Section 76.** **Fiscal Year:** The fiscal year of the Corporation shall be the year beginning July 1st and ending June 30th.
- Section 87.** **Bond:** At the expense of the Corporation, the Board of Directors may, by Resolution, require any or all officers, agents, and employees of the Corporation to give bond to the Corporation, with sufficient sureties, conditioned on the faithful performance of the duties of their respective officers or positions, and to comply with such conditions as may from time to time be required by the Board of Directors.
- Section 98.** **Inspection of Books:** The books of the Corporation may be inspected for specific and proper purposes by persons determined by the Board of Directors to be entitled thereto at such reasonable times, and places as

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the Board of Directors may determine, upon application by the person's desiring inspection thereof.

**Section 119. Independent Outside Audit:** The Board of Directors shall require a comprehensive, independent outside audit (certified audit) of the books and financial records of the Corporation on an annual basis, to be completed no later than three months after the end of the fiscal year.

**Section 412. Indemnification:** Any person who at any time serves or has served as a director, officer, employee, or agent of the Corporation, or in such capacity at the request of the Corporation for any other corporation, partnership, joint venture, trust, or other enterprise, shall have a right to be indemnified by the Corporation to the fullest extent permitted by law against:

- (a) unreasonable expenses, including attorneys' fees, actually and necessarily incurred by him in connection with any threatening, pending or completed action, suit or proceedings, whether civil, criminal, administrative or investigative, and whether or not brought by him/her in connection with any threatened, pending or completed action, suit or proceedings, whether civil, criminal, administrative or investigative, and whether or not brought by or on behalf of the Corporation, seeking to hold him/her liable by reason of the fact he/she was working in such capacity, and
- (b) reasonable payments made by him/her in satisfaction of any judgment, money decree, fine, penalty, or settlement for which he/she may have become liable in any such action, suit, or proceeding. The Board of Directors of the Corporation shall take all such action as may be necessary and appropriate to authorize the Corporation to pay the indemnification required by this By-Law, without limitation, to the extent needed, making a good faith evaluation of the manner in which the claimant for indemnity acted and of the reasonable amount of indemnity due him/her. Any person who at any time after the adoption of this By-Law serves or has served in any of the aforesaid capacities for or on behalf of the Corporation shall be deemed to be doing or to have done so in reliance upon, and as consideration for, the right of indemnification provided herein. Such right shall inure to the benefit of the legal representatives of any such person and shall not be exclusive of any other rights to which such person may be entitled apart from the provision of this By-Law. In addition to all of the foregoing, the Board of Directors shall purchase and maintain insurance on behalf of any person who is or was a director, officer, employee, or agent of the Corporation or is or was serving at the request of the Corporation as a director, officer, employee or agent of another corporation, partnership, joint venture, trust or other enterprise, against any liability asserted against him/her and incurred by him/her in any such capacity, or

arising out of his/her status as such, whether or not the Corporation would have the power to indemnify him/her against such liability.

**Section 4213. Amendments:** These By-Laws may be amended or replaced, and new By-Laws may be adopted only by the affirmative vote of two-thirds (2/3) of the Board of Directors. However, Article IV and this section (Article VI, Section 12) may only be amended or replaced by the affirmative vote of two-thirds (2/3) of the Board of Directors and with the approval of the County of Cumberland Board of Commissioners.

-----  
These By-Laws were approved at a meeting of the County of Cumberland Board of Commissioners on [August 16, 2021](#)

X  
[FACVB Board of Directors Chairman Signature](#)

X  
[Cumberland County Board of Commissioners Chairman Signature](#)



**OFFICE OF THE COUNTY ATTORNEY**

**MEMORANDUM FOR BOARD OF COMMISSIONERS AGENDA OF SEPTEMBER 15, 2025**

**TO: BOARD OF COUNTY COMMISSIONERS**

**FROM: POLICY COMMITTEE**

**DATE: 9/10/2025**

**SUBJECT: APPROVAL OF AN AMENDMENT TO RULE 29 OF THE BOARD'S RULES OF PROCEDURE**

**BACKGROUND**

The Local Emergency Planning Committee (LEPC) is a federally mandated group composed of community, industry, and emergency responder representatives with responsibility to plan for and coordinate responses to emergencies involving hazardous materials. LEPCs develop emergency response plans, provide the public with information on chemical hazards in their community, and ensure that facilities report their chemical inventories and immediately notify authorities in the event of an accidental release. Safety officers are commonly designated as the representatives to serve on the LEPC for the businesses and facilities that are subject to these regulations. Although the businesses and facilities are in the county, often the safety officers or other designated employees reside elsewhere, making them ineligible for appointment to the LEPC by the residency requirement in Rule 29.

**RECOMMENDATION / PROPOSED ACTION**

The Policy Committee recommended approval of this amendment to Rule 29 September 8, 2025.

**ATTACHMENTS:**

Description

Proposed Amendment to Rule 29

Type

Backup Material

Appointments – Boards/Committees

The Board of Commissioners appoints citizens to serve on various boards/committees within the County. The procedure for making appointments shall be:

- All members appointed to a board/committee must maintain residence in Cumberland County, except for those members of the Local Emergency Planning Committee representing businesses, industries, and facilities within Cumberland County which are subject to the requirements of Title III of the Superfund Amendments and Reauthorization Act.
- All appointments will be made in accordance with the Statute or Ordinance that created the board or committee, if applicable.
- No citizen may serve more than two appointed positions simultaneously or more than one appointive position if holding an elective position.
- No citizen may serve more than two consecutive terms on any board/committee (must be off at least one year before returning to board/committee). **Note:** the Board of Commissioners reserves the right to waive this requirement, based on special circumstances.
- If a person is appointed to serve an unexpired term, and serves less than half of the full term, he/she is eligible to serve two full terms. If the person serves more than half of the full term, that is considered to be one full term, and the person may only serve one additional full term.
- Unless otherwise provided by Statute, the Board of Commissioners may remove any appointee for cause, which may include chronic non-attendance at board/committee meetings.
- Appointee must uphold County policies pertaining to the work of the committee and comply with the County Code of Ethics.
- The Board of Commissioners will ordinarily nominate to fill vacancies at one meeting and appoint at the next meeting.
- The Board of Commissioners will accept recommendations for vacancies but is under no obligation to follow those recommendations.
- The Clerk's office maintains an applicant list for boards/committees; however, the Board may nominate/appoint someone who is not on the applicant list.
- Once the official appointment has been made, the Clerk's office will notify the person appointed, forwarding any necessary information to that person. Upon confirmation from the appointee of acceptance of the appointment, the Clerk's office will notify the board/committee of the appointment.

Applications for appointment to boards/committees are available in the Clerk's office and also on the County's website <http://www.co.cumberland.nc.us>





**OFFICE OF THE COUNTY ATTORNEY**

**MEMORANDUM FOR BOARD OF COMMISSIONERS AGENDA OF SEPTEMBER 15, 2025**

**TO: BOARD OF COUNTY COMMISSIONERS**

**FROM: COUNTY ATTORNEY & CLERK TO THE BOARD**

**DATE: 9/10/2025**

**SUBJECT: APPROVAL OF A POLICY GOVERNING MEETING ATTENDANCE FOR APPOINTEES TO BOARDS AND COMMISSIONS**

**BACKGROUND**

This matter was presented to the September 9, 2025, Policy Committee with the memo from the clerk to the board attached. The Policy Committee approved the policy in principle and directed that it be placed on the agenda for September 15, 2025, regular meeting, as a consent item. The county attorney has redrafted the language to clarify that the board of commissioners regards the failure to attend meetings as good cause for removing a member appointed by board to serve on the county's boards and commissions, to establish responsibility for implementing it, and the effective date. The clerk to the board and the county attorney collaborated on drafting this policy.

**RECOMMENDATION / PROPOSED ACTION**

This policy was recommended by the Policy Committee September 9, 2025.

**ATTACHMENTS:**

Description	Type
Clerk's Memo to Policy Committee	Backup Material
Policy Governing Meeting Attendance for Appointees	Backup Material

**KIRK J. DEVIERE**  
*Chairman*

**VERONICA B. JONES**  
*Vice-Chairwoman*

**GLENN B. ADAMS**  
**JEANNETTE M. COUNCIL**  
**W. MARSHALL FAIRCLOTH**  
**PAVAN D. PATEL**  
**HENRY C. TYSON**



**ANDREA TEBBE**  
*Clerk to the Board*

**IVA CLARK**  
*Deputy Clerk*

## **BOARD OF COMMISSIONERS**

**TO:** Policy Committee

**FROM:** Andrea Tebbe, Clerk to the Board  
Iva Clark, Deputy Clerk

**DATE:** September 4, 2025

**RE:** Attendance Policy for Cumberland County Boards and Commissions Appointees

Currently Cumberland County does not have an attendance policy for the Boards and Commissions; at the August 2025 Agenda Session the Board of Commissioners discussed implementing an attendance policy and proposed the following:

1. An appointed member shall attend at least 75 percent of the regularly scheduled meetings, special meetings and other activities of the board or commission, such as special events and subcommittee meetings where applicable on an annual basis from the date of their appointment.
2. Appointees who miss 2 consecutive meetings can be removed from the board or commission

If an appointee does not comply with the attendance policy, the appointee will be removed from the board or commission, and they will not be eligible to serve on any County Board or Commission for one year following their removal date.

**Cumberland County Board of Commissioners**  
**Policy Governing Attendance at Meetings for Appointees to Boards and Commissions**

**1.0 PURPOSE**

The purpose of this policy is to establish uniform meeting attendance requirements for members of boards and commissions appointed by the board of commissioners for the efficient conduct of the county's business by these boards and commissions.

**2.0 SCOPE**

This policy shall apply to all members of boards and commissions appointed by the board of commissioners.

**3.0 STATEMENT OF THE POLICY**

**3.1** A member shall attend at least 75 percent of the regularly scheduled meetings, special meetings and other activities of the board or commission, such as special events and subcommittee meetings, where applicable, on an annual basis from the date of their appointment. Failure to meet this attendance requirement shall constitute good cause for removal from the board or commission.

**3.2** A member's missing two consecutive meetings without having been excused in accordance with the bylaws of the board or commission shall constitute good cause for removal from the board or commission.

**3.3** Members who do not comply with each of these attendance requirements will be removed from the board or commission, and they will not be eligible for appointment by the board of commissioners to any other board or commission for one year following their removal date.

**4.0 IMPLEMENTATION**

**4.1** It shall be the responsibility of each board and commission to maintain adequate attendance records for members and to provide notice of the failure of any member to meet this attendance requirement to the clerk to the board of commissioners.

**4.2** The board of commissioners shall give notice of its consideration of the removal of a member for failing to comply with this attendance policy to the member and the chair of the board or commission no less than ten days prior to the meeting at which the action will be considered. The notice will provide each the opportunity to provide any further relevant information to the clerk to the board.

**4.3** This policy shall become effective when adopted by the board of commissioners September 15, 2025.



**PLANNING AND INSPECTIONS DEPARTMENT**

**MEMORANDUM FOR BOARD OF COMMISSIONERS AGENDA OF SEPTEMBER 15, 2025**

**TO: BOARD OF COUNTY COMMISSIONERS**

**FROM: HANK GRAHAM, FAMPO EXECUTIVE DIRECTOR**

**DATE: 9/15/2025**

**SUBJECT: SECTION 5311 GRANT APPLICATION AND APPROVAL OF SUBMISSION OF THE FY27 APPLICATIONS FOR THE COMMUNITY TRANSPORTATION PROGRAM (SECTIONS: 5307, 5310, 5311, ROAP) GRANT FUNDS**

**BACKGROUND**

As part of the annual operational funding of the Cumberland County Community Transportation Program (CTP), staff must request monetary grant allocations from the North Carolina Department of Transportation (see attached Unified Grant Application). This is an annual request that funds the Cumberland County CTP Program which coordinates existing transportation programs operating in Cumberland County using local transportation providers.

Staff requests that a public hearing be held on September 15, 2025, regarding the FY27 Community Transportation Program (Section 5311) Grant Application which is due October 3, 2025. The Section 5311 fund is the only fund which requires a public hearing for application.

For ease of application and supplementary to the Section 5311 public hearing, staff also requests approval for submission of grant applications for ROAP, Sections 5310 and 5307 in the amounts listed below. These grants do not require a public hearing for application.

The funding period will run from July 1, 2026 to June 30, 2027. Funding will be used to provide trips to work, school, medical, and general errands. The administrative portion of the grants will be used for salaries and fringes of the Transportation Coordinator and the Transportation Assistants, office supplies, driver drug and alcohol testing, travel to meetings and conferences, program marketing for all services provided to County residents, legal advertising, and North Carolina Public Transportation Association (NCPTA) memberships.

The Community Transportation Program is requesting funding in the following amounts from the NC Department of Transportation (a local match is required as noted below and is typically funded in the local FY Budget):

<b>PROJECT</b>	<b>TOTAL AMOUNT</b>	<b>LOCAL SHARE</b>
Administrative (5311)	\$215,355	\$32,303 (15%)
5310 Capital	\$300,000	\$60,000 (20%)
5307 Capital & Operating	\$196,506	\$98,253 (50%)
Combine Capital	\$22,000	\$2,200 (10%)
ROAP (EDTAP)	\$145,875	\$0.00 (0%)
ROAP (EMPL)	\$82,816	\$0.00 (0%)
ROAP (RGP)	\$82,957	\$8,296 (10%)
<b>TOTAL PROJECT</b>	<b>\$1,045,509</b>	<b>\$201,052</b>

**RECOMMENDATION / PROPOSED ACTION**

Staff requests the Board of Commissioners hold a Public Hearing for the Section 5311 grant application at their September 15, 2025, Regular Meeting and authorize the County Manager to approve the submission of the FY27 Community Transportation Program (Sections 5307, 5310, 5311, ROAP) grant applications to the NC Department of Transportation.

**ATTACHMENTS:**

Description	Type
FY2027 Program Resolution - Unified Grant Application	Backup Material
FY2027 Public Hearing Record	Backup Material
FY2027 Local Share Certificates - Unified Grant Application	Backup Material

**PUBLIC TRANSPORTATION PROGRAM RESOLUTION****FY27 RESOLUTION****Section 5311 (including ADTAP), 5310, 5339, 5307 and applicable State funding, or combination thereof.**

Applicant seeking permission to apply for Public Transportation Program funding, enter into agreement with the North Carolina Department of Transportation, provide the necessary assurances and the required local match.

A motion was made by (*Board Member's Name*) \_\_\_\_\_ and seconded by (*Board Member's Name or N/A, if not required*) \_\_\_\_\_ for the adoption of the following resolution, and upon being put to a vote was duly adopted.

WHEREAS, Article 2B of Chapter 136 of the North Carolina General Statutes and the Governor of North Carolina have designated the North Carolina Department of Transportation (NCDOT) as the agency responsible for administering federal and state public transportation funds; and

WHEREAS, the North Carolina Department of Transportation will apply for a grant from the US Department of Transportation, Federal Transit Administration and receives funds from the North Carolina General Assembly to provide assistance for rural public transportation projects; and

WHEREAS, the purpose of these transportation funds is to provide grant monies to local agencies for the provision of rural, small urban, and urban public transportation services consistent with the policy requirements of each funding source for planning, community and agency involvement, service design, service alternatives, training and conference participation, reporting and other requirements (drug and alcohol testing policy and program, disadvantaged business enterprise program, and fully allocated costs analysis); and

WHEREAS, the funds applied for may be Administrative, Operating, Planning, or Capital funds and will have different percentages of federal, state, and local funds.

WHEREAS, non-Community Transportation applicants may apply for funding for "purchase-of-service" projects under the Capital Purchase of Service budget, Section 5310 program.

WHEREAS, County Manager of Cumberland County hereby assures and certifies that it will provide the required local matching funds; that its staff has the technical capacity to implement and manage the project(s), prepare required reports, obtain required training, attend meetings and conferences; and agrees to comply with the federal and state statutes, regulations, executive orders, Section 5333 (b) Warranty, and all administrative

## UNIFIED GRANT APPLICATION

requirements related to the applications made to and grants received from the Federal Transit Administration, as well as the provisions of Section 1001 of Title 18, U. S. C.

WHEREAS, the applicant has or will provide all annual certifications and assurances to the State of North Carolina required for the project;

NOW, THEREFORE, be it resolved that the County Manager of Cumberland County is hereby authorized to submit grant application (s) for federal and state funding in response to NCDOT's calls for projects, make the necessary assurances and certifications and be empowered to enter into an agreement with the NCDOT to provide rural, small urban, and urban public transportation services.

I Andrea Tebbe, Clerk to the Board of Commissioners do hereby certify that the above is a true and correct copy of an excerpt from the minutes of a meeting of the Cumberland County Board of Commissioners duly held on the 15th day of September 2025.

\_\_\_\_\_  
*Signature of Certifying Official*

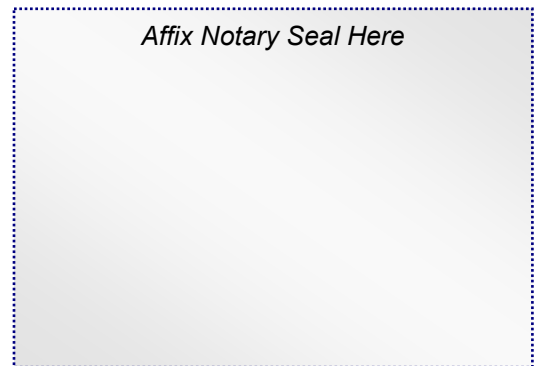
**\*Note that the authorized official, certifying official, and notary public should be three separate individuals.**

*Seal Subscribed and sworn to me*  
*(date)* \_\_\_\_\_

\_\_\_\_\_  
*Notary Public \**

\_\_\_\_\_  
*Printed Name and Address*

*My commission expires*  
*(date)* \_\_\_\_\_





## UNIFIED GRANT APPLICATION

### PUBLIC HEARING RECORD

**Important** – A public hearing MUST be conducted whether or not requested by the Public.

Section 5311 (including ADTAP), 5310, 5339, 5307 and applicable State funding, or combination thereof.

**APPLICANT:** County of Cumberland

**DATE:** September 15, 2025

**PLACE:** 117 Dick Street Fayetteville, NC 28301

**TIME:** 6:45PM

How many BOARD MEMBERS attended the public hearing? \_\_\_\_\_

How many members of the PUBLIC attended the public hearing? \_\_\_\_\_

#### Public Attendance Surveys

(Attached)

(Offered at Public Hearing but none completed)

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I, the undersigned, representing (*Legal Name of Applicant*) \_\_\_\_\_ do hereby certify to the North Carolina Department of Transportation, that a Public Hearing was held as indicated above and

#### During the Public Hearing

(NO public comments)

(Public Comments were made and meeting minutes will be submitted after board approval)

The estimated date for board approval of meeting minutes is: \_\_\_\_\_

\_\_\_\_\_  
Signature or Clerk to the Board

Andrea Tebbe, Clerk to the Board  
Printed Name and Title

\_\_\_\_\_  
Date

*Affix Seal Here*

UNIFIED GRANT APPLICATION

**VOLUNTARY TITLE VI PUBLIC INVOLVEMENT**

Title VI of the Civil Rights Act of 1964 requires the North Carolina Department of Transportation (NC DOT) to gather statistical data regarding participants and beneficiaries of the agency’s federal-aid programs and activities. NC DOT collects information on race, color, national origin and gender of the attendees to this public meeting to ensure the inclusion of all segments of the population impacted by a proposed project.

NCDOT wishes to clarify that this information gathering process **is completely voluntary** and that you are not required to disclose the statistical data requested to participate in this meeting. This form is a public document used to collect data, only.

The completed forms will be held on file at the North Carolina Department of Transportation. For Further information regarding this process please contact the NCDOT Title VI Program at telephone number 919.508.1808 or email at [titlevi@ncdot.gov](mailto:titlevi@ncdot.gov).

Project Name: Cumberland County Transportation Program		Date: September 15, 2025
Meeting Location		
Name (please print)		Gender: <input type="checkbox"/> Male <input type="checkbox"/> Female
General ethnic identification categories (check one)		
<input type="checkbox"/> Caucasian	<input type="checkbox"/> Hispanic American	<input type="checkbox"/> American Indian/Alaskan Native
<input type="checkbox"/> African American	<input type="checkbox"/> Asian/Pacific Islander	Other: _____
Color: _____		National Origin: _____

After completing this form, please fold and place it inside the designated box on the registration table.

Thank you for your cooperation.

## LOCAL SHARE CERTIFICATION FOR FUNDING

### County of Cumberland

#### Requested Funding Amounts

<u>Project</u>	<u>Total Amount</u>	<u>Local Share**</u>
5311 Administrative	\$ <b><u>215,355</u></b>	\$ <b><u>32,303</u></b> (15%)
5310 Operating (No State Match)	\$ <b><u>300,000</u></b>	\$ <b><u>60,000</u></b> (20%)
5307 Operating Assistance	\$ <b><u>196,506</u></b>	\$ <b><u>98,253</u></b> (50%)
Combined Capital	\$ <b><u>22,000</u></b>	\$ <b><u>2,200</u></b> (10%)
ROAP(EDTAP)	\$ <b><u>145,875</u></b>	\$ <b><u>0.00</u></b> (0%)
ROAP (EMPL)	\$ <b><u>82,816</u></b>	\$ <b><u>0.00</u></b> (0%)
ROAP (RGP)	\$ <b><u>82,957</u></b>	\$ <b><u>8,296</u></b> (10%)

Funding programs covered are 5311, 5310, 5339 Bus and Bus Facilities, 5307 (Small fixed route, regional, and consolidated urban-rural systems)

TOTAL	\$ <b><u>1,045,509</u></b>	\$ <b><u>201,052</u></b>
	<b>Total Funding Requests</b>	<b>Total Local Share</b>

**\*\*NOTE: Applicants should be prepared for the entire Local Share amount in the event State funding is not available.**

The Local Share is available from the following sources:

<u>Source of Funds</u>	<u>Apply to Grant</u>	<u>Amount</u>
<b><u>General Funds</u></b>	<b><u>\$201,052</u></b>	<b><u>\$ 201,052</u></b>
<b>TOTAL</b>		<b><u>\$ 201,052</u></b>

**\*\* Fare box revenue is not an applicable source for local share funding**

I, the undersigned representing County of Cumberland do hereby certify to the North Carolina Department of Transportation, that the required local funds for the FY2027 Community Transportation Program and 5307 Governors Apportionment will be available as of **July 1, 2026**, which has a period of performance of July 1, 2026 – June 30, 2027.

\_\_\_\_\_  
Signature of Authorized Official

\_\_\_\_\_  
Type Name and Title of Authorized Official

\_\_\_\_\_  
Date



**PLANNING AND INSPECTIONS DEPARTMENT**

**MEMORANDUM FOR BOARD OF COMMISSIONERS AGENDA OF SEPTEMBER 15, 2025**

**TO: BOARD OF COUNTY COMMISSIONERS**

**FROM: RAWLS HOWARD, DIRECTOR OF PLANNING & INSPECTIONS**

**DATE: 9/9/2025**

**SUBJECT: CASE # ZON-25-0030**

**BACKGROUND**

**ZON-25-0030:** Rezoning from R6A Residential District to C2(P) Planned Service and Retail District or to a more restrictive zoning district for a parcel comprising 3.72 +/- acres; located at 6235 Camden Rd and 6320 Rockfish Rd; submitted by Thomas Neville (Agent) on behalf of Charles Koonce, Donald Koonce Heirs, Peggy Koonce, and Tanna Kim Hutton (Owners).

**RECOMMENDATION / PROPOSED ACTION**

**Planning Board Meeting Date: August 19, 2025**

**Planning Board Action:** The Planning Board recommended approval of the rezoning request from R6A Residential District to C2(P) Planned Service and Retail District at their August 19, 2025, meeting for the reasons stated and as fully reflected in the meeting minutes which are incorporated herein by reference.

**Staff Recommendation:** Planning and Inspections staff recommends approval of the rezoning request from R6A Residential District to C2(P) Planned Service and Retail District. Staff finds that the request is consistent with the Southwest Cumberland Land Use Plan which calls for "Mixed Use" at this location. Staff also finds that the request is reasonable and in the public interest as it is compatible to and in harmony with the surrounding land use activities and zoning.

**If the Board of Commissioners wishes to follow the recommendation of the Planning Board in this case, the following motion is appropriate:**

**MOTION:**

In Case ZON-25-0030, I move to approve the rezoning request from R6A Residential District to C2(P) Planned Service and Retail District. The Board finds that the request is consistent with the Southwest Cumberland Land Use Plan which calls for "Mixed Use" at this location. The request is reasonable and in the public interest as it is compatible to and in harmony with the surrounding land use activities and zoning.

**If the Board of Commissioners does not wish to follow the recommendation of the Planning Board in this case, the following motion is appropriate:**

**MOTION:**

In Case ZON-25-0030, I move to deny the rezoning request from R6A Residential District to C2(P) Planned Service and Retail District. The Board finds that the request is not consistent with the Southwest Cumberland Land Use Plan. The request is not reasonable or in the public interest because \_\_\_\_\_.

**ATTACHMENTS:**

Description	Type
ZON-25-0030	Backup Material



## Cumberland County Joint Planning Board

September 9, 2025

MEMO TO: Cumberland County Board of Commissioners

FROM: Rawls Howard, Director of Planning & Inspections

SUBJECT: **ZON-25-0030:** Rezoning from R6A Residential District to C2(P) Planned Service and Retail District or to a more restrictive zoning district for a parcel comprising 3.72 +/- acres; located at 6235 Camden Rd and 6320 Rockfish Rd; submitted by Thomas Neville (Agent) on behalf of Charles Koonce, Donald Koonce Heirs, Peggy Koonce, and Tanna Kim Hutton (Owners).

ACTION: The Planning Board recommended approval of the rezoning request from R6A Residential District to C2(P) Planned Service and Retail District at their August 19, 2025, meeting for the reasons stated and as fully reflected in the meeting minutes which are incorporated herein by reference.

### MINUTES OF AUGUST 19, 2025

In Case ZON-25-0030, Planning and Inspections staff recommends approval of the rezoning request from R6A Residential District to C2(P) Planned Service and Retail District. Staff finds that the request is consistent with the Southwest Cumberland Land Use Plan which calls for "Mixed Use" at this location. Staff also finds that the request is reasonable and in the public interest as it is compatible to and in harmony with the surrounding land use activities and zoning.

**In Case ZON-25-0030, Mr. Crumpler made a motion, seconded by Ms. Lynd to recommend approval of the rezoning request from R6A Residential District to C2(P) Planned Service and Retail District. The board finds that the request is consistent with the Southwest Cumberland Land Use Plan which calls for "Mixed Use" at this location. The board also finds that the request is reasonable and in the public interest as it is compatible to and in harmony with the surrounding land use activities and zoning. Unanimous approval.**

#### **First Class and Record Owners' Mailed Notice Certification**

*A certified copy of the tax record owner(s) of the subject and adjacent properties and their tax record mailing address is contained within the case file and is incorporated by reference as if delivered herewith. The record owners' certified receipt of notice is also included.*

Location: 6235 Camden Rd. & 6320 Rockfish Rd

Jurisdiction: County-Unincorporated

**REQUEST**

Rezoning R6A to C2(P)

Applicant requests a rezoning from R6A Residential District to C2(P) Planned Service and Retail District for two parcels containing approximately 3.72 acres located at 6235 Camden Rd, the western larger lot, and 6320 Rockfish Rd, the eastern smaller lot, as shown in Exhibit "A". The intent is to rezone the property to a commercial zoning district for future commercial or office uses.

**PROPERTY INFORMATION**

**OWNER/APPLICANT:** Sharon Koonce, Peggy Koonce, Tanna Hutton, Charles Koonce, and Connie Koonce (Owner); Kimberlee Bozeman, Thomas Neville (Applicant).

**ADDRESS/LOCATION:** Located at 6235 Camden Rd and 6320 Rockfish Rd Refer to Exhibit "A", Location and Zoning Map. REID numbers: 0404469732000, 0404563605000.

**SIZE:** The two parcels contain approximately 3.72 acres combined. Road frontage along Camden Rd is approximately 350 feet, road frontage along Rockfish Rd. is approximately 635 feet. The property is approximately 375 feet in length at its deepest point.

**EXISTING ZONING:** The subject property is currently zoned R6A Residential District. R6A Residential District is a district designed for a mix of single- and multi-family dwellings including the use of manufactured homes on individual lots and in manufactured home parks.

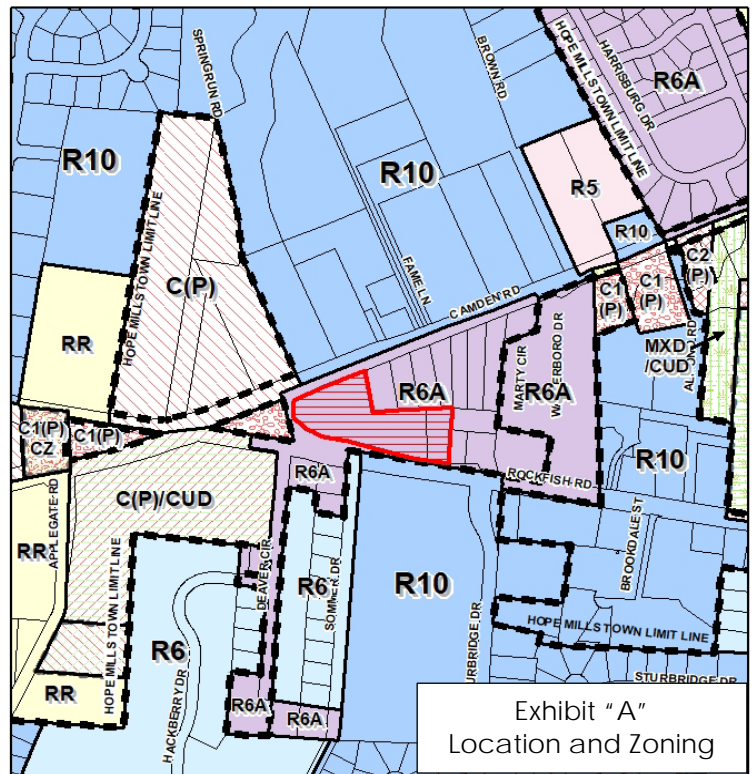


Exhibit "A"  
Location and Zoning

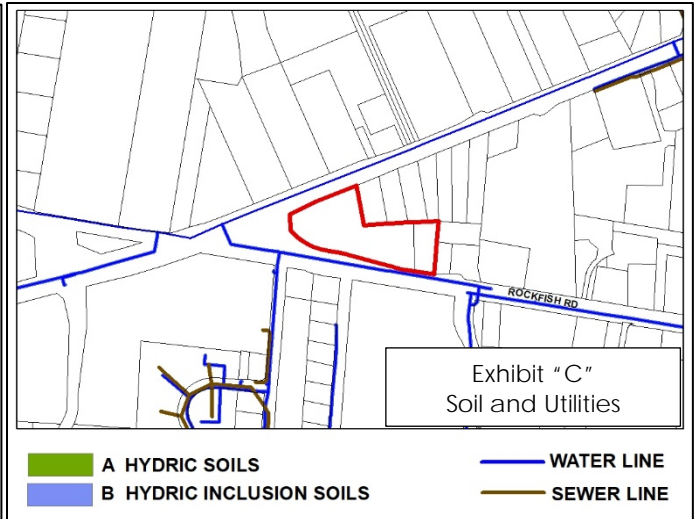
**EXISTING LAND USE:** Currently located at the western parcel is the Koonce Manufactured Home Park. Two manufactured homes are sited at the eastern parcel.

**SURROUNDING LAND USE:** Exhibit "B" illustrates the following:

- **North:** Single family homes and religious worship activities
- **East:** Single family homes, religious worship activities, and a manufactured home park
- **West:** Commercial Development
- **South:** Single-family homes and C. Wayne Collier Elementary School

**OTHER SITE CHARACTERISTICS:** The site is not located in a Watershed Protection Area nor within a Flood Zone Hazard Area. The subject property, as delineated in Exhibit "C", illustrates that hydric and hydric inclusion soils are not located on the property.



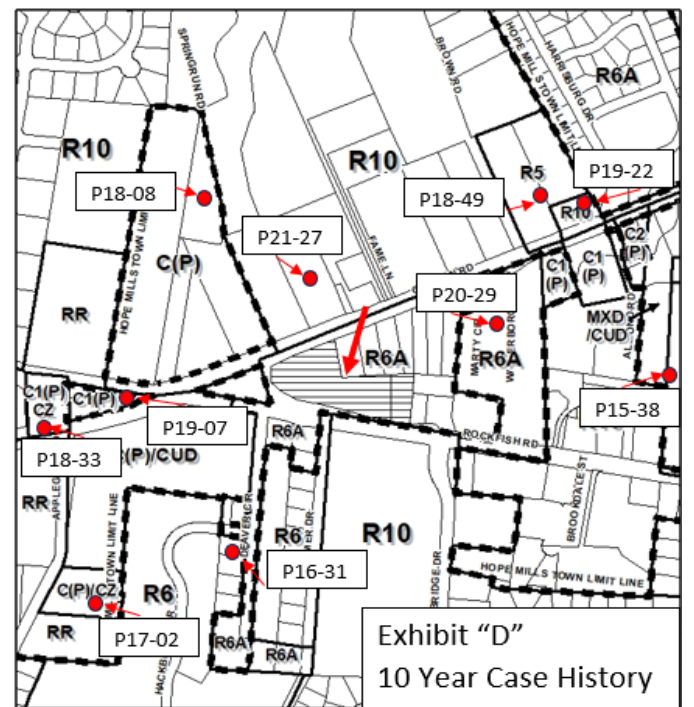


**TEN YEAR ZONE CASE HISTORY:**

Exhibit "D" denotes the following rezoning cases within the past ten years near the subject property:

- P15-38: R5 to MXD/CZ; Approved by Hope Mills
- P16-31: Initial Zoning to R6A; Approved by Hope Mills
- P17-02: RR to C(P)/CZ; Approved by County
- P18-08: C(P) & R10 to C(P); Approved by County
- P18-33: RR to C1(P)/CZ; Approved by County
- P18-49: RR & R10 to R5; Approved by County
- P19-07: C1(P) to C(P)/CZ; Denied by Hope Mills
- P19-22: R10 to C2(P); Denied by County
- P20-29: R5A to R6A; Approved by Hope Mills
- P21-27: R10 to C1(P); Denied by County

**DEVELOPMENT REVIEW:** A site plan review and approval, conforming to the County Zoning and Subdivision Ordinances, will be required via the Current Planning Division prior to commencement of any development activity. Any proposed subdivision will require preliminary plan review and approval by the Current Planning Division prior to any plat recordation, conforming to the County Zoning and Subdivision Ordinances.



**DIMENSIONAL PROVISIONS FOR REQUESTED DISTRICT:**

Minimum Standard	R6A (Existing)	C2(P) (Proposed)
Front Yard Setback	25 feet	50 feet
Side Yard Setback	10 feet	30 feet
Rear Yard Setback	15 feet	30 feet
Lot Area	6,000 sq. ft.	N/A
Lot Width	60 feet	N/A

**DEVELOPMENT POTENTIAL:**

Existing Zoning (R6A)	Proposed Zoning (C2(P))
39 dwelling units	0 dwelling units

- Lot count may be rounded up when a fraction occurs. When any requirement of this ordinance results in a fraction of a unit, a fraction of one-half or more shall be considered a whole unit, and a fraction of less than one-half shall be disregarded.

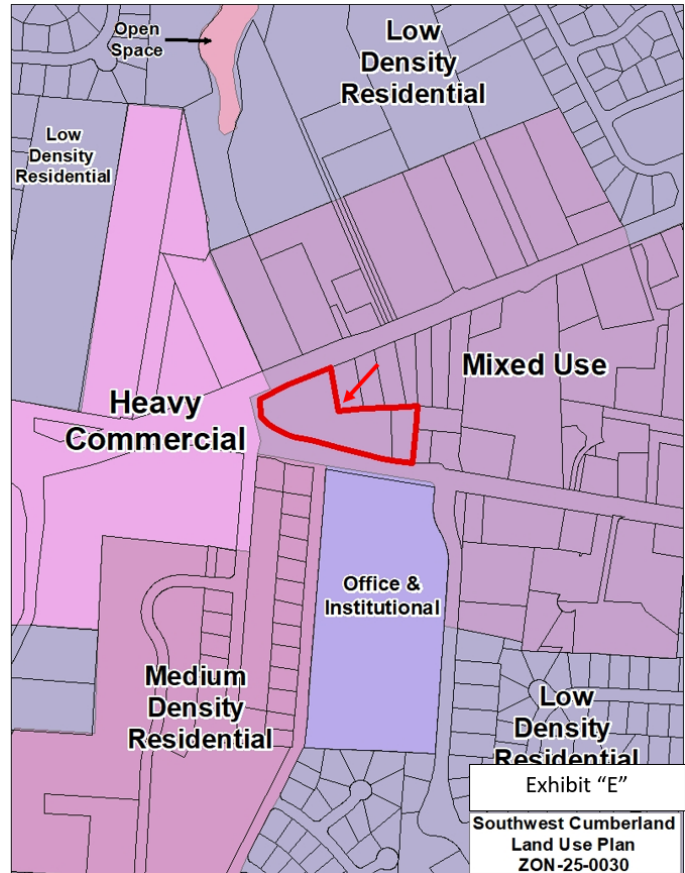
**COMPREHENSIVE PLANS:**

This property is located in the Southwest Cumberland Land Use Plan (2013). The future land use classification of the property is "Mixed Use". The associated zoning districts for Mixed Use are R5, C1(P), & C2(P).

**The proposed rezoning request is consistent with the future land use plan.**

Future Land Use Classification Development Goals, Notes, and Objectives:

- "Commercial development should be clustered in centers or districts that are appropriate for the location and scale with respect to adjacent land uses" (Southwest Cumberland Land Use Plan 2013, p. 137).
- "Create an atmosphere that supports existing and future commercial activities while complimenting the existing residential area; encourages and fosters economic development that is harmonious with the character of the area; respects environmentally sensitive areas; is well-designed and attractive; located in areas with sufficient infrastructure to support the type of commercial activities; and provides a range of commercial locations that accommodate market demands that meet the needs of area residents" (Southwest Cumberland Land Use Plan 2013, p. 136).
- "All commercial development in an established residential area should be in harmony with the area in scale, size, appearance, and accessibility" (Southwest Cumberland Land Use Plan 2013, p. 136).
- "Mixed use development should be encouraged with the uses being complementary and the site design, landscaping, parking, services areas, access and circulation must be related sensitively to provide a workable and visually pleasing environment" (Southwest Cumberland Land Use Plan 2013, p. 137).



**IMPACTS ON LOCAL INFRASTRUCTURE AND/OR FACILITIES**

**UTILITIES:** PWC water lines are available near the subject property along Camden Rd and Rockfish Rd. It is the applicant's responsibility to determine if this utility provider will serve their development. Prior to commercial development connecting to the available public water line, coordination with the Town of Hope Mills would be needed to determine if annexation may be required. No sewer lines are located in front of the property. Septic permits must be obtained from the Environmental Health office for any new development on the subject property if not connected to public sewer. The available utilities are shown on Exhibit "C".

**TRANSPORTATION.** Camden Rd and Rockfish Rd are classified as Minor Arterial Roads per the NCDOT Road Classification. Camden Rd is identified in the Transportation Improvement Program as Project No. U-3422B, West of SR 1112 (Rockfish Road) to SR 1596 (Hope Mills Road) to widen Camden Road to four-

lanes and improve the Rockfish Rd/Camden Rd intersection. The subject property will have no significant impact on the Transportation Improvement Program. Driveway permits must be obtained from NCDOT to serve any new development.

**SCHOOLS CAPACITY/ENROLLMENT:**

School Name	Enrollment	Capacity
C Wayne Collier Elementary	441	580
Hope Mills Middle	473	680
South View High	1437	1871

**ECONOMIC DEVELOPMENT:** Fayetteville Cumberland County Economic Development Corporation has reviewed the request and has no objections to the proposed rezoning.

**EMERGENCY SERVICES:** Cumberland County Fire Marshal’s office has reviewed the request and has no objections to the proposed rezoning.

**SPECIAL DISTRICTS/ OVERLAY DISTRICTS:** The property is not located within any special districts

Special Districts			
Fayetteville Regional Airport Overlay:	n/a	Averasboro Battlefield Corridor:	n/a
Five Mile Distance of Fort Bragg:	n/a	Eastover Commercial Core Overlay District:	n/a
Voluntary Agricultural District (VAD):	n/a	Spring Lake Main Street Overlay District:	n/a
VAD Half Mile Buffer:	n/a	Coliseum Tourism Overlay District:	n/a

n/a – not applicable

**STAFF RECOMMENDATION**

In Case ZON-25-0030, Planning and Inspections staff **recommends approval** of the rezoning request from R6A Residential District Residential to C2(P) Planned Service and Retail District. Staff finds that the request is consistent with the Southwest Cumberland Land Use Plan which calls for “Mixed Use” at this location. Staff also finds that the request is reasonable and in the public interest as it is compatible to and in harmony with the surrounding land use activities and zoning.

- Attachments:  
 Notification Mailing List  
 Application

## ATTACHMENT: MAILING LIST

DEPARTMENT OF TRANSPORTATION  
1546 MAIL SERVICE CENTER  
RALEIGH, NC 27611

DEAVER CIRCLE APARTMENTS LLC  
103 MIDWAY DR  
RAEFORD, NC 28376

TAVAREZ, NIXON;TAVAREZ, CARMEN  
4704 BEAUFORT DR  
FAYETTEVILLE, NC 28304

HOPE MILLS (ROCKFISH) WW LLC  
361 SUMMIT BLVD SUITE 110 101  
BIRMINGHAM, AL 35243

FLOWERS, MARY J  
PO BOX 901  
HOPE MILLS, NC 28348

HAYWORTH, SABRINA;HAYWORTH,  
DAVID CLYDE  
5864 ROCKFISH RD  
HOPE MILLS, NC 28348

CONGREGATIONAL CHRISTIAN  
CHURCH OF AMERICAN SAMOA  
6234 CAMDEN RD  
FAYETTEVILLE, NC 28306

SANCHEZ, ALLISON  
6139 CAMDEN ROAD  
FAYETTEVILLE, NC 28306

CHURCH OF GOD  
3515 STURBRIDGE DR  
HOPE MILLS, NC 28348

CAM ROCKS LLC  
3116 DEAVER CIR  
HOPE MILLS, NC 28348

LEWIS, LOIS LONG  
1230 WOODLAND DR  
FAYETTEVILLE, NC 28305

KOONCE, CHARLES E;HUTTON, T.  
KIM;KOONCE, D. C. HEIRS;KOONCE,  
PEGGY D  
298 ST JOHNS WOOD  
FAYETTEVILLE, NC 28303

EDWARDS, SHARON ANN  
6234 CAMDEN RD  
FAYETTEVILLE, NC 28306

LEE, PHILLIP PATRICK;LEE, BRANDY C  
6126 CAMDEN RD  
FAYETTEVILLE, NC 28306

HARRELL, NICHOLAS  
1270 CANADY POND RD  
HOPE MILLS, NC 28348

DOLLINGER, STEPHEN;DOLLINGER,  
STEPHANIE CHRISTINE  
5225 FAME LANE  
FAYETTEVILLE, NC 28306

GOLDEN BRIDGE INVESTMENT LLC  
215 LAFAYETTE WOOD MHP LOT 2  
RAEFORD, NC 28376

DECKER, JUSTIN K  
3106 SOMMER DR  
HOPE MILLS, NC 28348

STOUGH, KEITH;STOUGH, JOYCE  
6142 CAMDEN RD  
FAYETTEVILLE, NC 28306

CHRISTIAN TABERNACLE OUTREACH  
MINISTRY  
3425 MASTERS DR  
HOPE MILLS, NC 28348

HAM, MELISSA;HAM, CHARLES  
5278 FAME LN  
FAYETTEVILLE, NC 28306

EMANUEL, JAMES E  
7523 ABATOR DR  
HOPE MILLS, NC 28348

EHLE, ELLIS E JR  
P O BOX 48121  
CUMBERLAND, NC 28331

ATKINS, DAHLIA L  
STRATTON;TURLINGTON, RANEY  
GLENN  
5750 HWY 52  
GILLSVILLE, GA 30543

SIMMONS, LUISE P HEIRS  
3325 WELSH LAKE DR  
FAYETTEVILLE, NC 28306

CUMBERLAND COUNTY BD OF ED  
PO BOX 2357  
FAYETTEVILLE, NC 28302

BURNSIDE, JOHN P;POSTLE, MONIQUE  
KAY  
5181 FAME LN  
FAYETTEVILLE, NC 28306

TERRY, JACQUELINE RIGGS;TERRY,  
BRIAN LEE  
6258 ROCKFISH RD  
HOPE MILLS, NC 28348

YOWELL, BELINDA  
5067 C ARCTURUS CIR  
EIELSON AFB, AK 99702

ATTACHMENT: APPLICATION



Planning & Inspections Department

CASE #: _____
PLANNING BOARD MEETING DATE: _____
DATE APPLICATION SUBMITTED: _____

APPLICATION FOR  
REZONING REQUEST  
CUMBERLAND COUNTY ZONING ORDINANCE

The following items are to be submitted with the completed application:

1. A copy of the *recorded* deed and/or plat.
2. If a portion(s) of the property is being considered for rezoning, an accurate written legal description of only the area to be considered.
3. A check made payable to "Cumberland County" in the amount of \$\_\_\_\_\_.  
(See County Fee Schedule).

Rezoning Procedure:


1. Completed application submitted by the applicant.
2. Notification to surrounding property owners.
3. Planning Board hearing.
4. Re-notification of interested parties / public hearing advertisement in the newspaper.
5. County Commissioners' public hearing (approximately four weeks after Planning Board public hearing)
6. If approved by the County Commissioners, rezoning becomes effective immediately.

The Planning & Inspections Staff will advise on zoning options, inform applicants of development requirement and answer questions regarding the application and rezoning process. For further questions, call (910)678-7627 or (910)678-7609. Hours of operation are 8:00 a.m. to 5:00 p.m., Monday through Friday.

**NOTE: Any revisions, inaccuracies or errors to the application may cause the case to be delayed and will be scheduled for the next available board meeting according to the board's meeting schedule. Also, the application fee is *nonrefundable*.**

**TO THE CUMBERLAND COUNTY JOINT PLANNING BOARD AND THE BOARD OF COUNTY COMMISSIONERS OF CUMBERLAND COUNTY, NC:**

I (We), the undersigned, hereby submit this application, and petition the County Commissioners to amend and to change the zoning map of the County of Cumberland as provided for under the provisions of the County Zoning Ordinance. In support of this petition, the following facts are submitted:

1. Requested Rezoning from RLA to C2(P) 
2. Address of Property to be Rezoned: 6235 Camden Road
3. Location of Property, details: corner of Camden + Rockfish Roads
4. Parcel Identification Number (PIN #) of subject property: 0404-46-9732 +  
(also known as Tax ID Number or Property Tax ID) 0404-56-3605
5. Acreage: 3.72 Frontage: 1,077 Depth: 375
6. Water Provider: Well:  PWC: \_\_\_\_\_ Other (name): \_\_\_\_\_
7. Septage Provider: Septic Tank  PWC \_\_\_\_\_
8. Deed Book 10957, 2252, 489, Page(s) 206, 337, 270, Cumberland County Registry. (Attach copy of deed of subject property as it appears in Registry).
9. Existing use of property: mobile home park + residential
10. Proposed use(s) of the property: Commercial for marketing purposes
11. Do you own any property adjacent to or across the street from this property?  
Yes \_\_\_\_\_ No  If yes, where? \_\_\_\_\_
12. Has a violation been issued on this property? Yes \_\_\_\_\_ No

A copy of the recorded deed(s) and/or recorded plat map(s) must be provided. If the area is a portion of a parcel, a written legal description by metes and bounds, showing acreage must accompany the deeds and/or plat. If more than one zoning classification is requested, a correct mete and bounds legal description, including acreage, for each bounded area must be submitted.

*The Planning and Inspections Staff is available for advice on completing this application; however, they are not available for completion of the application.*

The undersigned hereby acknowledge that the County Planning Staff has conferred with the petitioner or assigns, and the application as submitted is accurate and correct.

Charles Koonce & Connie Koonce  
NAME OF OWNER(S) (PRINT OR TYPE)

298 St. Johns Wood, Fay NC 28303  
ADDRESS OF OWNER(S)

910-977-1995  
HOME TELEPHONE #

N/A  
WORK TELEPHONE #

J. Thomas Neville, Attorney  
NAME OF AGENT, ATTORNEY, APPLICANT (PRINT OR TYPE)

310 Dick Street Suite A, Fay NC 28301  
ADDRESS OF AGENT, ATTORNEY, APPLICANT

jtneville@ywnlaw.com ; kimbozeman@ywnlaw.com  
E-MAIL

N/A  
HOME TELEPHONE #

910-433-4433  
WORK TELEPHONE #

Charles E. Koonce  
SIGNATURE OF OWNER(S)

[Signature]  
SIGNATURE OF AGENT, ATTORNEY OR APPLICANT

Connie Koonce  
SIGNATURE OF OWNER(S)

**The contents of this application, upon submission, become "public record."**



The undersigned hereby acknowledge that the County Planning Staff has conferred with the petitioner or assigns, and the application as submitted is accurate and correct.

Peagay Koonce  
NAME OF OWNER(S) (PRINT OR TYPE)

4729 Bramble Street, Hope Mills NC 28348  
ADDRESS OF OWNER(S)

910-987-5534 HOME TELEPHONE #      N/A WORK TELEPHONE #

J. Thomas Neville, Attorney  
NAME OF AGENT, ATTORNEY, APPLICANT (PRINT OR TYPE)

310 Dick Street, Suite A, Fay NC 28301  
ADDRESS OF AGENT, ATTORNEY, APPLICANT

jtneville@jwnlaw.com ; kimbozeman@jwnlaw.com  
E-MAIL

N/A HOME TELEPHONE #      910-433-4433 WORK TELEPHONE #

Peagay A Koonce SIGNATURE OF OWNER(S)      [Signature] SIGNATURE OF AGENT, ATTORNEY OR APPLICANT

\_\_\_\_\_  
SIGNATURE OF OWNER(S)

**The contents of this application, upon submission, become "public record."**

The undersigned hereby acknowledge that the County Planning Staff has conferred with the petitioner or assigns, and the application as submitted is accurate and correct.

Sharon Koonce  
NAME OF OWNER(S) (PRINT OR TYPE)

3414 Regiment Drive, Fay NC 28303  
ADDRESS OF OWNER(S)

910-476-3230 HOME TELEPHONE #      N/A WORK TELEPHONE #

J. Thomas Neville, Attorney  
NAME OF AGENT, ATTORNEY, APPLICANT (PRINT OR TYPE)

310 Dick Street, Suite A, Fay NC 28301  
ADDRESS OF AGENT, ATTORNEY, APPLICANT

jtneville@ynwlaw.com ; kimboeraman@ynwlaw.com  
E-MAIL

N/A HOME TELEPHONE #      910-433-4433 WORK TELEPHONE #

Sharon D. Koonce SIGNATURE OF OWNER(S)      [Signature] SIGNATURE OF AGENT, ATTORNEY OR APPLICANT

\_\_\_\_\_  
SIGNATURE OF OWNER(S)

**The contents of this application, upon submission, become "public record."**

The undersigned hereby acknowledge that the County Planning Staff has conferred with the petitioner or assigns, and the application as submitted is accurate and correct.

Tanna K. Hutton  
NAME OF OWNER(S) (PRINT OR TYPE)

40 Evecasean Circle, Myrtle Beach, SC 29575  
ADDRESS OF OWNER(S)

704-345-5535 HOME TELEPHONE #      N/A WORK TELEPHONE #

J. Thomas Neville, Attorney  
NAME OF AGENT, ATTORNEY, APPLICANT (PRINT OR TYPE)

310 Dick Street, Suite A, Fayetteville, NC 28301  
ADDRESS OF AGENT, ATTORNEY, APPLICANT

jtneville@jvnlaw.com; kimbozeman@jvnlaw.com  
E-MAIL

N/A HOME TELEPHONE #      910-433-4433 WORK TELEPHONE #

Tanna K. Hutton SIGNATURE OF OWNER(S)      J. Thomas Neville SIGNATURE OF AGENT, ATTORNEY OR APPLICANT

\_\_\_\_\_  
SIGNATURE OF OWNER(S)

**The contents of this application, upon submission, become "public record."**

## PUBLIC NOTICE

The Cumberland County Board of Commissioners will meet at 6:45 p.m. on September 15, 2025 in Room 118 of the County Courthouse at 117 Dick Street to hear the following: **ZON-25-0023**:Rezoning from A1 Agricultural District to R40/CZ Residential District Conditional Zoning or to a more restrictive zoning district for a parcel comprising 10.16 +/- acres; located at the northwest corner of the intersection of Hayfield Rd and South River School Rd; submitted by Mike Adams (Agent) on behalf of JF Johnson Family Farms LLC (Owner/Applicant).

**ZON-25-0030**:Rezoning from R6A Residential District to C2(P) Planned Service and Retail District or to a more restrictive zoning district for a parcel comprising 3.72 +/- acres; located at 6235 Camden Rd and 6320 Rockfish Rd; submitted by Thomas Neville (Agent) on behalf of Charles Koonce, Donald Koonce Heirs, Peggy Koonce, and Tanna Kim Hutton (Owners).

**ZON-25-0031**:Rezoning from A1/CZ Agricultural District Conditional Zoning to A1A Agricultural District or to a more restrictive zoning district for a parcel comprising 1.00 +/- acres; located at 10785 Dunn Rd; submitted by Timothy and Troi Buckholz (Owners).

**ZON-25-0032**:Rezoning from A1 Agricultural District to RR Rural Residential District or to a more restrictive zoning district for a parcel comprising 0.92 +/- acres; located at 1708 Smoky Canyon Dr.; submitted by Edward Klement (Owners/Applicant).

Publication Dates  
LWLM0359260

SCHEDULE FOR AD NUMBER LWLM03592600

September 2, 2025  
Fayetteville Observer  
September 8, 2025  
Fayetteville Observer



**PLANNING AND INSPECTIONS DEPARTMENT**

**MEMORANDUM FOR BOARD OF COMMISSIONERS AGENDA OF SEPTEMBER 15, 2025**

**TO: BOARD OF COUNTY COMMISSIONERS**

**FROM: RAWLS HOWARD, DIRECTOR OF PLANNING & INSPECTIONS**

**DATE: 9/9/2025**

**SUBJECT: CASE # ZON-25-0031**

**BACKGROUND**

**ZON-25-0031:** Rezoning from A1/CZ Agricultural District Conditional Zoning to A1A Agricultural District or to a more restrictive zoning district for a parcel comprising 1.00 +/- acres; located at 10785 Dunn Rd; submitted by Timothy and Troi Buckholz (Owners).

**RECOMMENDATION / PROPOSED ACTION**

**Planning Board Meeting Date: August 19, 2025**

**Planning Board Action:** The Planning Board recommended approval of the rezoning from A1/CZ Agricultural District Conditional Zoning to A1A Agricultural District at their August 19, 2025, meeting for the reasons stated and as fully reflected in the meeting minutes which are incorporated herein by reference.

**Staff Recommendation:** Planning and Inspections staff recommends approval of the rezoning request from A1/CZ Agricultural District Conditional Zoning to A1A Agricultural District and find that: 1. Approval is an amendment to the adopted, current Vision Northeast Land Use Plan and that the Board of Commissioners should not require any additional request or application for amendment to said map for this request. 2. The requested district is more complimentary with plan policies by proposing uses that are less intense than the current use allowed on the property. 3. The proposed district allows residential uses that are commonly found in the immediate area. Staff also finds that the request is reasonable and in the public interest as it is compatible to and in harmony with the surrounding land use activities and zoning.

**If the Board of Commissioners wishes to follow the recommendation of the Planning Board in this case, the following motion is appropriate:**

**MOTION:**

In Case ZON-25-0031, I move to approve the rezoning request from A1/CZ Agricultural District Conditional Zoning to A1A Agricultural District and find that:

1. Approval is an amendment to the adopted, current Vision Northeast Land Use Plan and that the Board should not require any additional request or application for amendment to said map for this request.
2. The requested district is more complimentary with plan policies by proposing uses that are less intense than the current use allowed on the property.
3. The proposed district allows residential uses that are commonly found in the immediate area.

The Board finds that the request is reasonable and in the public interest as it is compatible to and in harmony with the surrounding land use activities and zoning.

**If the Board of Commissioners does not wish to follow the recommendation of the Planning Board in this case, the following motion is appropriate:**

**MOTION:**

In Case ZON-25-0031, I move to deny the rezoning request from A1/CZ Agricultural District Conditional Zoning to A1A Agricultural District. The Board finds that the request is not consistent with the Vision Northeast Land Use Plan. The request is not reasonable or in the public interest because \_\_\_\_\_.

**ATTACHMENTS:**

Description	Type
ZON-25-0031	Backup Material



## Cumberland County Joint Planning Board

September 9, 2025

MEMO TO: Cumberland County Board of Commissioners

FROM: Rawls Howard, Director of Planning & Inspections

SUBJECT: **ZON-25-0031:** Rezoning from A1/CZ Agricultural District Conditional Zoning to A1A Agricultural District or to a more restrictive zoning district for a parcel comprising 1.00 +/- acres; located at 10785 Dunn Rd; submitted by Timothy and Troi Buckholz (Owners).

ACTION: The Planning Board recommended approval of the rezoning from A1/CZ Agricultural District Conditional Zoning to A1A Agricultural District at their August 19, 2025, meeting for the reasons stated and as fully reflected in the meeting minutes which are incorporated herein by reference.

### MINUTES OF AUGUST 19, 2025

In Case ZON-25-0031, Planning and Inspections staff recommends approval of the rezoning request from A1/CZ Agricultural District Conditional Zoning to A1A Agricultural District and find that: 1. Approval is an amendment to the adopted, current Vision Northeast Land Use Plan and that the Board of Commissioners should not require any additional request or application for amendment to said map for this request. 2. The requested district is more complimentary with plan policies by proposing uses that are less intense than the current use allowed on the property. 3. The proposed district allows residential uses that are commonly found in the immediate area. Staff also finds that the request is reasonable and in the public interest as it is compatible to and in harmony with the surrounding land use activities and zoning.

**In Case ZON-25-0031, Mr. Crumpler made a motion, seconded by Ms. Lynd to recommend approval of the rezoning request from A1/CZ Agricultural District Conditional Zoning to A1A Agricultural District and find that: 1. Approval is an amendment to the adopted, current Vision Northeast Land Use Plan and that the Board of Commissioners should not require any additional request or application for amendment to said map for this request. 2. The requested district is more complimentary with plan policies by proposing uses that are less intense than the current use allowed on the property. 3. The proposed district allows residential uses that are commonly found in the immediate area. The board also finds that the request is reasonable and in the public interest as it is compatible to and in harmony with the surrounding land use activities and zoning. Unanimous approval.**

#### **First Class and Record Owners' Mailed Notice Certification**

*A certified copy of the tax record owner(s) of the subject and adjacent properties and their tax record mailing address is contained within the case file and is incorporated by reference as if delivered herewith. The record owners' certified receipt of notice is also included.*



**REQUEST** **Rezoning A1/CZ to A1A**

Applicant requests a rezoning from A1/CZ Agricultural District Conditional Zoning to A1A Agricultural District for a parcel containing approximately 1.00 acres located at 10785 Dunn Rd. The parcel contains an existing structure previously used for special events and as a restaurant. The current conditional zoning, approved in 2012, restricts the property's uses to "Assemblies, Outdoor Recreation, and Religious Worship Activities." The intent of the property owners is to convert the existing structure to a residential dwelling unit, making rezoning necessary to allow a residential use.

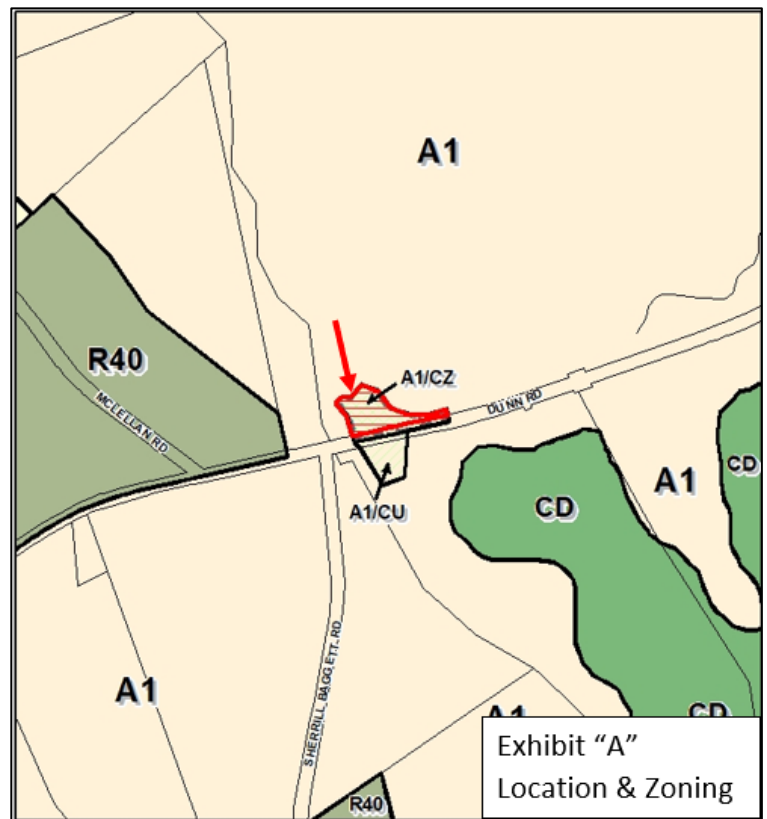
**PROPERTY INFORMATION**

**OWNER/APPLICANT:** Timothy and Troi Buckholtz  
(Owners and Applicant)

**ADDRESS/LOCATION:** Located at 10785 Dunn Rd.  
Refer to Exhibit "A", Location and Zoning Map.  
REID number: 1503279048000.

**SIZE:** The parcel contains approximately 1.00 acre. Road frontage along Dunn Road is approximately 437 feet. The property is approximately 211 feet in length at its deepest point.

**EXISTING ZONING:** The subject property is currently zoned A1/CZ Agricultural District/Conditional Zoning. The A1 Agricultural District is a district designed to promote and protect agricultural lands, including woodland, within the County. The general intent of the district is to permit all agricultural use to exist free from most private urban development except for large lot, single-family development. Some public and/or semi-public uses as well as a limited list of convenient commercial uses are permitted to ensure essential services for the residents.

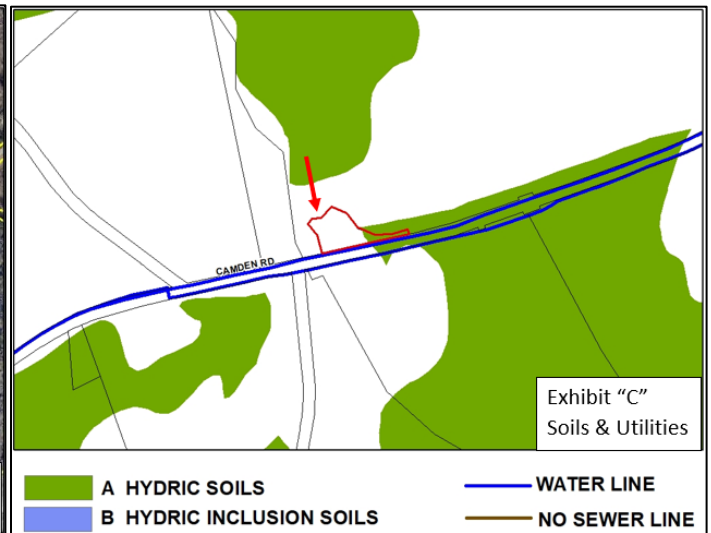


**EXISTING LAND USE:** The subject parcel contains a former commercial building and abuts Rhodes Pond. Exhibit "B" shows the existing use of the subject property.

**SURROUNDING LAND USE:** Exhibit "B" illustrates the following:

- **North:** Rhodes Pond and wooded lands.
- **East:** Rhodes Pond and wooded lands.
- **West:** Single-family home and farmlands.
- **South:** Single-family home and wooded lands.

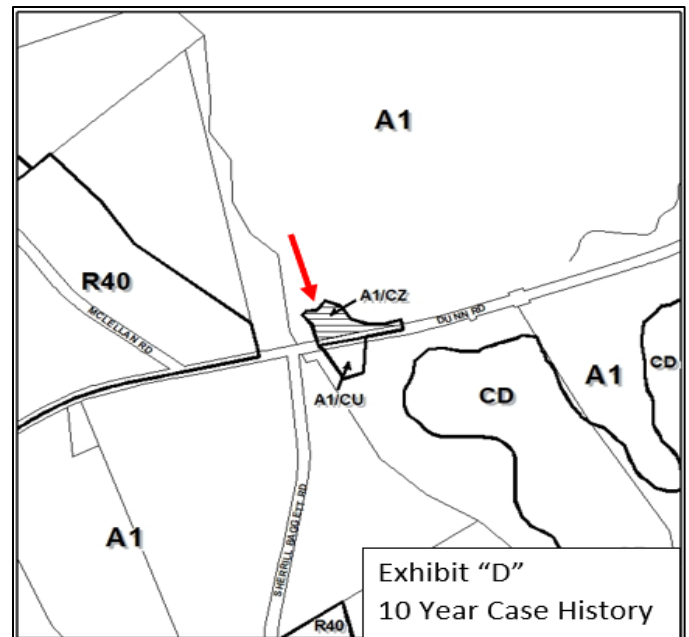
**OTHER SITE CHARACTERISTICS:** The site is not located in a Watershed Protection Area, but it is within a Flood Zone Hazard Area. The owners have applied for a base flood elevation certificate from the County Engineer's office. The subject property, as delineated in Exhibit "C", illustrates the presence of hydric soils on the far eastern portion of the property.



**TEN YEAR ZONE CASE HISTORY:**

Exhibit "D" denotes no zoning cases within the last ten years near the site.

**DEVELOPMENT REVIEW:** If any non-residential use is proposed, a site plan must be submitted for review and approval by the Current Planning Division office prior to the issuance of any Certificate of Occupancy.



**DIMENSIONAL PROVISIONS FOR REQUESTED DISTRICT:**

Minimum Standard	A1/CZ (Existing)	A1A (Proposed)
Front Yard Setback	50 feet	50 feet
Side Yard Setback	20 feet	20 feet
Rear Yard Setback	50 feet	50 feet
Lot Area	2 Acres	1 Acre
Lot Width	100 feet	100 feet

**DEVELOPMENT POTENTIAL:**

Existing Zoning (A1/CZ)	Proposed Zoning A1A
0 dwelling units	1 dwelling units

- Lot count may be rounded up when a fraction occurs. When any requirement of this ordinance results in a fraction of a unit, a fraction of one-half or more shall be considered a whole unit, and a fraction of less than one-half shall be disregarded.

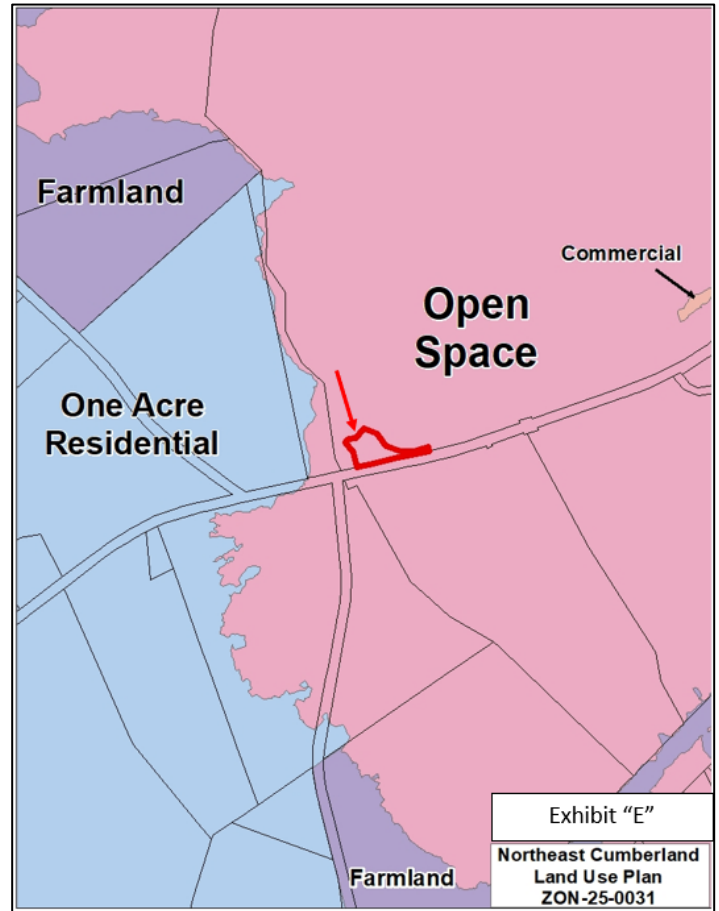
## COMPREHENSIVE PLANS:

This property is located in the Vision Northeast Land Use Plan (2010). The future land use classification of the property is "Open Space". The associated zoning district for Open Space is CD.

### The proposed rezoning request is not consistent with the future land use plan.

Future Land Use Classification Development Goals, Notes, and Objectives:

- "Protect, maintain and preserve natural areas (swamps, marshlands, creeks, streams, wetlands, bodies of water (Rhodes Pond), smaller existing ponds, South River, and Cape Fear River), historic sites and other natural resources from urban encroachment while providing limited access and/or utilization of these features" (Vision Northeast 2010, p. 19).
- "Plan and design future residential development to protect natural features, environmental sensitive areas, and protect and improve transportation corridors" (Vision Northeast 2010, p. 17).
- "PROTECT UNIQUE NATURAL HISTORIC RESOURCES...The Study Area is blessed with some unique natural features that have regional and statewide significance. These features include Rhodes Pond, the bluffs along the Cape Fear River, and the Cypress swamps along the South River" (Vision Northeast 2010, p. 60).
- "Locate residential development in areas with compatible land uses" (Vision Northeast 2010, p. 17).



## IMPACTS ON LOCAL INFRASTRUCTURE AND/OR FACILITIES

**UTILITIES:** Sewer lines are not available near the subject property. A Town of Falcon water line is abutting the property along Dunn Rd. Utility lines for water are shown on Exhibit "C". Septic will likely be required, and the lot size must meet the minimum area necessary to accommodate a septic system. Applicants must coordinate with the Town of Falcon to serve their development with water service or with the County Environmental Health Dept. for an on-site well permit.

**TRANSPORTATION:** Dunn Rd. is classified as Major Collector Road based on the NCDOT Functional Class Map. An NCDOT Driveway permit must be obtained with the conversion of the building from commercial use to residential.

**SCHOOLS CAPACITY/ENROLLMENT:** Cumberland County Schools did not provide comments by the time of publication of this report.

**ECONOMIC DEVELOPMENT:** Fayetteville-Cumberland County Economic Development Corporation has reviewed the request and had no objection to the proposed rezoning.

**EMERGENCY SERVICES:** Any future development of this property may have to comply with all applicable emergency access requirements in accordance with Section 503 of the 2018 NC Fire Code as well as fire protection water supply requirements in accordance with Section 507 of the 2018 NC Fire Code.

**SPECIAL DISTRICTS/ OVERLAY DISTRICTS:** This site is not located within any special district or overlay district.

<b>Special Districts</b>			
Fayetteville Regional Airport Overlay:	N/A	Averasboro Battlefield Corridor:	N/A
Five Mile Distance of Fort Bragg:	N/A	Eastover Commercial Core Overlay District:	N/A
Voluntary Agricultural District (VAD):	N/A	Spring Lake Main Street Overlay District:	N/A
VAD Half Mile Buffer:	N/A	Coliseum Tourism Overlay District:	N/A

**CONDITIONS OF APPROVAL:** This is a conventional rezoning. There are no conditions proposed at this time.

**STAFF RECOMMENDATION**

In Case ZON-25-0031, Planning and Inspections staff **recommends approval** of the rezoning request from A1/CZ Agricultural District Conditional Zoning to A1A Agricultural District and find that:

1. Approval is an amendment to the adopted, current Vision Northeast Land Use Plan and that the Board of Commissioners should not require any additional request or application for amendment to said map for this request.
2. The requested district is more complimentary with plan policies by proposing uses that are less intense than the current use allowed on the property.
3. The proposed district allows residential uses that are commonly found in the immediate area.

Staff also finds that the request is reasonable and in the public interest as it is compatible to and in harmony with the surrounding land use activities and zoning.

Attachments:  
Notification Mailing List  
Application

ATTACHMENT – MAILING LIST

BUCKHOLZ, TIMOTHY;BUCKHOLZ,  
TROI  
10785 DUNN RD  
DUNN, NC 28334

FOWL RHODES LLC  
111 COMMERCE DR  
DUNN, NC 28334

STATE OF NC - ON BEHALF OF  
WILDLIFE RESOURCES  
COMMISSION  
116 W JONES ST  
RALEIGH, NC 27603

BAGGETT, TALMAGE S JR, MARY B  
RICE;DEBRA, B MOORE  
2913 MIRROR LAKE DR  
FAYETTEVILLE, NC 28303

BENTLEY, ADAM THOMAS;BENTLEY,  
GRISELDA GONZALEZ  
10784 DUNN RD  
DUNN, NC 28334

MICHAEL, THOMAS R  
PO BOX 311  
GODWIN, NC 28344



# ATTACHMENT: APPLICATION



CASE #: ZON-25-0031

PLANNING BOARD  
MEETING DATE: 8/19/25

DATE APPLICATION  
SUBMITTED: 7/8/25

## APPLICATION FOR REZONING REQUEST CUMBERLAND COUNTY ZONING ORDINANCE

The following items are to be submitted with the completed application:

1. A copy of the *recorded* deed and/or plat.
2. If a portion(s) of the property is being considered for rezoning, an accurate written legal description of only the area to be considered.
3. A check made payable to "Cumberland County" in the amount of \$ 250.  
(See County Fee Schedule).

Rezoning Procedure:

1. Completed application submitted by the applicant.
2. Notification to surrounding property owners.
3. Planning Board hearing.
4. Re-notification of interested parties / public hearing advertisement in the newspaper.
5. County Commissioners' public hearing (approximately four weeks after Planning Board public hearing)
6. If approved by the County Commissioners, rezoning becomes effective immediately.

The Planning & Inspections Staff will advise on zoning options, inform applicants of development requirement and answer questions regarding the application and rezoning process. For further questions, call (910)678-7627 or (910)678-7609. Hours of operation are 8:00 a.m. to 5:00 p.m., Monday through Friday.

**NOTE: Any revisions, inaccuracies or errors to the application may cause the case to be delayed and will be scheduled for the next available board meeting according to the board's meeting schedule. Also, the application fee is *nonrefundable*.**

**TO THE CUMBERLAND COUNTY JOINT PLANNING BOARD AND THE BOARD OF COUNTY COMMISSIONERS OF CUMBERLAND COUNTY, NC:**

I (We), the undersigned, hereby submit this application, and petition the County Commissioners to amend and to change the zoning map of the County of Cumberland as provided for under the provisions of the County Zoning Ordinance. In support of this petition, the following facts are submitted:

1. Requested Rezoning from A1CZ Commercial to A1A Residential
2. Address of Property to be Rezoned: 10785 Dunn Road Dunn NC 28334
3. Location of Property: 1 mile north of Godwin NC on us hwy 301.
4. Parcel Identification Number (PIN #) of subject property: 1503-27-9048  
(also known as Tax ID Number or Property Tax ID)
5. Acreage: 1 acre + Frontage: 440 Depth: 255
6. Water Provider: Well: \_\_\_\_\_ PWC: \_\_\_\_\_ Other (name): Falcon
7. Septage Provider: Septic Tank  PWC \_\_\_\_\_
8. Deed Book 011667, Page(s) 00272, Cumberland County Registry. (Attach copy of deed of subject property as it appears in Registry).
9. Existing use of property: Commercial / Meetings
10. Proposed use(s) of the property: Primary Residence of Owners
11. Do you own any property adjacent to or across the street from this property?  
Yes \_\_\_\_\_ No  If yes, where? \_\_\_\_\_
12. Has a violation been issued on this property? Yes \_\_\_\_\_ No

A copy of the recorded deed(s) and/or recorded plat map(s) must be provided. If the area is a portion of a parcel, a written legal description by metes and bounds, showing acreage must accompany the deeds and/or plat. If more than one zoning classification is requested, a correct metes and bounds legal description, including acreage, for each bounded area must be submitted.

*The Planning and Inspections Staff is available for advice on completing this application; however, they are not available for completion of the application.*





## PUBLIC NOTICE

The Cumberland County Board of Commissioners will meet at 6:45 p.m. on September 15, 2025 in Room 118 of the County Courthouse at 117 Dick Street to hear the following:

**ZON-25-0023:** Rezoning from A1 Agricultural District to R40/CZ Residential District Conditional Zoning or to a more restrictive zoning district for a parcel comprising 10.16 +/- acres; located at the northwest corner of the intersection of Hayfield Rd and South River School Rd; submitted by Mike Adams (Agent) on behalf of JF Johnson Family Farms LLC (Owner/Applicant).

**ZON-25-0030:** Rezoning from R6A Residential District to C2(P) Planned Service and Retail District or to a more restrictive zoning district for a parcel comprising 3.72 +/- acres; located at 6235 Camden Rd and 6320 Rockfish Rd; submitted by Thomas Neville (Agent) on behalf of Charles Koonce, Donald Koonce Heirs, Peggy Koonce, and Tanna Kim Hutton (Owners).

**ZON-25-0031:** Rezoning from A1/CZ Agricultural District Conditional Zoning to A1A Agricultural District or to a more restrictive zoning district for a parcel comprising 1.00 +/- acres; located at 10785 Dunn Rd; submitted by Timothy and Troi Buckholz (Owners).

**ZON-25-0032:** Rezoning from A1 Agricultural District to RR Rural Residential District or to a more restrictive zoning district for a parcel comprising 0.92 +/- acres; located at 1708 Smoky Canyon Dr.; submitted by Edward Klement (Owners/Applicant).

Publication Dates

LWLM0359260

SCHEDULE FOR AD NUMBER LWLM03592600

September 2, 2025

Fayetteville Observer

September 8, 2025

Fayetteville Observer



**PLANNING AND INSPECTIONS DEPARTMENT**

**MEMORANDUM FOR BOARD OF COMMISSIONERS AGENDA OF SEPTEMBER 15, 2025**

**TO: BOARD OF COUNTY COMMISSIONERS**

**FROM: RAWLS HOWARD, DIRECTOR OF PLANNING & INSPECTIONS**

**DATE: 9/9/2025**

**SUBJECT: CASE # ZON-25-0032**

**BACKGROUND**

**ZON-25-0032:** Rezoning from A1 Agricultural District to RR Rural Residential District or to a more restrictive zoning district for a parcel comprising 0.92 +/- acres; located at 1708 Smoky Canyon Dr.; submitted by Edward Klement (Owner/Applicant).

**RECOMMENDATION / PROPOSED ACTION**

**Planning Board Meeting Date: August 19, 2025**

**Planning Board Action:** The Planning Board recommended denial of the rezoning from A1 Agricultural District to RR Rural Residential District at their August 19, 2025, meeting for the reasons stated and as fully reflected in the meeting minutes which are incorporated herein by reference.

**Staff Recommendation** Planning and Inspections staff recommends denial of the rezoning request from A1 Agricultural District to RR Rural Residential District. Staff finds that the request is not consistent with the South-Central Land Use Plan which calls for "Farmland" at this location. Staff also finds that the request is not reasonable or in the public interest as it is not compatible to or in harmony with the surrounding land use activities and zoning.

**If the Board of Commissioners wishes to follow the recommendation of the Planning Board in this case, the following motion is appropriate:**

**MOTION:**

In Case ZON-25-0032, I move to deny the rezoning request from A1 Agricultural District to RR Rural Residential District. The Board finds that the request is not consistent with the South-Central Land Use Plan which calls for “Farmland” at this location. The Board also finds that the request is not reasonable or in the public interest as it is not compatible to or in harmony with the surrounding land use activities and zoning.

**If the Board of Commissioners does not wish to follow the recommendation of the Planning Board in this case, the following motion is appropriate:**

**MOTION:**

In Case ZON-25-0032, I move to approve the rezoning request from A1 Agricultural District to RR Rural Residential District and find that the approval is an amendment to the adopted, current South-Central Land Use Plan and that the Board should not require any additional request or application for amendment to said map for this request.

The Board finds that the request is reasonable and in the public interest because \_\_\_\_\_.

**ATTACHMENTS:**

Description	Type
ZON-25-0032	Backup Material



## Cumberland County Joint Planning Board

September 9, 2025

MEMO TO: Cumberland County Board of Commissioners

FROM: Rawls Howard, Director of Planning & Inspections

SUBJECT: **ZON-25-0032:** Rezoning from A1 Agricultural District to RR Rural Residential District or to a more restrictive zoning district for a parcel comprising 0.92 +/- acres; located at 1708 Smoky Canyon Dr.; submitted by Edward Klement (Owner/Applicant).

ACTION: The Planning Board recommended denial of the rezoning from A1 Agricultural District to RR Rural Residential District at their August 19, 2025, meeting for the reasons stated and as fully reflected in the meeting minutes which are incorporated herein by reference.

### MINUTES OF AUGUST 19, 2025

In Case ZON-25-0032, Planning and Inspections staff recommends denial of the rezoning request from A1 Agricultural District to RR Rural Residential District. Staff finds that the request is not consistent with the South-Central Land Use Plan which calls for "Farmland" at this location. Staff also finds that the request is not reasonable or in the public interest as it is not compatible to or in harmony with the surrounding land use activities and zoning.

Timothy Doersam presented staff's presentation and findings.

Mr. Crumpler questioned why it was zoned A1 and if it was non-conforming.

Mr. Howard explained that the if it is the original zoning, the ordinance has stipulations that if you are zoned A1 and subdivided before a specific date, we could consider the lot under alternative standards for conformity.

Mr. Crumpler also questioned why it was not in harmony with the land use plan as there are manufactured home surrounding the area.

Mr. Moon explained that the applicant's intent was to rezone to RR to accommodate two single family homes on a lot. All lots within that community only have one single family home on them. So, it's an established recorded residential plat. In this case, you would be changing to RR when the remainder of the community is under the A1 character.

Mr. Baker asked if this would be the only lot in the area with two homes, were this to go forward?



## Cumberland County Joint Planning Board

Mr. Moon stated it would be.

Ms. Lynd noted that the lots in question were created in 1993 and expressed her belief that the zoning designation was applied after that date. She recalled that staff reports used to include the date when an area was initially zoned, which was particularly helpful in cases where historical context could influence decision making.

Mr. Crumpler agreed, stating that scattered parcels like these complicate the implementation of land use plans. He shared an additional example and questioned how such inconsistencies occur.

Mr. Howard responded by explaining that during initial countywide zoning efforts, a broad zoning blanket is typically applied due to the scale and complexity of the process. He noted that small, individual lots may not be addressed in detail during that phase. Instead, the fine-tuning occurs later when property owners bring specific requests before the board, as was the case in the current meeting.

Mr. Baker opened the public comments section.

There was one speaker in favor.

Mr. Howard called Mr. Edward Klement to the podium who gave his name and address for the record.

Mr. Edward Klement addressed the board regarding his intention to build a 1,200-square-foot home at the front of his property and relocate a renovated manufactured home to the rear for rental income. He noted that the mobile home had undergone substantial upgrades, including new cabinets and flooring.

Mr. Mobley inquired about the model and year of the manufactured home, emphasizing the importance of retaining the original data plate for inspection and verification purposes. He explained that data plates are often located inside cabinets, and with the installation of new cabinetry, Mr. Klement may encounter difficulty accessing or relocating the home if the plate has been removed or obscured.

Mr. Klement stated he believed it was 1986 and he knew it needed to be of a certain age to move.

Mr. Baker asked if there were any more questions for Mr. Klement. Seeing none he closed the public comments.

Mr. Mobley asked staff whether, under the current ordinance, a non-conforming lot such as the one in question could it be subdivided?

Mr. Howard responded that, given the existing lot size and zoning, subdivision is not available.



## Cumberland County Joint Planning Board

**In Case ZON-25-0032, Mr. Walters made a motion, seconded by Ms. Lynd, to recommend denial of the rezoning request from A1 Agricultural District to RR Rural Residential District. The board finds that the request is not consistent with the South-Central Land Use Plan which calls for “Farmland” at this location. The board also finds that the request is not reasonable or in the public interest as it is not compatible to or in harmony with the surrounding land use activities and zoning. Unanimous approval.**

**First Class and Record Owners’ Mailed Notice Certification**

*A certified copy of the tax record owner(s) of the subject and adjacent properties and their tax record mailing address is contained within the case file and is incorporated by reference as if delivered herewith. The record owners’ certified receipt of notice is also included.  
certified receipt of notice is also included.*



<b>REQUEST</b>	<b>Rezoning A1 to RR</b>
----------------	--------------------------

Applicants request a rezoning from A1 Agricultural District to RR Rural Residential District for a parcel containing approximately .92 acres located at the southeast corner of Smoky Canyon Drive and Jacamp Drive, as shown in Exhibit "A". This corner lot currently contains one manufactured dwelling unit. The intent of the property owner is to add a second manufactured dwelling unit onto the property.

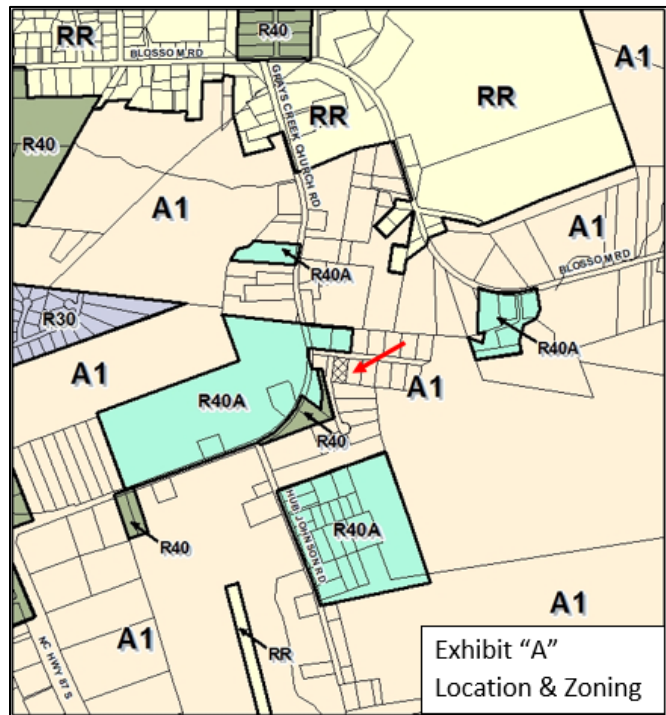
<b>PROPERTY INFORMATION</b>
-----------------------------

**OWNER/APPLICANT:** Edward A. Klement  
(Owner/Applicant)

**ADDRESS/LOCATION:** Located at 1708 Smoky Canyon Dr. Refer to Exhibit "A", Location and Zoning Map. REID number: 0442706174000

**SIZE:** The parcel contains approximately 0.92 acres. Road frontage along Smoky Canyon Dr. is 150 feet and 267 feet along Jacamp Drive. The property is approximately 267 feet in length at its deepest point.

**EXISTING ZONING:** The subject property is currently zoned A1 Agricultural District. The A1 Agricultural District is a district designed to promote and protect agricultural lands, including woodland, within the County. The general intent of the district is to permit all agricultural use to exist free from most private urban development except for large lot, single-family development. Some public and/or semi-public uses as well as a limited list of convenient commercials.

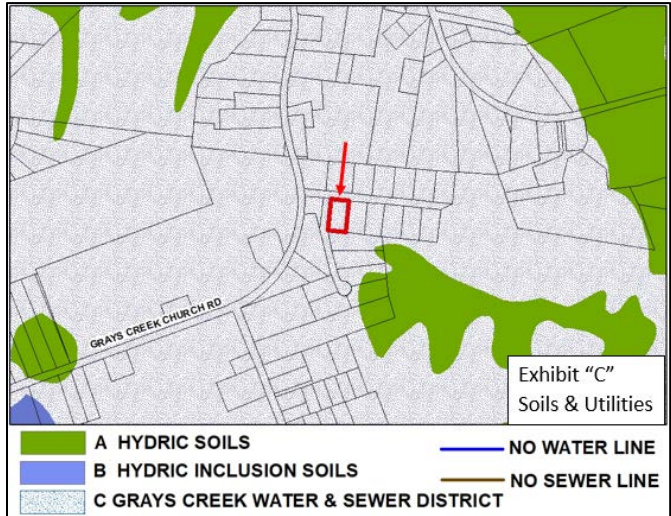


**EXISTING LAND USE:** One occupied single-family manufactured home located on a corner lot of an established residential subdivision. Typical lot sizes within the subdivision range from 0.87 to 1.2 acres in size with one home per lot. Exhibit "B" shows the existing use of the subject property.

**SURROUNDING LAND USE:** Exhibit "B" illustrates the following:

- **North:** Single Family and manufactured homes and wooded lands.
- **East:** Single Family and manufactured homes and wooded lands within the same platted residential neighborhood.
- **West:** Single Family homes manufactured homes and wooded lands within the same platted residential neighborhood
- **South:** Single Family homes and wooded lands.

**OTHER SITE CHARACTERISTICS:** The site is not located in a Watershed or within a Flood Zone Hazard Area. The subject property, as delineated in Exhibit "C", illustrates no presence of hydric or hydric inclusion soils on the property.

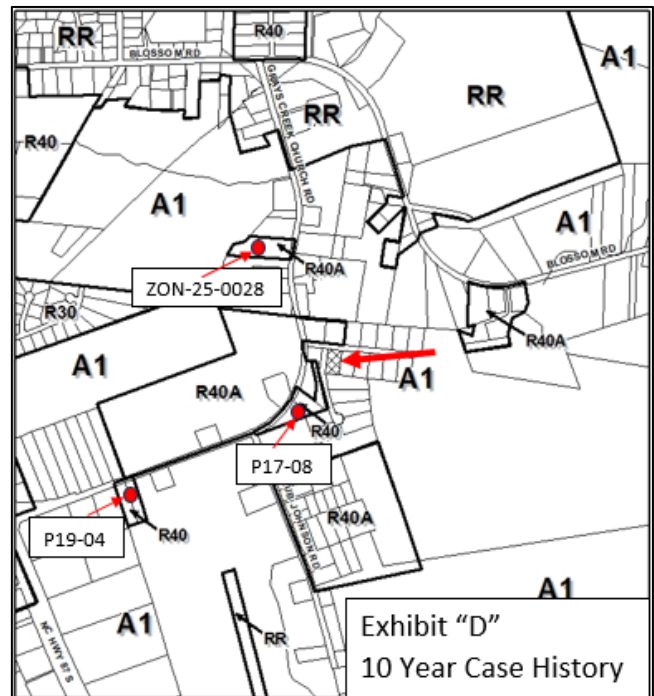


**TEN YEAR ZONE CASE HISTORY:**

Exhibit "D" denotes the following zoning case history below:

- P17-08: A1 to R40; Approved by County
- P19-04: A1 to R40; Approved by County
- ZON-25-0028: A1 to R40A; Approved by County

**DEVELOPMENT REVIEW:** Should the rezoning request be approved by the Board of County Commissioners, a group development permit or a subdivision plat must be approved by the Current Planning Division.



**DIMENSIONAL PROVISIONS FOR REQUESTED DISTRICT:**

Minimum Standard	A1 (Existing Zoning)	RR (Proposed)
Front Yard Setback	50 feet	30 feet
Side Yard Setback	20 feet	15 feet
Rear Yard Setback	50 feet	35 feet
Lot Area	2 acres	20,000 sq. ft
Lot Width	100'	100'

**Development Potential:**

Existing Zoning (A1)	Proposed Zoning (RR)
1 dwelling units	2 dwelling units

- Lot count may be rounded up when a fraction occurs. When any requirement of this ordinance results in a fraction of a unit, a fraction of one-half or more shall be considered a whole unit, and a fraction of less than one-half shall be disregarded.

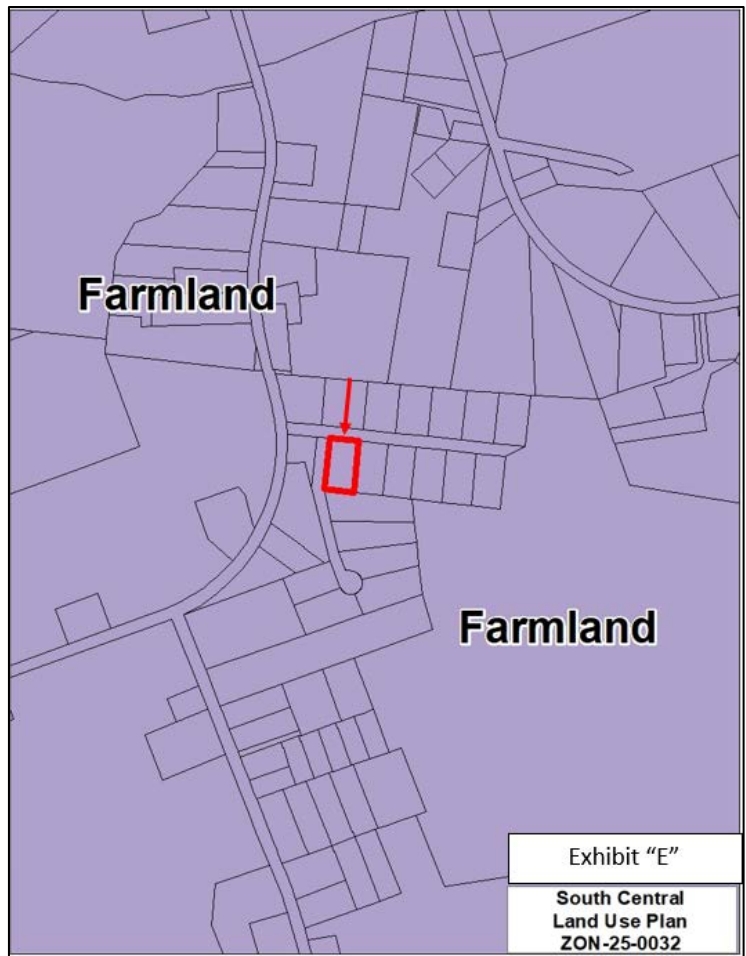
**COMPREHENSIVE PLANS:**

This property is located in the South-Central Land Use Plan (2015). The future land use classification of the property is "Farmland". The associated zoning districts for Farmland are A1, A1A, R40, R40A, and CD.

**The proposed rezoning request is not consistent with the future land use plan.**

Future Land Use Classification Development Goals, Notes, and Objectives:

- "Any residential development greater than two units per acre must have public or private water and sewer" (South Central Land Use Plan 2015, p. 93).
- "Preserve and protect farmland to ensure the continued viability of the farming and agribusiness industry in the Study Area" (South Central Land Use Plan 2015, p. 95).
- "The designated farmland area should be protected and preserved from normal development. Development in this area should be limited and be in character with a farming community" (South Central Land Use Plan 2015, p. 100).
- "Promote the concentration of development in areas with sufficient services such as water, sewer, roads, and nearby commercial establishments" (South Central Land Use Plan 2015, p. 95).



**IMPACTS ON LOCAL INFRASTRUCTURE AND/OR FACILITIES**

**UTILITIES:** Water and sewer lines are not available near the subject property as shown on Exhibit "C". The subject property is located within the Grays Creek Water & Sewer District. Well and septic will likely be required for each intended residential dwelling unit, and the lot size must meet the minimum area necessary to accommodate both.

**TRAFFIC:** The subject property sits on Smoky Canyon Drive and Jacamp Drive. Both streets are identified as local roads in the Metropolitan Transportation Plan. There are no roadway construction improvement projects planned, and the subject property will have no significant impact on the Transportation Improvement Program. Driveway permits for any new residential dwelling unit or relocation of any residential dwelling must be obtained through NCDOT.

**SCHOOLS CAPACITY/ENROLLMENT:**

School	Enrollment	Capacity
Alderman Road Elementary	610	707
Gray's Creek Middle	1103	1083
Gray's Creek High	1455	1517

**ECONOMIC DEVELOPMENT:** Fayetteville Cumberland County Economic Development Corporation has reviewed the request and had no objection to the proposed rezoning.

**EMERGENCY SERVICES:** Cumberland County Fire Marshal's office has reviewed the request and has no objections to the rezoning.

**SPECIAL DISTRICTS/ OVERLAY DISTRICTS:** The subject property is not within any special districts.

<b>Special Districts</b>			
Fayetteville Regional Airport Overlay:	<input type="checkbox"/>	Averasboro Battlefield Corridor:	<input type="checkbox"/>
Five Mile Distance of Fort Liberty:	<input type="checkbox"/>	Eastover Commercial Core Overlay District:	<input type="checkbox"/>
Voluntary Agricultural District (VAD):	<input type="checkbox"/>	Spring Lake Main Street Overlay District:	<input type="checkbox"/>
VAD Half Mile Buffer:	<input type="checkbox"/>	Coliseum Tourism Overlay District:	<input type="checkbox"/>

**CONDITIONS OF APPROVAL:** This is a conventional zoning. There are no conditions proposed at this time.

**STAFF RECOMMENDATION**

In Case ZON-25-0032, Planning and Inspections staff **recommends denial** of the rezoning request from A1 Agricultural District to RR Rural Residential District. Staff finds that the request is not consistent with the South-Central Land Use Plan which calls for "Farmland" at this location. Staff also finds that the request is not reasonable or in the public interest as it is not compatible to or in harmony with the surrounding land use activities and zoning.

Attachments:  
Notification Mailing List  
Application



## ATTACHMENT – MAILING LIST

HOLLOMAN, BENNIE SUE  
1733 SMOKY CANYON DR  
HOPE MILLS, NC 28348

GARCIA, JULIA J  
6315 BEAUCHAMP DR  
HOPE MILLS, NC 28348

MCKOY, SYLVESTER;MCKOY, HATTIE M  
4804 GRAYS CREEK CHURCH RDRD  
HOPE MILLS, NC 28348

WHITE, CARSON  
4824 GRAYS CREEK CHURCH ROAD  
HOPE MILLS, NC 28348

RAINS, JOSHUA  
4975 GRAYS CREEK CHURCH ROAD  
HOPE MILLS, NC 28348

WILLIAMS, DOUGLAS KEITH  
41 RIDGEVIEW DR  
CAMERON, NC 27829

STAPLES, ASHLEY MONIQUE  
8429 OLD PONDEROSA CIR  
RALEIGH, NC 27603

SMITH, PHILLIP C  
4944 GRAYS CREEK CHURCH ROAD  
HOPE MILLS, NC 28348

MCLAMB-WILCOX, SHEILA  
1725 SMOKY CANYON DRIVE  
HOPE MILLS, NC 28348

WILLIAMS, DARIUS L;WILLIAMS,  
YOLANDA M  
1610 BARMACK CT  
HOPE MILLS, NC 28348

BREWINGTON, PAUL D;BREWINGTON,  
VENUS J  
5037 HUB JOHNSON RD  
HOPE MILLS, NC 28348

SMITH, VIRGINIA R;ROBINSON,  
JACKIE;WILLIAMS, ERICA D  
4865 GRAYS CREEK CHURCH RD  
HOPE MILLS, NC 28348

SMITH, VIRGINIA R.;WILLIAMS, ERICA  
D.  
2512 FOREST LODGE DR  
FAYETTEVILLE, NC 28306

WILLIAMS, JERRY H;WILLIAMS,  
GERAL  
4819 GRAYS CREEK CHURCH RD  
HOPE MILLS, NC 28348

JOHNSON, AMY LYNN-  
SMITH;JOHNSON, JOSEPH  
CHRISTOPHER  
4948 GRAYS CREEK CHURCH RD  
HOPE MILLS, NC 28348

MILES, BERTHENA NICOLE  
6670 TABOR CHURCH RD  
FAYETTEVILLE, NC 28312

HEDLUND, KARL S;HEDLUND, LORI A  
3276 BLOSSOM RD  
FAYETTEVILLE, NC 28306

BOSTIC, WILLIE JAMES;MONROE-  
BOSTIC, SHAMEIKA  
4957 GRAYS CREEK CHURCH RD  
HOPE MILLS, NC 28348

PRIOR, ROBERT E  
6820 JACAMP  
HOPE MILLS, NC 28348

PHILLIPS, COURTNEY P;PHILLIPS,  
BRANDON  
2109 RAEFORD RD  
FAYETTEVILLE, NC 28305

BAKER, LUCY BUTLER;BUTLER,  
WILLIAM K;MARSHALL, CAROLE B  
1465 NEILL'S CREEK RD  
LILLINGTON, NC 27546

KLEMENT, EDWARD A  
1708 SMOKY CANYON DRIVE  
HOPE MILLS, NC 28348

BAKER, LUCY BUTLER, WILLIAM K  
BUTLER;CAROLE B MARSHALL  
1465 NEILL'S CREEK RD  
LILLINGTON, NC 27546

PETERS, MARK A  
1732 SMOKY CANYON DRHOPE MILLS,  
NC 28348

BOYKIN, KENNETH L  
215 VALECIAN WAY  
GREENSBORO, NC 27410

BOND, ZACHARY C  
1753 SMOKEY CANYON DR  
HOPE MILLS, NC 28348

SOVEREIGN ACCOUNTING PURE  
TRUST;RAEFORD, BEULAH;RAEFORD,  
ALFRED  
6286-C HACKBERRY DR  
HOPE MILLS, NC 28348

SANDERS, PHILIP R. JR.;SANDERS,  
TANYA C.  
1515 ABELIA RD  
HOPE MILLS, NC 28348

RESIMO, JAMES  
6828 JACAMP DR  
HOPE MILLS, NC 28348

WILLIAMS, LONNIE G;WILLIAMS,  
NANCY EDWARDS  
6811 JACAMP DR  
HOPE MILLS, NC 28348

ATTACHMENT: APPLICATION



CASE #: \_\_\_\_\_
PLANNING BOARD MEETING DATE: \_\_\_\_\_
DATE APPLICATION SUBMITTED: \_\_\_\_\_

APPLICATION FOR REZONING REQUEST CUMBERLAND COUNTY ZONING ORDINANCE

The following items are to be submitted with the completed application:

- 1. A copy of the recorded deed and/or plat.
2. If a portion(s) of the property is being considered for rezoning, an accurate written legal description of only the area to be considered.
3. A check made payable to "Cumberland County" in the amount of \$\_\_\_\_\_ (See County Fee Schedule).

Rezoning Procedure:

- 1. Completed application submitted by the applicant.
2. Notification to surrounding property owners.
3. Planning Board hearing.
4. Re-notification of interested parties / public hearing advertisement in the newspaper.
5. County Commissioners' public hearing (approximately four weeks after Planning Board public hearing)
6. If approved by the County Commissioners, rezoning becomes effective immediately.

The Planning & Inspections Staff will advise on zoning options, inform applicants of development requirement and answer questions regarding the application and rezoning process. For further questions, call (910)678-7627 or (910)678-7609. Hours of operation are 8:00 a.m. to 5:00 p.m., Monday through Friday.

NOTE: Any revisions, inaccuracies or errors to the application may cause the case to be delayed and will be scheduled for the next available board meeting according to the board's meeting schedule. Also, the application fee is nonrefundable.

**TO THE CUMBERLAND COUNTY JOINT PLANNING BOARD AND THE BOARD OF COUNTY COMMISSIONERS OF CUMBERLAND COUNTY, NC:**

I (We), the undersigned, hereby submit this application, and petition the County Commissioners to amend and to change the zoning map of the County of Cumberland as provided for under the provisions of the County Zoning Ordinance. In support of this petition, the following facts are submitted:

1. Requested Rezoning from A-1 to RURAL RESIDENTIAL
2. Address of Property to be Rezoned: 1708 SMOKY CANYON DR. HOPE MILLS
3. Location of Property, details: CORNER OF JACAMP AND SMOKY CANYON DR.
4. Parcel Identification Number (PIN #) of subject property: 0942-70-6174  
(also known as Tax ID Number or Property Tax ID)
5. Acreage: 0.97 Frontage: 157' Depth: 275'
6. Water Provider: Well:  PWC: \_\_\_\_\_ Other (name): \_\_\_\_\_
7. Septage Provider: Septic Tank  PWC \_\_\_\_\_
8. Deed Book 83 - PIAT, Page(s) 141 ~~PS-307 OAK~~, Cumberland County Registry. (Attach copy of deed of subject property as it appears in Registry).
9. Existing use of property: 1-2 BDRM DWELLING
10. Proposed use(s) of the property: 2-2 BDRM DWELLING
11. Do you own any property adjacent to or across the street from this property?  
Yes \_\_\_\_\_ No  If yes, where? \_\_\_\_\_
12. Has a violation been issued on this property? Yes \_\_\_\_\_ No

A copy of the recorded deed(s) and/or recorded plat map(s) must be provided. If the area is a portion of a parcel, a written legal description by metes and bounds, showing acreage must accompany the deeds and/or plat. If more than one zoning classification is requested, a correct metes and bounds legal description, including acreage, for each bounded area must be submitted.

*The Planning and Inspections Staff is available for advice on completing this application; however, they are not available for completion of the application.*



The undersigned hereby acknowledge that the County Planning Staff has conferred with the petitioner or assigns, and the application as submitted is accurate and correct.

EDWARD A. KIEMENT  
NAME OF OWNER(S) (PRINT OR TYPE)

1708 SMOKY CANYON DR. HOPE MILLS 28348  
ADDRESS OF OWNER(S)

N/A HOME TELEPHONE #      910-301-2688 WORK TELEPHONE #

EDWARD A KIEMENT  
NAME OF AGENT, ATTORNEY, APPLICANT (PRINT OR TYPE)

1708 SMOKY CANYON DR. HOPE MILLS, 28348  
ADDRESS OF AGENT, ATTORNEY, APPLICANT

EDWARD KIEMENT 9417 @ Gmail.com  
E-MAIL

N/A HOME TELEPHONE #      910-301-2688 WORK TELEPHONE #

 SIGNATURE OF OWNER(S)       SIGNATURE OF AGENT, ATTORNEY OR APPLICANT

\_\_\_\_\_  
SIGNATURE OF OWNER(S)

**The contents of this application, upon submission, become "public record."**

## PUBLIC NOTICE

The Cumberland County Board of Commissioners will meet at 6:45 p.m. on September 15, 2025 in Room 118 of the County Courthouse at 117 Dick Street to hear the following:

**ZON-25-0023:** Rezoning from A1 Agricultural District to R40/CZ Residential District Conditional Zoning or to a more restrictive zoning district for a parcel comprising 10.16 +/- acres; located at the northwest corner of the intersection of Hayfield Rd and South River School Rd; submitted by Mike Adams (Agent) on behalf of JF Johnson Family Farms LLC (Owner/Applicant).

**ZON-25-0030:** Rezoning from R6A Residential District to C2(P) Planned Service and Retail District or to a more restrictive zoning district for a parcel comprising 3.72 +/- acres; located at 6235 Camden Rd and 6320 Rockfish Rd; submitted by Thomas Neville (Agent) on behalf of Charles Koonce, Donald Koonce Heirs, Peggy Koonce, and Tanna Kim Hutton (Owners).

**ZON-25-0031:** Rezoning from A1/CZ Agricultural District Conditional Zoning to A1A Agricultural District or to a more restrictive zoning district for a parcel comprising 1.00 +/- acres; located at 10785 Dunn Rd; submitted by Timothy and Troi Buckholz (Owners).

**ZON-25-0032:** Rezoning from A1 Agricultural District to RR Rural Residential District or to a more restrictive zoning district for a parcel comprising 0.92 +/- acres; located at 1708 Smoky Canyon Dr.; submitted by Edward Klement (Owners/Applicant).

Publication Dates

LWLM0359260

SCHEDULE FOR AD NUMBER LWLM03592600



**ASSISTANT COUNTY MANAGER COMMUNITY SUPPORT SERVICES**

**MEMORANDUM FOR BOARD OF COMMISSIONERS AGENDA OF SEPTEMBER 15, 2025**

**TO: BOARD OF COUNTY COMMISSIONERS**

**FROM: DR. JENNIFER GREEN, PUBLIC HEALTH DIRECTOR**

**DATE: 9/15/2025**

**SUBJECT: CONSIDERATION OF CHANGES TO THE HEALTH DEPARTMENT'S BILLING MANUAL FOR OUT OF COUNTY RESIDENTS**

**BACKGROUND**

NC GS 230-39(g) allows health departments to set fees for services which are approved by The Board of Health and the Board of County Commissioners. The Health Department Billing Manual currently requires a residency requirement for the maternal health and child health clinics. This has created logistical and continuity of care challenges for staff and clients who receive other Health Department services without a residency requirement (e.g. WIC, immunizations, etc.)

Dr. Green will present data regarding the impact of this change to the billing manual. The Board of Health approved the change to remove the residency requirement for maternal health and child health clinics in the June 2025 board meeting.

This item was presented at the Cumberland County Policy Committee on September 8, 2025, the Cumberland County Board of Commissioners Agenda Meeting September 11, 2025. This item was approved to move to the September 15, 2025 Board of Commissioners Meeting as a Consent Agenda.

Request to change the residency requirement to the following:

- 1) Allow 15 months of coverage to non-resident of Cumberland County if the patient was a resident when services were initiated in Maternal and Child Health.
- 2) Allow 15 months of coverage to non-resident of Cumberland County as long as the referral to the Maternity or Child Health Clinics generated from another Cumberland County Health Department Clinic.

3) Allow children in the Cumberland County Foster Care System to continue to use the Maternity and/or Child Health Clinic for as long as they are under the care and supervision of Cumberland County Department of Social Services regardless of their residency.

**RECOMMENDATION / PROPOSED ACTION**

Approve the requested changes to the Public Health Billing Manual to include the following:

1) Allow 15 months of coverage to non-resident of Cumberland County if the patient was a resident when services were initiated in Maternal and Child Health.

2) Allow 15 months of coverage to non-resident of Cumberland County as long as the referral to the Maternity or Child Health Clinics generated from another Cumberland County Health Department Clinic.

3) Allow children in the Cumberland County Foster Care System to continue to use the Maternity and/or Child Health Clinic for as long as they are under the care and supervision of Cumberland County Department of Social Services regardless of their residency.



**ASSISTANT COUNTY MANAGER COMMUNITY SUPPORT SERVICES**

**MEMORANDUM FOR BOARD OF COMMISSIONERS AGENDA OF SEPTEMBER 15, 2025**

**TO: BOARD OF COUNTY COMMISSIONERS**

**FROM: HEATHER SKEENS, ASSISTANT COUNTY MANAGER**

**DATE: 9/15/2025**

**SUBJECT: CONSIDERATION OF THE FIRST AMENDMENT TO THE AGREEMENT FOR INMATE HEALTH CARE SERVICES BY WELLPATH, LLC**

**BACKGROUND**

Wellpath, LLC is the current Jail Health Provider for the Sheriff's Office Detention Center. The initial agreement effective date was December 1, 2023. Due to the increased population census at the Detention Center over the past year, there is a need to increase the staffing by the provider to ensure appropriate inmate health care. The increased amount for inmate health care was approved as part of the FY25-26 Budget. Additionally, the proposal for the increased staffing and budget was signed by Chairman deViere on July 16, 2025.

The First Amendment to the agreement is in-line with the approved budget and proposal.

**RECOMMENDATION / PROPOSED ACTION**

Approve the First Amendment to the Agreement For Inmate Health Care Services by Wellpath, LLC

**ATTACHMENTS:**

Description	Type
Wellpath Contract	Backup Material
Signed Proposal	Backup Material

**FIRST AMENDMENT TO THE AGREEMENT FOR INMATE HEALTH CARE  
SERVICES AT CUMBERLAND COUNTY, NORTH CAROLINA  
(Effective July 1, 2025)**

This First Amendment, effective July 1, 2025 (this "Amendment"), to the Agreement for Inmate Health Care Services, dated December 1, 2023, as amended (the "Agreement") is by and between Wellpath LLC ("Wellpath") and the County of Cumberland, a political subdivision in the State of North Carolina ("County").

**WHEREAS**, the Parties have determined that it is necessary and in the best interest of Covered Persons that 1.5 FTEs for the Registered Nurse position will be converted to Charge Nurse/Registered Nurse, with a pay increase from \$45.02 to \$48.00 per hour, and 0.6 FTEs for the Registered Nurse position will be converted to Charge Nurse/Registered Nurse, with a pay increase from \$45.02 to \$48.00; and

**WHEREAS**, the Parties wish to implement a 2.7% CPI annual increase to make the new compensation \$5,335,522.81 annually, \$444,626.90 monthly; and

**WHEREAS**, in accordance with Section 11.21, the Parties desire to amend the Agreement to memorialize such changes.

**NOW, THEREFORE**, in consideration of the mutual covenants herein contained and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Parties agree as follows:

1. **RECITALS.** The Parties hereto incorporate the foregoing recitals as a material portion of this Amendment.
2. **AMENDMENT TO EXHIBIT A OF AGREEMENT.** The Parties agree that the Staffing Matrix attached hereto as Exhibit A-1 shall replace the previous Staffing Matrix attached to the Agreement as Exhibit A.
3. **AMENDMENT TO SECTION 8.0 OF AGREEMENT.** The Agreement shall be amended by deleting Section 8.0 in its entirety and inserting the following language in lieu thereof:  
  
8.0 **ANNUAL AMOUNT/MONTHLY PAYMENTS.** The base annual amount to be paid by the County to Wellpath under this Agreement effective July 1, 2025 through June 30, 2026 is Five Million Three Hundred and Thirty-Five Thousand Five Hundred and Twenty-Two Dollars and Eighty-One Cents (\$5,335,522.81) for a period of twelve (12) months. Each monthly payment shall equal Four Hundred and Forty-Four Thousand Six Hundred and Twenty-Six Dollars and Ninety Cents (\$444,626.90), pro-rated for any partial months and subject to any reconciliations as set forth below. Each monthly payment is to be made on or before the first day of the month of service.

- 4. **SEVERABILITY.** If any terms or provisions of this Amendment or the application thereof to any person or circumstance shall to any extent be invalid or unenforceable, the remainder of this Amendment or the application of such term or provision to person or circumstances other than those as to which it is held invalid or unenforceable shall not be affected thereby and each term and provision of this Amendment shall be valid and enforceable to the fullest extent permitted by law.
- 5. **DEFINITIONS.** Capitalized terms used but not defined herein shall have the meaning ascribed to them under the Agreement.
- 6. **REMAINING PROVISIONS.** The remaining provisions of the Agreement not amended by this Amendment shall remain in full force and effect.

**IN WITNESS WHEREOF**, the Parties have caused this Amendment to be executed in their names or their official acts by their respective representatives, each of whom is duly authorized to execute the same.

**AGREED TO AND ACCEPTED AS STATED ABOVE:**

Cumberland County, North Carolina

By: \_\_\_\_\_  
Kirk deViere  
Title: Chairman

Wellpath LLC

Signed by:  
By: Erik Hammes  
Erik Hammes  
Title: President, Local Government East

THIS INSTRUMENT HAS BEEN PRE-AUDITED  
IN THE MANNER REQUIRED BY THE LOCAL  
GOVERNMENT BUDGET AND FISCAL CON-  
TROL ACT.

Robin M. Kanca  
FINANCE DIRECTOR

APPROVED FOR LEGAL SUFFICIENCY  
UPON FORMAL EXECUTION BY ALL PARTIES  
BY: [Signature] 9/15/25  
County Attorney's Office



**EXHIBIT A-1**

**STAFFING MATRIX**

Cumberland County, NC -									
Day Shift									
POSITION	Mon	Tues	Wed	Thur	Fri	Sat	Sun	Hrs/Week	FTEs
Health Services Administrator	8	8	8	8	8			40	1.000
Medical Director	8		4					12	0.300
Director of Nursing	8	8	8	8	8			40	1.000
Mid-level Practitioner NP/PA	8	8	8	8	8			40	1.000
Licensed Practical Nurse	36	36	36	36	36	36	36	252	6.300
Charge Nurse, RN	12	12	12	12	12	12	12	84	2.100
RN - Intake	12	12	12	12	12	12	12	84	2.100
Medication Tech	16	16	16	16	16	16	16	112	2.800
Medical Assistant, Pharmacy Supervisor	8	8	8	8	8			40	1.000
Psychiatrist (Telepsych)	4		4		4			12	0.300
Psych NP	6	5		5	6			22	0.550
Mental Health Coordinator	8	8	8	8	8			40	1.000
Mental Health Professional	8	8	8	8	8			40	1.000
Dentist		5.5		5.5				11	0.275
Dental Assistant		5.5		5.5				11	0.275
Administrative Assistant	8	8	8	8	8			40	1.000
<b>Total Hours/FTE - Day</b>								<b>880</b>	<b>22.000</b>
Evening Shift									
Med Tech	24	24	24	24	24	24	24	168	4.2
<b>TOTAL HOURS/FTE - Per Week</b>								<b>168</b>	<b>4.2</b>
Night Shift									
Registered Nurse - Intake	12	12	12	12	12	12	12	84	2.100
Licensed Practical Nurse	12	12	12	12	12	12	12	84	2.100
Charge Nurse, RN	12	12	12	12	12	12	12	84	2.100
<b>Total Hours/FTE - Night</b>								<b>252</b>	<b>6.300</b>
Weekly Total									
<b>TOTAL HOURS/FTE - Per Week</b>								<b>1,300</b>	<b>32.500</b>

### Certificate Of Completion

Envelope Id: F48532A3-AE1F-4F67-8710-0E2579A21763 Status: Completed  
 Subject: Complete with Docusign: Cumberland\_County\_NC\_First\_Amendment.pdf  
 Source Envelope:  
 Document Pages: 3 Signatures: 1 Envelope Originator:  
 Certificate Pages: 5 Initials: 0 Christi Cunningham  
 AutoNav: Enabled ChriCunningham@Wellpath.us  
 Envelopeld Stamping: Enabled IP Address: 130.41.210.94  
 Time Zone: (UTC-06:00) Central Time (US & Canada)

### Record Tracking

Status: Original Holder: Christi Cunningham Location: DocuSign  
 8/6/2025 10:55:06 AM ChriCunningham@Wellpath.us

### Signer Events

Erik Hamnes  
 EHamnes@Wellpath.us  
 President  
 Security Level: Email, Account Authentication (None)

### Signature

Signed by:  
  
 Erik Hamnes  
 2E5DE9CE4F8F486...  
 Signature Adoption: Pre-selected Style  
 Using IP Address: 12.79.93.70

### Timestamp

Sent: 8/6/2025 10:57:49 AM  
 Viewed: 8/6/2025 11:53:10 AM  
 Signed: 8/6/2025 11:54:37 AM

**Electronic Record and Signature Disclosure:**  
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 ID: 76b8d861-9b6f-4daf-ac6b-41422cb8829f

### In Person Signer Events

### Signature

### Timestamp

### Editor Delivery Events

### Status

### Timestamp

### Agent Delivery Events

### Status

### Timestamp

### Intermediary Delivery Events

### Status

### Timestamp

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### Status

### Timestamp

### Carbon Copy Events

### Status

### Timestamp

Aiden Preciado  
 APreciado@Wellpath.us  
 Security Level: Email, Account Authentication (None)  
**Electronic Record and Signature Disclosure:**  
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Aisha Gollither  
 agollither@wellpath.us  
 Security Level: Email, Account Authentication (None)  
**Electronic Record and Signature Disclosure:**  
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Crystal Knoch  
 Crystal.Knoch@Wellpath.us  
 Security Level: Email, Account Authentication (None)  
**Electronic Record and Signature Disclosure:**  
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Carbon Copy Events	Status	Timestamp
<p>Emily Wilson EmiWilson@Wellpath.us Security Level: Email, Account Authentication (None)</p> <p><b>Electronic Record and Signature Disclosure:</b> Accepted: 6/17/2024 9:55:21 AM ID: c6077bbf-e0db-4e6c-8f6e-3fc000893006</p>	<b>COPIED</b>	<p>Sent: 8/6/2025 10:57:50 AM Viewed: 8/6/2025 12:45:07 PM</p>
<p>Kasie Presley KPresley@Wellpath.us Security Level: Email, Account Authentication (None)</p> <p><b>Electronic Record and Signature Disclosure:</b> Not Offered via DocuSign</p>	<b>COPIED</b>	<p>Sent: 8/6/2025 10:57:51 AM Viewed: 8/6/2025 12:01:27 PM</p>
<p>Katie Stone kostone@wellpath.us Associate General Counsel Wellpath LLC Security Level: Email, Account Authentication (None)</p> <p><b>Electronic Record and Signature Disclosure:</b> Not Offered via DocuSign</p>	<b>COPIED</b>	<p>Sent: 8/6/2025 10:57:51 AM</p>
<p>Michael Yang MiYang@Wellpath.us Security Level: Email, Account Authentication (None)</p> <p><b>Electronic Record and Signature Disclosure:</b> Not Offered via DocuSign</p>	<b>COPIED</b>	<p>Sent: 8/6/2025 10:57:51 AM</p>

Witness Events	Signature	Timestamp
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Notary Events	Signature	Timestamp
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Envelope Summary Events	Status	Timestamps
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Envelope Sent	Hashed/Encrypted	8/6/2025 10:57:52 AM
Certified Delivered	Security Checked	8/6/2025 11:53:10 AM
Signing Complete	Security Checked	8/6/2025 11:54:37 AM
Completed	Security Checked	8/6/2025 11:54:37 AM

Payment Events	Status	Timestamps
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Electronic Record and Signature Disclosure
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## **ELECTRONIC RECORD AND SIGNATURE DISCLOSURE**

From time to time, Wellpath LLC (we, us or Company) may be required by law to provide to you certain written notices or disclosures. Described below are the terms and conditions for providing to you such notices and disclosures electronically through the DocuSign system. Please read the information below carefully and thoroughly, and if you can access this information electronically to your satisfaction and agree to this Electronic Record and Signature Disclosure (ERSD), please confirm your agreement by selecting the check-box next to 'I agree to use electronic records and signatures' before clicking 'CONTINUE' within the DocuSign system.

### **Getting paper copies**

At any time, you may request from us a paper copy of any record provided or made available electronically to you by us. You will have the ability to download and print documents we send to you through the DocuSign system during and immediately after the signing session and, if you elect to create a DocuSign account, you may access the documents for a limited period of time (usually 30 days) after such documents are first sent to you. After such time, if you wish for us to send you paper copies of any such documents from our office to you, you will be charged a \$0.00 per-page fee. You may request delivery of such paper copies from us by following the procedure described below.

### **Withdrawing your consent**

If you decide to receive notices and disclosures from us electronically, you may at any time change your mind and tell us that thereafter you want to receive required notices and disclosures only in paper format. How you must inform us of your decision to receive future notices and disclosure in paper format and withdraw your consent to receive notices and disclosures electronically is described below.

### **Consequences of changing your mind**

If you elect to receive required notices and disclosures only in paper format, it will slow the speed at which we can complete certain steps in transactions with you and delivering services to you because we will need first to send the required notices or disclosures to you in paper format, and then wait until we receive back from you your acknowledgment of your receipt of such paper notices or disclosures. Further, you will no longer be able to use the DocuSign system to receive required notices and consents electronically from us or to sign electronically documents from us.

### **All notices and disclosures will be sent to you electronically**

Unless you tell us otherwise in accordance with the procedures described herein, we will provide electronically to you through the DocuSign system all required notices, disclosures, authorizations, acknowledgements, and other documents that are required to be provided or made available to you during the course of our relationship with you. To reduce the chance of you inadvertently not receiving any notice or disclosure, we prefer to provide all of the required notices and disclosures to you by the same method and to the same address that you have given us. Thus, you can receive all the disclosures and notices electronically or in paper format through the paper mail delivery system. If you do not agree with this process, please let us know as described below. Please also see the paragraph immediately above that describes the consequences of your electing not to receive delivery of the notices and disclosures electronically from us.

#### **How to contact Wellpath LLC:**

You may contact us to let us know of your changes as to how we may contact you electronically, to request paper copies of certain information from us, and to withdraw your prior consent to receive notices and disclosures electronically as follows:

To contact us by email send messages to: [wksims@wellpath.us](mailto:wksims@wellpath.us)

#### **To advise Wellpath LLC of your new email address**

To let us know of a change in your email address where we should send notices and disclosures electronically to you, you must send an email message to us at [wksims@wellpath.us](mailto:wksims@wellpath.us) and in the body of such request you must state: your previous email address, your new email address. We do not require any other information from you to change your email address.

If you created a DocuSign account, you may update it with your new email address through your account preferences.

#### **To request paper copies from Wellpath LLC**

To request delivery from us of paper copies of the notices and disclosures previously provided by us to you electronically, you must send us an email to [wksims@wellpath.us](mailto:wksims@wellpath.us) and in the body of such request you must state your email address, full name, mailing address, and telephone number. We will bill you for any fees at that time, if any.

#### **To withdraw your consent with Wellpath LLC**

To inform us that you no longer wish to receive future notices and disclosures in electronic format you may:

i. decline to sign a document from within your signing session, and on the subsequent page, select the check-box indicating you wish to withdraw your consent, or you may;

ii. send us an email to [wksims@wellpath.us](mailto:wksims@wellpath.us) and in the body of such request you must state your email, full name, mailing address, and telephone number. We do not need any other information from you to withdraw consent.. The consequences of your withdrawing consent for online documents will be that transactions may take a longer time to process..

### **Required hardware and software**

The minimum system requirements for using the DocuSign system may change over time. The current system requirements are found here: <https://support.docusign.com/guides/signer-guide-signing-system-requirements>.

### **Acknowledging your access and consent to receive and sign documents electronically**

To confirm to us that you can access this information electronically, which will be similar to other electronic notices and disclosures that we will provide to you, please confirm that you have read this ERSD, and (i) that you are able to print on paper or electronically save this ERSD for your future reference and access; or (ii) that you are able to email this ERSD to an email address where you will be able to print on paper or save it for your future reference and access. Further, if you consent to receiving notices and disclosures exclusively in electronic format as described herein, then select the check-box next to 'I agree to use electronic records and signatures' before clicking 'CONTINUE' within the DocuSign system.

By selecting the check-box next to 'I agree to use electronic records and signatures', you confirm that:

- You can access and read this Electronic Record and Signature Disclosure; and
- You can print on paper this Electronic Record and Signature Disclosure, or save or send this Electronic Record and Disclosure to a location where you can print it, for future reference and access; and
- Until or unless you notify Wellpath LLC as described above, you consent to receive exclusively through electronic means all notices, disclosures, authorizations, acknowledgements, and other documents that are required to be provided or made available to you by Wellpath LLC during the course of your relationship with Wellpath LLC.



April 30, 2025

Ennis Wright, Sheriff  
 Cumberland County Detention Center  
 204 Gillespie St,  
 Fayetteville, NC 28301

RE: Annual Renewal and Compensation Adjustment - Year Two (2)

Greetings, Sheriff Wright:

I hope this letter finds you well. Wellpath is pleased to be your provider for Health Care Services, and we are excited to move into another year of delivering quality healthcare at Cumberland County Detention Center.

### Annual Renewal and Compensation Adjustment

Per Section 9.0 of our agreement, the current term is set to expire on June 30, 2025, and may automatically renew for the second year of the initial three-year term, effective from July 1, 2025, through June 30, 2026. Pursuant to Section 8.1, upon each subsequent renewal, the annual compensation shall increase based on the CPI for the Medical Care Services component for the Urban Consumer in the Southern Region, for the month of April.

To ensure adequate time for review and approval, Wellpath requests the use of the most recently published Consumer Price Index (CPI) as reported for February 2025, which is currently 2.7%. This adjustment raises the total contract amount by **\$116,236.57**, bringing it from **\$4,305,058.00** to **\$4,421,294.57**, effective July 1, 2025. The chart below breaks down the monthly and annual costs associated with this increase.

Cumberland County, NC	Monthly	Annual Amount
Base Compensation (7/1/2024 - 6/30/2025)	\$358,754.83	\$4,305,058.00
CPI Increase 2.7%	\$9,686.38	\$116,236.57
<b>Base Compensation (7/1/2025 - 6/30/2026)</b>	<b>\$368,441.21</b>	<b>\$4,421,294.57</b>

### Staffing Enhancements

As part of the proposed staffing enhancements for Cumberland County, several position title changes will be implemented, with some maintaining their current pay rate and others receiving a pay adjustment. Additionally, modifications to Full-Time Equivalents (FTEs) will be made to optimize service delivery, including increases for key roles and the introduction of a Medical Technician (Med Tech) position on evening shifts. These changes are designed to enhance operational efficiency while maintaining high-quality care standards.

### Title and Wage Modifications

The following position titles will change, with no adjustments in their current hourly wage or FTEs.

- RN-Sick Call converts to RN-Intake (Day Shift)
- Medical Assistant converts to Medical Assistant/Pharmacy Supervisor (Day Shift)
- LPN-Intake converts LPN (Day Shift)



The title of the current day-shift Registered Nurse (RN) position on the staffing matrix will be updated, maintaining existing FTE levels while increasing the hourly wage.

- 1.5 FTEs (M-F): RN position will convert to Charge Nurse/RN, with a pay increase from \$45.02 to \$48.00 per hour.
- 0.6 FTEs (Weekends): RN position will convert to Charge Nurse/RN, with a pay increase from \$45.02 to \$48.00 per hour, plus a \$1.25 weekend shift differential.

This Charge RN will oversee direct patient care and supervises on-duty staff, ensuring timely clinical accountability, particularly within the MAT program - similar to a Shift Sergeant in corrections. In contrast, the Director of Nursing (DON) on staff handles administrative leadership, including program oversight, staff development, policy management, and quality assurance - functioning like a correctional lieutenant.

### *Staffing Adjustments*

To enhance operational efficiency and meet organizational needs, we propose the following staffing adjustments:

- Medical Director FTE increases by 0.15 FTEs
- Mid-Level Nurse Practitioner/Physician Assistant (NP/PA) FTE increases by 0.4 FTEs
- Discharge Planner FTE decreases by 1.0 FTEs (Removes from matrix)
- RN – Intake (Night Shift) Increases by 2.10 FTEs

As of today, the Wellpath team passes over 90,000 medications daily. Many of these medications (specifically psychiatric medications) are scheduled to be administered between 8p-10p each night. Currently we staff 2 Medication Technicians to complete the medication pass each shift. Unfortunately, due to the large volume of pills passed in the evening hours, Medication Technicians that work 3p-11:30p are unable to complete the medication pass timely and are staying until 1:30a-2a to complete charting and documentation of medication refusals. Allowing an additional med tech on evening shift will enable the team to deliver medications more efficiently and reduce the strain on custody as well. Therefore, we propose converting 1.4 FTEs from Med Tech (day shift) and 2.1 FTEs from Med Tech (night shift) to the evening shift, along with adding an additional 0.7 FTEs, resulting in a total of 4.2 FTEs for the Med Tech position (evening shift).

An additional staff member is needed on the day shift to assist with the increased acuity of patient care needs and with the operational flow of the med pass. Splitting the med pass onto 3 different carts to assist with the burden of the evening requires an adjustment to the day shift med pass staff too. It is our recommendation that we add an additional 2.10 FTEs for the LPN on the day shift to assist with the med pass and have them within our higher medical-acuity units to monitor and assess as needed. This additional nurse should assist with the burden of nursing staff assignments as we will be reducing the number of inmates per nursing assignment. This nurse will be assigned to the Special Management and Initial Housing units only during day shift. This will allow the nurses covering units C and B/D to focus on those patients for the day and lessens the stress and increases quality of patient care for all involved.

In addition, Wellpath requests an additional 0.20 FTEs of tele-psych hours to support compliance with North Carolina state statute 10A NCAC 14J.0601, which requires patients to be removed from suicide watch by a physician.



The table below breaks down the monthly and annual cost associated with these staffing enhancements, effective July 1, 2025, if accepted. A copy of the proposed staffing matrix is attached to page five (5).

Cumberland County, NC				
Position	FTE	Hours	Monthly	Annually
Medical Director	0.15	6.00	7,460.94	89,531.23
Mid-Level NP/PA	0.40	16.00	7,584.71	91,016.52
Charge Nurse, RN (M-F)	1.50	60.00	1,265.06	15,180.74
Charge Nurse, RN (Weekends)	0.60	24.00	718.28	8,619.40
Psychiatrist (Telepsych)	0.20	8.00	9,062.05	108,744.63
Licensed Practical Nurse (M-F)	1.50	60.00	14,547.50	174,570.00
Licensed Practical Nurse (Weekends)	0.60	24.00	6,031.58	72,379.00
Discharge Planner	-1.00	-40.00	(5,773.44)	(69,281.23)
Med Tech (M-F) DAY	-1.00	-40.00	(6,179.72)	(74,156.58)
Med Tech (Weekends) DAY	-0.40	-16.00	(2,605.53)	(31,266.36)
Med Tech (M-F) NIGHT	-1.50	-60.00	(9,269.57)	(111,234.87)
Med Tech (Weekends) NIGHT	-0.60	-24.00	(3,908.30)	(46,899.55)
Med Tech (M-F) EVENING	3.00	120.00	21,327.75	255,933.03
Med Tech (Weekends) EVENING	1.20	48.00	8,955.62	107,467.42
RN - Intake (M-F) NIGHT	1.50	60.00	19,111.77	229,341.26
RN - Intake (Weekends) NIGHT	0.60	24.00	7,856.97	94,283.61
<b>Total Proposed Staffing</b>	<b>6.75</b>	<b>270.00</b>	<b>76,185.69</b>	<b>914,228.24</b>

### Adjustment for MADP

The contract price is based on an ADP of up to 580 inmates. In the event the ADP exceeds 580 or falls below 550 for three consecutive months, Parties shall be afforded the opportunity to negotiate staffing matrix changes to ensure optimal care for patients. In the event the ADP increases to 580-610, the annual staffing amount to be paid by the County shall be \$4,449,666.00. In the event the ADP increases to 610-640 ADP, the annual staffing amount to be paid by the County shall be \$4,465,554.00. In the event the ADP increases to 640-670 ADP, the annual staffing amount to be paid by the County shall be \$4,521,152.00. In the event the ADP decreases to 520-550 ADP, the annual staffing amount to be paid by the County shall be \$4,160,450.00. In the event the ADP decreases to 490-520 ADP, the annual staffing amount to be paid by the County shall be \$4,144,562.00. In the event the ADP decreases to 460-490 ADP, the annual staffing amount to be paid by the County shall be \$4,088,964.00.

### Detailed Overview

The table below outlines the monthly and annual cost for the 2.7% CPI annual increase as well as the proposed staffing enhancements, effective July 1, 2025.

Cumberland County, NC - Detailed Overview		
Item	Monthly	Annual Amount
Base Compensation (7/1/2024 - 6/30/2025)	\$358,754.83	\$4,305,058.00
2.7% CPI Increase	\$9,686.38	\$116,236.57
<b>Base Compensation (7/1/2025 - 6/30/2026)</b>	<b>\$368,441.21</b>	<b>\$4,421,294.57</b>
Staffing Enhancements	\$76,185.69	\$914,228.24
<b>Total Proposed Compensation (7/1/2025 - 6/30/2026)</b>	<b>\$444,626.90</b>	<b>\$5,335,522.81</b>

OK  
DWS  
7-14-25



This is a proposal only and does not constitute a contract amendment. Wellpath has developed this proposal based on current wage rates. The prices in this proposal shall remain valid for **90 days from the date of this letter**. Wellpath reserves the right to adjust the prices to reflect current market data.

If the County agrees to the proposal, please sign the following page, and email a scanned copy to Kasie Presley, Retention Specialist, at [KPresley@Wellpath.us](mailto:KPresley@Wellpath.us). Upon receipt of the signed proposal, indicating acceptance of these changes, our Legal Department will draft a formal contract amendment and route it to the appropriate County individuals for signature. All other terms of our agreement shall remain in full force and effect.

We greatly appreciate the relationship we have established working with Cumberland County Detention Center and look forward to another successful year of working together. Please do not hesitate to contact Crystal Knoch, Director of Operations, at (575)-626-5811 with any questions or concerns.

Sincerely

Emily Wilson  
Regional Vice President

Cc: Erik Hames, Sr. Vice President  
Crystal Knoch, Regional Director of Operations  
Tony Lamonica, Director of Partner Services  
Christi Cunningham, Contract Administrator

The undersigned is authorized by Cumberland County to accept the above terms:

  
\_\_\_\_\_  
Authorized Cumberland County Representative

7-16-25  
\_\_\_\_\_  
Date Signed

Kirk J. deViere  
\_\_\_\_\_  
Print Name

Chairman  
\_\_\_\_\_  
Title

PLEASE NOTE: Final delivery of the contract amendment will be via email. If hard copies with original signatures are required, please indicate the number of copies needed: 3.



### Attachment #1 – Proposed Staffing Matrix

Cumberland County, NC - Proposed Staffing Matrix									
Day Shift									
POSITION	Mon	Tues	Wed	Thur	Fri	Sat	Sun	Hrs/Week	FTEs
Health Services Administrator	8	8	8	8	8			40	1.000
Medical Director	8		4					12	0.300
Director of Nursing	8	8	8	8	8			40	1.000
Mid-level Practitioner NP/PA	8	8	8	8	8			40	1.000
Licensed Practical Nurse	36	36	36	36	36	36	36	252	6.300
Charge Nurse, RN	12	12	12	12	12	12	12	84	2.100
RN - Intake	12	12	12	12	12	12	12	84	2.100
Medication Tech	16	16	16	16	16	16	16	112	2.800
Medical Assistant, Pharmacy Supervisor	8	8	8	8	8			40	1.000
Psychiatrist (Telepsych)	4		4		4			12	0.300
Psych NP	6	5		5	6			22	0.550
Mental Health Coordinator	8	8	8	8	8			40	1.000
Mental Health Professional	8	8	8	8	8			40	1.000
Dentist		5.5		5.5				11	0.275
Dental Assistant		5.5		5.5				11	0.275
Administrative Assistant	8	8	8	8	8			40	1.000
<b>Total Hours/FTE - Day</b>								<b>880</b>	<b>22.000</b>
Evening Shift									
Med Tech	24	24	24	24	24	24	24	168	4.2
<b>TOTAL HOURS/FTE - Per Week</b>								<b>168</b>	<b>4.2</b>
Night Shift									
Registered Nurse - Intake	12	12	12	12	12	12	12	84	2.100
Licensed Practical Nurse	12	12	12	12	12	12	12	84	2.100
Charge Nurse, RN	12	12	12	12	12	12	12	84	2.100
<b>Total Hours/FTE - Night</b>								<b>252</b>	<b>6.300</b>
Weekly Total									
<b>TOTAL HOURS/FTE - Per Week</b>								<b>1,300</b>	<b>32.500</b>





## **SOLID WASTE MANAGEMENT**

### **MEMORANDUM FOR BOARD OF COMMISSIONERS AGENDA OF SEPTEMBER 15, 2025**

**TO: BOARD OF COUNTY COMMISSIONERS**

**FROM: AMANDA LEE, PE, GENERAL MANAGER FOR NATURAL RESOURCES**

**DATE: 9/10/2025**

**SUBJECT: APPROVAL OF ASSET MANAGEMENT PLANS FOR THE WATER AND SEWER DISTRICTS**

#### **BACKGROUND**

The Public Utilities Department has been working with McGill Associates, PA, on Asset Management Plans (AMP) for the water and sewer districts owned by Cumberland County. These plans are needed to effectively manage the systems and budget for projects that support the utility needs of customers within each district. As part of the AMP studies a 10-year Capital Improvements Plan (CIP) is being included for each district in accordance with NC Department of Environmental Quality Division of Water Infrastructure Guidance. Projects will include focusing on operational and maintenance challenges and consideration to potential growth.

The suggested CIP was incorporated into the FY26 budget. The CIP for the Water and Sewer Enterprise funds can be found on page 77 of the Recommended Annual Budget for FY26. It should be noted that in the CIP Cost Summary for each AMP has a year one of FY26, and continues for ten years, whereas FY30+ is combined in the CIP Recommended Budget document. All amounts remain the same.

Matthew Jones, PE, with McGill Associates, presented an overview of the studies to the Infrastructure Committee on September 8, 2025. The Infrastructure Committee approved moving this item to the Consent Agenda of the September 15, 2025, Board of Commissioners' meeting, as well as to the Consent Agendas of the Kelly Hills Water and Sewer District Governing Board, the NORCRESS Water and Sewer District Governing Board, the Overhills Park Water and Sewer District Governing Board, and the Gray's Creek Water and Sewer District Governing Board.

#### **RECOMMENDATION / PROPOSED ACTION**

The Public Utilities Project Manager, General Manager for Natural Resources and Management recommend

the following proposed actions for the Board of Commissioners and the Kelly Hills Water and Sewer District Governing Board, the NORCRESS Water and Sewer District Governing Board, the Overhills Park Water and Sewer District Governing Board, and the Gray's Creek Water and Sewer District Governing Board:

Approve the Asset Management Plans (AMP), including the 10-year Capital Improvements Plans (CIP), for the Kelly Hills, NORCRESS, Overhills Park, and Gray's Creek Water and Sewer Districts.

**ATTACHMENTS:**

Description	Type
Kelly Hills Asset Management Plan	Backup Material
NORCRESS Asset Management Plan	Backup Material
Overhills Asset Management Plan	Backup Material
Southpoint Asset Management Plan	Backup Material
McGill Associates AMP Presentation	Backup Material



**SEWER ASSET MANAGEMENT PLAN**

**KELLY HILLS / SLOCOMB ROAD  
WATER AND SEWER DISTRICT**

**CUMBERLAND COUNTY, NC**



PINEHURST, NORTH CAROLINA

**SEWER ASSET MANAGEMENT PLAN**

**KELLY HILLS / SLOCOMB ROAD  
WATER AND SEWER DISTRICT**

**CUMBERLAND COUNTY, NC**

**MATTHEW JONES, PE**  
matthew.jones@mcgillassociates.com



5 Regional Circle, Suite A  
Pinehurst, NC 28374  
910.295.3159

**AUGUST 2025**

**PROJECT NO. 20.02507**

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- Appendix A – Manhole Inspection List**
- Appendix B – Smoke Testing Results List**
- Appendix C – Wastewater Collection System Permit**
- Appendix D – PWC Agreement**

## EXECUTIVE SUMMARY

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The purpose of this Asset Management Plan (AMP) is to document the condition of the Kelly Hills/Slocomb Road (Kelly Hills) Sewer District's infrastructure to assist the County with becoming more proactive in the management, operation and financing of its sewer collection system. The Kelly Hills Sewer District serves approximately 102 residential connections in the northern area of Cumberland County. There are 166 properties within the Kelly Hills District are not currently connected and are paying the sewer availability fee. The District's sewer collection system consists of approximately four and a half miles of gravity sewer and approximately 100 manholes. Collected wastewater is pumped from the Kelly Hills Lift Station, which is owned and operated by Fayetteville PWC, to the PWC collection system. Wastewater generated from the district is ultimately treated at the Cross Creek Water Reclamation Facility (NC0023957), which is also owned and operated by Fayetteville PWC.

This asset inventory and assessment consisted of assembling data on sewer pipe, manholes, and other appurtenances in the collection system. This assessment included performing inspections of selected manholes, performing smoke testing throughout the system, and reviewing existing data with County Staff. This information was evaluated and is summarized in this document which includes the asset management plan and capital improvements plan. This process resulted in the development of a 10-year Capital Improvements Plan (CIP) to guide the County with scheduling and financing the capital projects and equipment purchases necessary to maintain and improve its wastewater collection system. Through the AMP process, approximately 20% of the manholes and 25% of the cleanouts in the sewer collection system are in need of rehabilitation due to deterioration and fair condition.

The CIP includes a focused improvement to components within the sewer system that need rehabilitation or replacement based on existing condition, and on improvements that could improve management of the sewer system for staff. These planned projects will bring the County into a better position to serve its customers by improving the reliability

of the collection system. The County should look to its CIP to guide its next projects, and the CIP should be updated regularly as priorities change and as projects are completed. It is noted that many factors may impact the priorities including failures, and funding availability both local and through grant and loan programs. This assessment project provides evidence for the prioritization of manhole rehabilitation and improvement projects in the CIP.

### ***System Evaluation***

All of the pipe material in the Kelly Hills sewer system is PVC pipe. The collection system was first put into service in 2005, therefore the relative age of the system is low. PVC pipe is the most common material used for sewer systems today. The typical useful life for PVC pipe is anywhere from 40 to 60 years.

As part of the AMP, McGill Associates, PA (McGill) assisted the County with evaluating the condition of its sewer infrastructure to identify projects in line with these goals. The following items were included in the AMP scope:

- Identify areas to conduct smoke testing to identify potential sources of I/I into the sewer system;
- Analyze the Kelly Hills lift station, based on County-provided data
- Inspect selected sewer manholes within the system to establish overall system condition;
- Identify and evaluate potential sewer system improvements;
- Prioritize sewer system improvements;
- Prepare opinions of probable costs for sewer system improvements; and
- Create a Capital Improvements Plan.

### **Manhole Inspections**

All manholes in the Kelly Hills sewer system are precast concrete based on information provided by County staff. The results of the selected manhole inspections performed as a part of this inventory were used to develop an assessment of manhole conditions in the

system. Based on the inspections performed, manholes that were inspected were assigned a condition rating – excellent, good, fair, or poor. Of the ten manholes they were all in good to fair condition. The remaining 90 are noted as unknown condition, but the manholes inspected are believed to be representative of the system based on input from County staff. These results are recorded in Figure 5 and included in Appendix A.

### Lift Station Inspection

The Lift Station serving the Kelly Hills District is owned and operated by Fayetteville PWC, therefore inspection of the station was not included as a part of this assessment. The Lift Station is located at 355 Bethune Drive. Analysis of flow data and customer usage was performed and is included in this report.

### Findings and Recommendations

The system evaluation allowed McGill to assemble a list of general recommendations and high priority projects to guide the County in the next 10 years. General recommendations to the District included establishing its own flow monitoring and smoke testing programs in high priority areas to determine sewer rehabilitation needs and inspecting sewer lines and manholes with CCTV equipment during routine cleanings to track the condition of these items. McGill also recommended the County begin rehabilitation and/or replacement of existing manholes within the collection system in order to reduce the risk of I/I.

Data and field investigation reporting were utilized to identify the priority projects within the collection system, focusing on manhole rehabilitation.

Table 1 summarizes projects identified during this assessment, centering around manhole rehabilitation projects. A project to install flow monitors is included to give greater control and understanding of flows from the collection system.



**Table 1: Summary of Capital Improvements Projects**

No.	Project Name	Cost
1	Manhole Rehabilitation Project 1	\$81,000.00
2	Flow Monitoring Improvements	\$103,900.00
3	Manhole Rehabilitation Project 2	\$81,000.00
4	Manhole Rehabilitation Project 3	\$81,000.00
5	Manhole Rehabilitation Project 4	\$81,000.00
<b>10-Year CIP Total Project Cost</b>		<b>\$427,900.00</b>

***Capital Improvements Plan***

The purpose of this asset inventory and assessment was to document the condition of the District’s inventoried infrastructure to assist the County with becoming proactive in the management of its wastewater system, to include capital project planning. The County does not currently have a Capital Improvements Plan (CIP) for its wastewater system. The CIP being developed from this current assessment will guide the County through its planning for projects within the 10-year window. The CIP will remain a living document and be updated in the future so that it remains current to the Districts’ highest priorities and provides accurate cost estimates. The CIP included in this assessment includes projects focused on rehabilitation of existing manholes, which have been identified to be potential sources for I/I into the system. Through discussion with County staff, field investigation and review of existing system data, the specific defects and general problematic areas within the wastewater system have been summarized. These results were used to develop the CIP and formulate a 10-year plan.

The complete asset inventory and assessment task consisted of multiple field work and analysis components, culminating in the development of the Kelly Hills/Slocomb Road Water and Sewer District’s CIP. McGill developed cost estimates for all projects based on current 2024 materials and construction costs. The updated CIP is intended to be adopted by the County to guide its selection of sewer system improvement projects over the next decade. This plan also includes a budget-level recommendation for staffing associated with system operations and maintenance for all County utility districts.

## 1.1 BACKGROUND

The Kelly Hills/Slocomb Road Water and Sewer District is located in Cumberland County, North Carolina, and is owned and operated by Cumberland County. The District includes a wastewater collection system that currently serves 102 residential customers as of August 2025. The collection system consists of approximately four and a half miles of gravity sewer mains that are 8-inch, 12-inch, 15-inch, and 16-inch in diameter. These gravity sewer mains are constructed of PVC and Ductile Iron pipe. The system was put into service in 2005. Figure 1 shows the existing sewer collection system.

Developing a Capital Improvements Plan (CIP) will allow the District to update its current rate setting model to better estimate future revenue and expenses, capital outlay, indebtedness, and overall health of the sewer system enterprise fund reserves. A model of this nature would continue to balance revenues and expenditures with a longer-term approach to rate setting and establish a financially sound framework for the District to follow.

The District has experienced the degradation of manholes within its sewer collection system due to the age of the system and resulting from wear over time.

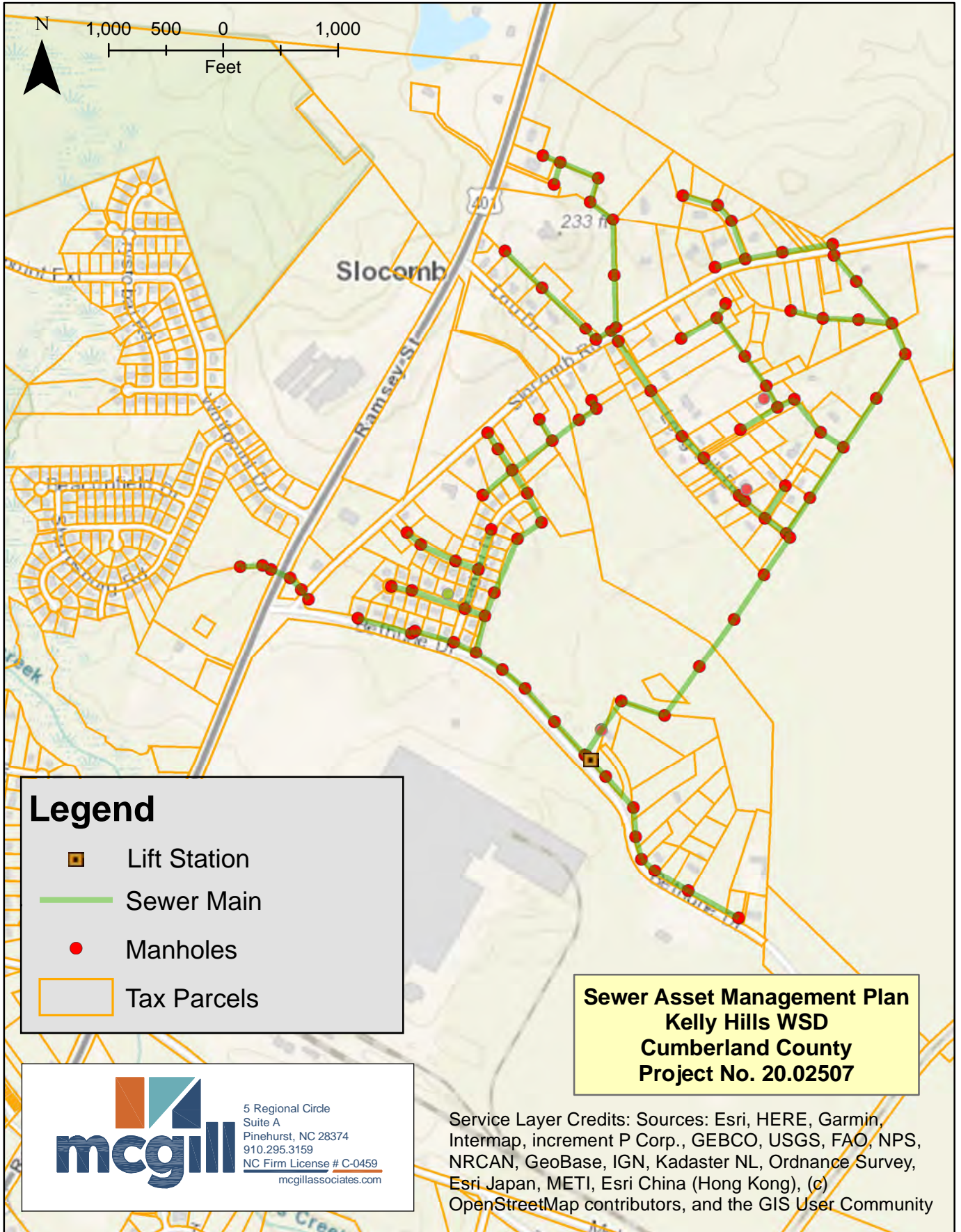
Even with the relatively young age of the Kelly Hills system, County staff remains cognizant that infiltration and inflow (I/I) is always a concern, particularly in a scenario where the County's operation costs are based on the gallons of flow that enter into the existing lift station. Therefore, the top challenges for the Kelly Hills sewer system are mitigating I/I that results from deteriorated infrastructure and collecting reliable data on existing sewer flows for operations and maintenance planning. The information collected through this assessment project will help identify system deficiencies and develop improvement projects to reach these goals.

This process resulted in the development of a 10-year Capital Improvements Plan (CIP) to guide the District with scheduling and financing the capital projects and equipment purchases necessary to restore its wastewater collection system. Through the AMP process, the McGill and County staff have identified approximately multiple that require rehabilitation or replacement due to their poor condition.

The purpose of this Asset Management Plan (AMP) is to document the condition of the Districts' inventoried infrastructure to assist the District with becoming more viable and proactive in the management and financing of its wastewater system. The District continues to look to its CIP to guide its next projects; therefore, it is vital that the CIP remains current to the Districts' highest priorities and provides accurate cost estimates. This assessment project was utilized for the prioritization of replacement of lines and improvement projects in the CIP.

# Kelly Hills Overall System Map

## Figure 1



**2.1 SMOKE TESTING****2.1.1 Overview**

Smoke testing is one of the most cost-effective ways to locate defects in sewer mains and laterals. In this process, artificially produced non-harmful smoke is injected into the sewer line via a blower placed over a selected manhole. The pressurized smoke travels up and down the sewer line and connections and emerges at openings in the system. This visual aide allows test crews to easily identify, record, and mark locations where defects are present. If the sewer is in good condition, one should only see smoke rising from manhole lids and house roof vents. If the line has defects, such as breaks or illegal connections, the smoke will emerge at these points.

**2.1.2 Investigation**

McGill met with County staff to identify areas that would benefit most from smoke testing. Based on the size of the Kelly Hills District, it was determined that the entire system could be smoke tested. McGill prepared a detailed map of the area based on the County's GIS database. The Fire Department and customers along the route were alerted to the upcoming testing.

### **2.1.3 Methodology**

McGill and County staff smoke tested all four and a half miles of gravity sewer lines over a period of two days to determine locations where I/I enter the wastewater collection system. For each line to be tested, County staff recommended a centrally located manhole on which to place the blower based on the manhole's accessibility and avoidance of traffic. The manhole nomenclature used by the County was utilized and the location, configuration and condition of each one was recorded.

At each location, the following procedure was executed.

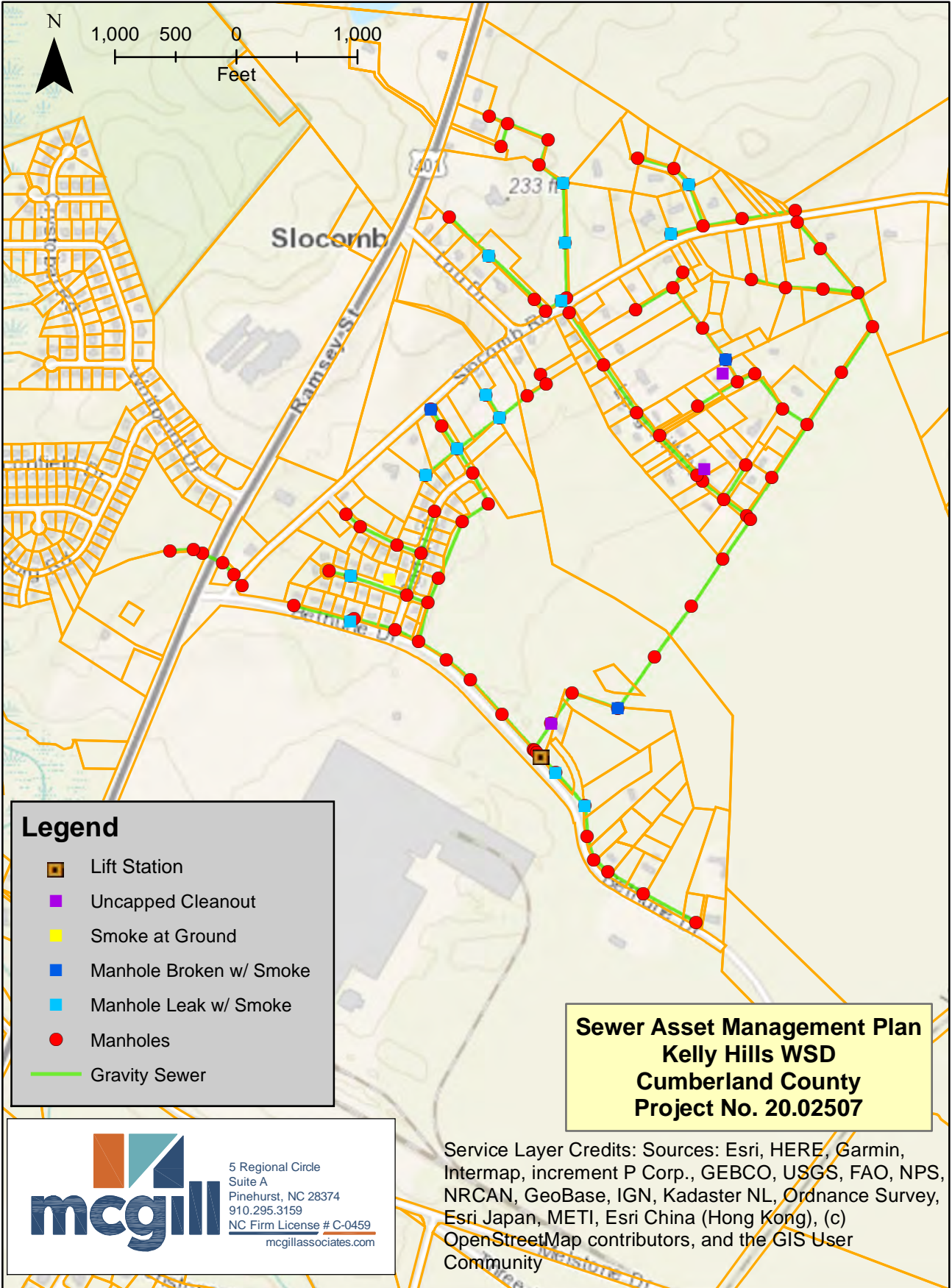
1. Place the blower on the manhole (with the rubber seal, if necessary).
2. Fill smoke pump up to  $\frac{3}{4}$  with liquid smoke.
3. Close all smoke pump valves.
4. Start blower and allow to warm up.
5. Open smoke pump valves.
6. Pressurize smoke pump by pumping the canister manually.
7. Once smoke begins emerging from roof vents, begin surveying for smoke emergencies indicating defects or problem areas in the pipeline.
8. For each defect, record the opening type, address, manhole identifier, and notes.
9. Additionally, mark each defect with paint.

This process continued until all visible defects were marked and recorded. Figure 2 shows some problematic system openings.



# Kelly Hills Smoke Testing Map

## Figure 2





## **2.2.4 Results**

The crew recorded 54 abnormal smoke outlets, which divided generally into four categories.

1. **Uncapped cleanouts:** Several cleanout caps were missing or broken. The cumulative number of broken cleanouts in the District can contribute significant I/I. County staff had repair caps on hand during the testing and were able to install new caps where needed.
2. **Broken Cleanouts:** Ground smoke was detected adjacent to the cleanout, which appeared to be damaged or below grade. Replacement of the cleanout assembly will be needed.
3. **Ground Smoke:** Ground smoke can be the result of broken lines, joint separation, etc. Any of these problems can cause significant I/I.
4. **Unsealed manholes:** Some manholes emitted excess smoke indicating cracked concrete or offset rings. Manholes located in ditches are most likely to contribute I/I.

A spreadsheet describing all smoke occurrences can be found in Appendix A and all locations were documented in the mapping information in ArcGIS for the County staff's use.

## **2.2 SEWER MAINS**

### **2.2.1 Overview**

Kelly Hills/Slocomb road sewer mains consist of polyvinyl chloride (PVC) pipe. The District's existing sewer lines range from 8-16-inches in diameter. The age of the system and system materials were confirmed by the County based records from construction of the system in 2005. Condition was determined based on visual inspection of select manholes and smoke testing of the system.

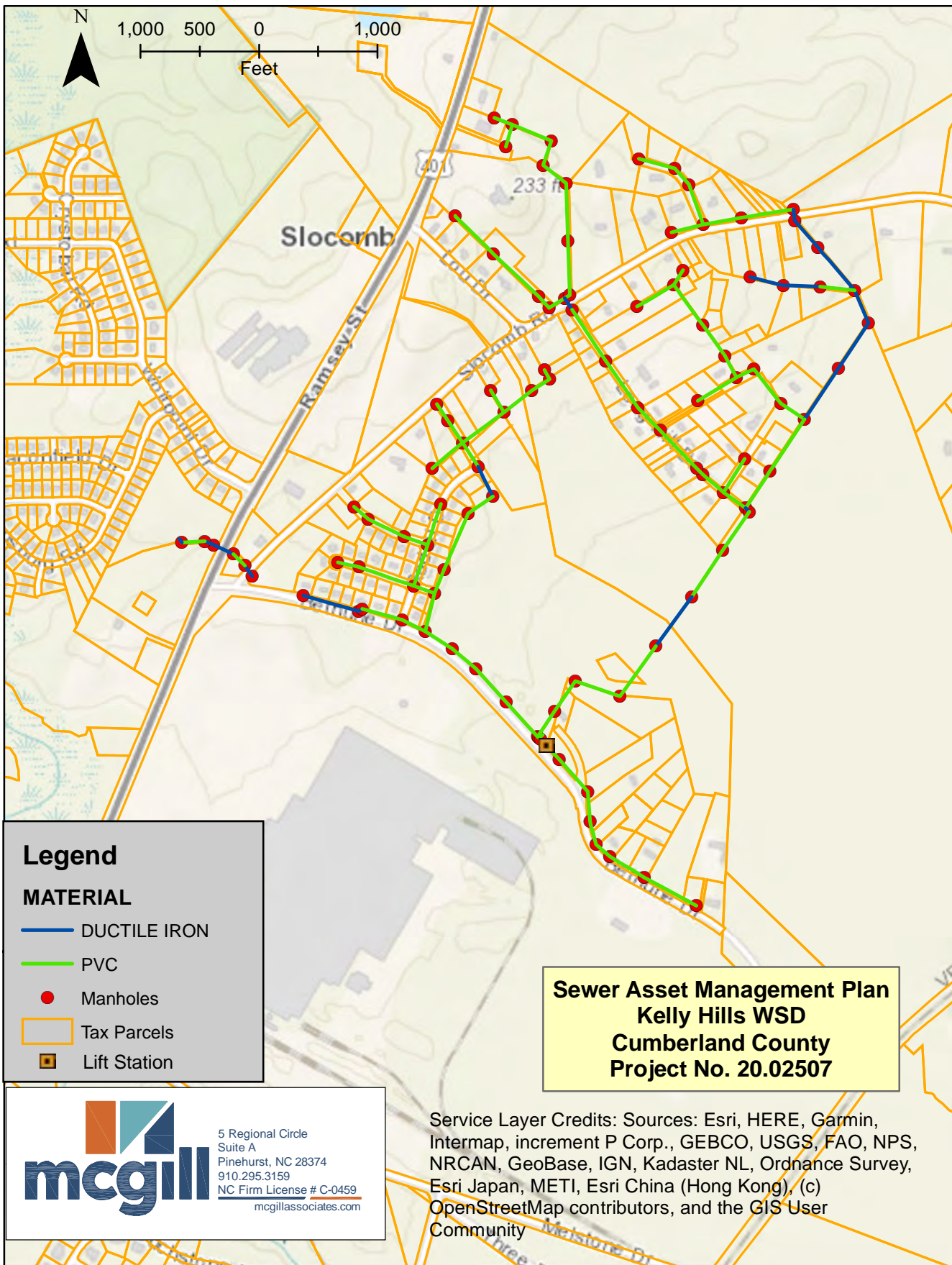
### **2.2.2 Investigation**

With District input from County staff, McGill has reviewed the district's data on the sewer mains throughout the District's collection system. The sewer main material and diameters were verified by the County and updated according to GIS records. Figure 3 shows the sewer line materials in the system, and Figure 4 shows the sewer line diameter throughout the system.

The purpose of this portion of the assessment was to create a working system inventory and then review which areas of Kelly Hills District have system components in need of replacement or rehabilitation.

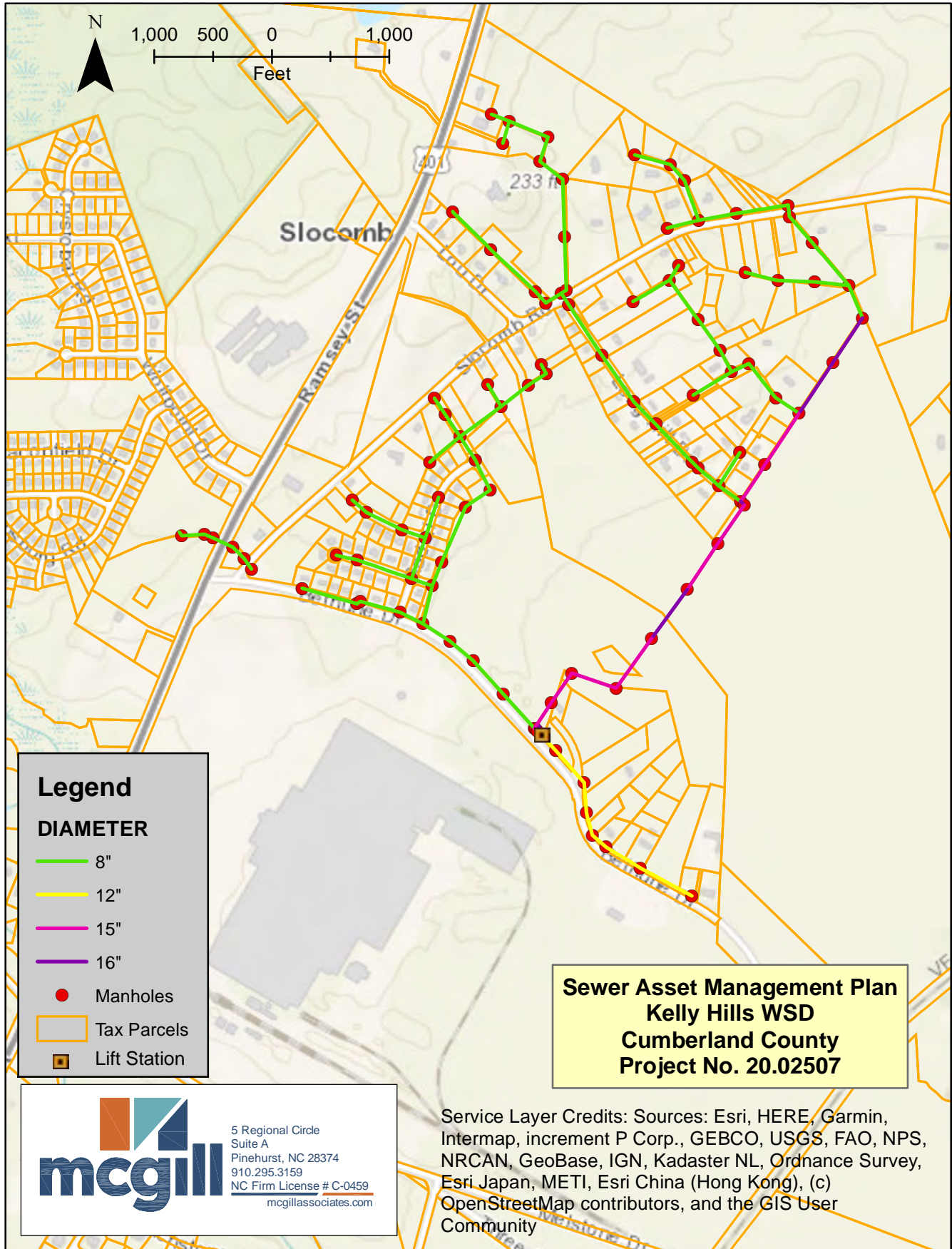
# Kelly Hills Sewer Line Material Map

## Figure 3



# Kelly Hills Sewer Line Diameter Map

## Figure 4





### 2.2.3 Methodology

McGill reviewed the District's GIS data for the sewer collection system. County staff provided information on manholes where deterioration was suspected. Smoke testing was performed throughout the system. The County's GIS mapping was utilized to create maps that document the collection system by material and by diameter.

### 2.2.4 Results

The existing gravity sewer pipe in the sewer system ranges from 8-inch to 16-inch in diameter based on County records. All pipe diameters therefore do meet current NCDEQ minimum design standards. Based on the age of the system, the PVC and ductile iron pipe installed in 2005 has not exceeded its useful life, and therefore replacement is not recommended outright. Recommendations will include planned CCTV inspections by the County of the existing piping in order to verify existing condition and provide future updates to this AMP/CIP. Based on the age of the pipes and no documented issues from County staff, pipe in the system has been noted to be in good/excellent condition. Tables 2 and 3 show the assessment based on material and then broken out by diameter.

**Table 2: Summary of Gravity Sewer Main by Material**

<b>Material</b>	<b>Diameters (in)</b>	<b>Total LF</b>	<b>% of System</b>
<b>Polyvinyl Chloride</b>	<i>8, 12, 15</i>	<b>19,750</b>	<b>83.9%</b>
<b>Ductile Iron</b>	<i>8, 16</i>	<b>3,790</b>	<b>16.1%</b>
<b>Total LF</b>		<b>23,540</b>	<b>100%</b>

**Table 3: Summary of Gravity Sewer Main by Diameter**

<b>Diameter</b>	<b>Total LF</b>	<b>% of System</b>
<b>8"</b>	<b>17,900</b>	<b>76.0%</b>
<b>12"</b>	<b>1,670</b>	<b>7.1%</b>
<b>15"</b>	<b>2,690</b>	<b>11.4%</b>
<b>16"</b>	<b>1,280</b>	<b>5.5%</b>
<b>Total LF</b>	<b>23,540</b>	<b>100%</b>

**Table 4: Summary of Gravity Sewer Main Conditions by Age**

<b>Year Put Into Service</b>	<b>Total LF</b>	<b>% of System</b>
<b>2005</b>	<b>23,544</b>	<b>100%</b>
<b>Total LF</b>	<b>23,544</b>	<b>100%</b>

## **2.3 MANHOLE INSPECTIONS**

### **2.3.1 Overview**

Manholes are the primary access points to the sanitary sewer system and are essential for its operation and maintenance. As they allow personnel access to the sewer system, manholes are also likely culprits for allowing I/I to enter the sewer system. Manholes in low-lying areas with improperly sealed lids, manhole joints, and poor connection practices can all be sources of I/I. Storm drains or the presence of manholes in ditches and low-lying areas in Kelly Hills/Slocomb road frequently allow standing water to remain for hours or days after a storm event which can exacerbate inflow through manhole lids.

One of the most cost-effective practices for managing this intrusion is visual manhole inspections, where the various components of the manhole are rated according to their condition. Some examples of noticeable deficiencies are benches which have deteriorated from abrasion and corrosion and rings which can be moved by traffic, soil, and the freeze/thaw cycle. Defects in any aspect of the manhole can lead to I/I, structural instability, and manhole failure.

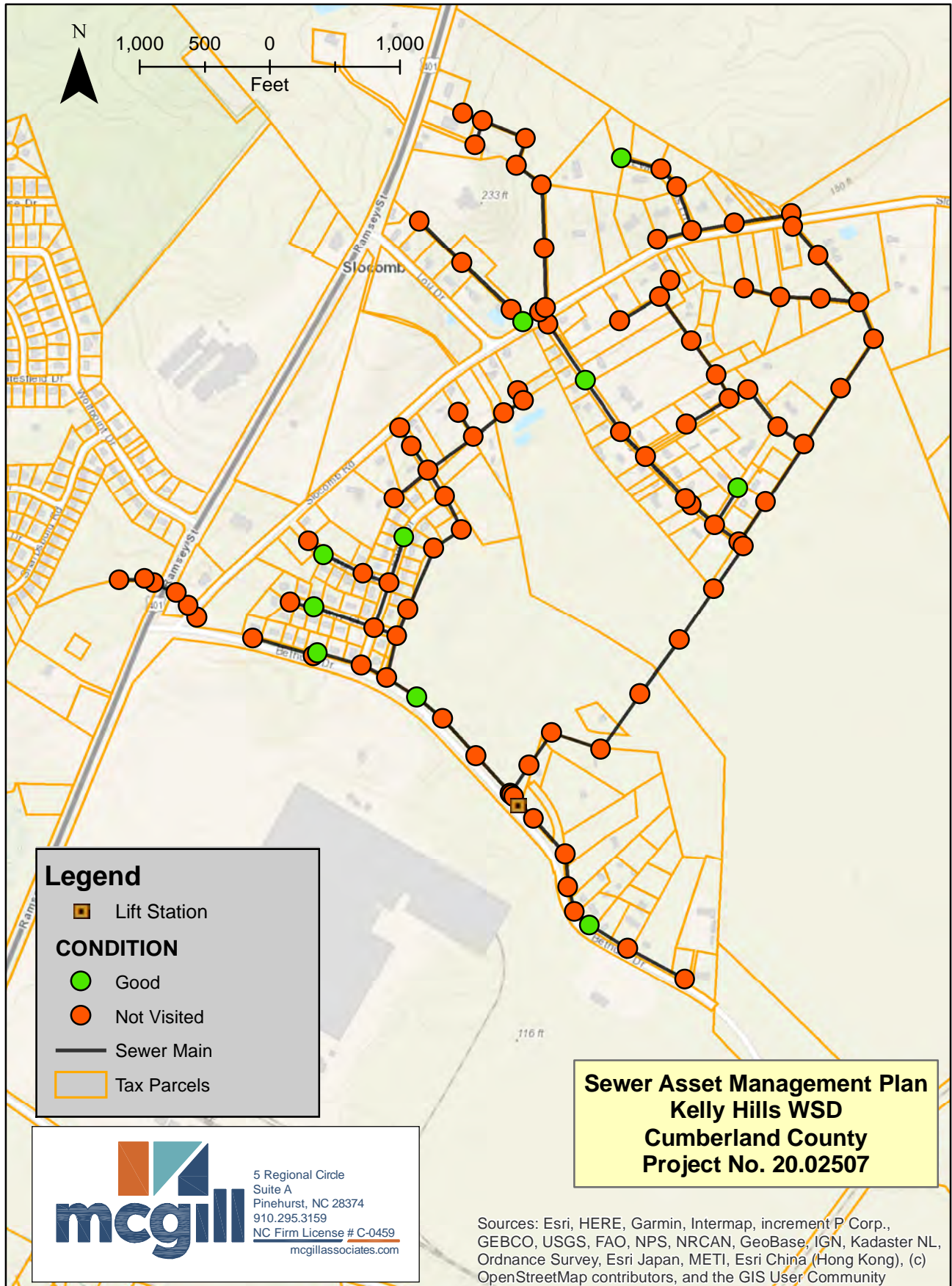
### **2.3.2 Investigation**

After the Kelly Hills system was put into service, the GIS record was created in 2006. The purpose of this portion of the assessment was to perform selected field inspections to determine an overall system assessment. A total of 100 manholes are currently inventoried by the District. Approximately ten manholes were inspected as a part of this inventory and assessment. The map of the diameter of all manholes that were accessible (not paved over or otherwise not located) are shown in Figure 3.



# Kelly Hills Manhole Condition Map

## Figure 5



### **2.3.3 Methodology**

The District of Kelly Hills/Slocomb Road sewer collection system contains 100 sewer manholes. Working with County staff, McGill inspected selected manholes within the sewer system to obtain a representative condition sampling. County staff determined which manholes to inspect in each area based on manhole location and orientation. Manholes prioritized for inspection include those located in existing ditches or low-lying areas where the manhole would be susceptible to degradation and inflow from surface water. At each manhole, the inspector recorded the manhole's location, dimensions, material, and condition of its various components. All information including photographs of the interior of the manhole and top area were uploaded into the GIS mapping.

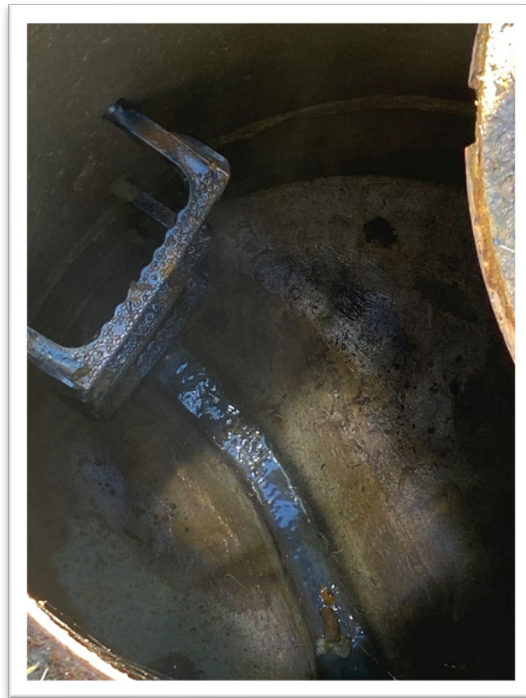
Some typical distresses include:

- Wear and asphalt paving on the cover;
- Corrosion and mud seepage on the ring and frame;
- Gas residue, corrosion, seepage, and deteriorating concrete on the cone and riser;
- Wetness, silt, root intrusion, and deteriorating concrete on the barrel;
- Dirt and corrosion on the rungs;
- Silt accumulation on the bench; and
- Misaligned pipes, obstructions, trough deteriorating, standing water, and no flow in the channel.

Based on the recorded comments, each component was assigned a condition score, and these scores were combined into an overall condition rating for each manhole- excellent, good, fair, or poor. The images below depict the interiors of various condition manholes.



*SMH-027203, Treadway Court. Precast manhole shows signs of corrosion and wear over time. Invert is well-formed.*



*SMH-027197, Bethune Drive. Precast manhole in good condition, invert well formed.*

### 2.3.4 Results

All of the ten inspected manholes are precast manholes. Due to the relative low age of the system, County staff confirmed that all of the existing manholes in Kelly Hills are precast sewer manholes. Of the manholes observed, all were noted as good to fair condition. Still, the presence of I/I and deterioration was observed in several instances. Based on the condition of those observed, it is suspected that the remaining manholes not inspected would have similar condition to those observed. Tables 5 and 6 summarize the manhole materials and condition.

**Table 5: Summary of Manholes by Material**

<b>Material</b>	<b>Total</b>
<b>Precast Concrete</b>	<b>100</b>
	<b>100</b>

**Table 6: Summary of Manholes by Condition**

<b>Condition</b>	<b>Total</b>
<b>Good-Fair</b>	<b>10</b>
<b>Unknown</b>	<b>90</b>
	<b>100</b>

The County maintains its collection system using the ESRI platform and includes the attribute data for each manhole. A spreadsheet including condition comments for each manhole can be found in Appendix A.

## 2.4 LIFT STATION

### 2.4.1 Overview

The Kelly Hills Lift Station is owned and operated by Fayetteville PWC. The station includes a flow meter that is used for recording flow generated by the Kelly Hills Sewer Collection System. The monthly records from that station were provided by the County and have used to develop an average use per user for the District. The results of the analysis are below.

Lift Station Design Capacity	100,000 GPD
Metered Average Daily Use	16,900 GPD
Permitted, Not Yet Tributary Flow	29,520 GPD
<i>Pending Development Usage</i>	<i>41,400 GPD</i>
Lift Station Available Capacity*	<b>53,580 GPD</b>

\*Does not include pending development usage. Available capacity including pending amount is 12,150 GPD.



Recommendations for various sewer system improvements to include the gravity sewer pipe and manholes in the collection system include general recommendations, high priority projects (within 10-years) and future projects (past the 10-year planning window). General recommendations are typically less costly and can be implemented more quickly, whereas high priority projects may require financial assistance and be undertaken in phases.

### **3.1 GENERAL RECOMMENDATIONS**

#### **3.1.1 *Smoke Testing***

Smoke testing is a valuable tool that can be used to locate broken pipe, cleanouts, or manholes that need repair. Any of these issues can be a source for the inflow and infiltration (I&I) of surface water into the sewer collection system. It is recommended that the District utilize smoke testing on an “as needed” basis to troubleshoot possible problem areas. The most common repairs that would result from smoke testing include replacing missing or broken cleanout caps and removing buildup from manholes. Other repairs that can be performed at this time are patching the exterior concrete or replacing the rings/lids of manholes identified to be leaking during smoke testing. These may be contributing to significant I/I into the wastewater collection system. Similarly, line breaks in flooded areas should also be addressed promptly. It is also recommended that the District continue to conduct regular smoke testing to monitor the system’s ongoing wear and identify specific areas for improvement.

#### **3.1.2 *Video Evaluations***

Based on information provided by the County, video evaluations were not performed as part of the system inventory. County staff reports that no video evaluations have been performed on the collection system to date. It is recommended that the County plan to perform video evaluation of the system as a part of O&M in order to stay vigilant concerning potential issues within the collection system.

### **3.1.3 Manhole Inspections**

Manhole inspections uncovered some infrastructure deficiencies which can be repaired immediately to improve the condition and function of the wastewater collection system. The full list of manholes and their field assessment is included in Appendix A. Manhole rehabilitation and replacement is the priority work that is targeted by the CIP. The proposed projects are divided out on an annual basis in order to include the improvements as a reasonable component of annual budgeting.

### **3.1.4 Flow Monitoring**

The District and McGill have discussed that flow monitoring is not needed at this time. Should the County begin to suspect the presence of I&I, they will engage in flow monitoring to verify as needed. The PWC Lift Station does provide for metering of flow received within the district. It is recommended within the CIP that the County install an in-line flow meter within the collection system just upstream of the lift station, in order to assist with recording of data and calibration with the PWC maintained lift station.



## 3.2 PRIORITY PROJECTS

### 3.2.1 *Manhole Rehabilitation Projects*

In these projects, manholes will be repaired and lined. The projects are scoped to be undertaken every 3 years. Each project is priority targeting any manhole deficiencies or evidence of I/I observed during manhole inspections or leaks based on the results of the smoke testing. There are a range of issues from broken risers to cracks in the frame of the manhole that warrant various repairs. To reduce the amount of I/I that enters the system it is imperative to repair these manholes. The project will be ongoing to spread out the cost for the County over a 10-year period. There are 100 manholes in the system, and for planning purposes it is assumed that 50% of the manholes would benefit from rehabilitation and lining. In order to fit a reasonable budgeting target, the rehabilitation of those 50 manholes is broken into four projects, which are included in the CIP separately, but can be combined or modified as needed given annual budgetary considerations. The projects also include replacement of existing cleanout assemblies for select residences. The results of the smoke testing identified that some cleanouts were damaged below grade, therefore replacement of the assembly would be necessary.

This project is recommended to be pursued with a manhole rehabilitation specialty company with scopes large enough to get competitive pricing for each mobilization. The manholes proposed for rehabilitation or replacement range in depth; therefore an average depth of seven vertical feet (VF) was used per manhole for estimating purposes. The capital improvements plan breaks this project into four phases with a budget of approximately \$81,000 every three years over a 10-year span with the exception of year four, if the County elects to perform the flow monitoring improvement project, as outlined in Table 7. The total cost of the manhole rehabilitation projects is estimated to be \$324,000.

**Table 7: Preliminary Opinion of Probable Cost for Manhole Rehabilitation Projects**

Item	Description	Units	Quantity	Unit Price	Total Cost
1	Mobilization	LS	3%	N/A	\$ 1,900
2	Rehabilitate Existing Manhole	VF	84	\$ 500	\$ 42,000
3	Additional Manhole Repairs	LS	1	\$ 10,000	\$ 10,000
4	Asphalt Surface Restoration	LS	1	\$ 8,500	\$ 8,500
5	Replace Cleanout Assembly on Existing Service	EA	3	\$ 1,100	\$ 3,300
<b>Construction Subtotal</b>					<b>\$ 65,700</b>
Contingency (15%)					\$ 9,800
Engineering Coordination					\$ 5,500
<b>Total Base Project Cost</b>					<b>\$ 81,000</b>

*\*Cost estimates are based on the knowledge of a professional engineer based on 2024 construction costs and are subject to change due to bidding environment and other factors.*

**3.2.2 Flow Monitoring Improvement Project**

This project includes installing two in-line flow monitoring devices on the two downstream collection lines within the sewer system. These devices will allow the County to monitor its own sewer flow. This data can be utilized by staff for planning and budgeting purposes.

The project includes two 8-inch electromagnetic flow meters in a precast underground bypass vault with associated piping and appurtenances. The meters will be installed on the County’s 12-inch and 15-inch lines outside of the existing lift station. The preliminary cost estimate for this project is \$103,900 as outlined in Table 8 below.

**Table 8: Preliminary Opinion of Probable Cost for Flow Monitoring Improvements Project**

Item	Description	Units	Quantity	Unit Price	Total Cost
1	Mobilization	LS	3%	N/A	\$ 2,400
2	8-inch Mag Meter	EA	2	\$ 25,000	\$ 50,000
3	Precast Concrete Valve Vault	EA	2	\$ 8,000	\$ 16,000
4	Piping, Valves, Fittings	LS	1	\$ 15,000	\$ 15,000
<b>Construction Subtotal</b>					<b>\$ 83,400</b>
Construction Contingency (15%)					\$ 12,500
Engineering Coordination					\$ 8,000
<b>Total Base Project Cost</b>					<b>\$ 103,900</b>

*\*Cost estimates are based on the knowledge of a professional engineer based on 2024 construction costs and are subject to change due to bidding environment and other factors.*

### **3.3 CIP PROJECTS SUMMARY**

The purpose of this asset management plan was to document the condition of the Kelly Hills sewer infrastructure to assist the County with becoming more viable and proactive in the management and financing of its wastewater system. The County intends to look to its CIP to guide its next project; therefore, it is vital that the CIP be established as an accurate depiction of current conditions and reflect the Districts' highest priorities with accurate cost estimates. The development of this AMP will serve as a positive step towards ensuring that the District can maintain its level of service agreement.

Sewer manhole rehabilitation and cleanout replacement was evaluated based on current staff input and the results of the field inspections. The existing manholes and cleanouts were divided into projects recommended for the next 10-years.

McGill prepared cost estimates for all projects based on current materials and construction costs. The 10-year CIP is intended to be adopted by the District to guide its selection of sewer system improvement projects over the next two decades. The cost summary for the 10-year CIP is shown below in Table 9.

**Table 7: CIP Cost Summary**

Year <sup>1</sup>	Manhole Rehabilitation Project 1	Flow Monitoring Improvements	Manhole Rehabilitation Project 2	Manhole Rehabilitation Project 3	Manhole Rehabilitation Project 4	TOTAL COST
1	\$ 81,000.00	\$ -	\$ -	\$ -	\$ -	\$ 81,000.00
2	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3	\$ -	\$ 103,900.00	\$ -	\$ -	\$ -	\$ 103,900.00
4	\$ -	\$ -	\$ 81,000.00	\$ -	\$ -	\$ 81,000.00
5	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
7	\$ -	\$ -	\$ -	\$ 81,000.00	\$ -	\$ 81,000.00
8	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
9	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
10	\$ -	\$ -	\$ -	\$ -	\$ 81,000.00	\$ 81,000.00
<b>TOTAL ESTIMATED CIP COST</b>						<b>\$ 427,900.00</b>

Notes:

1: Considering timeline for adoption of this plan and County budget planning cycle, Year 1 is anticipated to be FY 2026

## 4.0

## OPERATIONS AND MAINTENANCE PLAN

### 4.1 GENERAL RECOMMENDATIONS

The purpose of an Operations and Maintenance (O&M) Program is to provide an organized and cost-effective approach to ongoing maintenance, repair and replacement activities that will maintain the sewer collection system, so it performs as intended and meets the requirements of the sewer utility's System-Wide Collection System Permit, issued under North Carolina General Statutes Article 21 of Chapter 143.

This section provides a general description of proactive O&M, which can be defined as scheduled maintenance activities (preventive maintenance), performed on a regular basis in order to achieve the highest level of system performance using available resources and minimizing failures that can result in Sewer System Overflows (SSOs)

Developing an O&M Program begins with accurate records of infrastructure inventory, asset locations and physical condition. Coupled with work records and system performance history, preventive maintenance schedules can be developed to efficiently address general system needs, from cleaning and debris removal to site-specific maintenance work such as cutting and repair work.

The following elements provide the foundation for an effective O&M program:

- Maintain up-to-date wastewater treatment plant equipment documentation, sewer collection system maps and related work history and operational data.
- Develop a routine preventive O&M program and activities for staff and contractors maintaining the sewer collection system and a system to document scheduled activities.
- Develop a rehabilitation and replacement plan identifying and prioritizing system deficiencies and implement short- and long-term actions to address the deficiencies.
- Develop and implement training programs to build technical competence and emergency preparedness.
- Develop and provide equipment and replacement part inventories, including critical replacement parts.

## **Sewer System Mapping**

Sewer system maps and related databases are typically managed using a Geographic Information System (GIS). The District of Kelly Hills/ Slocomb Road currently utilizes ESRI as the GIS platform from which to manage the utility systems. This GIS mapping is supported by a database that records sewer main size, material types, and locations of manholes and clean-out connections. The platform has the ability to store more information that is currently being utilized by the County, including invert and rim elevations and other attributes of system appurtenances. If County intends to utilize the GIS platform for managing and recording maintenance performed and planned, it is recommended that the County investigate alternative software to ensure that they are utilizing a software that meets their needs with respect to budget.

The GIS database should be updated on a regular basis. Software applications such as work order systems are available to allow field staff to update GIS data as inspection and maintenance activities are completed. Other applications can also allow staff to update and edit maps. Field information that was gathered by McGill and County staff as a part of this assessment is now included in the County's GIS system database for future reference.

GIS can organize work history along with operational data, inspection records and images to provide managers, operations staff and engineers with powerful data sets to track current resource allocations and forecast short and long-term operational and capital needs. Outcomes of detailed analysis such as recommended sewer main rehabilitation work versus sewer overflows can be mapped to present the relationship visually for ease of understanding.



## **Preventive Operation and Maintenance (O&M)**

Preventive maintenance is performing routine and scheduled maintenance activities before wastewater treatment plant and lift station equipment or buried infrastructure fails, for the purpose of extending useful life, reducing overall operating costs, and increasing system reliability. This proactive approach to maintenance work is more efficient and cost effective than reactive and curative operations. Preventive maintenance activities will also help operations staff to better understand the wastewater treatment plant equipment, lift station equipment, and collection system components and how they work under various conditions. This knowledge is essential to setting maintenance priorities and developing the scope and timing of long-term rehabilitation and replacement projects.

## **Scheduled Cleaning of Sewers**

EPA recommends, at a minimum, that 100% of sewer mains should be cleaned every five (5) years, or 20% of the system annually. The sewer utility's Collection System Operating Permit requires 10% of the gravity sewers to be cleaned annually. High pressure jetting is the most common approach using various spray nozzles for general cleaning and debris removal. Mechanical cutters are used to address root intrusion and cleaning agents can be added to help remove fats, oils, and grease (FOG).

More frequent cleaning is scheduled for areas with a history of heavy debris, grease buildup and roots. CCTV inspections are also used to identify areas to clean more often, such as sections with minor defects such as offset joints and service taps protruding into the main line. Sewer sections near siphons are cleaned more frequently to ensure continuous and uninterrupted operation.

As part of the O&M Program, a master list of cleaning operations, priority locations and scheduling can be incorporated into GIS. Maps can be produced to define work areas, schedule resources, including contracted services, track progress and task completion. Updating GIS maintenance operations data (partial blockages found, debris quantity, etc.)

will help managers adjust cleaning frequency and area boundaries as needed to increase program efficiency, reduce sewer blockages, and avoid SSOs.

## **Routine Visual Inspections**

Routine inspections are used to assess the condition of lift stations, manholes and surface facilities, recording general conditions and evidence of possible structural problems or failures (offset structures, etc.), corrosion, surcharging, overflows and excessive Inflow and Infiltration (I&I). Work orders are generated based on inspection records to effect operational adjustments, scheduling more detailed inspections and/or making necessary repairs.

## **Manhole Inspection Program**

Manhole inspections keep the asset inventory up-to-date and are used not only to update collection system maps, but to determine structural condition. During manhole inspections, a complete inventory is taken of each manhole including construction materials, ring size, depth to invert, flow conditions and evidence of problems. The National Association of Sewer Service Companies (NASSCO) Manhole Assessment and Certification Program (MACP) may be adopted or used as a guide to ensure consistency and reliability of evaluation and ranking methodology.

The results from routine manhole inspections and monitoring are used to prioritize areas needing CCTV inspections to assess pipe condition such as manholes with evidence of slow flow or surcharging. Information is recorded and used to schedule maintenance and repairs.

## **CCTV Inspection Program**

While routine cleaning and visual inspection are used to assess the condition of surface facilities and manholes, CCTV video inspections are the primary method used to assess the condition of the sewer pipes. Using conventional defect criteria is highly recommended to provide standardization and consistency in sewer pipe condition

assessment and ranking. The NASSCO Pipeline Assessment and Certification Program (PACP) may be adopted or used as a guide to ensure consistency and reliability of evaluation and ranking methodology.

## **Maintenance Activity Records**

Detailed records and daily logs of O&M work provide valuable information to help managers evaluate the effectiveness of maintenance activities and make adjustments to optimize the use of limited resources. Equipment, manpower and other resources are tracked along with detailed descriptions of defects and/or obstructions encountered including debris, FOG, structural failures, etc. Maintenance work resulting in system modifications or extensions is required to be incorporated into record drawings and system maps. Scheduled testing of emergency and standby equipment is also a requirement of the collection system permit.

These records are required to be reviewed periodically to identify problems that cannot be resolved in a short period of time in order to develop a plan to address the problem(s). Maintaining these records for an extended period of time (5-years or more) will also provide accurate reference points of maintenance investments made over time that will track the effectiveness of operation and maintenance activities.

In the event of a sewer spill or system overflow, maintenance records will need to provide sufficient detail to satisfy reporting requirements for the event, including location(s), volume of wastewater, corrective actions, etc. This data may also be integrated into GIS to allow mapping of these events over time in order to identify patterns and/or trends that will assist with scheduling maintenance and planning rehabilitation and other capital improvements.

## **Resolution of Customer Complaints**

Customer complaints are primarily for sewer backups and odors. Sewer backups require an immediate response to diagnose and resolve the problem. These complaints can occur outside normal business hours, significantly escalating costs. Detailed records of the problems found, and the resources needed to address the failed condition, provide valuable feedback for making adjustments to the preventive maintenance program that can reduce these types of calls and help lower overall maintenance costs.

These records can also identify areas where private service laterals frequently fail. Notifying customers in these areas will allow them the opportunity to address deficiencies proactively, which will also help reduce customer “emergency” calls.

## **Capital Improvements Plan**

A Capital Improvements Plan (CIP) is required by the collection system permit to identify rehabilitation, replacement and expansion needs of the system. The CIP is required to address the short and long-term needs of the system, covering at least a 3 to 5-year planning period, and must include the estimated cost of each capital project.

CIP development incorporates maintenance activity, cleaning and inspection records, and system performance data that may include flow monitoring and hydraulic modeling to evaluate the existing system and to recommend improvements needed to correct existing deficiencies, and ensure adequate capacity is maintained throughout the system.

Capital planning includes consideration of on-going funding for rehabilitation and replacement of the collection system as it wears out, and potential upgrades for expansion as needed.

## **Training Program**

Training programs provide a mechanism for educating employees and establishing their technical competence to perform operations, maintenance, and emergency responses safely and effectively. A combination of in-house skill training and specialized training purchased or provided through state and national associations, conferences and vendor training programs are typically used to build and enhance skills for performing daily work duties. Periodic training reinforces previous efforts, as people often overlook things that are used infrequently. It also provides an opportunity to train new staff and learn about new problems, new techniques, and changes in equipment.

Emergency training educates system personnel about emergency situations and resulting effects on the wastewater system, public health, and environmental impacts. It also provides an opportunity to practice responses. Good record keeping ensures personnel are properly trained and prepared to effectively operate and maintain the collection system under any given circumstance. Regular review of training records is essential for keeping content up-to-date and maintaining proper employee awareness.

## **Equipment and Replacement Parts**

A reasonable supply of equipment and replacement parts should be maintained to fully support all operations and maintenance activities. A detailed inventory is essential to ensure availability under normal operations and emergency conditions. Specialized equipment or parts may be too costly to keep in stock, so arrangements with vendors and/or contractors may be necessary to ensure availability during non-business hours or during emergencies.

## 4.2 STAFFING RECOMMENDATIONS

Cumberland County is responsible for three wastewater collection systems and one water system: NORCRESS, Overhills, Kelly Hills, and Southpoint Water System. While each of these districts maintains its own operating budget, the Board leadership and operational management is performed solely by Cumberland County. Therefore, in consideration of the typical utility system management and operations and maintenance that is necessary for maintaining each of the systems, McGill has considered all of the four utility systems cumulatively. While each system could be analyzed separately, considering the systems together is more consistent with actual management of the systems.

Typical metrics for analyzing full-time equivalent (FTE, representing quantity full-time workers) are based on either the population served by the system or by miles of utility piping (water main or sewer line) within each system. For reference, Table 8 below summarizes the customers and piping in each of the County’s utility systems.

**Table 8: Utility System Comparison**

DISTRICT	Number of Connections		Paying Avail. Fee	Pipe in System (mi.)
	Water	Sewer		
<b>Southpoint</b>	84		129	2.8
<b>Kelly Hills</b>		102	166	4.5
<b>Overhills</b>		107	318	4.0
<b>NORCRESS</b>		452	666	41.1
<b>TOTALS</b>	<b>84</b>	<b>661</b>	<b>1279</b>	<b>52.4</b>

**Table 9: Typical Population vs. Pipe Length**

<b>Population</b>	<b>Pipe in System (mi.)</b>
0-100	5
101-500	5
501-3300	21
3301-10000	62

The typical sizes of utility systems from a community system EPA study<sup>1</sup> are shown in Table 9, and are generally consistent when compared to the County’s systems. This study was selected as a basis for comparison due to its comprehensive nature, having included water systems nationwide in its breadth. NORCRESS is the exception when compared to Table 9. This is mostly likely indicative of the system serving a more rural population where the connection density is less, and resulting from the length of force main piping in the system that increases the overall length but does not contribute to population density. Overall, these metrics were found to be reasonably consistent with the County’s systems. Similarly, the data is consistent regardless of whether the utility system is a water systems or wastewater collection system.

The objective is to make budget-level staffing recommendations for the County’s utility systems based on what is typical across the industry and other utility systems of comparable size. The EPA study utilized provides typical FTE for the roles of manager, plant operator, distribution (and collection, for our purposes), and administrative functions. All of these were considered applicable to management and operation of the County’s utility systems. Note: while the County is not responsible for plant operation in any system, the lift stations in the NORCRESS and Overhills systems are the County’s responsibility, therefore this metric was used, albeit in a smaller percentage, to account for the management of those resources.

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<sup>1</sup> Analysis conducted using excerpts from US EPA document, “National Characteristics of Drinking Water Systems Serving 10,000 or Fewer People,” published July 2011.



Table 10 shows Further utilizing the EPA statistics as base for typical FTE for each of the positions, based on the system size in terms of miles of pipe main.

**Table 10: Average Community System Statistics**

Employee Category	System Size (miles of Main)		Mean	Cumberland County
	Pop. 500-3300	Pop. 3300-10000		
	21	62	41.5	51.7
<b>Manager FTE</b> per mile	0.6	1.1	0.85	1.06
	0.029	0.018	0.020	0.020
<b>Plant Operator FTE</b> per mile	0.6	1.3	0.95	1.03
	0.029	0.021	0.023	0.023
<b>Distribution FTE</b> per mile	0.8	2.5	1.65	2.06
	0.038	0.040	0.040	0.040
<b>Administrative FTE</b> per mile	0.6	1.5	1.05	1.31
	0.029	0.024	0.025	0.025

The green highlighted cells are the calculated FTEs that were applied to estimate staffing size based on the quantity of pipe across the County’s four utility systems. Those calculated FTEs are based on the size of systems managed by the County and reasonable estimate of staffing needed for these systems.

Each of the FTEs is applied to each respective employee category. McGill utilized wage information from Zip Recruiter and a benefits multiplier of 1.38 from the U.S. Bureau of Labor Statistics to develop the summary shown in Table 11.

**Table 11: Overall Salary Estimates**

Employee Category	Hourly Rate	Annual Salary	Ben. Mult.	Total	Applied FTE	Applied Budget Cost
Manager	\$38.50	\$80,080.00	1.38	\$110,510.40	1.06	\$117,000
Operator	\$24.52	\$51,001.60	1.38	\$70,382.21	1.03	\$72,700
Distribution	\$23.57	\$49,025.60	1.38	\$67,655.33	2.06	\$139,100
Administrative	\$21.33	\$44,366.40	1.38	\$61,225.63	1.31	\$80,100
<b>Total Applied Budget Cost Based FTEs</b>						<b>\$408,900</b>

Utilizing industry metrics and comparing to systems of comparable size, McGill offers the proceeding section as a general staffing recommendation. This section and these budget values are provided for preliminary planning purposes only.

Staffing levels appear to be reasonable based on the District's ability to operate and maintain the system while providing a reliable level service to its customers.

While this budget number is higher than the current budget staffing, consideration should also be given to the cumulative effect cost to the County for contracted operation and distribution support in the NORCRESS and Kelly Hills district.

# **APPENDICES**



## **Appendix A**

### **Manhole Inspection List**

# Kelly Hills Manhole Inspection

DATE: January 17th, 2024

FACILITYID	MH ID NO.	CONDITION
115136	SMH027236	Good
115167	SMH027267	Good
115168	SMH027268	Good
115098	SMH027198	Good
115101	SMH027201	Good
115103	SMH027203	Good
115109	SMH027209	Good
115113	SMH027213	Good
115125	SMH027225	Good
115188	SMH027287	Good

## **Appendix B**

### **Smoke Testing Results List**



## Kelly Hills Smoke Testing Manholes

Date: September 21, 28, 2023		
Manhole ID	Status	Notes
SMH027233	Leak	Smoke around lid
SMH027234	Leak	Smoke around lid
SMH027246	Broken	
SMH027248	Seal	Smoke from lid
SMH027258	Seal	Smoke from collar
SMH027259	Seal	Smoke around lid
SMH027264	Leak	From around bottom of mh
SMH027265	Leak	
SMH027197	Leak	Leak around the lid
SMH027198	Seal	Smoke around lid
SMH027203	Leak	Smoke around rim
SMH027209	Seal	Smoke around lid
SMH027214	Leak	Smoking from top
SMH027215	Leak	
SMH027218	Broken	Cracked ring
SMH027219	Leak	
SMH027220	Leak	
SMH027223	Leak	
SMH027226	Leak	
SMH027277	Broken	
SMH027279	Seal	Smoke around concrete collar
SMH027283	Leak	
SMH027284	Leak	
SMH027288	Seal	Smoke around lid

<b>Kelly Hills Smoke Testing Cleanouts</b>		
<b>Date: September 21, 28, 2023</b>		
<b>Facility ID</b>	<b>Status</b>	<b>Notes</b>
33904	Broken	Broken cap
33991	Broken	Broken no cap
34012	Broken	Needs cap 9/28/2023 no cap
33889	Broken	
33908	Broken	
33961	Broken	Both valves broken
33895	Broken	
33990	Broken	cleanout cap repaired
33927	Broken	smoking from sides,burnt
33945	Broken	
34014	Broken	
33972	Broken	Missing lid covers
34029	Broken	
33913	Broken	
33916	Broken	
33985	Broken	broken cap
34033	Broken	Replace whole top
33926	Broken	Broken cap unable to open
33937	Broken	CO broken from bush hogging
34031	Broken	Around lid cracked
33966	Broken	
33976	Broken	CO in yard house
33906	Broken	Repaired
33964	Broken	Vacant lot
33955	Broken	Possible I&I issue.
33901	Broken	No cap repaired
33910	Broken	Broken cap in yard, cap replaced



## **Appendix C**

### **Wastewater Collection System Permit**



Michael F. Easley, Governor  
William G. Ross Jr., Secretary  
North Carolina Department of Environment and Natural Resources  
Alan W. Klimek, P.E. Director  
Division of Water Quality

October 27, 2003

Mr. Joseph Glass  
City of Fayetteville,  
Public Works Commission  
PO Drawer 1089  
Fayetteville, NC 28302

**SUBJECT: Permit No. WQ0023202  
Kelly Hills/Slocomb Road Water & Sewer District  
Wastewater Collection System Extension  
Cumberland County**

Dear Mr. Glass:

In accordance with your application received October 23, 2003, we are forwarding herewith Permit No. WQ0023202, dated October 27, 2003, to the City of Fayetteville, Public Works Commission for the construction and operation of the subject wastewater collection system extension. This permit shall be effective from the date of issuance until rescinded and shall be subject to the conditions and limitations as specified therein. This cover letter shall be considered a part of this permit and is therefore incorporated therein by reference.

Please pay particular attention to Permit Condition 3 which requires that the wastewater collection facilities be properly operated and maintained in accordance with 15A NCAC 2H .0227 or any individual system-wide collection system permit issued to the Permittee.

Permitting of this project does not constitute an acceptance of any part of the project that does not meet 15A NCAC 2H .0200; the Division of Water Quality's (Division) Gravity Sewer Minimum Design Criteria adopted February 12, 1996 as applicable; and the Division's Minimum Design Criteria for the Fast-Track Permitting of Pump Stations and Force Mains adopted June 1, 2000 as applicable, unless specifically mentioned therein. Division approval is based on acceptance of the certification provided by the North Carolina-licensed Professional Engineer named in the application. It shall be the Permittee's responsibility to ensure that the as-constructed project meets the appropriate design criteria and rules. Failure to comply may result in penalties in accordance with North Carolina General Statute § 143-215.6A through § 143-215.6C, construction of additional or replacement wastewater collection facilities, and/or referral of the North Carolina-licensed Professional Engineer to the licensing board.

In accordance with provisions of Article 21 of Chapter 143, General Statutes of North Carolina as amended, and other applicable Laws, Rules, and Regulations, permission is hereby granted to the City of Fayetteville, Public Works Commission for the construction and operation of



Mr. Joseph Glass  
Page 2  
October 27, 2003

approximately 18,811 linear feet of 8-inch gravity sewer; as well as approximately 1,699 linear feet of 12-inch gravity sewer; as well as approximately 2,664 linear feet of 15-inch gravity sewer; as well as approximately 1,258 linear feet gravity sewer; a 0.1416 mgd, 225 gpm @ 74' TDH pump station with permanent generator; as well as approximately 2,388 linear feet of 6-inch force main to serve 144 three-bedroom residences, 10 three-bedroom mobile homes and 2 two-hundred seat churches as part of the Kelly Hills/Slocumb Road Water & Sewer District project, and the discharge of 56,640 gallons per day of collected domestic wastewater into the City of Fayetteville, Public Works Commission Cross Creek Wastewater Treatment Facility's existing sewerage system, pursuant to the application received October 23, 2003 and in conformity with 15A NCAC 2H .0200; the Division's Gravity Sewer Minimum Design Criteria adopted February 12, 1996 as applicable; the Division's Minimum Design Criteria for the Fast-Track Permitting of Pump Stations and Force Mains adopted June 1, 2000 as applicable; and other supporting data subsequently filed and approved by the Department of Environment and Natural Resources and considered as part of this permit.

The sewage and wastewater collected by this system shall be treated in the City of Fayetteville, Public Works Commission Cross Creek Wastewater Treatment Facility (Permit No. NC0023957) prior to being discharged into the receiving stream.

If any parts, requirements, or limitations contained in this permit are unacceptable, you have the right to request an adjudicatory hearing upon written request within 30 days following receipt of this permit. This request must be in the form of a written petition, conforming to Chapter 150B of North Carolina General Statutes, and filed with the Office of Administrative Hearings, 6714 Mail Service Center, Raleigh, NC 27699-6714. Unless such demands are made, this permit shall be final and binding.

If you need additional information concerning this matter, please contact Grady Dobson at (910) 486-1541 extension 729.

Sincerely,



for Alan W. Klimek, P.E.

cc: Cumberland County Health Department  
Fayetteville Regional Office, Water Quality Section (WWTF Permit No. NC0023957)  
Mr. James M. Kizer, Jr., Moorman, Kizer & Reitzel, Inc.  
Water Quality Central Files  
NDPU

**NORTH CAROLINA**  
**ENVIRONMENTAL MANAGEMENT COMMISSION**  
**DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES**  
**RALEIGH**  
**WASTEWATER COLLECTION SYSTEM EXTENSION PERMIT**

---

This permit shall be effective from the date of issuance until rescinded and shall be subject to the following specified conditions and limitations:

1. This permit shall become voidable unless the wastewater collection facilities are constructed in accordance with the conditions of this permit; 15A NCAC 2H .0200; the Division of Water Quality's (Division) Gravity Sewer Minimum Design Criteria adopted February 12, 1996 as applicable; the Division's Minimum Design Criteria for the Fast-Track Permitting of Pump Stations and Force Mains adopted June 1, 2000 as applicable; and other supporting materials unless specifically mentioned herein.
2. This permit shall be effective only with respect to the nature and volume of wastes described in the application and other supporting data.
3. The wastewater collection facilities shall be properly maintained and operated at all times. The Permittee shall maintain compliance with an individual system-wide collection system permit for the operation and maintenance of these facilities as required by 15A NCAC 2H .0227. If an individual permit is not required, the following performance criteria shall be met as provided in 15A NCAC 2H .0227:
  - a. The sewer system shall be effectively maintained and operated at all times to prevent discharge to land or surface waters, and any contravention of the groundwater standards in 15A NCAC 2L .0200 or the surface water standards in 15A NCAC 2B .0200.
  - b. A map of the sewer system shall be developed prior to January 1, 2004 and shall be actively maintained.
  - c. An operation and maintenance plan shall be developed and implemented.
  - d. Pump stations that are not connected to a telemetry system shall be inspected every day (i.e. 365 days per year). Pump stations that are connected to a telemetry system shall be inspected at least once per week.
  - e. High-priority sewer lines shall be inspected at least once per every six-month period of time.
  - f. A general observation of the entire sewer system shall be conducted at least once per year.
  - g. Inspection and maintenance records shall be maintained for a period of at least three years.
  - h. Overflows and bypasses shall be reported to the appropriate Division regional office in accordance with 15A NCAC 2B .0506(a), and public notice shall be provided as required by North Carolina General Statute §143-215.1C.



4. **This permit shall not be transferable.** In the event there is a desire for the wastewater collection facilities to change ownership, or there is a name change of the Permittee, a formal permit request shall be submitted to the Division accompanied by documentation from the parties involved, and other supporting materials as may be appropriate. The approval of this request shall be considered on its merits and may or may not be approved.
5. Construction of the gravity sewers, pump stations, and force mains shall be scheduled so as not to interrupt service by the existing utilities nor result in an overflow or bypass discharge of wastewater to the surface waters of the State.
6. Upon completion of construction and prior to operation of these permitted facilities, a certification, a copy of the construction record drawings, as well as supporting design calculations for any pump stations permitted as part of this project shall be received from a North Carolina-licensed Professional Engineer certifying that the facilities have been installed in accordance with this permit; 15A NCAC 2H .0200; the Division's Gravity Sewer Design Criteria adopted February 12, 1996 as applicable; the Division's Minimum Design Criteria for the Fast-Track Permitting of Pump Station and Force Main adopted June 1, 2000 as applicable; and other supporting materials. If this project is to be completed in phases and partially certified, you shall retain the responsibility to track further construction approved under the same permit, and shall provide a final certificate of completion once the entire project has been completed. A copy of the construction record drawings, indicating the facilities constructed in the phase being certified, shall be submitted with each partial certification. Mail the Engineer's Certification, one copy of the "Construction Record Drawings," and one copy of the supporting design calculations to the Non-Discharge Permitting Unit, 1617 Mail Service Center, Raleigh, NC 27699-1617.
7. A copy of the construction record drawings shall be maintained on file by the Permittee for the life of the wastewater collection facilities.
8. Failure to abide by the conditions and limitations contained in this permit; 15A NCAC 2H .0200; the Division's Gravity Sewer Design Criteria adopted February 12, 1996 as applicable; the Division's Minimum Design Criteria for the Fast-Track Permitting of Pump Station and Force Mains adopted June 1, 2000 as applicable; and other supporting materials may subject the Permittee to an enforcement action by the Division, in accordance with North Carolina General Statutes §143-215.6A through §143-215.6C.
9. In the event that the wastewater collection facilities fail to perform satisfactorily, including the creation of nuisance conditions, the Permittee shall take immediate corrective action, including those as may be required by this Division, such as the construction of additional or replacement facilities.
10. The issuance of this permit shall not exempt the Permittee from complying with any and all statutes, rules, regulations, or ordinances that may be imposed by other government agencies (local, state and federal) which have jurisdiction, including but not limited to applicable river buffer rules in 15A NCAC 2B .0200, erosion and sedimentation control requirements in 15A NCAC Ch. 4 and under the Division's General Permit NCG010000, and any requirements pertaining to wetlands under 15A NCAC 2B .0200 and 15A NCAC 2H .0500.

**11. Noncompliance Notification:**

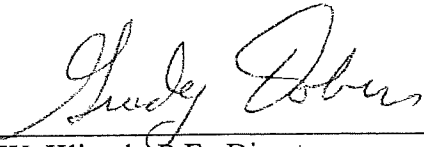
The Permittee shall report by telephone to the Fayetteville Regional Office, telephone number (910) 486-1541, as soon as possible, but in no case more than 24 hours or on the next working day, following the occurrence or first knowledge of the occurrence of either of the following:

- a. Any process unit failure, due to known or unknown reasons, that renders the facility incapable of adequate wastewater transport, such as mechanical or electrical failures of pumps, line blockage or breakage, etc.; or
- b. Any failure of a pumping station or sewer line resulting in a by-pass directly to receiving waters without treatment of all or any portion of the influent to such station or facility.

Persons reporting such occurrences by telephone shall also file a written report in letter form within five days following first knowledge of the occurrence. This report must outline the actions taken or proposed to be taken to ensure that the problem does not recur.

Permit issued this the twenty-seventh day of October 2003

NORTH CAROLINA ENVIRONMENTAL MANAGEMENT COMMISSION



for Alan W. Klimek, P.E., Director  
Division of Water Quality

By Authority of the Environmental Management Commission

**Permit Number WQ0023202**

**Fast Track Engineering Certification**

Permit No. WQ0023202  
October 27, 2003

Complete and submit this form to the permit issuing regional office with the following:

- One copy of the project record drawings (plan & profile views of sewer lines) of the wastewater collection system extension
- supporting design calculations (selected pumps, system curve, operating point, available storage if portable generator(s) or storage greater than longest past three year outage reliability option selected) for any pump stations permitted as part of this project
- Changes to the project should be clearly identified on the record drawings or in written summary form. Permit modifications are required for any changes resulting in non-compliance with this permit, regulations or minimum design criteria.

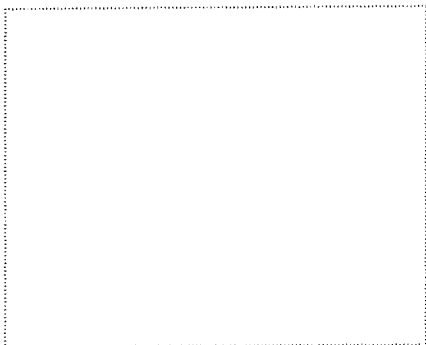
This project shall not be considered complete nor allowed to operate until this Engineer's Certification and all required supporting documentation have been received by the Division. **Therefore, it is highly recommended that this certification be sent in a manner that provides proof of receipt by the Division.**

**ENGINEER'S CERTIFICATION**

Partial                       Final

I, \_\_\_\_\_, as a duly registered Professional Engineer in the State of North Carolina, having been authorized to observe ( periodically,  weekly,  full time) the construction of the Kelly Hills/Slocomb Road Water & Sewer District, Cumberland County project for the Permittee hereby state that, to the best of my abilities, due care and diligence was used in the observation of the construction such that the construction was observed to be built within substantial compliance of this permit; 15A NCAC 2H .0200; the Division of Water Quality's (Division) Gravity Sewer Minimum Design Criteria adopted February 12, 1996 as applicable; the Division's Minimum Design Criteria for the Fast-Track Permitting of Pump Stations and Force Mains adopted June 1, 2000 as applicable; and other supporting materials.

North Carolina Professional Engineer's seal, signature, and date:



**SEND THIS FORM & SUPPORTING DOCUMENTATION WITH REQUIRED ATTACHMENTS TO THE FOLLOWING ADDRESS**

**FAYETTEVILLE REGIONAL OFFICE  
225 GREEN STREET, SUITE 714  
FAYETTEVILLE NC 28301**

The Permittee is responsible for tracking all partial certifications up until a final certification is received. Any wastewater flow made tributary to the wastewater collection system extension prior to completion of this Engineer's Certification shall be considered a violation of the permit and shall subject the Permittee to appropriate enforcement actions.



## **Appendix D**

### **PWC Agreement**

**STATE OF NORTH CAROLINA  
COUNTY OF CUMBERLAND  
SANITARY SEWER WHOLESALE AGREEMENT**

**THIS AGREEMENT** made and entered into this 24<sup>th</sup> day of September 2014 by and between the City of Fayetteville acting by and through its Public Works Commission of the City of Fayetteville (hereinafter referred to as "Commission" or "PWC") and the County of Cumberland, a North Carolina body politic acting by and through its Kelly Hills/Slocomb Road Water & Sewer District, (hereinafter referred to as "Kelly Hills").

**WITNESSETH**

**THAT, WHEREAS,** Kelly Hills owns and operates a wastewater collection system, as described in Exhibit B, that currently serves approximately 115 customers in the Kelly Hills/Slocomb Road area; and,

**WHEREAS,** Commission owns and operates wastewater treatment facilities (the "Municipal Wastewater System") and provides wholesale wastewater treatment services; and,

**WHEREAS,** Kelly Hills wishes to contract with Commission for PWC to furnish wholesale wastewater treatment service to Kelly Hills for the treatment of Kelly Hills wastewater; and ,

**WHEREAS,** Commission agrees to furnish wastewater treatment service pursuant to the terms of this agreement; and,

**WHEREAS,** Kelly Hills wishes to contract with Commission for PWC to provide operation and maintenance services to Kelly Hills for the Kelly Hills Sanitary Sewer system; and,

**WHEREAS,** Commission agrees to furnish operation and maintenance services to Kelly Hills for the Kelly Hills Sanitary Sewer system pursuant to the terms of this agreement; and,

**WHEREAS,** both parties recognize the Commission must implement and enforce a pretreatment program to control wastewater discharges from Significant Industrial Users ("SIUs") under 40 CFR Part 403 or other dischargers who require issuance of SIU or local permits.

**NOW THEREFORE,** Commission and Kelly Hills agree to the following terms and conditions:

1. Discharge Points:

As of the Effective Date, wastewater from Kelly Hills existing sanitary sewer collection system will be discharged into the Commission's Municipal Wastewater System at the

existing entry point listed in this Section 1 and thence treated at Commission's plants as deemed appropriate. Existing entry point is PWC Lift station at 355 Bethune Drive. Kelly Hills shall not discharge into Commission's Municipal Wastewater System at any other entry point without prior written approval from the Commission. Exhibit A shows the approved discharge points.

2. Flow Measurement:

Within one hundred and twenty (120) business days from the Effective Date of this agreement, Commission shall install at Kelly Hills' expense a flow measurement device at the Kelly Hills approach main where Kelly Hills discharges wastewater into the Commission's Municipal Wastewater System. Commission at its expense, shall be responsible for maintenance and calibration of the flow measurement device and calibration shall be done annually and shall operate within the accuracy tolerances as specified by the manufacturer. Commission shall provide Kelly Hills a copy of the calibration records of the flow measurement device.

3. Basic Operations and Maintenance

A. The cost of basic operation and maintenance of the sanitary sewer collection system is built into the sanitary sewer rate being charged to Kelly Hills. Basic operation and maintenance includes:

1. Rights-of-way and/or easement maintenance to allow for accessibility to the sanitary sewer collection system.
2. Cleaning of at least 10% of the sanitary sewer collection system each year.
3. A general observation of the entire sanitary sewer collection system throughout the course of every year.
4. Semiannual inspections of all high priority lines (i.e. aerial, sub-waterway crossing, line contacting surface waters, siphon, line positioned parallel to stream banks subject to eroding, or line designated as high priority in a permit if applicable).
5. Point repair to a damaged or broken sanitary sewer main pipe, not to include replacement of multiple pipe joints.
6. Point repair to a damaged or broken sanitary sewer lateral or cleanout, not to include outright renewal of entire lateral.
7. Cleaning and rodding of clogged sanitary sewer mains and laterals.
8. Repair of manholes to include resetting of manhole ring and cover, not to include adjustments to or replacement of manhole or ring and cover; not to include repairs warranted to address I&I or corrosion issues.



- B. Other extraordinary work required or requested by Kelly Hills will be NU billed at the appropriate rate to include applicable overtime and overhead for labor, equipment and materials ( to include an amount for all direct and indirect charges) plus 10%. Examples of extraordinary work are: SSO remediation and post cleaning and inspection, work consider as a capital improvement under Financial Accounting Standards Board (FASB) standards, replacement of multiple joints of sanitary sewer pipe, renewal of a sanitary sewer lateral, installation of a new sanitary sewer lateral, elder valve installation, smokedye testing and CCTV inspection. Kelly Hills shall have the right to install themselves or to hire a contractor(s) to perform this work to PWC standards.
- C. The Commission shall at its discretion exercise the right to decline or subcontract any work required or requested by Kelly Hills that would conflict with the Commission's responsibilities and requirements for the operation and maintenance of the Commissions' sanitary sewer collection system.
- D. Commission will provide other services, upon request, but which will be billed separately and not included in the Wholesale Sewer Rate. A partial list of the other services that may be available to Kelly Hills include the following:
1. Promote participation agreements with other benefitted parties;
  2. Participation and administration of utility extension contracts;
  3. Right-of-way acquisition for land and easement requirements to be secured in the name of Kelly Hills within the limits permitted by law but not to include actions in eminent domain;
  4. Inspection services during construction;
  5. Miscellaneous services such as GIS mapping as requested.
- E. Other services requested by Kelly Hills will be NU billed at the appropriate rate to include applicable overtime and overhead for labor, equipment and materials ( to include an amount for all direct and indirect charges) plus 10%.

4. Upsizing Mains

Commission will be responsible for the cost associated with upsizing mains within the delineated Kelly Hills service as may be deemed necessary in order to meet

Commission's existing and future sanitary sewer needs which would not be otherwise required for the sanitary sewer collection system being installed by Kelly Hills pursuant to this Agreement.

5. Ownership of Sewer Lines

A. All sanitary sewer lines installed within the boundaries of the Kelly Hills Sanitary Sewer District shall be owned and operated by Kelly Hills subject to Commission's right to upsize such mains at its expense and to transmit sanitary sewer through such mains to areas beyond the Kelly Hills area.

B. Commission shall own and operate the lift station located at 355 Bethune Drive, Fayetteville, NC and the associated force main.

6. Rights-of-way and encroachments

Kelly Hills will acquire all rights-of-way and/or encroachments as may be needed for construction and maintenance of the sanitary sewer collection system as referenced herein.

7. Extension of Mains Outside Kelly Hills Service Area

Commission reserves the right to extend or continue sanitary sewer mains from such mains as initially constructed by Kelly Hills to points outside of the delineated Kelly Hills service area. Future connections or main extensions that occur outside of the delineated Kelly Hills area are not subject to this Agreement and shall be the property of Commission unless the Kelly Hills boundary is expanded by law to serve development of contiguous properties. If such extensions occur, then the Commission shall install a flow measurement device at its expense to measure all flow being generated by customers outside of the Kelly Hills Service Area. A map of showing the boundaries of the Kelly Hills service is show as Exhibit B.

8. Extension of Mains Within Kelly Hills Service Area

The further extension of or connection to mains within the delineated Kelly Hills service area will be pursuant to applicable extension and connection policies and procedures of Kelly Hills in effect at the time a request for service is made.

9. Compliance with Commission Policies and Procedures

Kelly Hills may by resolution adopt a policy whereby future customers and/or extenders of sanitary sewer infrastructure in the Kelly Hills service area will be subject to the then current applicable Commission Policies and Procedures to simplify the application process for customers with the understanding that such customers remain responsible to Kelly Hills for compliance with such policies and procedures.

10. Notification of Excessive Inflow/Infiltration

Upon notification by Commission that volumes of Kelly Hills wastewater entering Commission's lines, based on flow measuring data, exceed one hundred twenty-five percent (125%) of the average volume of sewer measured at the Discharge Point during any consecutive three-month billing period, Kelly Hills shall initiate an infiltration/inflow study to be conducted or supervised by a professional consulting engineer. Such study will provide Kelly Hills with recommendations designed to reduce infiltration/inflow to acceptable levels as delineated by the United States Environmental Protection Agency. Said study shall be made during the fiscal year immediately following notification. Corrective measures shall be taken by Kelly Hills upon receipt of and based on said infiltration/inflow study. Kelly Hills shall be responsible for all costs associated with any required infiltration/inflow study and corrective measures. Results of any infiltration/inflow study and proposed corrective measures shall be sent to Commission for review and approval.

11. New Laterals

- A. At Kelly Hills request, Commission will install new laterals in the Kelly Hills Sanitary Sewer District at Kelly Hills expense. Commission will NU bill Kelly Hills for such laterals at the appropriate rate to include applicable overtime and overhead for labor, equipment and materials (to include an amount for all direct and indirect charges) plus 10%.
- B. Kelly Hills, at its sole discretion, may install or contract for the installation of new laterals in the Kelly Hills Sanitary Sewer District.
- C. All new laterals will be designed and built to the PWC standards in effect at the time of the design and construction.

12. Monthly Billing:

- A. As of the Effective Date, the flow measuring device at the Kelly Hills connective main will be read, as nearly as practical, at regular monthly intervals. The period of time between device readings shall not be less than twenty-seven (27) days and not more than thirty-three (33) days. If Commission is unable to read the flow measuring device, for any reason, the wastewater flow shall be estimated by Commission on the basis of Kelly Hills wastewater flow for the preceding three billing periods for which readings were obtained. Bills rendered on the basis of such estimates shall be as valid as if made from actual device readings and appropriate adjustment of Kelly Hills bill shall be made at first actual reading of the flow measuring device subsequent to such estimate.
- B. The term "month" or "monthly" refers to the interval(s) transpiring between the previous meter reading date and the current meter reading date, and bills shall be rendered accordingly.

- C. The Commission will submit bills to Kelly Hills on a monthly basis for the prior month's sewer treatment service.
- D. If at the time of this Agreement's Effective Date, the flow measurement device at Kelly Hills approach main is not installed, the parties agree that billing shall continue under the existing arrangement, as specified in the Kelly Hills/Slocomb Road Water & Sewer District Sanitary Sewer Service Agreement as amended October 24, 2005 until such time that the flow measurement device is installed and calibrated.
- E. The Commission will, annually, or such time as shall be determined by Commission, perform a rate analysis to determine the rates which are applicable to serving Commission's various classes of water and sanitary sewer service. Among those classes of service will be wholesale sanitary sewer service classes, a class which includes Kelly Hills.
- F. Commission will use audited balance sheets, income statements, comparable wholesale market rate data, and return on investment financial information as the basis for determining the rates applicable to this Agreement. Commission may at its option, adjust audited financial data for changes to such financial data known or reasonably expected to occur during the period in which the billing rate will be in effect.
- G. Commission will provide at least 30 days' notice to Kelly Hills of any rate changes.
- H. The initial Wholesale Sewer Rate to be charged to Kelly Hills, including the cost of O&M, is \$ 4.1267 per 1,000 gallons, or \$ .0041267 per gallon, the rate effective January 1, 2014. This cost includes the cost of basic operation and maintenance of the sanitary sewer collection system as described in paragraph 3.

13. Capacity Charges

- A. Commission shall receive and treat up to 100,000 gallons per day of Kelly Hills wastewater, representing the projected average daily usage generated from sources within the Kelly Hills Sanitary Sewer District. Kelly Hills has purchased 32,430 gallons per day sanitary sewer treatment capacity using \$ 92,640 of FIF credits. Upon execution of this agreement Kelly Hills will purchase an additional 67,570 gallons per day of sanitary sewer treatment capacity using \$ 201,358.60 of their existing FIF credits that expire in October 2015.

Kelly Hills has the option, in the future, to purchase any or all of the remaining 50,000 gallons per day force main capacity at the then current FIF charge. Such purchases will be made in increments of at least 5% of the then current contract capacity.



- B. Kelly Hills shall, advise Commission of any anticipated growth in number of connections to its sanitary sewer system, population served and anticipated volume of wastewater as Kelly Hills becomes aware of such growth.. Commission does not anticipate any restriction on annual increase in flow from Kelly Hills, if within limits of the contract demand of 100,000 gallons per day. However, flow limits may be imposed if a regulatory agency having jurisdiction over Commission's treatment facilities requires restriction on flow increases on Commission's system.
  - C. Commission shall notify Kelly Hills if the measured average daily usage in gallons per day of wastewater reaches 80% of the contract demand.
  - D. If the measured average daily usage in gallons per day of wastewater from Kelly Hills exceeds 90% of the contract demand, Kelly Hills shall purchase additional contract demand at the current Commission capacity rate in increments of at least 5% of the existing contract demand.
14. Surcharges for Carbonaceous Biochemical Oxygen Demand (CBOD) and Suspended Solids (SS) and Total Kjeldhal Nitrogen (TKN):
- A. A surcharge for CBOD, Suspended Solids or NH<sub>3</sub> will be applied to those customers of Kelly Hills who are issued SIU or local permits ("Industrial Users"). These surcharges will be determined in accordance with the Commission Rate Schedule "Sanitary Sewer Surcharges" currently indexed as 620.05. Such surcharge billing will be determined by testing samples of wastewater from each Industrial Users' discharge at Commission's laboratories pursuant to standard test requirements and procedures of the State and Federal governments. Commission shall bill surcharges directly to the Industrial Users. The additional costs to treat wastewater in excess of limits stated above are determined by the Commission and published annually. The Commission will, from time-to-time, review and revise the surcharge applicable to Industrial Users based on testing.
  - B. Kelly Hills shall terminate sewer service to any Industrial User upon notice from the Commission that said Industrial User has failed to pay surcharges pursuant to Sections 5 or 7 or any additional fees or penalties under the City of Fayetteville's Sewer Use Ordinance.
15. Sewer Use Ordinance Requirement:
- A. The Sanitary Sewer Ordinance of the City of Fayetteville, as amended from time-to-time, shall be applicable to all Kelly Hills customers whose wastewater is discharged to Commission's Municipal Wastewater System.

- B. Kelly Hills shall be responsible for regulation of all customers who discharge wastewater through Kelly Hills system to the Commission's Municipal Wastewater System. Kelly Hills shall be responsible for enforcement of the requirements of the City of Fayetteville's Sanitary Sewer Ordinance.

16. Sewer Use Ordinance, and Pretreatment Requirements and Costs:

- A. The Sanitary Sewer Use Ordinance of the City of Fayetteville and subsequent revisions of such Ordinance to include pretreatment requirements and cost, both incorporated herein by reference, shall be applicable to the effluent of Kelly Hills' sanitary sewer being discharged into the Commission's sanitary sewer system.
- B. Kelly Hills hereby designates Commission as the agent of Kelly Hills for the purposes of implementation and enforcement of the pretreatment requirements of Kelly Hills for industrial users located in Kelly Hills' jurisdiction. Commission hereby accepts the designation of agent of Kelly Hills' jurisdiction for purposes of implementation and enforcement of the pretreatment requirements. If Commission determines the pretreatment requirements are not enforceable by Commission, then Kelly Hills shall provide timely enforcement. Kelly Hills shall continue to enforce all other provisions of the City's Sanitary Sewer Use Ordinance.
- C. Commission, on behalf of and as an agent for Kelly Hills', agrees to perform technical and administrative duties necessary to implement and enforce the pretreatment requirements, including but not limited to the following:
  - 1. Updating industrial waste survey no less than once every five (5) years;
  - 2. Providing technical services such as sampling and analysis;
  - 3. Permitting of Significant Industrial Users (SIU's);
  - 4. Conducting inspection and compliance monitoring at permitted SIU's and certain commercial users; and
  - 5. Performing enforcement activities.

In addition, Kelly Hills authorizes the Commission, as its agent, to take emergency action to stop or prevent any discharge which presents or may present an imminent danger to the health or welfare of humans, reasonably appears to threaten the environment, threatens to interfere with the operation of Commission's sanitary sewer treatment system (including the collection system and its workers' safety), or which could pass through the treatment plant and threaten the integrity of the publicly owned treatment works receiving stream.

- D. Kelly Hills, as with other Commission customers, shall be responsible for additional cost associated with treatment of sanitary sewer in excess of published limits as determined by Commission. Such pretreatment surcharge billing will be determined by testing of samples of sanitary sewer from the Kelly Hills sanitary sewer collection system at Commission's laboratories pursuant to standard test requirements and procedures of the State and Federal governments. The pretreatment surcharge procedure as it applies to commercial industrial customers is described in Commission's Rates and Policies Manual and is incorporated herein by reference.
- E. Kelly Hills shall pay Commission for actual costs incurred by Commission, including all reasonably allocated overhead costs, implementing and enforcing pretreatment requirements on behalf of Kelly Hills'. Commission shall bill Kelly Hills monthly for pretreatment costs incurred by Commission in implementing and enforcing Kelly Hills' pretreatment requirements, which shall be payable within 30 days of date of invoice.

17. Corrosion Control:

Kelly Hills shall be responsible for ensuring compliance with hydrogen sulfide discharge limits at the point(s) of discharge to the Commission's Municipal Wastewater System. The discharge of dissolved sulfide by Kelly Hills to Commission's Municipal Wastewater System at the discharge point(s) identified in Section 1 of this Agreement, are limited to the following: a daily average of 5mg/l in solution and/or 10 ppm in atmosphere and a maximum of 10 mg/l in solution and/or 30 ppm in atmosphere per day. PWC, at its own expense, shall perform all testing and as needed shall coordinate with Kelly Hills. Kelly Hills, at its own expense, shall be responsible for the addition of any chemicals or additional treatment necessary to comply with the hydrogen sulfide limit. Any addition of chemicals to control hydrogen sulfide shall be coordinated with Commission prior to introduction into the system.

18. Indemnity and Responsibilities:

Kelly Hills assumes responsibility for and shall indemnify (or defend at Commission's sole option) Commission, its successors and assigns, and hold it harmless against all injuries, liabilities, claims, damages, losses, costs and expenses, including reasonable attorney's fees and costs, personal injury or property damage, arising out of or related to 1) the construction, maintenance and operation of Kelly Hills sanitary sewer system, 2) Kelly Hill's discharge into the Commission's Municipal Wastewater System, 3) this Agreement, or 4) fines or penalties by any Federal, State or local agency or body.. Kelly Hills will not indemnify PWC for intentional or negligent acts solely attributable to PWC, its employees, agents, or contractors.

19. Suspension or Termination of Sanitary Wastewater Treatment Service:

Commission, in addition to all other legal remedies, may either terminate this Agreement or suspend sanitary sewer treatment service to Kelly Hills for:



- a) Any material default or breach of this Agreement by Kelly Hills; Fraudulent or unauthorized use of the sanitary sewer treatment service or discharge of sanitary sewer in such manner as to circumvent Commission's meter(s) serving Kelly Hills; or,
- b) Failure to pay monthly sanitary sewer bills when due and payable.
- c) No such termination or suspension, however, will be made by Commission without thirty (30) days written notice delivered to Kelly Hills personally or by mail, within which time Kelly Hills may cure any such alleged default or breach or commence in good faith to cure any such default or breach which cannot reasonably be cured within thirty (30) days, except that only seven (7) days' notice need be given under subsection (b) above.
- d) Commission's suspension of sanitary sewer service or termination of this Agreement upon any authorized grounds shall not relieve Kelly Hills of:
  - 1) Liability for the payment of sanitary sewer treatment service to the date of suspension or termination of this Agreement; nor
  - 2) Liability for any actual damages sustained by Commission.

20. Payment:

Monthly bills are payable within thirty (30) days from date thereof at P.O. Box 1089, Fayetteville, North Carolina, 28302, or its successors. A late payment charge in accordance with PWC's Schedule of Deposits, Fees, and Charges shall be applicable to all bills rendered pursuant to this Agreement except when notified within fifteen (15) days by Kelly Hills in writing of an invoice dispute, but Kelly Hills shall pay the undisputed amount pursuant to this contract.

21. Term of Agreement:

The term of this Agreement is for twenty (20) years from September 24, 2014 until September 24, 2034 (the "Initial Term"). This Agreement shall automatically renew at the end of the Initial Term for a period of one (1) year, and shall automatically renew each year thereafter for a period of one year, unless terminated pursuant to the terms of Paragraph 10, or by either party by giving not less than one (1) year written notice to the other party, or upon mutual consent of both parties. Either party may terminate this Agreement during the Initial Term by giving the other party one (1) year written notice.

22. Prior Agreements: This Sanitary Sewer Wholesale Agreement shall replace the Sanitary Sewer Service Agreement by and between the City of Fayetteville acting by and through its Public Works Commission of the City of Fayetteville and the Kelly Hills /Slocomb Road Sanitary Sewer District dated April 19, 2004 and amended October 24, 2005.

23. Continuity of Service:

Commission does not guarantee continuous utility service, but shall use reasonable diligence in providing uninterrupted services. Having used such reasonable diligence, Commission shall not be liable to Kelly Hills or its customers for failure to provide continuous services. The performance of Commission's obligations under this Agreement shall be excused during such times and to the extent such performance is prevented by reason of any event beyond the control of Commission, including without limitation, flood, earthquake, storm, lightning, fire, explosion, war, riot, civil disturbances, terrorist act, strikes, sabotage, or act of God.

24. Dispute Resolution:

Commission and Kelly Hills will attempt in good faith to resolve any dispute or claim arising out of or in relation to this Agreement through direct negotiations between Commission and Kelly Hills' staff. If the dispute is not settled through such negotiations, then Commission and Kelly Hills agree to attend voluntary mediation prior to initiating formal legal proceedings. Said voluntary mediation shall be initiated by either party giving notice of the same, and shall be concluded within 30 days of such notice. Said voluntary mediation shall be conducted pursuant to the North Carolina Rules Implementing Statewide Mediated Settlement Conferences in Superior Court Civil Actions in effect at the time said notice is given. The requirements of this Section 25 shall not apply to emergency situations where the dispute involves potential harm to the Commission's Municipal Wastewater System.

25. Amendment Proceedings:

This Agreement may be amended, changed, modified, altered, or assigned only by written consent of Commission and Kelly Hills.

26. Notices:

All notices hereunder, other than monthly invoices and payment of the same, shall be sent to the following addresses using regular mail unless otherwise specified in writing:

Commission:            General Manager  
                              Public Works Commission  
                              P.O. Box 1089  
                              Fayetteville, NC 28302

Kelly Hills: Chairman, Governing Board  
Kelly Hills/Slocomb Road Water and Sewer District  
P. O. Box 1829  
Fayetteville, NC 28302-1829

27. Binding Effect:

This Agreement shall be binding upon and inure to the benefit of the parties hereto, their heirs, successors and assigns.

28. Entire Agreement:

This Agreement contains the entire Agreement of the parties and there are no representations, inducements, or other provisions other than those expressed in writing.

29. Kelly Hills acknowledges that, in carrying out the terms of this agreement, PWC will disclose certain confidential customer information to Kelly Hills (the "Confidential Information"). Kelly Hills agrees not to disclose the Confidential Information to third parties, except as may be reasonably necessary to carry out the terms of this Agreement. Kelly Hills will advise PWC of any such disclosure prior to disclosure and obtain PWC's consent. In the event Kelly Hills inadvertently discloses Confidential Information, Kelly Hills will immediately notify PWC of such inadvertent disclosure and will take all appropriate actions to prevent further dissemination or disclosure of the Confidential Information.

29. Governing Law:

This Agreement shall be governed by the laws of the State of North Carolina.

30. Severability:


It is hereby declared to be the intention of Commission and Kelly Hills that the paragraphs, sentences, clauses, and phrases of this Agreement are severable. If one or more paragraphs, sections, sentences, clauses, or phrases shall be declared void, invalid, or otherwise unenforceable for any reason by valid and final judgment or decree of any court of competent jurisdiction, such judgment or decree shall not affect the remaining provisions of this Agreement and the same shall continue to be fully effective and enforceable on the basis that said remaining provisions would have been agreed to by Commission and Kelly Hills without the incorporation of such void, invalid, or otherwise unenforceable paragraph, section, sentence, clause, or phrase.

31. Effective Date:

The Effective Date, as that term is used in this Agreement, shall be the date that the Agreement is fully executed by both parties.

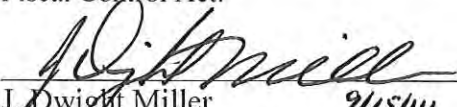
IN WITNESS WHEREOF, the parties hereto, through their duly authorized officers, have executed this contract as to the date and year first above written.

PUBLIC WORKS COMMISSION  
OF THE CITY OF FAYETTEVILLE

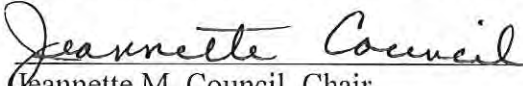
By:   
Michael G. Lallier, Chairman

ATTEST:  
  
Lynne Greene, Secretary

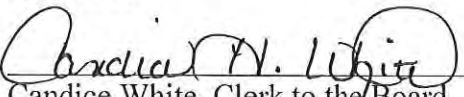
This instrument has been preaudited in the manner required by the Local Government Budget and Fiscal Control Act.

  
J. Dwight Miller *9/15/14*  
PWC Chief Financial Officer

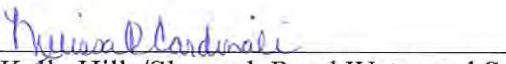
KELLY HILLS/SLOCOMB ROAD WATER AND SEWER DISTRICT

By:   
Jeannette M. Council, Chair



ATTEST:  
  
Candice White, Clerk to the Board

This instrument has been preaudited in the manner required by the Local Government Budget and Fiscal Control Act.

  
Kelly Hills/Slocomb Road Water and Sewer District  
Finance Officer


**Legal Review of the Contract between the City of Fayetteville, Acting through its Public Works Commission, and Cumberland County, Acting through its Kelly Hills/Slocumb Road Water & Sewer District, Approved by the Board of Commissioners August 18, 2014**

Section 18 of this agreement is subject to N.C.G.S. § 22B-1. Construction indemnity agreements invalid. That statute states:

Any promise or agreement in, or in connection with, a contract or agreement relative to the design, planning, construction, alteration, repair or maintenance of a building, structure, highway, road, appurtenance or appliance, including moving, demolition and excavating connected therewith, purporting to indemnify or hold harmless the promisee, the promisee's independent contractors, agents, employees, or indemnitees against liability for damages arising out of bodily injury to persons or damage to property proximately caused by or resulting from the negligence, in whole or in part, of the promisee, its independent contractors, agents, employees, or indemnitees, is against public policy and is void and unenforceable.

To the extent that any portion of this indemnity agreement is enforceable, there is no limit on the amount of the obligation that may be incurred.

Subject to proper execution by both parties and the effective dates of the term being inserted into Section 21, this agreement is approved for legal sufficiency for the reason that the Public Works Commission is the sole provider of sewer service for the Kelly Hills Water & Sewer District and the agreement terms were not negotiable.

  
\_\_\_\_\_  
County Attorney 8-19-14

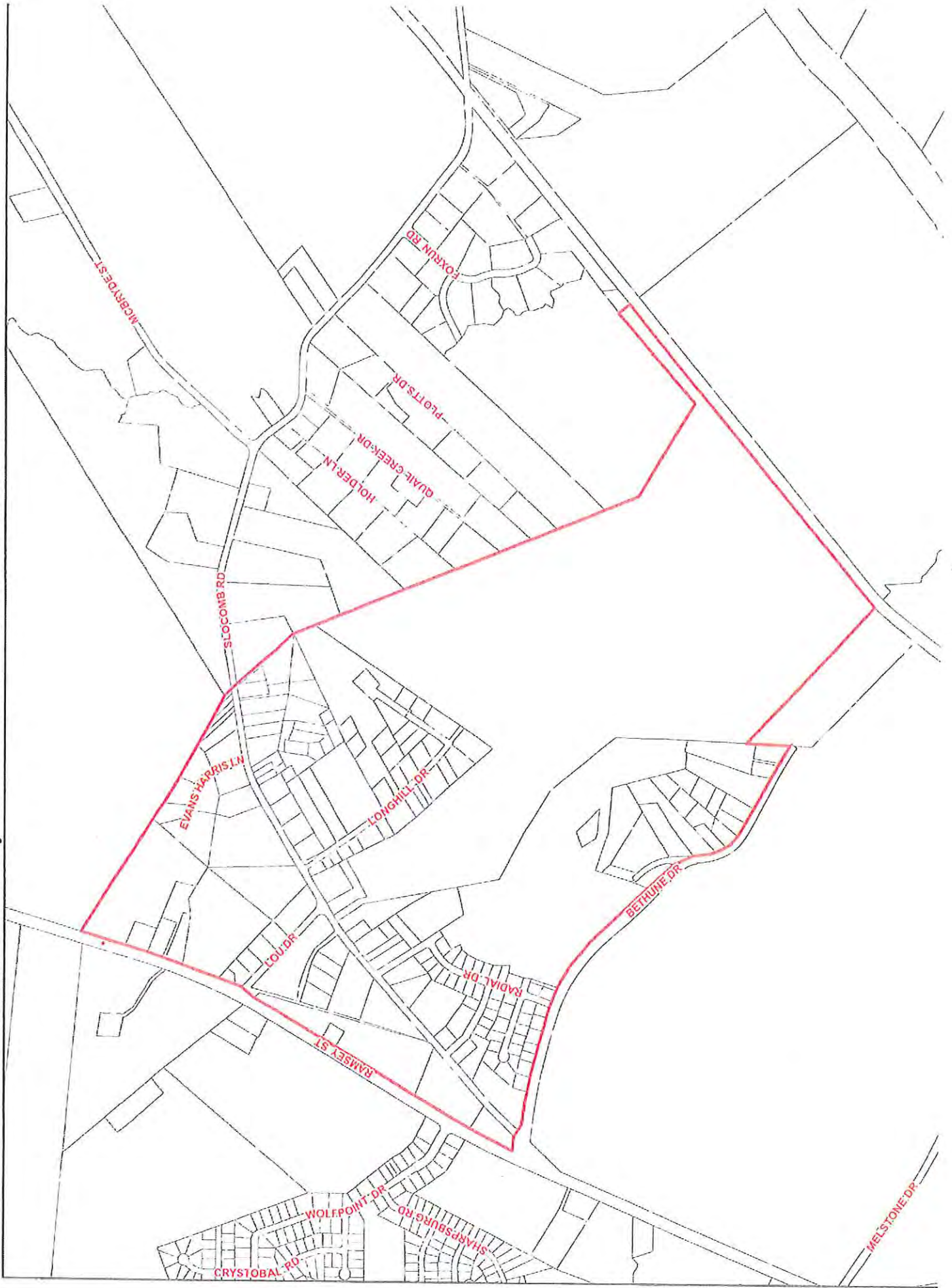
## **Exhibit A – Kelly Hills Discharge Points**

The approved discharge point(s) for Kelly Hills are:

1. The flow measurement device at the Kelly Hills force main.



EXHIBIT-B: Kelly Hills Water and Sewer District





**SEWER ASSET MANAGEMENT PLAN**

**NORTHERN CUMBERLAND REGIONAL  
SEWER SYSTEM (NORCRESS) DISTRICT**

**CUMBERLAND COUNTY, NC**



PINEHURST, NORTH CAROLINA

**SEWER ASSET MANAGEMENT PLAN**

**NORTHERN CUMBERLAND REGIONAL  
SEWER SYSTEM (NORCRESS) DISTRICT**

**CUMBERLAND COUNTY, NC**

**MATTHEW JONES, PE**  
matthew.jones@mcgillassociates.com



5 Regional Circle, Suite A  
Pinehurst, NC 28374  
910.295.3159

**AUGUST 2025**

**PROJECT NO. 20.02507**

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**Appendix A – Manhole Inventory List**

**Appendix B – Smoke Testing Results List**

**Appendix C – Rainfall Data**

**Appendix D – Flow Monitoring Data, Hourly Graphs**

**Appendix E – Capital Improvement Project Product Data**

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## EXECUTIVE SUMMARY

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The purpose of this Asset Management Plan (AMP) is to document the condition of the Northern Cumberland Regional Sewer System (NORCRESS) District's infrastructure to assist the County with becoming more proactive in the management, operation, and financing of its wastewater collection system. The NORCRESS District serves approximately 452 connections in the northeastern area of Cumberland County. Approximately 666 properties within the district are not currently connected and are paying the sewer availability fee. The District's wastewater collection system consists of approximately 26 miles of gravity sewer, four sewer lift stations, 15 miles of force main, and 424 manholes. Collected wastewater is pumped from the Wade 2 Lift Station to Eastover Central Lift Station and then sent to Fayetteville PWC. Flow generated from the district is ultimately treated at the Cross Creek Water Reclamation Facility (NC0023957), which is owned and operated by Fayetteville PWC. A copy of the agreement is included in Appendix F.

This asset inventory and assessment consisted of assembling data on gravity sewer pipe, manholes, and other appurtenances in the collection system. This assessment included performing inspections of selected manholes, performing smoke testing throughout the system, performing flow monitoring at select locations within the system, and reviewing existing data with County Staff. The information was evaluated and is summarized in this document which includes the asset management plan and capital improvements plan. This process resulted in the development of a 10-year Capital Improvements Plan (CIP) to guide the District with scheduling and financing the capital projects and equipment purchases necessary to maintain and improve its wastewater collection system. Through the AMP process, it is estimated that approximately 40% of the manholes in the sewer collection system are in need of rehabilitation due to deterioration.

The CIP includes a focused improvement to components within the sewer system that need rehabilitation or replacement based on existing condition, and on improvements that could improve management of the sewer system for staff. These planned projects will

bring the system into a better position to serve its customers by improving reliability of the collection system. The District should look to its CIP to guide its next projects, and the CIP should be updated regularly as priorities change and as projects are completed. It is noted that many factors may impact the priorities including failures, and funding availability both local and through grant and loan programs. This assessment project provides evidence for the prioritization of manhole rehabilitation and improvement projects in the CIP.

### ***System Evaluation***

The pipe material in the NORCRESS system is primarily PVC pipe. The collection system was first put into service in 2005, therefore the relative age of the system is low. PVC pipe is the most common material used for sewer systems today. The typical useful life for PVC pipe is anywhere from 40 to 60 years. There is some ductile iron pipe (DIP) used at culvert crossings and HDPE used for directional drill of the Falcon and Wade force mains.

As part of the AMP, McGill Associates, PA (McGill) assisted the District with evaluating the condition of its sewer infrastructure to identify projects in line with these goals. The following items were included in the AMP scope:

- Identify areas to conduct smoke testing to locate potential sources of I/I into the sewer system;
- Flow monitoring in select areas (6 sewershed areas within the Towns of Godwin and Falcon)
- Inspect selected sewer manholes within the system to establish overall system condition;
- Identify and evaluate potential sewer system improvements;
- Prioritize sewer system improvements;
- Prepare opinions of probable costs for sewer system improvements; and
- Create a Capital Improvements Plan.



### Flow Monitoring

McGill met with County staff to identify areas of concern within the sewer system and select locations to place flow meters. From these discussions, the NORCRESS wastewater collection system was divided into six total sewersheds between the Towns of Godwin and Falcon, according to the GIS mapping as depicted in Figure 2. These sites were selected to favor areas where County staff suspected I/I and the sewershed was easily able to be isolated within the total system. Overall, flow monitoring revealed that while all sites had sufficient capacity to handle dry weather flow, there was additional flow during dry weather conditions that raises some concern. Falcon Site 2 had peak flows which used around 40% of the estimated capacity during dry weather conditions, and Falcon Site 1 had peak flows over 60% existing capacity. There was only one significant rainfall event during the flow monitoring period, and I/I did seem to be an issue for the system. All six flow monitoring locations logged higher flows immediately following the event.

### Smoke Testing

McGill and the Cumberland County staff smoke tested segments of gravity sewer lines connected to multiple manholes across the system, enabling the full smoke testing of the entire 26 miles of the sewer system. This testing occurred over a period of several days to determine locations where I/I could enter the wastewater collection system. For each segment, McGill and County staff selected a centrally located manhole on which to place the blower based on the manhole's accessibility. The crew recorded smoke emerging from 240 abnormal locations, which divided generally into four categories- broken or uncapped cleanouts, broken lines, unsealed manholes, and unknown defects. All smoke occurrences are recorded in Appendix A and shown in Figure 3.

### Manhole Inspections

All manholes in the NORCRESS system are precast concrete based on information provided by County staff. The results of the selected manhole inspections performed as a part of this inventory were used to develop an assessment of manhole conditions in the

system. Based on the inspections performed, manholes that were inspected were assigned a condition score, and these scores were combined into an overall condition rating for each manhole- excellent, good, fair, or poor. Of the 37 manholes inspected, approximately 34 were in good condition and four were in fair condition. These results are recorded in Figure 7 and included in Appendix A.

### Lift Station Inspections

The NORCRESS System is served by four lift stations: one in Godwin, one in Falcon, and two in Wade. The County previously contracted with Freese and Nichols to perform an analysis and report on the lift stations. Lift station inspection was not included in the scope of this assessment. Analysis of the lift stations was included the NOCRESS Comprehensive Sewer Evaluation study completed by Freese and Nichols in June 2021. For reference, record drawings for the lift stations are included in Appendix G of this report.

### Findings and Recommendations

The system evaluation allowed McGill to assemble a list of general recommendations and high priority projects to guide the County in the next 10 years. General recommendations to the District included establishing its own flow monitoring and smoke testing programs in high priority areas to determine sewer rehabilitation needs and inspecting sewer lines and manholes with CCTV equipment during routine cleanings to track the condition of these items. McGill also recommended the County begin rehabilitation and/or replacement of existing manholes within the collection system in order to reduce the risk of I/I.

Data and field investigation reporting were utilized to identify the priority projects within the collection system, focusing on manhole rehabilitation.

Table 1 summarizes projects identified during this assessment, centering around additional flow monitoring, flow meters, and manhole rehabilitation projects. A project to

install flow monitors is included to give greater control and understanding of flows from the collection system.

**Table 1: Summary of Capital Improvements Projects**

<b>No.</b>	<b>Project Name</b>	<b>Cost</b>
1	Flow Monitoring Study	\$25,440.00
2	Manhole Rehabilitation Project 1	\$118,600.00
3	Flow Monitoring Improvements	\$203,900.00
4	Manhole Rehabilitation Project 2	\$118,600.00
5	Manhole Rehabilitation Project 3	\$118,600.00
6	Manhole Rehabilitation Project 4	\$118,600.00
7	New Generators All Lift Stations	\$640,000.00
8	Upgrade SCADA	\$240,000.00
9	Falcon Force Main-Inspect, Clean, and Replace ARVs	\$80,000.00
<b>10-Year CIP Total Project Cost</b>		<b>\$1,714,620.00</b>

***Capital Improvements Plan***

The purpose of this asset inventory and assessment was to document the condition of the District’s inventoried infrastructure to assist the County with becoming proactive in the management of its wastewater system, to include capital project planning. The County does not currently have a Capital Improvements Plan (CIP) for its wastewater system. The CIP being developed from this current assessment will guide the County through its planning for projects within the 10-year window. The CIP will remain a living document and be updated in the future so that it remains current to the Districts’ highest priorities and provides accurate cost estimates. The CIP included in this assessment includes projects focused on rehabilitation of existing manholes, which have been identified to be potential sources for I/I into the system. Through discussion with County staff, field investigation and review of existing system data, the specific defects and general problematic areas within the wastewater system have been summarized. These results were used to update the CIP and formulate a ten-year plan.

The complete asset inventory and assessment task consisted of five parts culminating in the development of the NORCRESS Water and Sewer District’s CIP. McGill developed

cost estimates for all projects based on current 2024 materials and construction costs. The updated CIP is intended to be adopted by the County to guide its selection of sewer system improvement projects over the next decade. This plan also includes a budget-level recommendation for staffing associated with system operations and maintenance for all County utility districts.

**1.1 BACKGROUND**

The NORCRESS District is located in Cumberland County, North Carolina, and is owned and operated by Cumberland County. The District includes a wastewater collection system that currently serves 452 customers. A summary of customer type based on use is provided in Table 2. The collection system consists of approximately four and a half miles of gravity sewer mains that are 8-inch, 12-inch, 15-inch, and 16-inch in diameter. These gravity sewer mains are constructed of PVC and Ductile Iron pipe and are all 15 years old. Figure 1 shows the existing sewer collection system.

Developing a Capital Improvements Plan (CIP) will allow the District to update its current rate setting model to better estimate future revenue and expenses, capital outlay, indebtedness, and overall health of the sewer system enterprise fund reserves. A model of this nature would continue to balance revenues and expenditures with a longer-term approach to rate setting and establish a financially sound framework for the District to follow.

The District has experienced the degradation of manholes within its sewer collection system due to the age of the system and resulting from wear over time.

Even with the relatively young age of the NORCRESS system, County staff remains cognizant that infiltration and inflow (I/I) is always a concern, particularly in a scenario where the County's operation costs are based on the gallons of flow that enter into the existing lift station. The County is also aware that during dry weather there tend to be excessive flows in Godwin and Falcon (and therefore Wade, where flows are pumped from both Towns). Therefore, the top challenges for the NORCRESS system are mitigating I/I that results from deteriorated infrastructure and identifying the source of any additional flows into the collection system that do not first enter via water connection and are therefore billable. This additional information will help the County anticipate typical flows and assist with operations and maintenance planning. The information collected

throughout this assessment project will help identify system deficiencies and develop improvement projects to reach these goals.

This process resulted in the development of a 10-year Capital Improvements Plan (CIP) to guide the District with scheduling and financing the capital projects and equipment purchases necessary to restore its wastewater collection system. Through the AMP process, the McGill and County staff have estimated that approximately eighty-four (84) manholes would benefit from rehabilitation due to their poor condition.

The purpose of this Asset Management Plan (AMP) is to document the condition of the Districts' inventoried infrastructure to assist the District with becoming more viable and proactive in the management and financing of its wastewater system. The District continues to look to its CIP to guide its next projects; therefore, it is vital that the CIP remains current to the Districts' highest priorities and provides accurate cost estimates. This assessment project was utilized for the prioritization of replacement lines and improvements projects in the CIP.

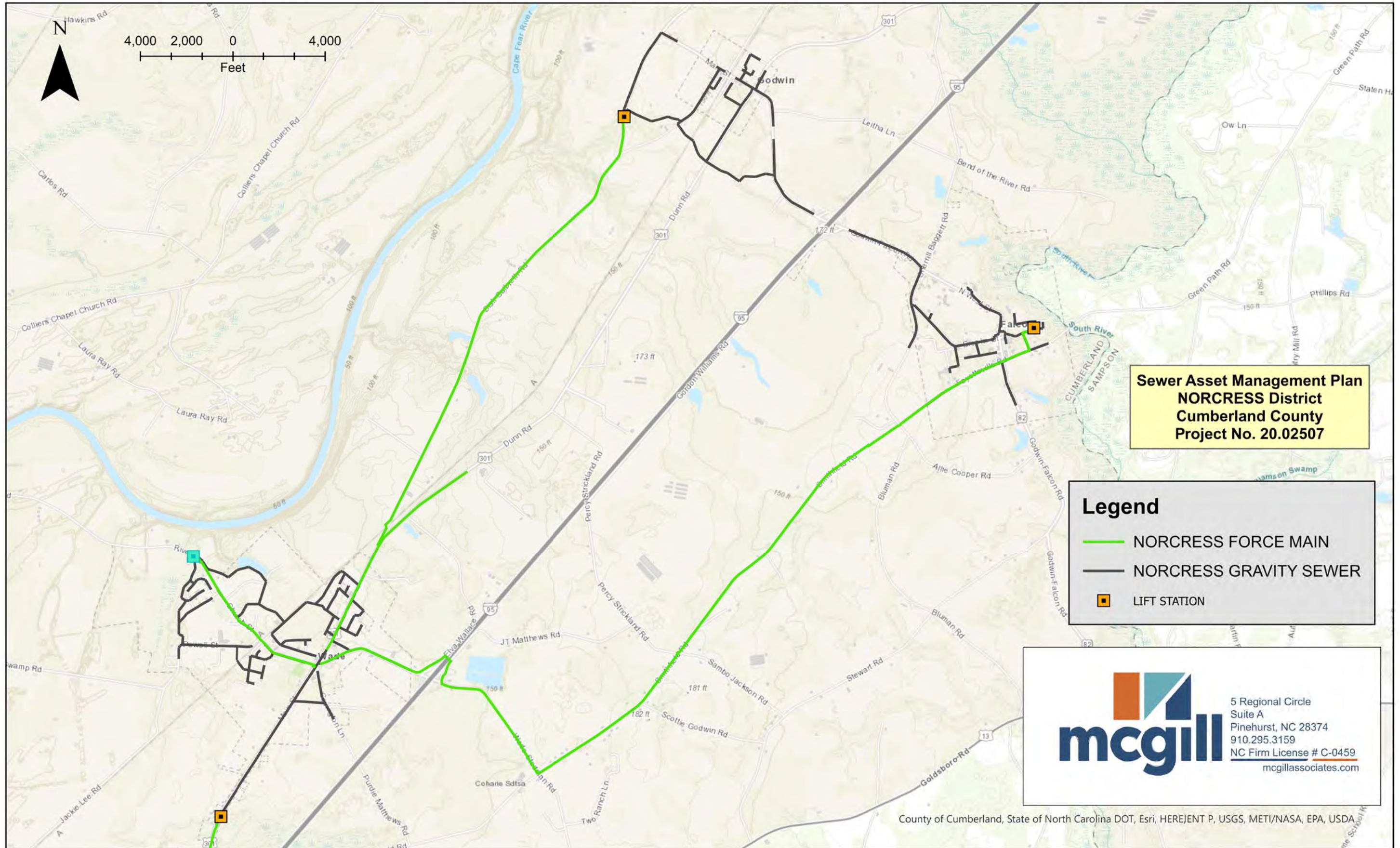
**Table 2: Summary of Customers by Use**

<b>Diameter</b>	<b>Total</b>	<b>% of System</b>
<b>Residential</b>	<b>394</b>	<b>87.1%</b>
<b>Commercial</b>	<b>50</b>	<b>11.1%</b>
<b>Industrial</b>	<b>3</b>	<b>0.7%</b>
<b>Flat Rate</b>	<b>5</b>	<b>1.1%</b>
<b>Total LF</b>	<b>452</b>	<b>100%</b>



# NORCRESS Overall System Map

## Figure 1



**Sewer Asset Management Plan**  
**NORCRESS District**  
**Cumberland County**  
**Project No. 20.02507**

**Legend**

- NORCRESS FORCE MAIN
- NORCRESS GRAVITY SEWER
- LIFT STATION



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## 2.1 FLOW MONITORING

### 2.1.1 Overview

The purpose of flow monitoring was to determine the capacity, average daily flow, and wet-weather flows within areas of the NORCRESS system. This information reveals locations where significant Infiltration and Inflow (I/I) enters the system causing a reduction in available capacity and potential for overflows and sewer backups in the system. Infiltration and Inflow have similar impacts but are contributed to by different sources and can be located and/or resolved using different methods.

Infiltration is water, besides wastewater, that seeps into the sewer system through the ground. Typical infiltration sources include broken pipes, defective pipe joints, damaged manhole walls, and broken service connections. Infiltration typically enters a system slowly and may remain evident in the sewer system for several days following a rainfall event. Although infiltration generally does not produce high peak flows, infiltration regularly results in large volumes if I/I.

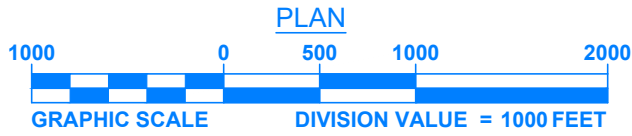
Inflow is water, besides wastewater, that enters the sewer system directly. Typical inflow sources include storm/sewer cross-connections, roof leader connections to sewers, vented manhole covers, and missing cleanout caps. Inflow produces rapid flow increases and often causes sewer system surcharging and overflows during rainfall events. Inflow regularly results in peak I/I flow and high peaking factors.

### 2.1.2 Investigation

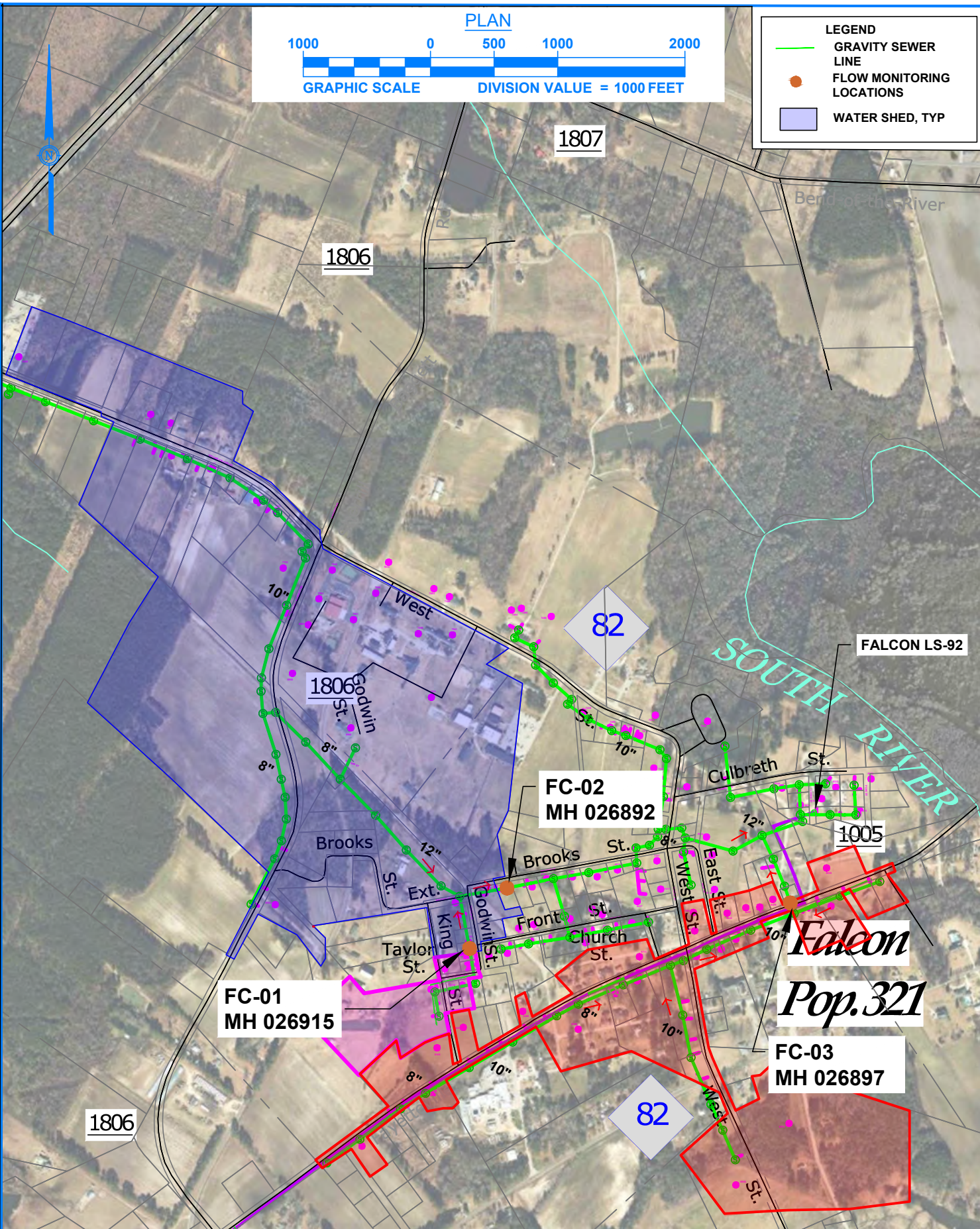
Meetings were held with County staff to identify areas of concern within the sewer system and select locations to place flow meters. McGill reviewed the results of the 2021 Freese and Nichols NORCRESS Study, in which the recommendation was to further monitor the flow in Godwin and Falcon. Both of those Towns produced higher than anticipated flow during the period of monitoring during that study. From discussions with County staff, it

was determined that flow monitors would be placed within the Towns of Godwin and Falcon. Three sewersheds were developed for each Town, resulting in the placement of three flow monitors in each Town. Utilizing staff from KRG Utility, McGill owned flow monitors were installed and flow was monitored from October 18 through November 28, 2023. A map of both Towns and the sewersheds and monitoring locations is shown in Figure 2 and Figure 3. The shaded areas denote the sewersheds for each site.





LEGEND	
	GRAVITY SEWER LINE
	FLOW MONITORING LOCATIONS
	WATER SHED, TYP



P:\2020\20.02507-CUMBERLAND-ENGINEERING\DRAWINGS\FIGURES\20.02507 FLOW MONITORING FIGURE.DWG PLOT DATE 3/21/2024 3:52 PM DEMI WATKINS

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<b>DATE</b>	OCTOBER 2023
<b>PROJECT #</b>	20.02507
<b>PROJECT MANAGER</b>	M. JONES

**ASSET MANAGEMENT PLAN**  
**CUMBERLAND COUNTY PUBLIC UTILITIES**  
CUMBERLAND COUNTY, NORTH CAROLINA

NORCRESS FLOW  
MONITORING IN FALCON

SHEET  
**FIG 2**







### 2.1.3 Methodology

Average dry-weather flows provide the basis for capacity and wet-weather flow analyses. To develop the average dry-weather flows, McGill averaged the flows for each day with typical flow (no rain events or evidence of silt/debris). Several days that fit this criterion were used in the calculation to acquire the dry-weather flow each respective meter. If present, daily groundwater infiltration into the sewer system is included in the reported average daily flows.

During the flow monitoring period, rain events were recorded on October 21, Nov 11-13, and November 23 based on rainfall data recorded at the Fayetteville Regional Airport (provided in Appendix C). The flows at each of the six flow monitoring devices were recorded during these events. The rainfall event on October 21 was less than 0.5 inches and did not cause I/I based on the monitoring data. The events from November 11-13 and November 22 recorded over 2 inches of rainfall and did contribute I/I into the system. Anticipated flows for each basin were estimated based on the dwellings served. The range represents the estimated value based on usage of 225 gpd/dwelling, which is the updated estimate from 360 gpd/dwelling based on NCAC 02T rules. Dry weather flows were approximated based on the flow seen between rain events at the meter. Actual average daily flow recorded by the meters is also noted.

**Table 3: Summary of Flow Monitoring Drainage Areas**

Site	Flow Meter Location	Structures/Dwellings	Area (acres)	Estimated Flow (gpd)	Dry Average Flow (gpd)	Total Average Flow (gpd)
FC-01	Godwin St	5	14.4	22,925*	11,970	12,070
FC-02	Brooks St	22	224.3	16,050*	23,170	24,970
FC-03	Fayetteville Rd	22	88.9	4,950	1,660	1,625
GW-01	Burnette Rd	17	111.8	6120	7,800	7,930
GW-02	Dunn Rd	21	84.1	7560	7,875	7,290
GW-03	Dunn Rd	13	95.0	4680	4,560	4,340

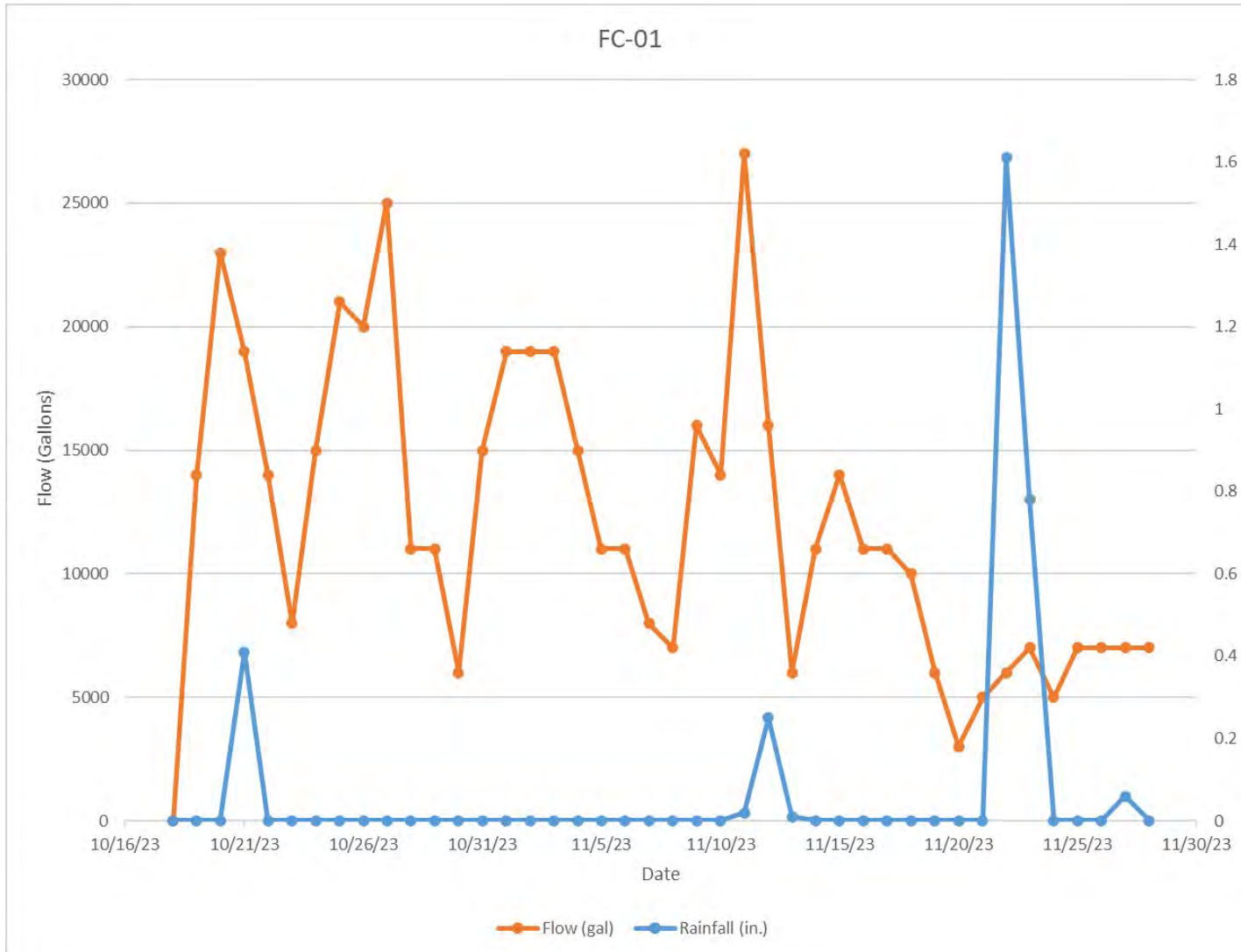
\*FC-01 and FC-02 Expected Flows include estimated average daily flows for Martins Meats and the Falcon Children’s home. These two entities represent the largest water users in the system.

**Table 4: Summary of Large Users In Falcon**

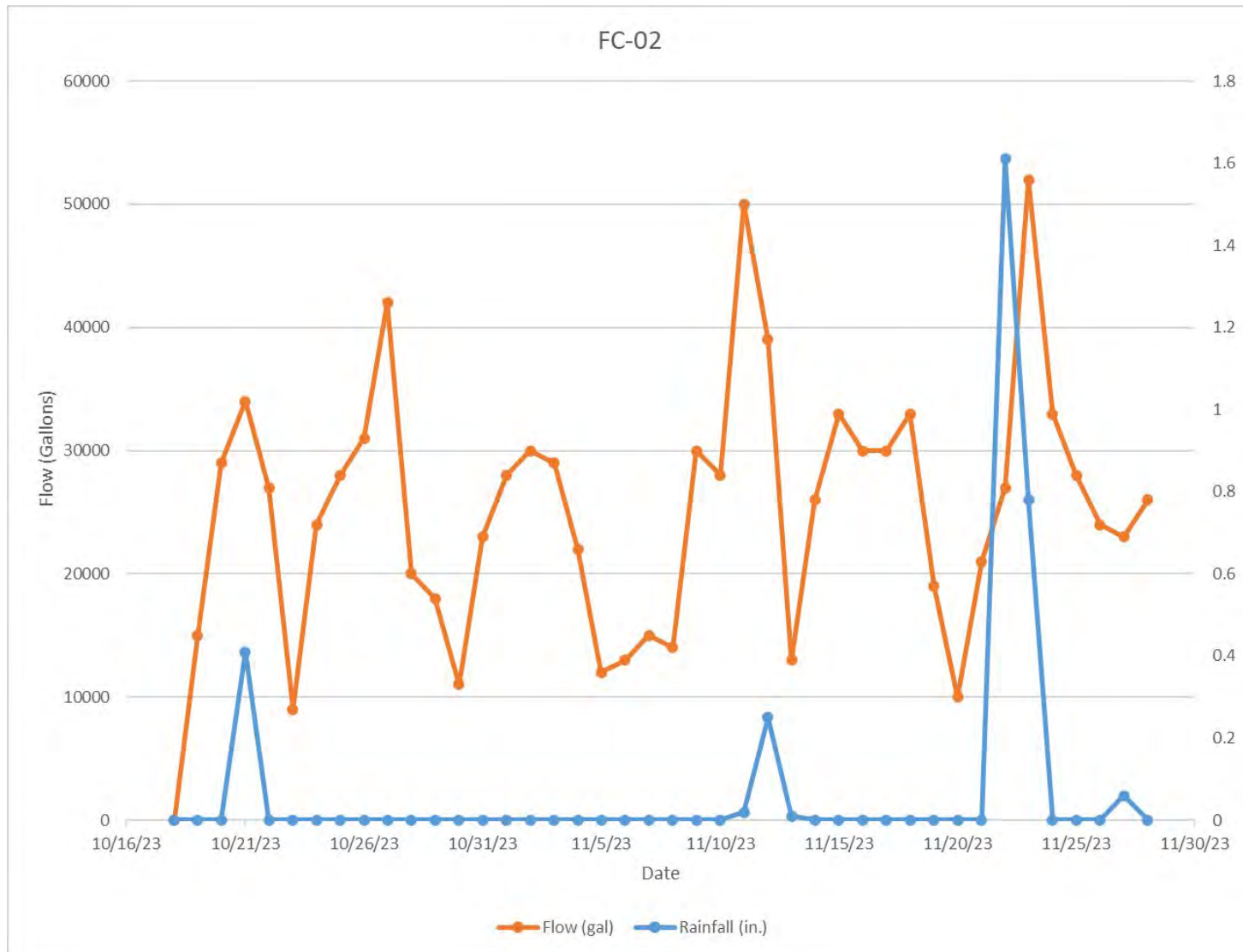
	<b>Total Water Usage (gal)</b>	<b>Total Sewer flow (gal)</b>	<b>Notes</b>
<b>Martins (Accts: 562,665,808)</b>			
October	736,630	202,000	<i>Sewer Flow monitored 10/18-10/31</i>
November	573,810	305,000	<i>Sewer Flow monitored 11/1-11/28</i>
Avg Flow (gpd)	21,840.67		
<b>Falcon Children's Home (Accts: 96,97,98,101,102,103,208,209,210,211,213,328,378,495,585,913,914,915,982,1052)</b>			
October	406,750	109,000	<i>Sewer Flow monitored 10/18-10/31</i>
November	258,500	433,000	<i>Sewer Flow monitored 11/1-11/28</i>
Avg Flow (gpd)	11,087.50		



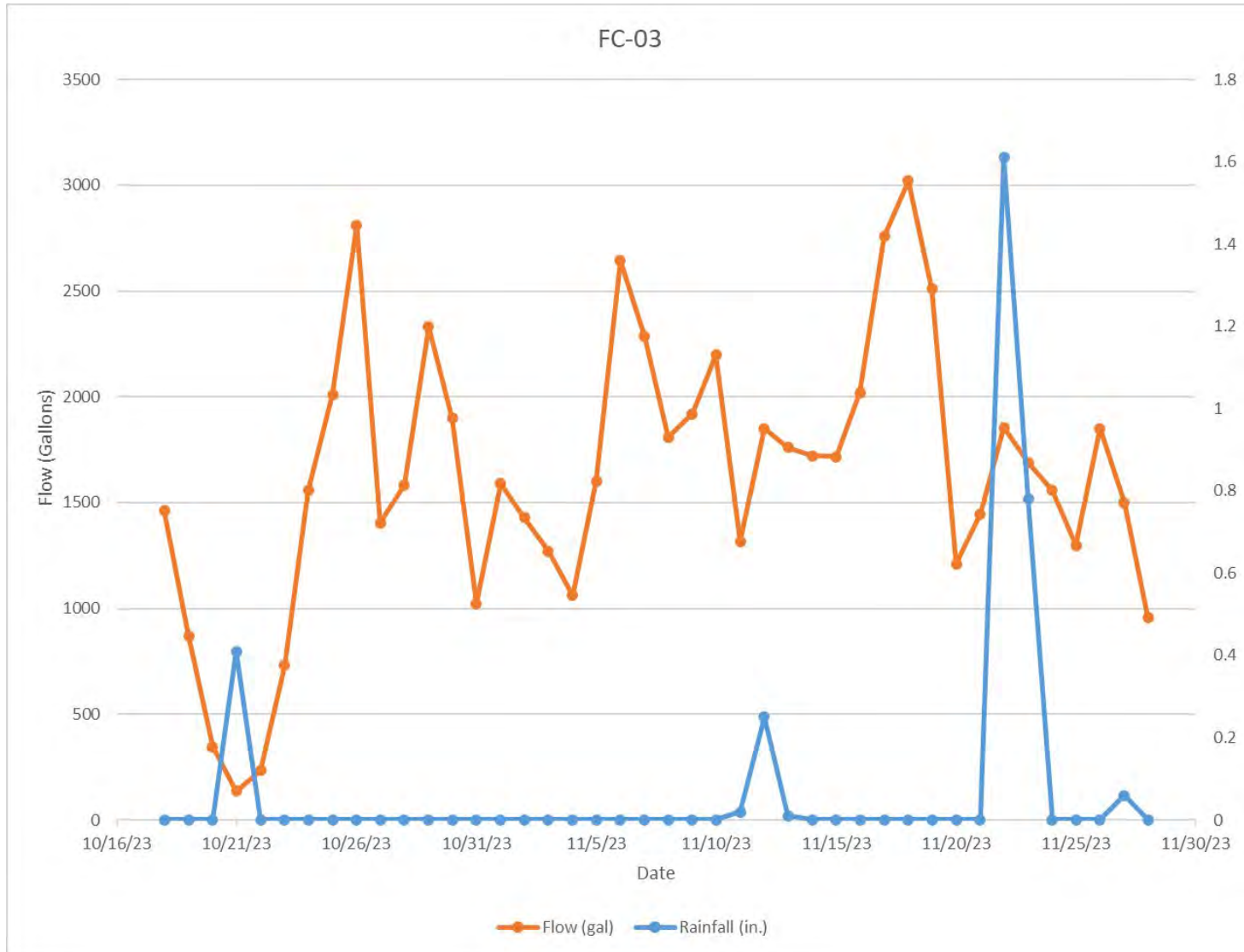
**Graph 1: Falcon Location 01, Daily Flow vs. Rainfall**



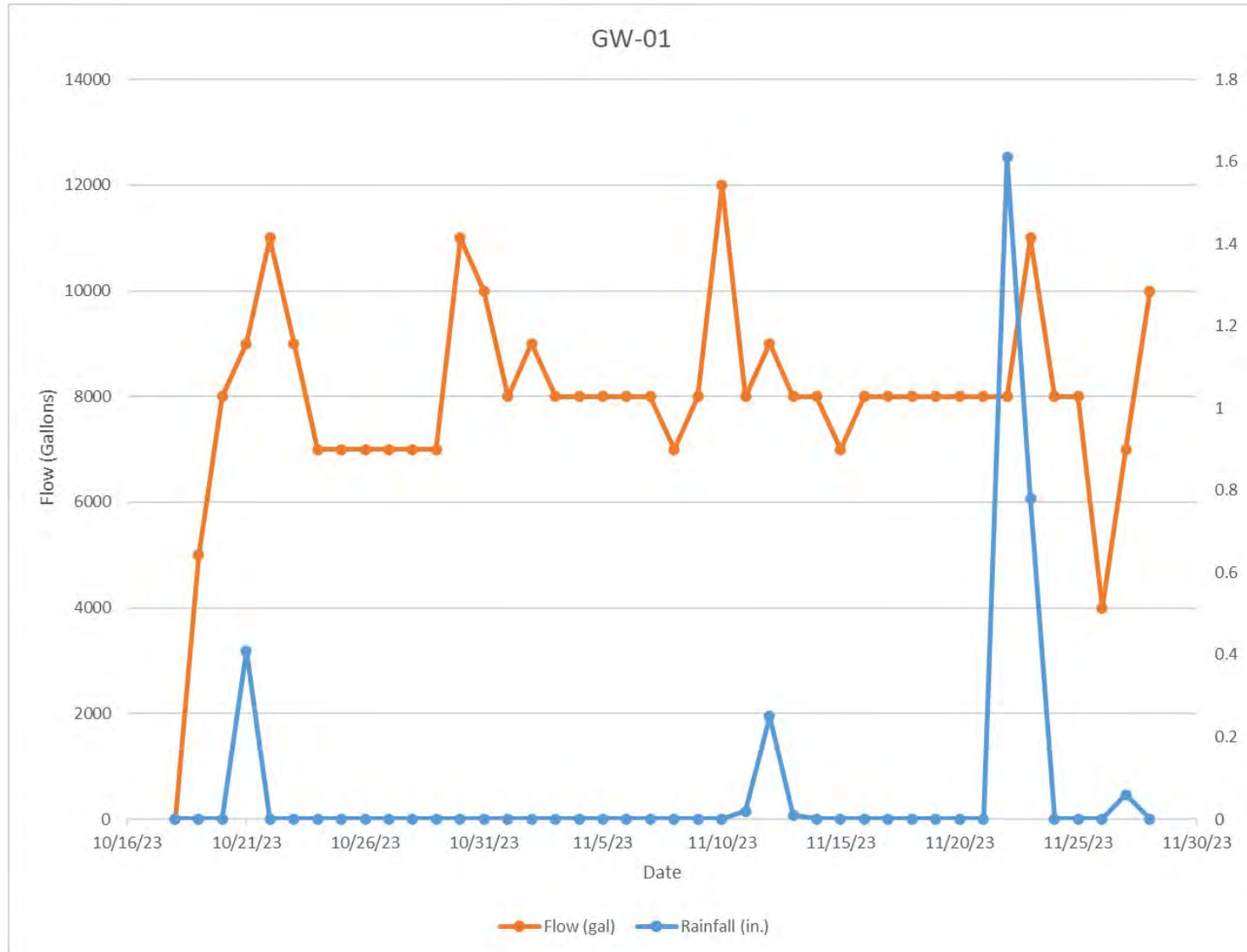
**Graph 2: Falcon Location 02, Daily Flow vs. Rainfall**



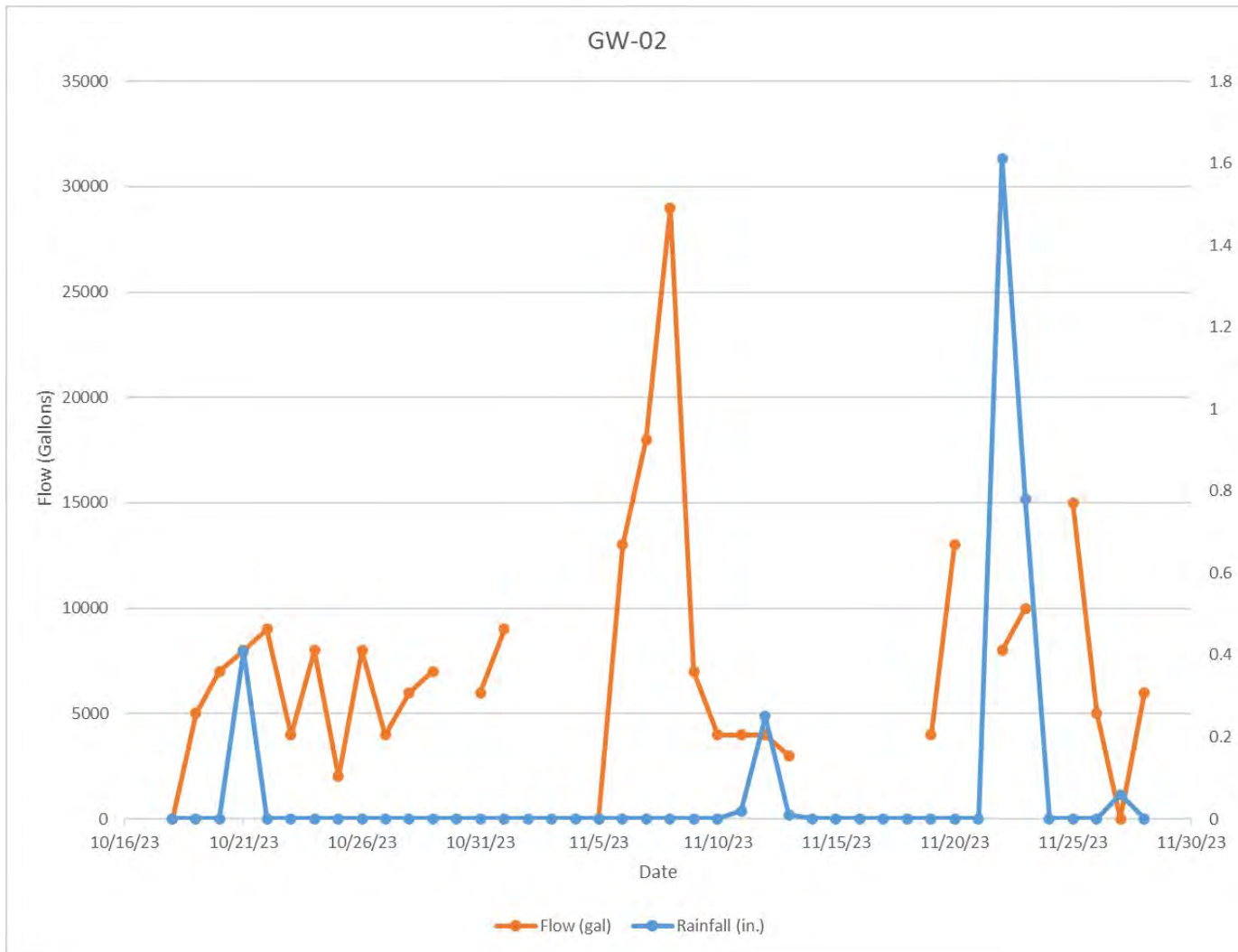
**Graph 3: Falcon Location 03, Daily Flow vs. Rainfall**



**Graph 4: Godwin Location 01, Daily Flow vs. Rainfall**

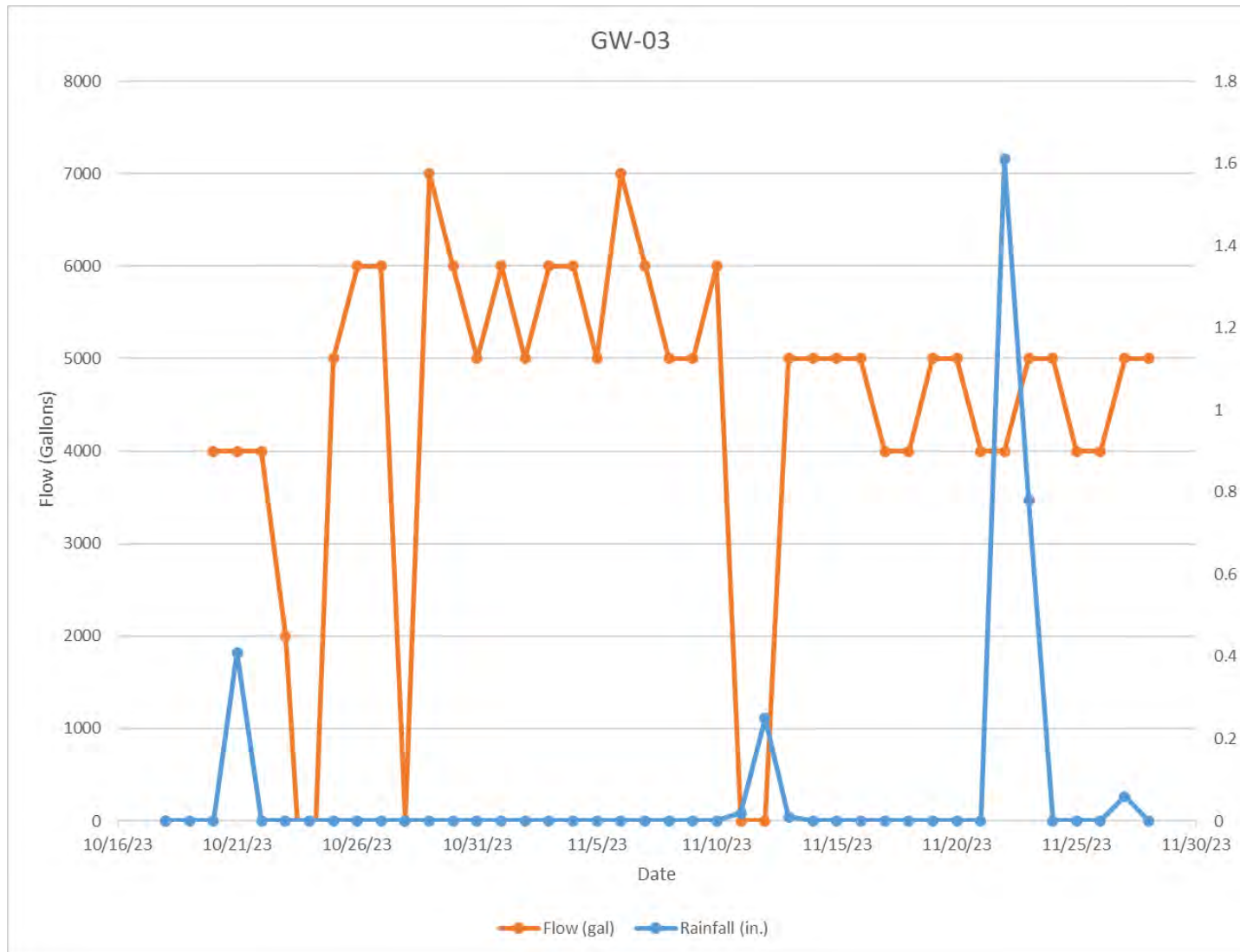


**Graph 5: Godwin Location 02, Daily Flow vs. Rainfall**



Note: Several segments on the graphed flow line show no recorded flow as a result of a negative recorded reading for total flow during the day. There was evidence in the manhole of flow backing up to the mounted meter during this period.

**Graph 6: Godwin Location 03, Daily Flow vs. Rainfall**



#### **2.1.4 Results**

The purpose of the flow monitoring was to determine which locations in the NORCRESS wastewater collection system were the best candidates for further field testing to uncover sources of I/I and other issues. Flow monitoring revealed the following behaviors for the sites/sewersheds depicted in Figure 1:

- All sites had sufficient capacity to handle current dry-weather flow.
- No locations exhibited significant I/I indicators
- Location FC-02 had evidence of inflow as the flow spiked during rain event but then returned quickly.
- Most of the locations monitored showed flows following events that were typical based on dry weather conditions.
- Flow from Martin's Meats do not appear to exceed water usage based on FC-01.
- Flow from Falcon Children's Home does appear to exceed water usage based on FC-02.

The County experiences frequent issues with increased flow from the NORCRESS system that exceeds water usage in the system. Given the results of flow monitoring, it is recommended that additional flow monitoring be performed in Falcon. Additionally, further investigation of possible groundwater or other sources of flow into the system from the Falcon Children's Home property.

In terms of additional monitoring, McGill recommends mid-term flow monitoring of the Falcon area (and any other areas where I/I or unaccounted flow is suspected). Duration would be for a year to begin with, in order to have 12-months of data to review against rainfall and water usage.



## **2.2 SMOKE TESTING**

### **2.2.1 Overview**

Smoke testing is one of the most cost-effective ways to locate defects in sewer mains and laterals. In this process, artificially produced non-harmful smoke is injected into the sewer line via a blower placed over a selected manhole. The pressurized smoke travels up and down the sewer line and connections and emerges at openings in the system. This visual aide allows test crews to easily identify, record, and mark locations where defects are present. If the sewer is in good condition, one should only see smoke rising from manhole lids and house roof vents. If the line has defects, such as breaks or illegal connections, the smoke will emerge at these points.

### **2.2.2 Investigation**

McGill met with County staff to identify areas that would benefit most from smoke testing. Based on the size of the NORCRESS District and having the use of the County's team and equipment in addition to McGill, it was determined that the entire system could be smoke tested. McGill prepared a detailed map of the areas based on the County's GIS database. The Fire Department and customers along the route were alerted to the upcoming testing.

### **2.2.3 Methodology**

McGill and County staff smoke tested all 26 miles of gravity sewer lines over a period of three days to determine locations where I/I enter the wastewater collection system. For each line to be tested, County staff recommended a centrally-located manhole on which to place the blower based on the manhole's accessibility and avoidance of traffic. The manhole nomenclature used by the County was utilized and the location, configuration and condition of each one was recorded.

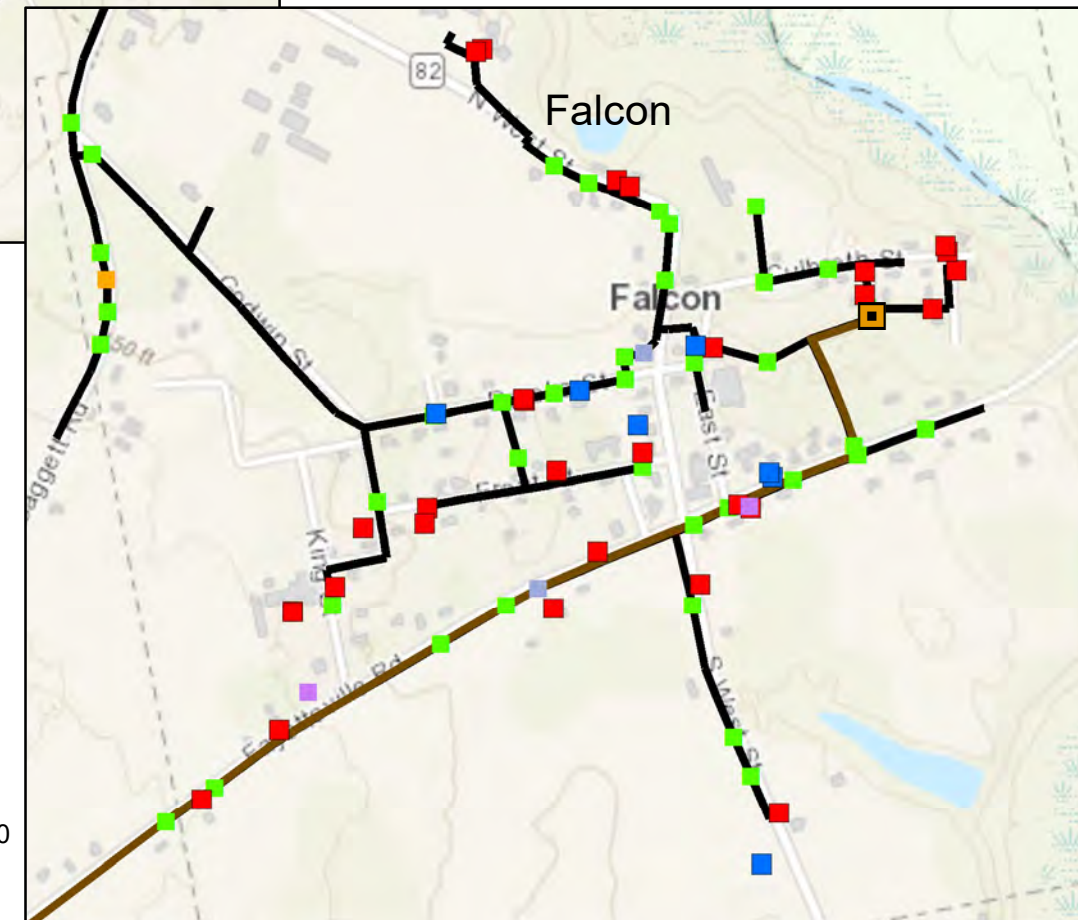
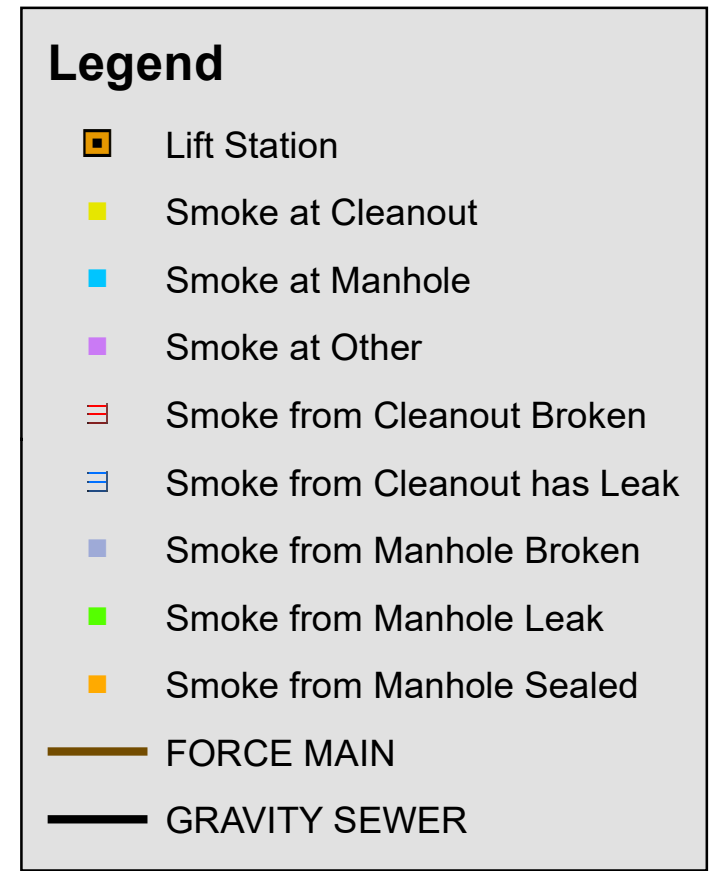
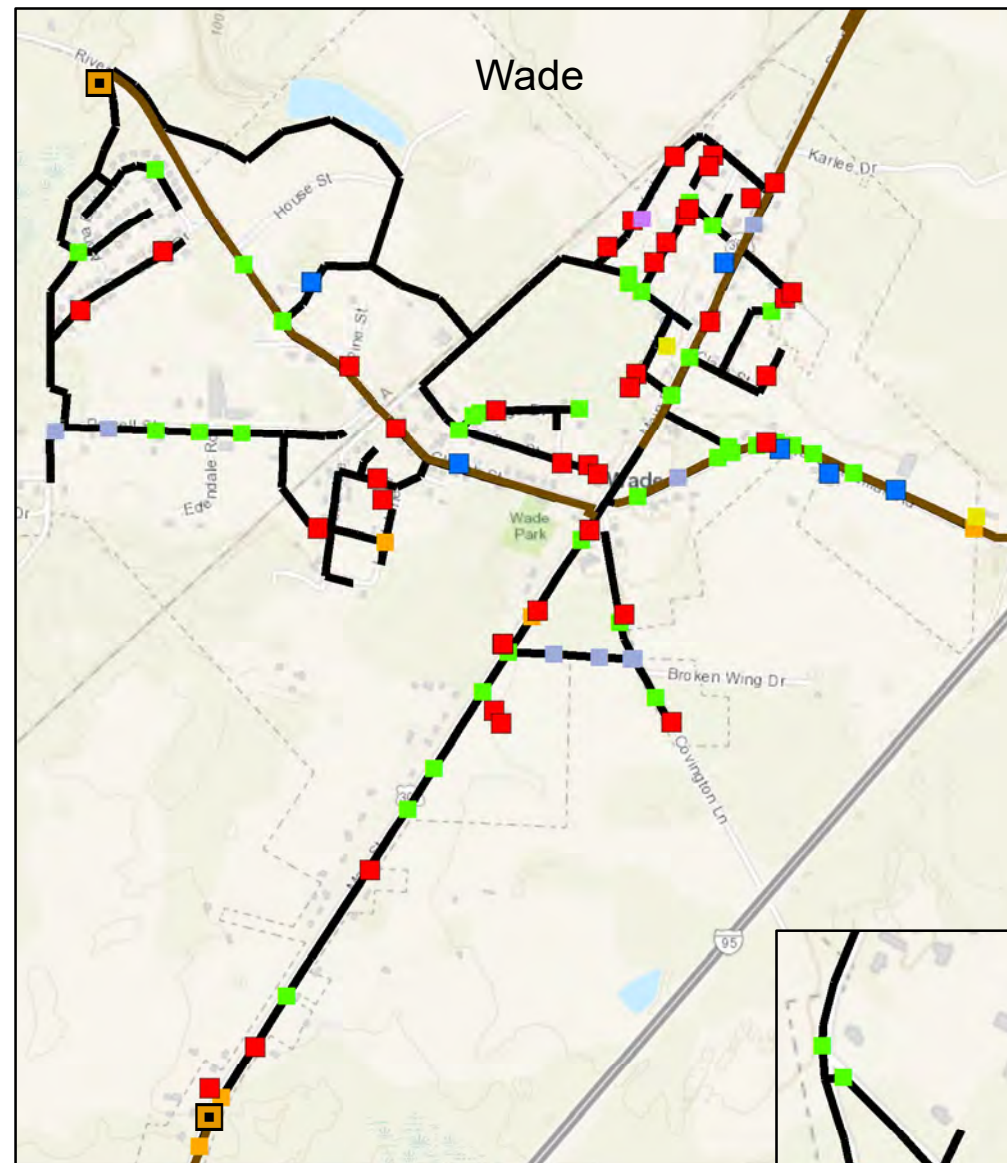
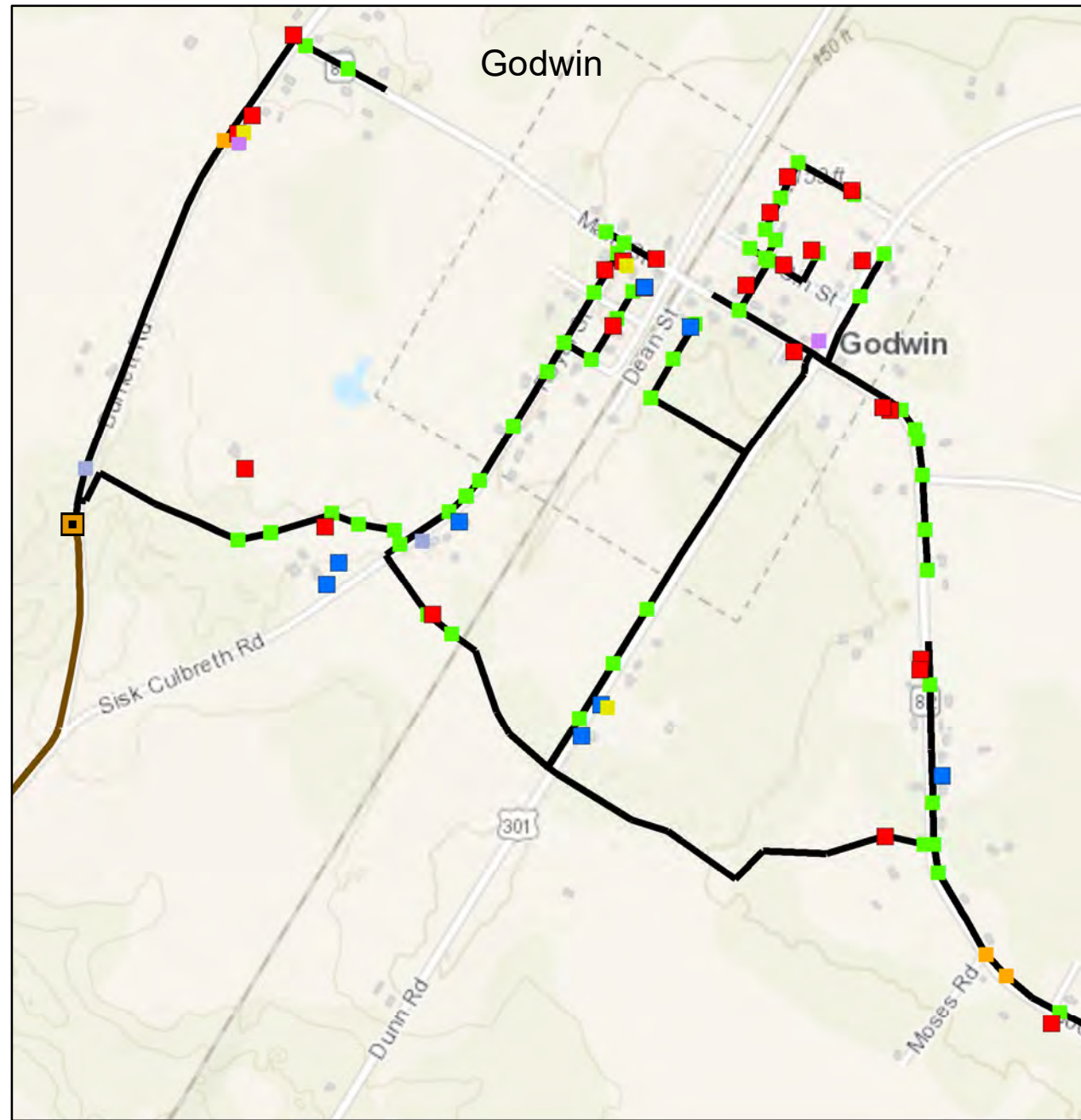
At each location, the following procedure was executed.

1. Place the blower on the manhole (with the rubber seal, if necessary).
2. Fill smoke pump up to  $\frac{3}{4}$  with liquid smoke.
3. Close all smoke pump valves.
4. Start blower and allow to warm up.
5. Open smoke pump valves.
6. Pressurize smoke pump by pumping the canister manually.
7. Once smoke begins emerging from roof vents, begin surveying for smoke emergencies indicating defects or problem areas in the pipeline.
8. For each defect, record the opening type, address, manhole identifier, and notes.
9. Additionally, mark each defect with paint.

This process continued until all visible defects were marked and recorded. Figure 4 shows some problematic system openings.

# NORCRESS Smoke Testing Map

## Figure 4

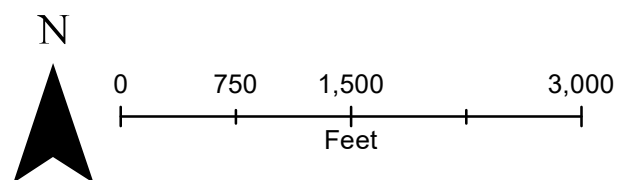


**Sewer Asset Management Plan**  
**NORCRESS District**  
**Cumberland County**  
**Project No. 20.02507**



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### **2.2.4 Results**

The crew recorded 240 abnormal smoke outlets, which divided generally into five categories.

1. Broken or uncapped cleanouts: Several cleanout caps were missing or broken. The cumulative number of broken cleanouts in the District can contribute to significant I/I. County staff had repair caps on hand during the testing and was able to install new caps where needed.
2. Ground Smoke: Ground smoke can be the result of broken lines, joint separation, etc. Any of these problems can cause significant I/I.
3. Unsealed manholes: Some manholes emitted excess smoke indicating cracked concrete or offset rings. Manholes located in ditches are most likely to contribute I/I.
4. Connected storm drains and culverts: Storm drains and culverts connected to the sanitary sewer systems contribute significant amounts of I/I into the system. These connections are good candidates for video testing.
5. Unknown: Some smoke occurrences require further investigation to determine the type of opening.

A spreadsheet describing all smoke occurrences can be found in Appendix A and all locations were documented in the mapping information in ArcGIS for the County staff to use.



## **2.3 SEWER MAINS**

### **2.3.1 Overview**

NORCESS sewer mains consist of polyvinyl chloride (PVC) and ductile iron pipe. The District's existing sewer lines range from 8-16 inches in diameter. The age of the system and system materials were confirmed by the County based records from construction of the system in 2005. Condition was determined based on visual inspection of select manholes and smoke testing of the system.

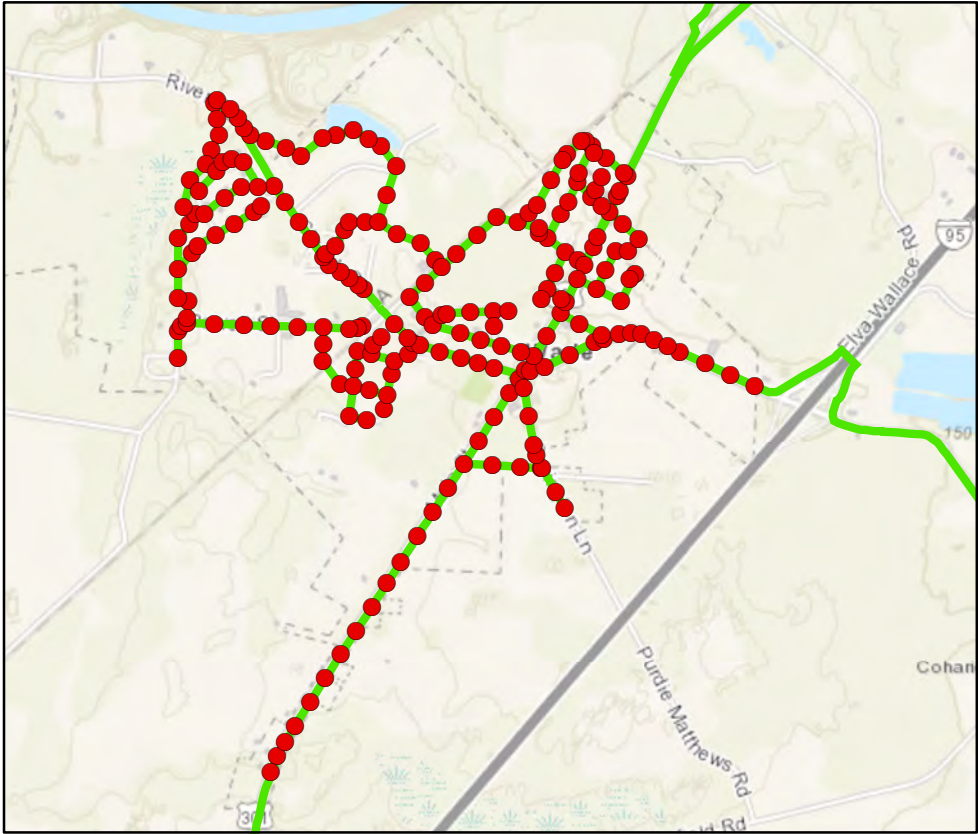
### **2.3.2 Investigation**

With County input, McGill has reviewed the District's data on sewer mains throughout the collection system. The sewer main material and diameters were verified by the County and updated according to GIS records. Figure 5 shows the sewer line materials in the system, and Figure 6 shows the sewer line diameter throughout the system.

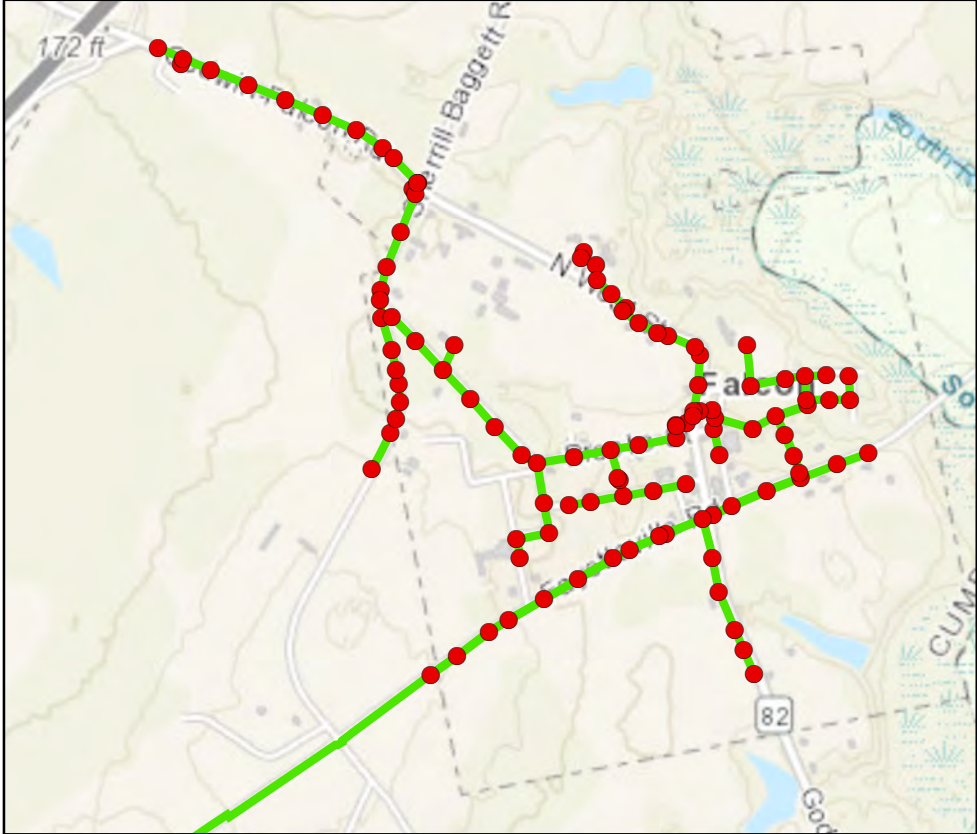
The purpose of this portion of the assessment was to create a working system inventory and then review which areas of the NORCESS District have system components in need of replacement or rehabilitation.

# Norcross Line Material Map Figure 5

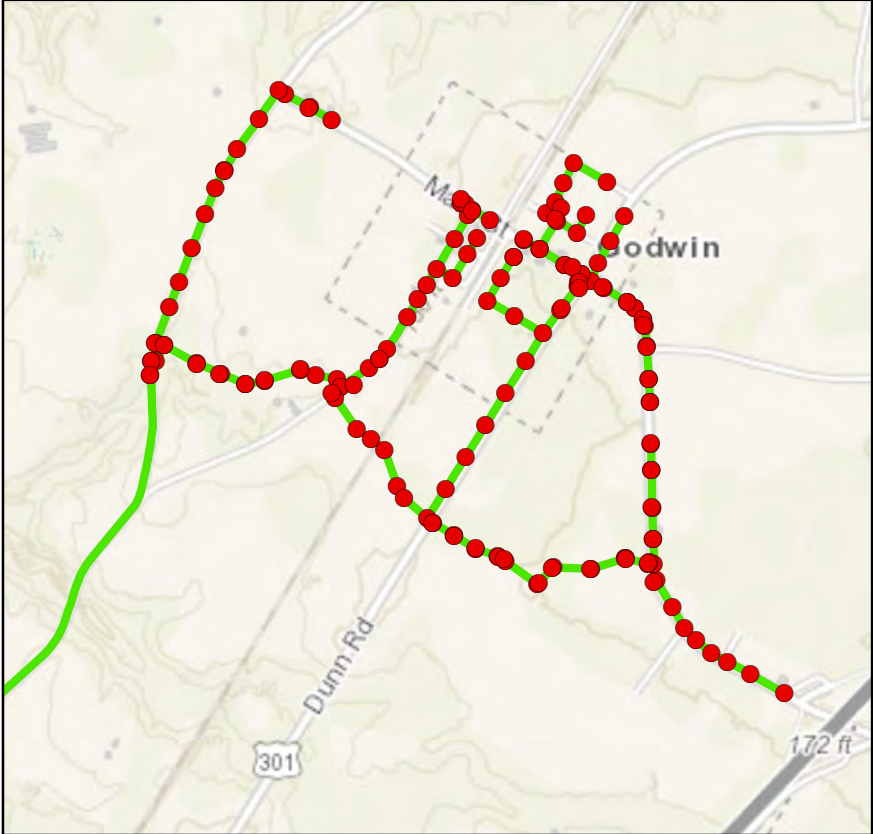
Wade



Falcon



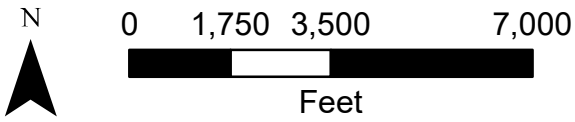
Godwin



**Sewer Asset Management Plan  
NORCRESS District  
Cumberland County  
Project No. 20.02507**

**Legend**

- PVC
- Norcross Manholes



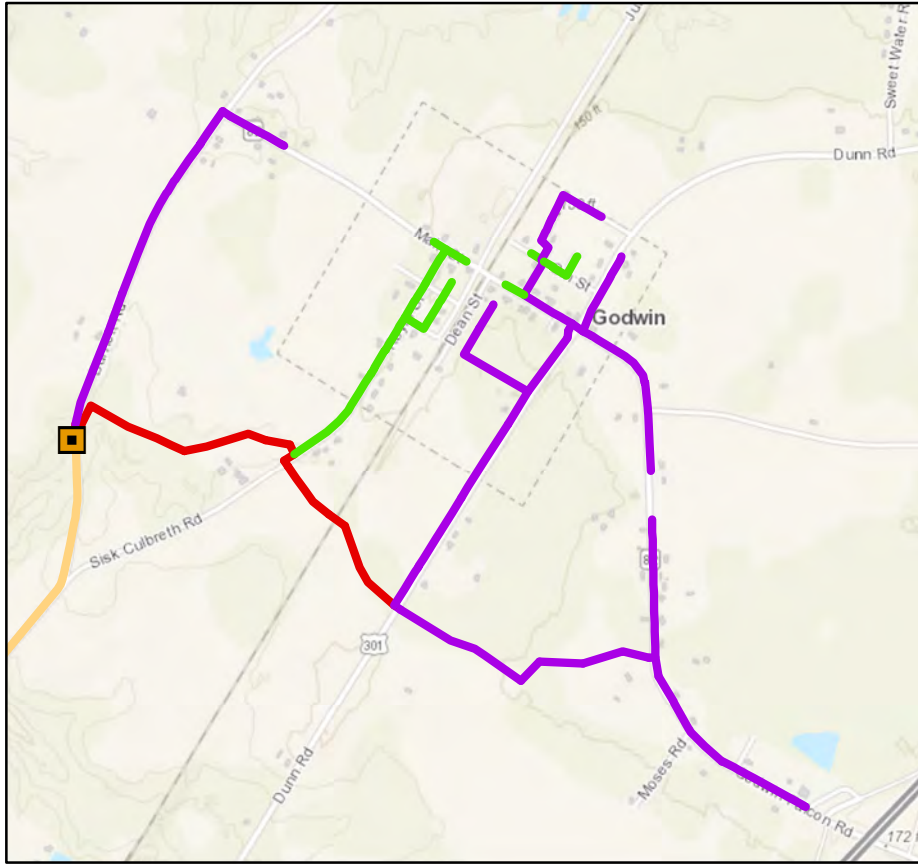

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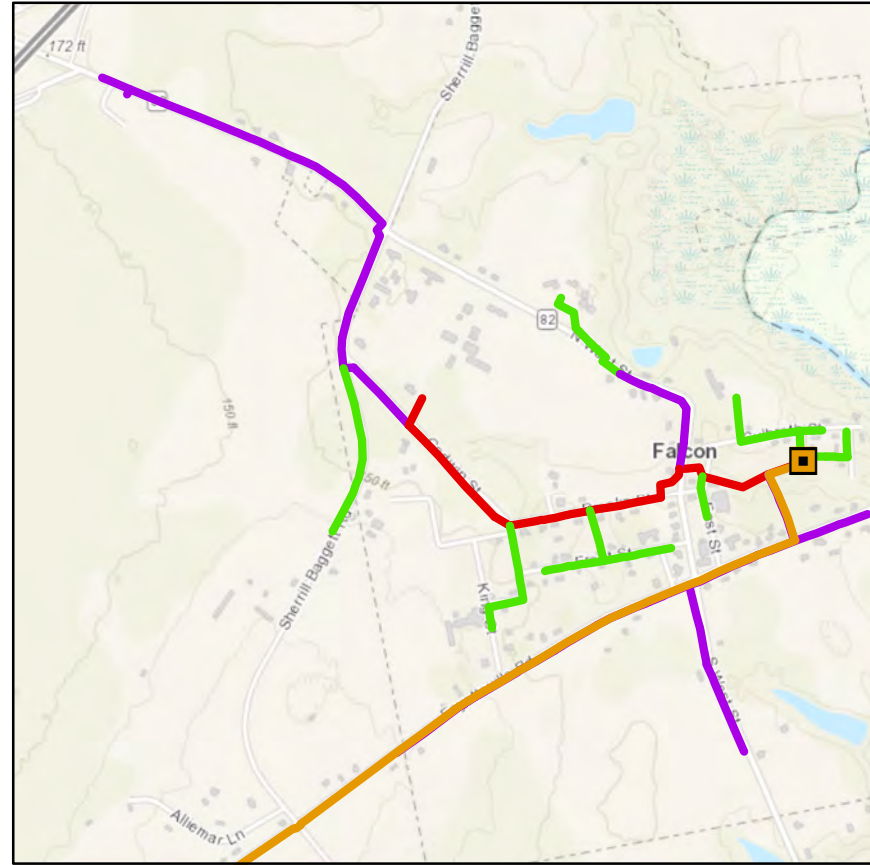
# NORCRESS Sewer Line Diameter Map

## Figure 6

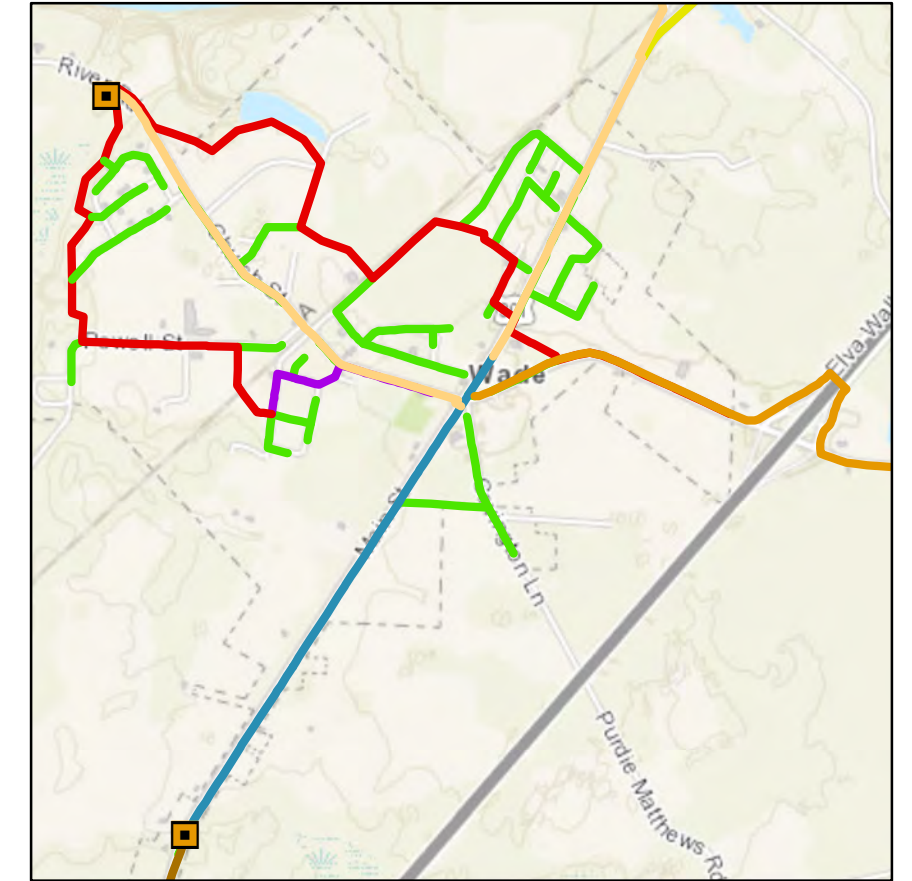
Godwin



Falcon



Wade



**Legend**

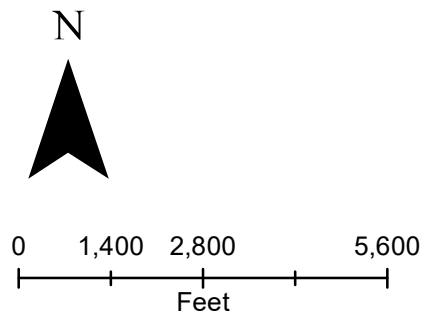
**GRAVITY SEWER DIAMETER**

- 8"
- 10"
- 12"
- 15"

**FORCE MAIN DIAMETER**

- 3"
- 6"
- 8"
- 10"

Lift Station



**Sewer Asset Management Plan**  
**NORCRESS District**  
**Cumberland County**  
**Project No. 20.02507**

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\*PVC Material throughout Norcross System



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### 2.3.3 Methodology

McGill reviewed the County's GIS data for the sewer collection system. County staff provided information on manholes where deterioration was suspected. Flow monitoring and smoke testing were performed throughout the system. The County's GIS mapping was utilized to create maps that document the collection system by material and by diameter.

### 2.3.4 Results

The existing gravity sewer pipe in the sewer system ranges from 8-inch to 16-inch in diameter based on County records. All pipe diameters therefore do meet current NCDEQ minimum design standards. Based on the age of the system, the PVC and ductile iron pipe installed in 2005 have not exceeded its useful life, and therefore replacement is not recommended outright. Recommendations will include planned CCTV inspections by the County of the existing piping in order to verify existing condition and provide future updates to this AMP/CIP. Based on the age of the pipes and no documented issues from County staff, pipe in the system has been noted to be in good/excellent condition. Tables 5 through 9 show the assessment based on material and then broken out by diameter and age.

**Table 5: Summary of Gravity Sewer Main by Material**

<b>Material</b>	<b>Diameters (in)</b>	<b>Total LF</b>	<b>% of System</b>
<b>Polyvinyl Chloride</b>	<i>8, 12, 15</i>	<b>134,275</b>	<b>97.2%</b>
<b>Ductile Iron</b>	<i>8, 16</i>	<b>3,907</b>	<b>2.8%</b>
<b>Total LF</b>	<b>N/A</b>	<b>138,182</b>	<b>100%</b>

**Table 6: Summary of Gravity Main Sewer Main by Diameter**

Diameter	Total LF	% of System
8"	85,144	37.71%
10"	23,235	27.29%
12"	22,720	26.68%
15"	7,083	8.32%
<b>Total LF</b>	<b>138,182</b>	<b>100%</b>

**Table 7: Summary of Force Main by Material**

Material	Diameters (in)	Total LF	% of System
Polyvinyl Chloride	8, 12, 15	73,650	93.6%
Ductile Iron	8, 16	4,015	5.1%
HDPE	8	1,013	1.3%
<b>Total LF</b>	<b>N/A</b>	<b>78,678</b>	<b>100%</b>

**Table 8: Summary of Force Main Sewer Main by Diameter**

Diameter	Total LF	% of System
3"	4,082	5.2%
6"	28,123	35.7%
8"	35,364	45.0%
10"	11,109	14.1%
<b>Total LF</b>	<b>78,678</b>	<b>100%</b>

**Table 9: Summary of Pipe Condition by Age**

Year Put Into Service	Type	Total LF	% of System
2005	Gravity	138,182	64%
2005	Force Main	78,678	36%
<b>Total LF</b>		<b>216,860</b>	<b>100%</b>

## **2.4 MANHOLE INSPECTIONS**

### **2.4.1 Overview**

Manholes are the primary access points to the sanitary sewer system and are essential for its operation and maintenance. As they allow personnel access to the sewer system, manholes are also likely culprits for allowing I/I to enter the sewer system. Manholes in low-lying areas with improperly sealed lids, manhole joints, and poor connection practices can all be sources of I/I. Storm drains or the presence of manholes in ditches and low-lying areas in NORCRESS frequently allow standing water to remain for hours or days after a storm event which can exacerbate inflow through manhole lids.

One of the most cost-effective practices for managing this intrusion is visual manhole inspections, where the various components of the manhole are rated according to their condition. Some examples of noticeable deficiencies are benches which have deteriorated from abrasion and corrosion and rings which can be moved by traffic, soil, and the freeze/thaw cycle. Defects in any aspect of the manhole can lead to I/I, structural instability, and manhole failure.

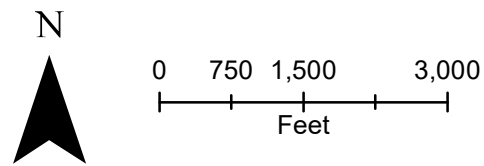
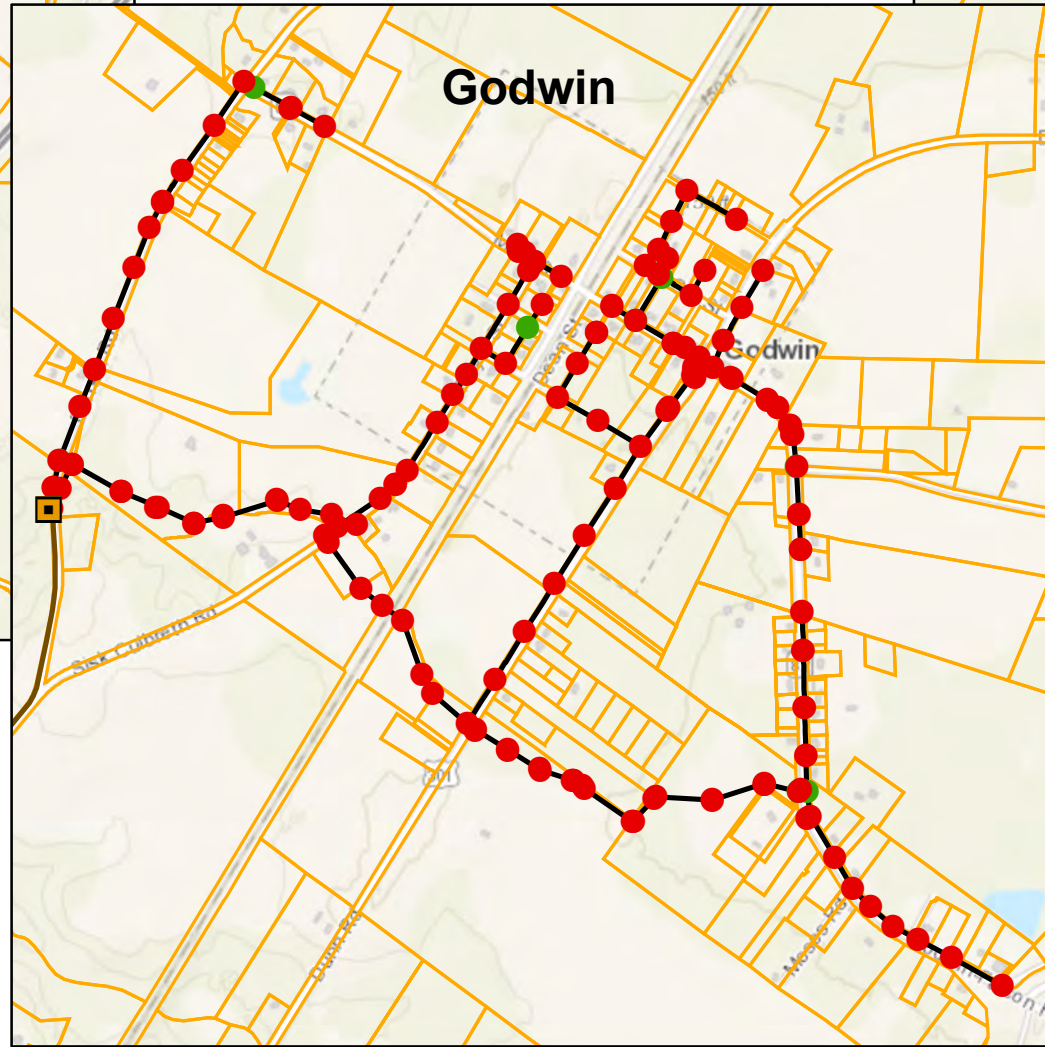
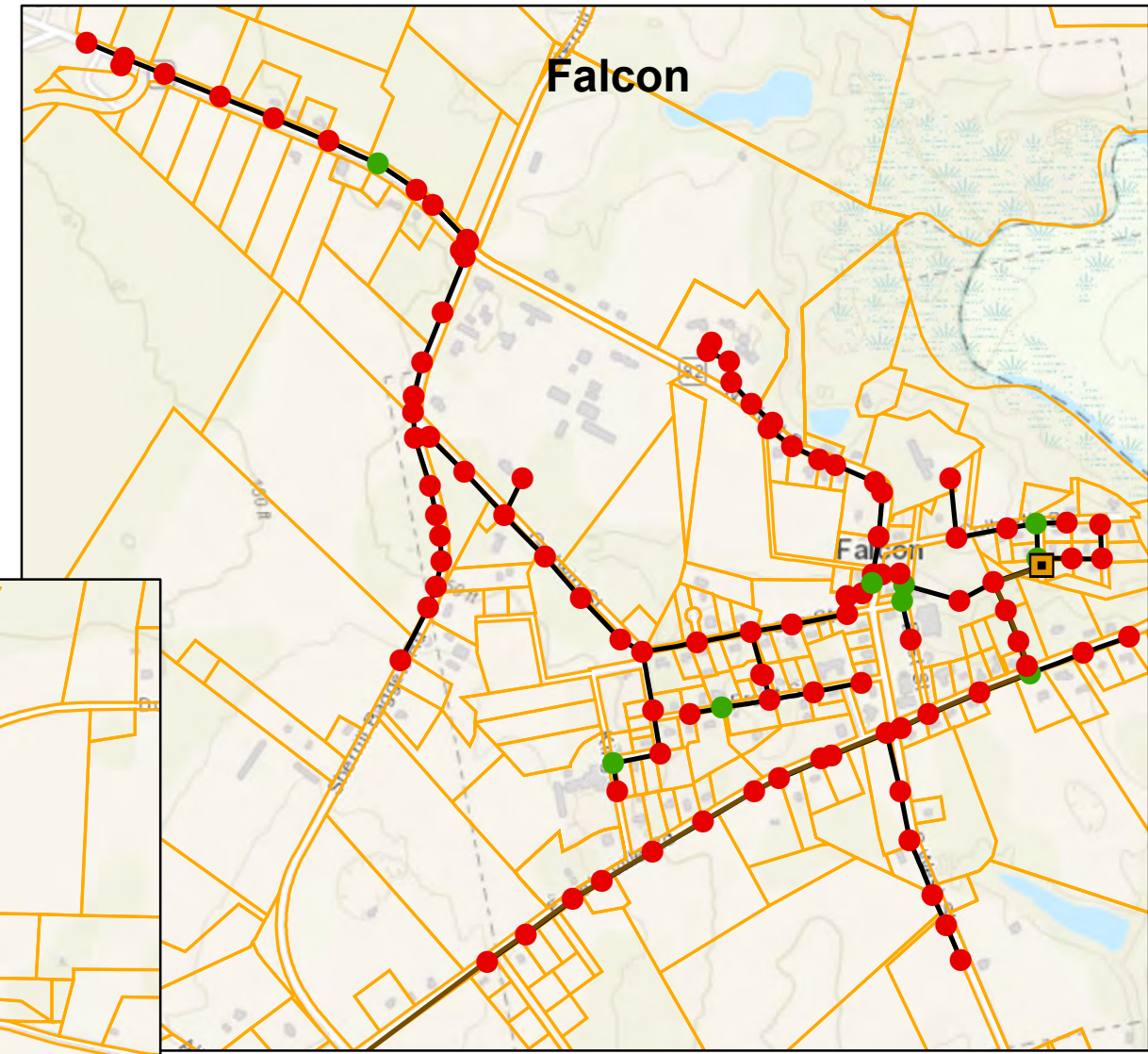
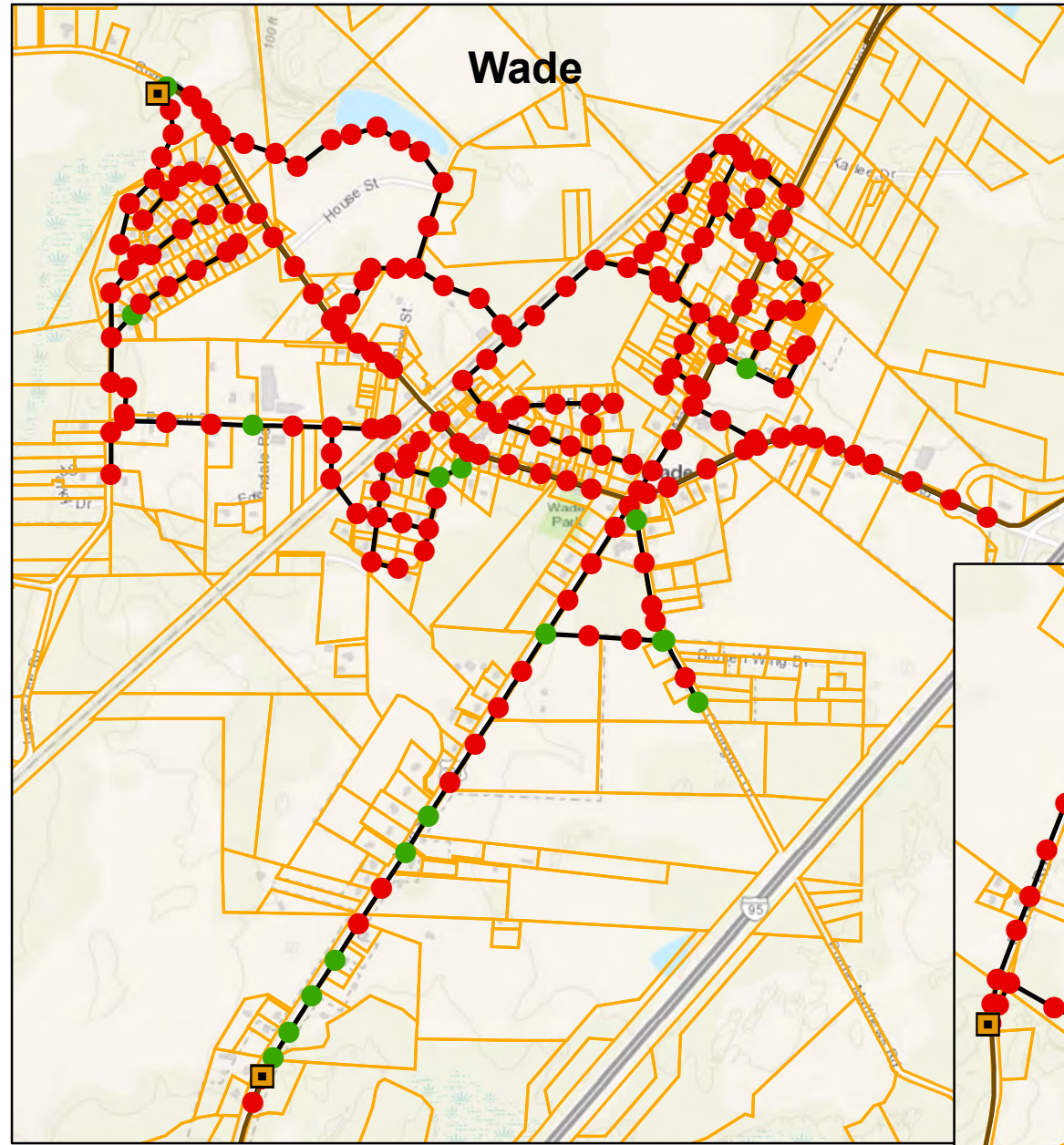
### **2.4.2 Investigation**

After the NORCRESS system was put into service, the GIS record was created in 2006. The purpose of this portion of the assessment was to perform field inspections of select manholes within the system to develop an overall system assessment. A total of 424 manholes are currently inventoried by the District. Approximately 37 manholes were inspected as a part of this inventory and assessment. The map including all manholes that were inspected is shown in Figure 7.



# NORCRESS Manhole Inspection Map

## Figure 7



**Legend**

**Manholes**

**Condition**

- Not Visited
- Good
- NORCRESS FORCE MAIN
- NORCRESS SEWER MAIN
- Lift Station
- Tax Parcels



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**Cumberland County**  
**Project No. 20.02507**

### **2.4.3 Methodology**

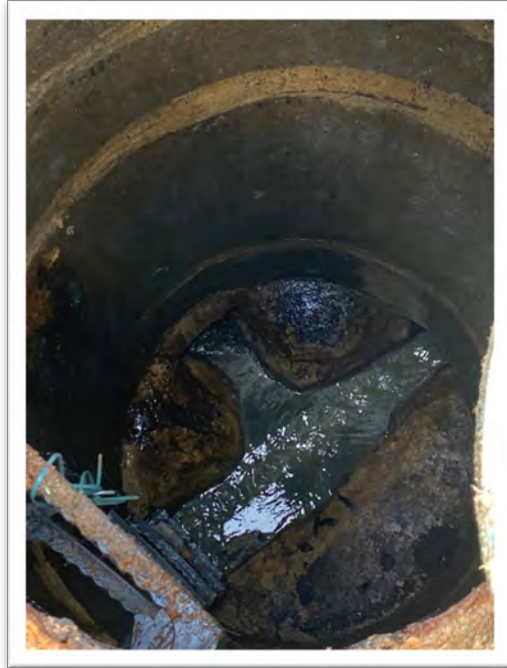
The NORCRESS District sewer collection system contains 424 sewer manholes. Working with County staff, McGill inspected selected manholes within the sewer system to obtain a representative condition sampling. County staff determined which manholes to inspect in each area based on manhole location and orientation. Manholes prioritized for inspection include those located in existing ditches or low-lying areas where the manhole would be susceptible to degradation and inflow from surface water. At each manhole, the inspector recorded the manhole's location, dimensions, material, and condition of its various components. All information including photographs of the interior of the manhole and top area were uploaded into the GIS mapping.

Some typical distresses include:

- Wear and asphalt paving on the cover;
- Corrosion and mud seepage on the ring and frame;
- Gas residue, corrosion, seepage, and deteriorating concrete on the cone and riser;
- Wetness, silt, root intrusion, and deteriorating concrete on the barrel;
- Dirt and corrosion on the rungs;
- Silt accumulation on the bench; and
- Misaligned pipes, obstructions, trough deteriorating, standing water, and no flow in the channel.

Based on the recorded comments, each component was assigned a condition score, and these scores were combined into an overall condition rating for each manhole- excellent, good, fair, or poor. The images below depict the interiors of various condition manholes.





*SMH 028208, River Road in Wade. Manhole shows minor corrosion over time.*



*SMH 028044, Main Street in Wade. Rehabilitated manhole with lining, some corrosion on frame.*



*SMH 027930, Main Street in Godwin. Manhole in good condition.*



*SMH 026913, King Street in Falcon. Manhole in good condition.*



#### 2.4.4 Results

All of the 37 inspected manholes were precast manholes. Due to the relative low age of the system, County staff confirmed that all of the existing manholes in NORCRESS are precast sewer manholes. Of the manholes observed, a majority were noted as good condition, and others observed were described as poor condition. Based on the condition of those observed, it is suspected that the remaining manholes not inspected would have similar condition to those observed. Tables 10 and 11 summarize the manhole materials and condition.

**Table 10: Summary of Manholes by Material**

<b>Material</b>	<b>Total</b>
<b>Precast Concrete</b>	<b>424</b>
	<b>424</b>

**Table 11: Summary of Manholes by Condition**

<b>Material</b>	<b>Total</b>
<b>Excellent-Good</b>	<b>33</b>
<b>Fair-Poor</b>	<b>4</b>
<b>Unknown</b>	<b>387</b>
	<b>424</b>

The County maintains its collection system using the ESRI platform and includes the attribute data for each manhole. A spreadsheet including condition comments for each manhole can be found in Appendix A.

## 2.5 LIFT STATIONS

### 2.5.1 Overview

The NORCRESS Lift Station is owned and operated by Fayetteville PWC. The station includes a flow meter that is used for recording flow generated by the NORCRESS Sewer Collection System. The capacities of each lift station are listed below.

Falcon Lift Station #92:

Lift Station Design Capacity	70,000 GPD
------------------------------	------------

Wade Lift Station #89:

Lift Station Design Capacity	45,000 GPD
------------------------------	------------

Wade Lift Station #90:

Lift Station Design Capacity	125,000 GPD
------------------------------	-------------

Godwin Lift Station # 91:

Lift Station Design Capacity	10,000 GPD
------------------------------	------------

\*Lift Station Design Capacity information is from the Freese and Nichols report called Northern Cumberland Regional Sewer System Comprehensive Sewer Evaluation.

Recommendations for various sewer system improvements to include the gravity sewer pipe and manholes in the collection system include general recommendations, high priority projects (within 10-years) and future projects (past the 10-year planning window). General recommendations are typically less costly and can be implemented more quickly, whereas high priority projects may require financial assistance and be undertaken in phases.

### **3.1 GENERAL RECOMMENDATIONS**

#### **3.1.1 *Smoke Testing***

Smoke testing is a valuable tool that can be used to locate broken pipe, cleanouts, or manholes that need repair. Any of these issues can be a source for the inflow and infiltration (I&I) of surface water into the sewer collection system. It is recommended that the District perform comprehensive smoke testing of the entire system at least every other year. Additionally, the District should utilize smoke testing on an “as needed” basis to troubleshoot possible problem areas. The most common repairs that would result from smoke testing include replacing missing or broken cleanout caps and removing buildup from manholes. Other repairs that can be performed at this time are patching the exterior concrete or replacing the rings/lids of manholes identified to be leaking during smoke testing. These may be contributing significant I/I into the wastewater collection system. Similarly, line breaks in flooded areas should also be addressed promptly. It is also recommended that the District continue to perform regular smoke testing to monitor the system’s ongoing wear and identify specific areas for improvement.

#### **3.1.2 *Video Evaluations***

Based on information provided from the County, video evaluations were performed by Hydrostructures. Hydrostructures cleaned and provided CCTV inspections of the gravity lines in 2016 as part of the system inventory. It is recommended that the District plan to

perform video evaluation of the system every 5 years as a part of O&M in order to stay vigilant concerning potential issues within the collection system.

### **3.1.3 Manhole Inspections**

Manhole inspections uncovered some infrastructure deficiencies which can be repaired immediately to improve the condition and function of the wastewater collection system. The full list of manholes and their field assessment is included in Appendix A. Manhole rehabilitation and replacement is the priority work that is targeted by the CIP. The proposed projects are divided out over an annual basis in order to include the improvements as a reasonable component of annual budgeting.

### **3.1.4 Flow Monitoring**

The County and McGill have discussed that additional flow monitoring would be beneficial to the County in this system. It is recommended that the County perform flow monitoring at a frequency of every 3 to 5 years to monitor I/I within the system. Initially, we recommend focusing the monitoring in the Town of Falcon.

Additionally, should the County begin to suspect the presence of I&I at specific locations within the system, they will engage in flow monitoring to verify as needed. The PWC Lift Station does provide for metering of flow received within the district. It is recommended within the CIP that the County install an in-line flow meter within the collection system just upstream of the lift station, in order to assist with recording of data and calibration with the PWC maintained lift station.

## **3.2 PRIORITY PROJECTS**

### **3.2.1 Manhole Rehabilitation Projects**

In these projects, manholes will be repaired and lined where possible, unless replacement is needed. The projects are scoped to be undertaken every three years. Each project is priority targeting any manhole deficiencies or evidence of I/I observed during manhole inspections. There are a range of issues from broken risers to cracks in the frame of the manhole that warrant various repairs. To reduce the amount of I/I that enters the system it is imperative to repair these manholes. The project will be ongoing as to spread out the cost for the County over a 10-year period. There are 424 manholes in the system, and based on inspections and smoke testing, it is estimated that approximately 20% of the manholes would benefit from rehabilitation and lining. In order to fit a reasonable budgeting target, the rehabilitation of 84 manholes is broken into 4 projects, which are included in the CIP separately, but can be combined or modified as needed given annual budgetary considerations.

This project is recommended to be pursued with a manhole rehabilitation specialty company with scopes large enough to get competitive pricing for each mobilization. The manholes proposed for rehabilitation or replacement range in depth, therefore an average depth of seven vertical feet (VF) was used per manhole for estimating purposes. The capital improvements plan breaks this project into 4 phases with a budget of approximately \$118,600 every three years over a 10-year span, as outlined in Table 12. The total cost of the manhole rehabilitation projects is estimated to be \$474,400.

**Table 12: Preliminary Opinion of Probable Cost for Manhole Rehab Projects**

<b>Item</b>	<b>Description</b>	<b>Units</b>	<b>Quantity</b>	<b>Unit Price</b>	<b>Total Cost</b>
1	Mobilization	LS	3%	N/A	\$ 2,800
2	Rehabilitate Existing Manhole	VF	147	\$ 500	\$ 73,500
3	Additional Manhole Repairs	LS	1	\$ 10,000	\$ 10,000
4	Asphalt Surface Restoration	LS	1	\$ 12,500	\$ 12,500
<b>Construction Subtotal</b>					<b>\$ 98,800</b>
Contingency (15%)					\$ 14,800
Engineering Coordination					\$ 5,000
<b>Total Base Project Cost</b>					<b>\$ 118,600</b>

*\*Cost estimates are based on the knowledge of a professional engineer based on 2024 construction costs and are subject to change due to bidding environment and other factors.*

**3.2.2 Flow Meter Project**

This project includes installing four in-line flow meters on the existing gravity lines upstream of the four lift stations the sewer system. These devices will allow the County to monitor its own sewer flow. This data can be utilized by staff for planning and budgeting purposes.

The project includes two 8-inch electromagnetic flow meters in a precast underground bypass vault with associated piping and appurtenances. The meters will be installed on the County’s gravity sewer lines outside of the existing lift stations. The preliminary cost estimate for this project is \$203,900 as outlined in Table 13 below.

**Table 13: Preliminary Opinion of Probable Cost for Flow Meter Project**

Item	Description	Units	Quantity	Unit Price	Total Cost
1	Mobilization	LS	3%	N/A	\$ 4,900
2	8-inch Mag Meter	EA	4	\$ 25,000	\$ 100,000
3	Precast Concrete Valve Vault	EA	4	\$ 8,000	\$ 32,000
4	Piping, Valves, Fittings	LS	1	\$ 30,000	\$ 30,000
<b>Construction Subtotal</b>					<b>\$ 166,900</b>
Construction Contingency (15%)					\$ 25,000
Engineering Coordination					\$ 12,000
<b>Total Base Project Cost</b>					<b>\$ 203,900</b>

*\*Cost estimates are based on the knowledge of a professional engineer based on 2024 construction costs and are subject to change due to bidding environment and other factors.*



**3.2.3 Flow Monitoring Study**

This project includes the rental of four non-contact flow monitors. These devices will give the County the ability to develop a database of real-time sewer flow data in the collection system in order to pinpoint potential sources for I/I and uncaptured flow. Additionally, the budget includes utilizing the Flow Works software, a cloud-based data management program that will put flow monitoring and rainfall data into usable format for tracking and reporting. This data can be utilized by staff for planning and budgeting purposes.

The project includes rental of four Hach Flo-Dar Area/Velocity Flow Meter Sensors with wireless data transmission. The monitors are designed to be installed above the flow, therefore can typically be installed from the surface without the need for confined-space entry permit. The project also includes the purchase of a rain gauge with RTU. The project is quoted for 2-months of monitoring with the FlowWorks Software. Longer duration and the option for flow monitoring equipment purchase can be further explored. The preliminary cost estimate for this project is \$25,440 as outlined in Table 14 below.

**Table 14: Preliminary Opinion of Probable Cost for Flow Monitoring Study**

Item	Description	Units	Quantity	Unit Price	Total Cost
1	Hach Flo-Dar Rental	EA	8	\$ 1,925	\$ 15,400
2	Device Data Hosting	EA	4	\$ 555	\$ 2,220
3	FlowWorks Device Monthly	EA	8	\$ 100	\$ 800
4	FlowWorks Device Setup	EA	4	\$ 180	\$ 720
5	Rain Guage with RTU	EA	1	\$ 3,000	\$ 3,000
<b>Construction Subtotal</b>					<b>\$ 22,140</b>
Construction Contingency (15%)					\$ 3,300
<b>Total Base Project Cost</b>					<b>\$ 25,440</b>

*\*Cost estimates are based on the knowledge of a professional engineer based on 2024 construction costs and are subject to change due to bidding environment and other factors.*

**3.2.4 Air Release Valve Replacement and Ice Pigging**

This project includes replacement of existing air release valves along the 8-inches force main that extends from the Falcon lift station to a sewer manhole in the Town of Wade. These devices will give improvement performance of force main by more adequately allowing for release of built up air within the over seven miles of existing force main.

**Table 155: Preliminary Opinion of Probable Cost for ARV and Ice Pigging**

Item	Description	Units	Quantity	Unit Price	Total Cost
1	Mobilization	LS	3%	N/A	\$ 2,400
2	2" Combination Air Release Valve	EA	8	\$ 10,000	\$ 80,000
3	Install Pigging Stations and Perform Ice Pigging on Force Main	LS	1	\$ 150,000	\$ 150,000
<b>Construction Subtotal</b>					<b>\$ 232,400</b>
Construction Contingency (15%)					\$ 34,900
<b>Total Base Project Cost</b>					<b>\$ 267,300</b>

### **3.3 CIP PROJECTS SUMMARY**

The purpose of this asset management plan was to document the condition of the NORCRESS sewer infrastructure to assist the County with becoming more viable and proactive in the management and financing of its wastewater system. The County intends to look to its CIP to guide its next projects; therefore, it is vital that the CIP be established as an accurate depiction of current conditions and reflect the District's highest priorities with accurate cost estimates. The development of this AMP will serve as a positive step towards ensuring that the District can maintain its level of service agreement.

Sewer manhole rehabilitation was evaluated based on current staff input and the results of the field inspections. The existing manholes were divided into projects recommended for the next 10 years.

McGill prepared cost estimates for all projects based on current materials and construction costs. The 10-year CIP is intended to be adopted by the District to guide its selection of sewer system improvement projects over the next two decades. The cost summary for the 10-year CIP is shown below in Table 16.

**Table 16: CIP Projects Cost Summary**

Year <sup>1</sup>	Flow Monitoring Study	Manhole Rehabilitation Project 1	Flow Meter Project	Manhole Rehabilitation Project 2	Manhole Rehabilitation Project 3	Manhole Rehabilitation Project 4	New Generators- All Lift Stations <sup>2</sup>	Upgrade SCADA <sup>2</sup>	Falcon Force Main- Inspect, Clean, Replace ARVs <sup>2</sup>	TOTAL COST
1	\$ 25,440.00						\$ 640,000.00			\$ 665,440.00
2		\$ 118,600.00						\$ 240,000.00		\$ 358,600.00
3			\$ 203,900.00						\$ 80,000.00	\$ 283,900.00
4				\$ 118,600.00						\$ 118,600.00
5	\$ 25,440.00									\$ 25,440.00
6										\$ -
7					\$ 118,600.00					\$ 118,600.00
8										\$ -
9										\$ -
10	\$ 25,440.00					\$ 118,600.00				\$ 144,040.00
<b>TOTAL ESTIMATED CIP COST</b>										<b>\$ 1,714,620.00</b>

**Notes:**

- 1: Considering the timeline for adoption of this plan and County budget planning cycle, Year 1 is anticipated to be FY 2026
- 2: Project was previously included in a Capital Improvements Plan developed by Freese and Nichols for the NORCRESS District.

## 4.0

## OPERATIONS AND MAINTENANCE PLAN

### 4.1 GENERAL RECOMMENDATIONS

The purpose of an Operations and Maintenance (O&M) Program is to provide an organized and cost-effective approach to ongoing maintenance, repair and replacement activities that will maintain the sewer collection system, so it performs as intended and meets the requirements of the sewer utility's System-Wide Collection System Permit, issued under North Carolina General Statutes Article 21 of Chapter 143.

This section provides a general description of proactive O&M, that can be defined as scheduled maintenance activities (preventive maintenance), performed on a regular basis in order to achieve the highest level of system performance using available resources and minimizing failures that can result in Sewer System Overflows (SSOs)

Developing an O&M Program begins with accurate records of infrastructure inventory, asset locations and physical condition. Coupled with work records and system performance history, preventive maintenance schedules can be developed to efficiently address general system needs, from cleaning and debris removal to site-specific maintenance work such as cutting and repair work.

The following elements provide the foundation for an effective O&M program:

- Maintain up-to-date wastewater treatment plant equipment documentation, sewer collection system maps and related work history and operational data.
- Develop a routine preventive O&M program and activities for staff and contractors maintaining the sewer collection system and a system to document scheduled activities
- Develop a rehabilitation and replacement plan identifying and prioritizing system deficiencies and implement short- and long-term actions to address the deficiencies
- Develop and implement training programs to build technical competence and emergency preparedness.
- Develop and provide equipment and replacement part inventories, including critical replacement parts

## **Sewer System Mapping**

Sewer system maps and related databases are typically managed using a Geographic Information System (GIS). The NORCRESS District currently utilizes ESRI as the GIS platform from which to manage the utility systems. This GIS mapping is supported by a database that records sewer main size, material types, and locations of manholes and clean-out connections. The platform has the ability to store more information that is currently being utilized by the County, including invert and rim elevations and other attributes of system appurtenances. If the County intends to utilize the GIS platform for managing and recording maintenance performed and planned, it is recommended that the County investigate alternative software to ensure that they are utilizing a software that meets their needs with respect to budget.

The GIS database should be updated on a regular basis. Software applications such as work order systems are available to allow field staff to update GIS data as inspection and maintenance activities are completed. Other applications can also allow staff to update and edit maps. Field information that was gathered by McGill and County staff as a part of this assessment is now included in the County's GIS system database for future reference.

GIS can organize work history along with operational data, inspection records and images to provide managers, operations staff and engineers with powerful data sets to track current resource allocations and forecast short and long-term operational and capital needs. Outcomes of detailed analysis such as recommended sewer main rehabilitation work versus sewer overflows can be mapped to present the relationship visually for ease of understanding.

## **Preventive Operation and Maintenance (O&M)**

Preventive maintenance is performing routine and scheduled maintenance activities before wastewater treatment plant and lift station equipment or buried infrastructure fails, for the purpose of extending useful life, reducing overall operating costs, and increasing system reliability. This proactive approach to maintenance work is more efficient and cost effective than reactive and curative operations. Preventive maintenance activities will also help operations staff to better understand the lift station equipment, and collection system components and how they work under various conditions. This knowledge is essential to setting maintenance priorities and developing the scope and timing of long-term rehabilitation and replacement projects.

## **Scheduled Cleaning of Sewers**

EPA recommends, at a minimum, that 100% of sewer mains should be cleaned every 5-years, or 20% of the system annually. The sewer utility's Collection System Operating Permit requires 10% of the gravity sewers to be cleaned annually. High pressure jetting is the most common approach using various spray nozzles for general cleaning and debris removal. Mechanical cutters are used to address root intrusion and cleaning agents can be added to help remove fats, oils, and grease (FOG).

More frequent cleaning is scheduled for areas with a history of heavy debris, grease buildup and roots. CCTV inspections are also used to identify areas to clean more often, such as sections with minor defects such as offset joints and service taps protruding into the main line. Sewer sections near siphons are cleaned more frequently to ensure continuous and uninterrupted operation.

As part of the O&M Program, a master list of cleaning operations, priority locations and scheduling can be incorporated into GIS. Maps can be produced to define work areas, schedule resources, including contracted services, track progress and task completion. Updating GIS maintenance operations data (partial blockages found, debris quantity, etc.)



will help managers adjust cleaning frequency and area boundaries as needed to increase program efficiency, reduce sewer blockages, and avoid SSOs.

## **Routine Visual Inspections**

Routine inspections are used to assess the condition of lift stations, manholes and surface facilities, recording general conditions and evidence of possible structural problems or failures (offset structures, etc.), corrosion, surcharging, overflows and excessive Inflow and Infiltration (I&I). Work orders are generated based on inspection records to effect operational adjustments, scheduling more detailed inspections and/or making necessary repairs.

## **Manhole Inspection Program**

Manhole inspections keep the asset inventory up-to-date and are used not only to update collection system maps, but to determine structural condition. During manhole inspections, a complete inventory is taken of each manhole including construction materials, ring size, depth to invert, flow conditions and evidence of problems. The National Association of Sewer Service Companies (NASSCO) Manhole Assessment and Certification Program (MACP) may be adopted or used as a guide to ensure consistency and reliability of evaluation and ranking methodology.

The results from routine manhole inspections and monitoring are used to prioritize areas needing CCTV inspections to assess pipe condition such as manholes with evidence of slow flow or surcharging. Information is recorded and used to schedule maintenance and repairs.

## **CCTV Inspection Program**

While routine cleaning and visual inspection are used to assess the condition of surface facilities and manholes, CCTV video inspections are the primary method used to assess the condition of the sewer pipes. Using conventional defect criteria is highly recommended to provide standardization and consistency in sewer pipe condition

assessment and ranking. The NASSCO Pipeline Assessment and Certification Program (PACP) may be adopted or used as a guide to ensure consistency and reliability of evaluation and ranking methodology.

## **Maintenance Activity Records**

Detailed records and daily logs of O&M work provide valuable information to help managers evaluate the effectiveness of maintenance activities and make adjustments to optimize the use of limited resources. Equipment, manpower and other resources are tracked along with detailed descriptions of defects and/or obstructions encountered including debris, FOG, structural failures, etc. Maintenance work resulting in system modifications or extensions is required to be incorporated into record drawings and system maps. Scheduled testing of emergency and standby equipment is also a requirement of the collection system permit.

These records are required to be reviewed periodically to identify problems that cannot be resolved in a short period of time in order to develop a plan to address the problem(s). Maintaining these records for an extended period of time (5-years or more) will also provide accurate reference points of maintenance investments made over time that will track the effectiveness of operation and maintenance activities.

In the event of a sewer spill or system overflow, maintenance records will need to provide sufficient detail to satisfy reporting requirements for the event, including location(s), volume of wastewater, corrective actions, etc. This data may also be integrated into GIS to allow mapping of these events over time in order to identify patterns and/or trends that will assist with scheduling maintenance and planning rehabilitation and other capital improvements.

## **Resolution of Customer Complaints**

Customer complaints are primarily about sewer backups and odors. Sewer backups require an immediate response to diagnose and resolve the problem. These complaints can occur outside normal business hours, significantly escalating costs. Detailed records of the problems found, and the resources needed to address the failed condition, provide valuable feedback for making adjustments to the preventive maintenance program that can reduce these types of calls and help lower overall maintenance costs.

These records can also identify areas where private service laterals frequently fail. Notifying customers in these areas will allow them the opportunity to address deficiencies proactively, which will also help reduce customer “emergency” calls.

## **Capital Improvements Plan**

A Capital Improvements Plan (CIP) is required by the collection system permit to identify rehabilitation, replacement and expansion needs of the system. The CIP is required to address the short and long-term needs of the system, covering at least a 3 to 5-year planning period, and must include the estimated cost of each capital project.

CIP development incorporates maintenance activity, cleaning and inspection records, and system performance data that may include flow monitoring and hydraulic modeling to evaluate the existing system and to recommend improvements needed to correct existing deficiencies, and ensure adequate capacity is maintained throughout the system.

Capital planning includes consideration of on-going funding for rehabilitation and replacement of the collection system as it wears out, and potential upgrades for expansion as needed.

## **Training Program**

Training programs provide a mechanism for educating employees and establishing their technical competence to perform operations, maintenance, and emergency responses safely and effectively. A combination of in-house skill training and specialized training purchased or provided through state and national associations, conferences and vendor training programs are typically used to build and enhance skills for performing daily work duties. Periodic training reinforces previous efforts, as people often overlook things that are used infrequently. It also provides an opportunity to train new staff and learn about new problems, new techniques, and changes in equipment.

Emergency training educates system personnel about emergency situations and resulting effects on the wastewater system, public health, and environmental impacts. It also provides an opportunity to practice responses. Good record keeping ensures personnel are properly trained and prepared to effectively operate and maintain the collection system under any given circumstance. Regular review of training records is essential for keeping content up-to-date and maintaining proper employee awareness.

## **Equipment and Replacement Parts**

A reasonable supply of equipment and replacement parts should be maintained to fully support all operations and maintenance activities. A detailed inventory is essential to ensure availability under normal operations and emergency conditions. Specialized equipment or parts may be too costly to keep in stock, so arrangements with vendors and/or contractors may be necessary to ensure availability during non-business hours or during emergencies.

## 4.2 STAFFING RECOMMENDATIONS

Cumberland County is responsible for three wastewater collection systems and one water system: NORCRESS, Overhills, Kelly Hills, and Southpoint Water System. While each of these districts maintains its own operating budget, the Board leadership and operational management is performed solely by Cumberland County. Therefore, in consideration of the typical utility system management and operations and maintenance that is necessary for maintaining each of the systems, McGill has considered all of the four (4) utility systems cumulatively. While each system could be analyzed separately, considering the systems together is more consistent with actual management of the systems.

Typical metrics for analyzing full-time equivalent (FTE, representing quantity full-time workers) are based on either the population served by the system or by miles of utility piping (water main or sewer line) within each system. For reference, Table 17 below summarizes the customers and piping in each of the County’s utility systems.

**Table 17: Utility System Comparison**

DISTRICT	Number of Connections		Paying Avail. Fee	Pipe in System (mi.)
	Water	Sewer		
<b>Southpoint</b>	84		129	2.8
<b>Kelly Hills</b>		102	166	4.5
<b>Overhills</b>		107	318	4.0
<b>NORCRESS</b>		452	666	41.1
<b>TOTALS</b>	<b>84</b>	<b>661</b>	<b>1279</b>	<b>52.4</b>

**Table 18: Typical Population vs. Pipe Length**

<b>Population</b>	<b>Pipe in System (mi.)</b>
0-100	5
101-500	5
501-3300	21
3301-10000	62

The typical sizes of utility systems from a community system EPA study<sup>1</sup> are shown in Table 18, and are generally consistent when compared to the County's systems. This study was selected as a basis for comparison due to its comprehensive nature, having included water systems nationwide in its breadth. NORCRESS is the exception when compared to Table 18. This is mostly likely indicative of the system serving a more rural population where the connection density is less, and resulting from the length of force main piping in the system that increases the overall length but does not contribute to population density. Overall, these metrics were found to be reasonably consistent with the County's systems. Similarly, the data is consistent regardless of whether the utility system is a water systems or wastewater collection system.

The objective is to make budget-level staffing recommendations for the County's utility systems based on what is typical across the industry and other utility systems of comparable size. The EPA study utilized provides typical FTE for the roles of manager, plant operator, distribution (and collection, for our purposes), and administrative functions. All of these were considered applicable to management and operation of the County's utility systems. Note: while the County is not responsible for plant operation in any system, the lift stations in the NORCRESS and Overhills systems are the County's responsibility, therefore this metric was used, albeit in a smaller percentage, to account for the management of those resources.

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<sup>1</sup> Analysis conducted using excerpts from US EPA document, "National Characteristics of Drinking Water Systems Serving 10,000 or Fewer People," published July 2011.

Table 19 shows Further utilizing the EPA statistics as base for typical FTE for each of the positions, based on the system size in terms of miles of pipe main.

**Table 19: Average Community System Statistics**

Employee Category	System Size (miles of Main)		Mean	Cumberland County
	Pop. 500-3300	Pop. 3300-10000		
	21	62	41.5	51.7
<b>Manager FTE</b> per mile	0.6	1.1	0.85	1.06
	0.029	0.018	0.020	0.020
<b>Plant Operator FTE</b> per mile	0.6	1.3	0.95	1.03
	0.029	0.021	0.023	0.023
<b>Distribution FTE</b> per mile	0.8	2.5	1.65	2.06
	0.038	0.040	0.040	0.040
<b>Administrative FTE</b> per mile	0.6	1.5	1.05	1.31
	0.029	0.024	0.025	0.025

The green highlighted cells are the calculated FTEs that were applied to estimate staffing size based on the quantity of pipe across the County’s four utility systems. Those calculated FTEs are based on the size of systems managed by the County and reasonable estimate of staffing needed for these systems.

Each of the FTEs is applied to each respective employee category. McGill utilized wage information from Zip Recruiter and a benefits multiplier of 1.38 from the U.S. Bureau of Labor Statistics to develop the summary shown in Table 20.

**Table 20: Overall Salary Estimates**

Employee Category	Hourly Rate	Annual Salary	Ben. Mult.	Total	Applied FTE	Applied Budget Cost
Manager	\$38.50	\$80,080.00	1.38	\$110,510.40	1.06	\$117,000
Operator	\$24.52	\$51,001.60	1.38	\$70,382.21	1.03	\$72,700
Distribution	\$23.57	\$49,025.60	1.38	\$67,655.33	2.06	\$139,100
Administrative	\$21.33	\$44,366.40	1.38	\$61,225.63	1.31	\$80,100
<b>Total Applied Budget Cost Based FTEs</b>						<b>\$408,900</b>

Utilizing industry metrics and comparing to systems of comparable size, McGill offers the proceeding section as a general staffing recommendation. This section and these budget values are provided for preliminary planning purposes only.



Staffing levels appear to be reasonable based on the District's ability to operate and maintain the system while providing a reliable level service to its customers.

While this budget number is higher than the current budget staffing, consideration should also be given to the cumulative effect cost to the County for contracted operation and distribution support in the NORCRESS and Kelly Hills district.

# **APPENDICES**



## **Appendix A**

### **Manhole Inspection List**



<b>Norcross Manhole Inspection</b>		
<b>Date:</b>	<b>Nov. 28 and 30, 2023, Feb. 5, 2024</b>	
<b>Manhole ID</b>	<b>Condition</b>	<b>Notes</b>
SMH028220	Poor	Crack on interior from being hit by mower
SMH028209	Poor	
SMH026946	Poor	Black inside manhole and corrosion around collar
SMH028208	Good	
SMH028215	Good	
SMH029390	Good	
SMH028093	Good	
SMH027974	Good	
SMH027985	Good	
SMH028003	Good	
SMH028033	Good	
SMH028025	Good	
SMH028026	Good	
SMH027171	Good	
SMH026913	Good	Outside of Martin's Meats
SMH026927	Good	
SMH026896	Good	
SMH026879	Good	
SMH026880	Good	
SMH026933	Good	
SMH026934	Good	
SMH027941	Good	
SMH027930	Good	
SMH028067	Good	
SMH028038	Good	
SMH028039	Good	
SMH028054	Good	
SMH028053	Good	
SMH028040	Good	
SMH028061	Good	
SMH028045	Good	
SMH028050	Good	
SMH028041	Good	
SMH028044	Good	Ring very rusted
SMH028146	Good	
SMH028145	Good	
SMH026946	Poor	Black inside manhole and corrosion around collar





## **Appendix B**

### **Smoke Testing Results List**

# Norcross Smoke Testing Manholes

Date: October 24-26th 2023		
Manhole ID	Smoke Status	Notes in the field
SMH026878	Leak	
SMH026879	Leak	Smoke around concrete
SMH026880	Leak	Cracked ring
SMH026885	Broken	smoke
SMH026886	Leak	
SMH026887	Leak	Smoking from edges
SMH026887	Leak	Smoking from edges
SMH026892	Leak	Smoking from edges
SMH026895	Leak	Smoking from edges
SMH026896	Leak	Small amount of smoke
SMH026897	Leak	
SMH026900	Leak	Smoking from edges
SMH026901	Leak	Small amount of smoke
SMH026904	Broken	concrete collar broken
SMH026905	Leak	Rim broken
SMH026906	Leak	
SMH026906	Leak	
SMH026911	Leak	
SMH026912	Leak	Buried in front of Martin's
SMH026915	Leak	Smoking
SMH026916	Leak	smoking
SMH026918	Leak	Smoking
SMH026919	Leak	Small amount of smoke
SMH026921	Leak	
SMH026922	Leak	
SMH026923	Leak	
SMH026925	Leak	Smoke around lid
SMH026929	Leak	
SMH026930	Leak	
SMH026931	Leak	
SMH026932	Leak	
SMH026934	Leak	
SMH026941	Leak	Smoking
SMH026942	Leak	Small amount of smoke
SMH026944	Leak	Cracked concrete smoke around lid and collar
SMH026945	Leak	
SMH027168	Leak	
SMH027170	Leak	Smoking from edges
SMH027172	Leak	
SMH027173	Leak	
SMH027174	Leak	
SMH027175	Leak	

SMH027176	Leak	
SMH027179	Leak	smoking
SMH027180	Leak	smoking
SMH027183	Leak	smoke around lid
SMH027184	Leak	smoking
SMH027185	Seal	smoking around sealed lid
SMH027188	Leak	
SMH027441	Leak	
SMH027929	Leak	
SMH027930	Leak	
SMH027933	Broken	Lid removed, possible dumping
SMH027941	Broken	Lid missing, possible dumping
SMH027947	Leak	smoking from lid edges
SMH027948	Leak	
SMH027950	Leak	
SMH027951	Leak	
SMH027952	Leak	smoking from edges
SMH027955	Leak	Smoking from edges
SMH027956	Leak	Smoking from edges
SMH027963	Leak	
SMH027964	Leak	
SMH027965	Leak	
SMH027966	Leak	
SMH027967	Leak	
SMH027968	Leak	Smoking from edges
SMH027969	Leak	Smoking from edges
SMH027970	Leak	
SMH027971	Leak	
SMH027972	Leak	
SMH027973	Leak	Smoking from edges
SMH027974	Leak	Smoking from edges
SMH027975	Leak	
SMH027976	Leak	
SMH027985	Leak	Smoking from edges
SMH027987	Leak	
SMH027988	Leak	
SMH027989	Leak	
SMH027993	Leak	
SMH027994	Leak	
SMH027995	Leak	
SMH027996	Leak	
SMH027997	Leak	
SMH027998	Leak	
SMH027999	Leak	Smoke around lid and ground
SMH028000	Leak	smoke around lid

SMH028002	Leak	
SMH028003	Leak	
SMH028004	Leak	
SMH028006	Leak	
SMH028007	Leak	Smoking from edges
SMH028008	Leak	
SMH028018	Leak	Riser is shifted
SMH028019	Leak	Smoke around lid
SMH028021	Seal	smoking
SMH028022	Seal	smoking
SMH028024	Leak	
SMH028025	Leak	
SMH028026	Leak	
SMH028027	Leak	
SMH028029	Leak	
SMH028031	Leak	smoke around ground and concrete
SMH028032	Leak	
SMH028033	Leak	
SMH028034	Leak	
SMH028035	Leak	
SMH028036	Leak	
SMH028038	Seal	smoke around rim
SMH028041	Leak	
SMH028046	Leak	
SMH028047	Leak	Smoking from edges
SMH028048	Leak	
SMH028049	Leak	
SMH028050	Leak	Smoking from edges
SMH028051	Broken	smoke from collar
SMH028052	Broken	smoke from collar
SMH028053	Broken	smoke from collar
SMH028054	Broken	collar busted
SMH028056	Leak	
SMH028057	Seal	
SMH028059	Leak	Smoking from edges
SMH028073	Broken	Concrete cracked around mh
SMH028074	Leak	
SMH028075	Leak	
SMH028076	Leak	
SMH028077	Leak	
SMH028078	Leak	
SMH028079	Leak	
SMH028080	Leak	
SMH028081	Leak	
SMH028084	Leak	

SMH028092	Leak	Smoking from edges
SMH028099	Leak	Smoking from top sides of mh
SMH028104	Leak	Small amount of smoke from edges of mh. Concrete base is cracked
SMH028105	Leak	Smoking from edges of mh and ground around it
SMH028106	Leak	Small amount of smoke come from edges. Looks like holes in top from missing screw or bolt
SMH028113	Leak	Small amount of smoke coming from sides of mh
SMH028114	Leak	Smoking from mh and ground around it
SMH028117	Broken	
SMH028129	Seal	Smoking from mh
SMH028142	Seal	Broken around concrete
SMH028160	Leak	Small amount of smoke from edges of mh
SMH028164	Leak	Very small amount of smoke coming from mh
SMH028165	Leak	Smoking from edges of mh
SMH028169	Leak	Small amount of smoke coming from edges of mh
SMH028181	Leak	
SMH028189	Leak	Small amount of smoke coming from edges of mh
SMH028214	Leak	
SMH028215	Leak	
SMH028216	Leak	
SMH028217	Broken	Smoke coming up around the ground near manhole
SMH028230	Seal	Smoke around seal
SMH029404	Leak	Small amount of smoke from edges of mh

## Norcross Smoke Testing Cleanouts

Date: October 24-26th 2023

Facility ID	Smoke Status	Notes in the field
32849	Leak	Smoking from c/o and house
32851	Leak	Leaking from broken cap
32853	Broken	
32855	Leak	
32866	Broken	
32867	Broken	
32870	Broken	
32871	Broken	
32874	Broken	
32877	Broken	Busted pipe
32878	Broken	Busted pipe
32900	Broken	Stack
32901	Leak	
32905	Leak	
32907	Broken	
32909	Broken	Smoking
32915	Broken	
32918	Broken	Busted pipe
32930	Broken	
32943	Broken	
32964	Leak	Small amount of smoke
32967	Broken	Missing cap broken sides on c/o
36922	Broken	
36925	Broken	Broken off cap
36926	Broken	
36934	Broken	Pipe busted
36935	Broken	Pipe busted
36946	Broken	Broken stack
36947	Broken	Stack broke no cap
36948	Broken	
36949	Broken	Broken needs cap
36955	Broken	Needs cap
36964	Leak	
36990	Broken	
36991	Broken	
36999	Broken	Pipe busted
37003	Broken	Pipe broken
37005	Broken	
37009	Broken	
37018	Broken	
37019	Broken	
37020	Broken	

37023	Broken	
37023	Broken	
37025	Broken	
37236	Broken	
37238	Broken	
37265	Broken	
37266	Broken	Smoking from house, c/o and ground
37272	Broken	
37058	Broken	
37070	Broken	Broken cap but fixed in field
37078	Broken	Pipe broken
37079	Broken	Pipe broken
37080	Broken	Broken ring and cap
37091	Broken	Cap broken
37138	Leak	Small amount of smoke coming from c/o
37145	Broken	Cap missing
37149	Broken	
37169	Broken	
37172	Broken	Vacant lot near manhole
37181	Leak	
37202	Broken	
37219	Broken	
37222	Broken	
37225	Broken	
37277	Leak	Smoking from cap and ground around c/o
37284	Broken	
37287	Broken	
37291	Broken	Stack cracked
37292	Broken	Broken cap
37307	Broken	
37314	Broken	
41110	Leak	
41695	Broken	
41712	Broken	
43878	Broken	
42156	Leak	
46282	Broken	Smoke coming from holes in cap
54547	Broken	Busted pipe
59583	Broken	
62262	Leak	
32864	Leak	
32865	Broken	
32882	Leak	No cap
32883	Broken	Pipe busted





## **Appendix C**

### **Rainfall Data**



Daily Precipitation from Fayetteville Regional Airport  
Cumberland County 20.02507

<b>Time</b>	<b>Precipitation (in)</b>
Day	Total
18-Oct	0
19-Oct	0
20-Oct	0
21-Oct	0.41
22-Oct	0
23-Oct	0
24-Oct	0
25-Oct	0
26-Oct	0
27-Oct	0
28-Oct	0
29-Oct	0
30-Oct	0
31-Oct	0
1-Nov	0
2-Nov	0
3-Nov	0
4-Nov	0
5-Nov	0
6-Nov	0
7-Nov	0
8-Nov	0
9-Nov	0
10-Nov	0
11-Nov	0.02
12-Nov	0.25
13-Nov	0.01
14-Nov	0
15-Nov	0
16-Nov	0
17-Nov	0
18-Nov	0
19-Nov	0
20-Nov	0
21-Nov	0
22-Nov	1.61
23-Nov	0.78
24-Nov	0
25-Nov	0
26-Nov	0
27-Nov	0.06
28-Nov	0
29-Nov	0
	<b>3.14</b>

Source: <https://www.wunderground.com/history/weekly/us/nc/fayetteville/KFAY/date>



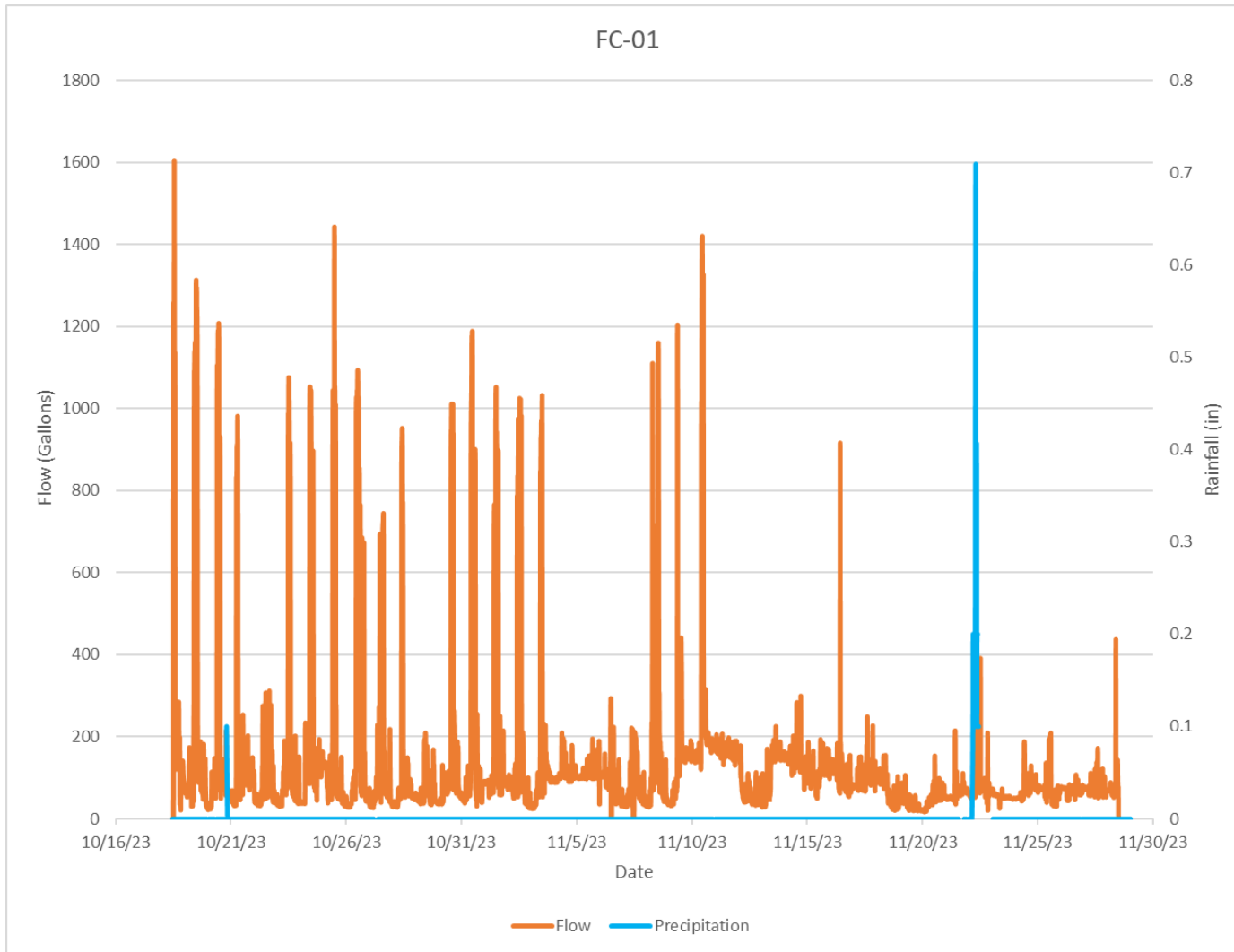
## **Appendix D**

### **Flow Monitoring Data, Hourly Graphs**

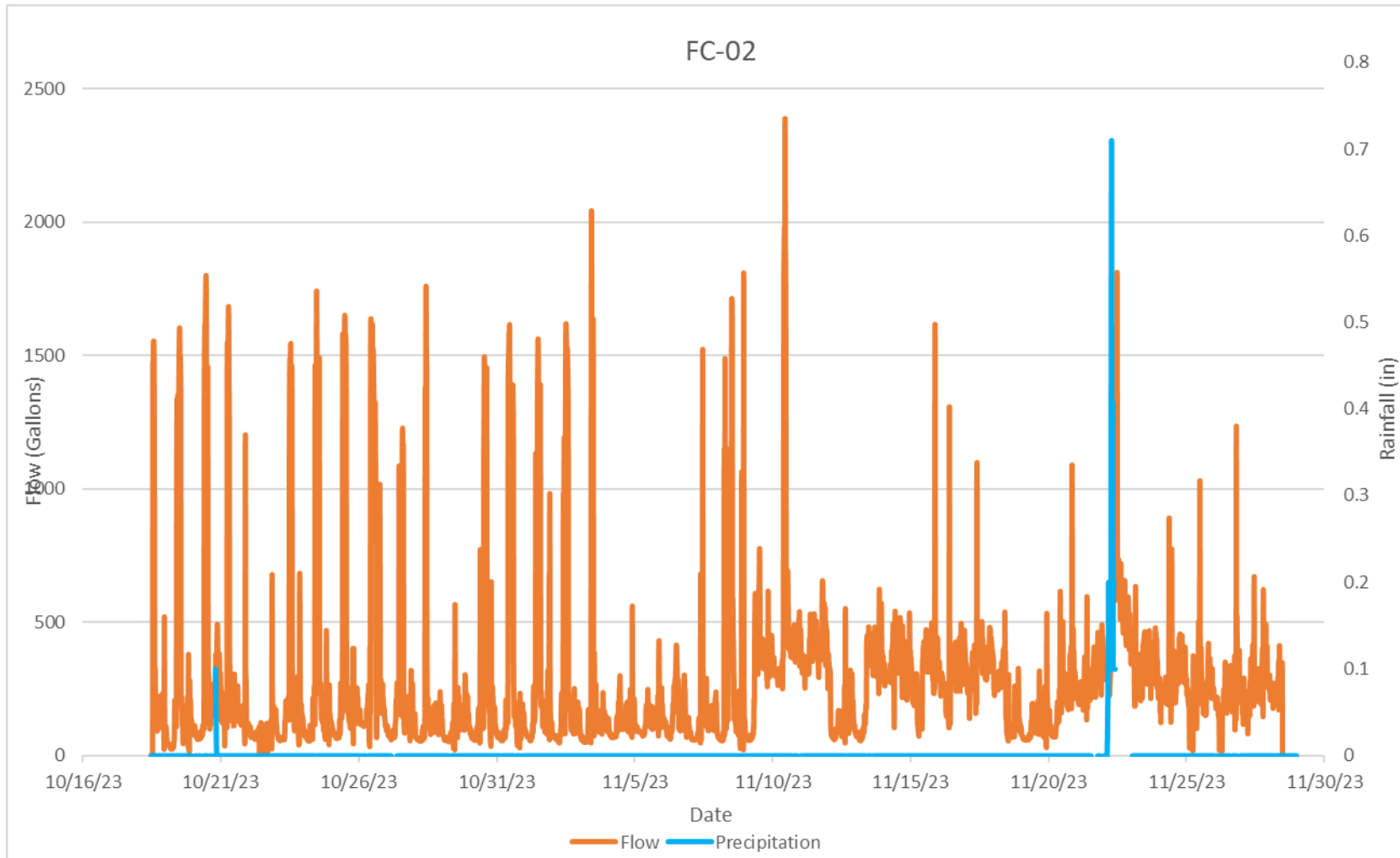




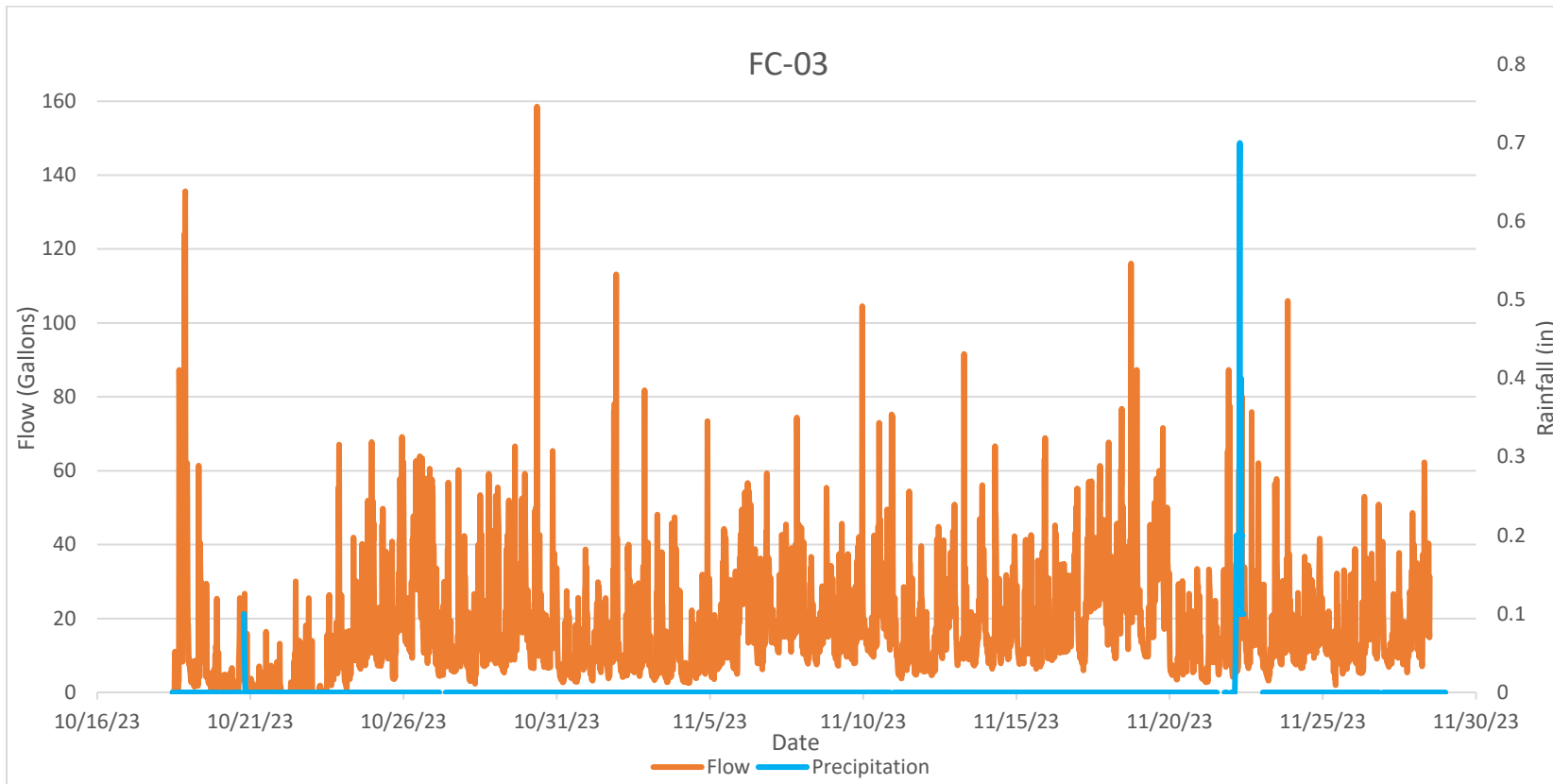
**Graph 1A: Falcon Location 01, Hourly Flow vs. Rainfall**



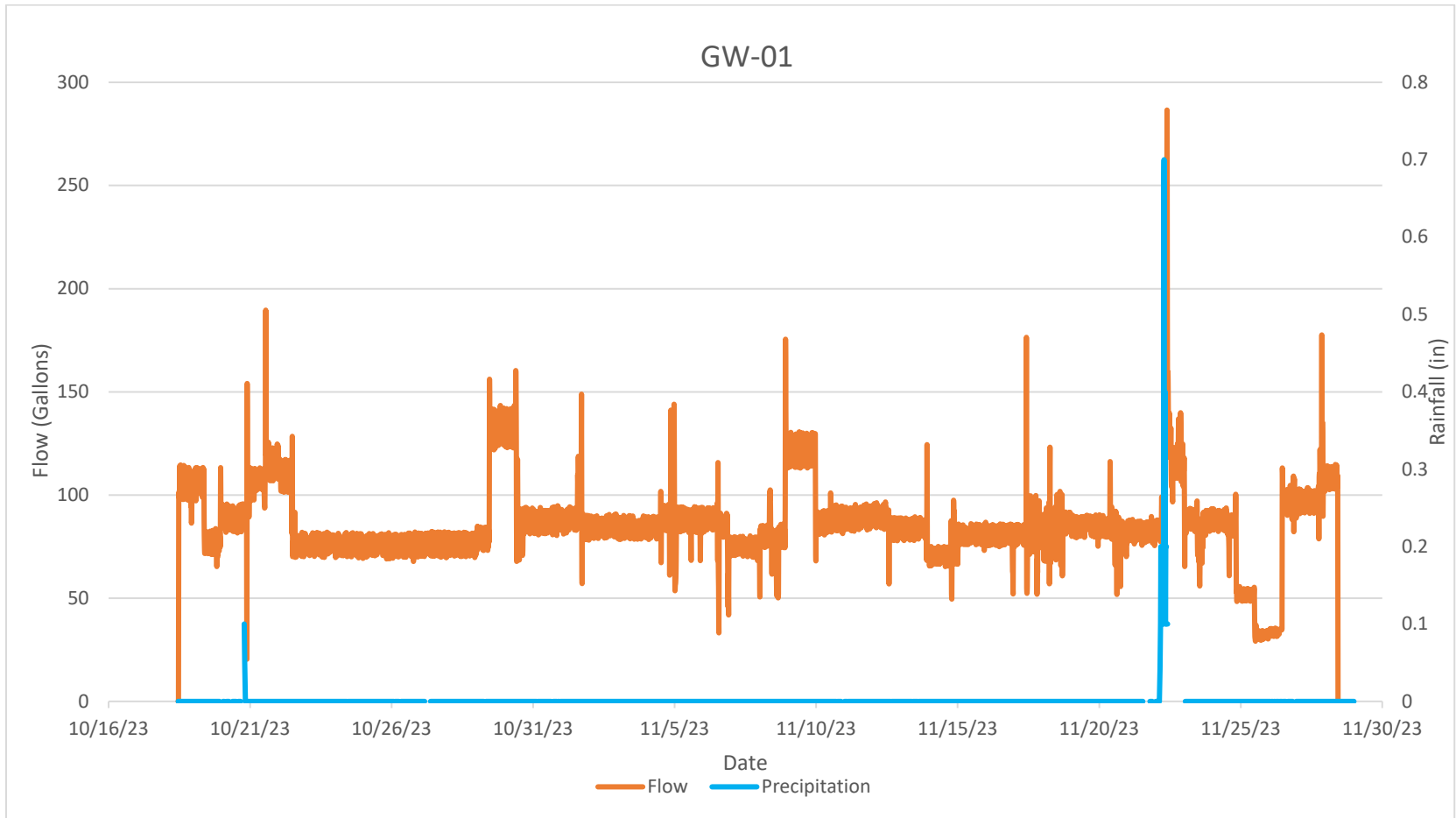
**Graph 2A: Falcon Location 02, Hourly Flow vs. Rainfall**



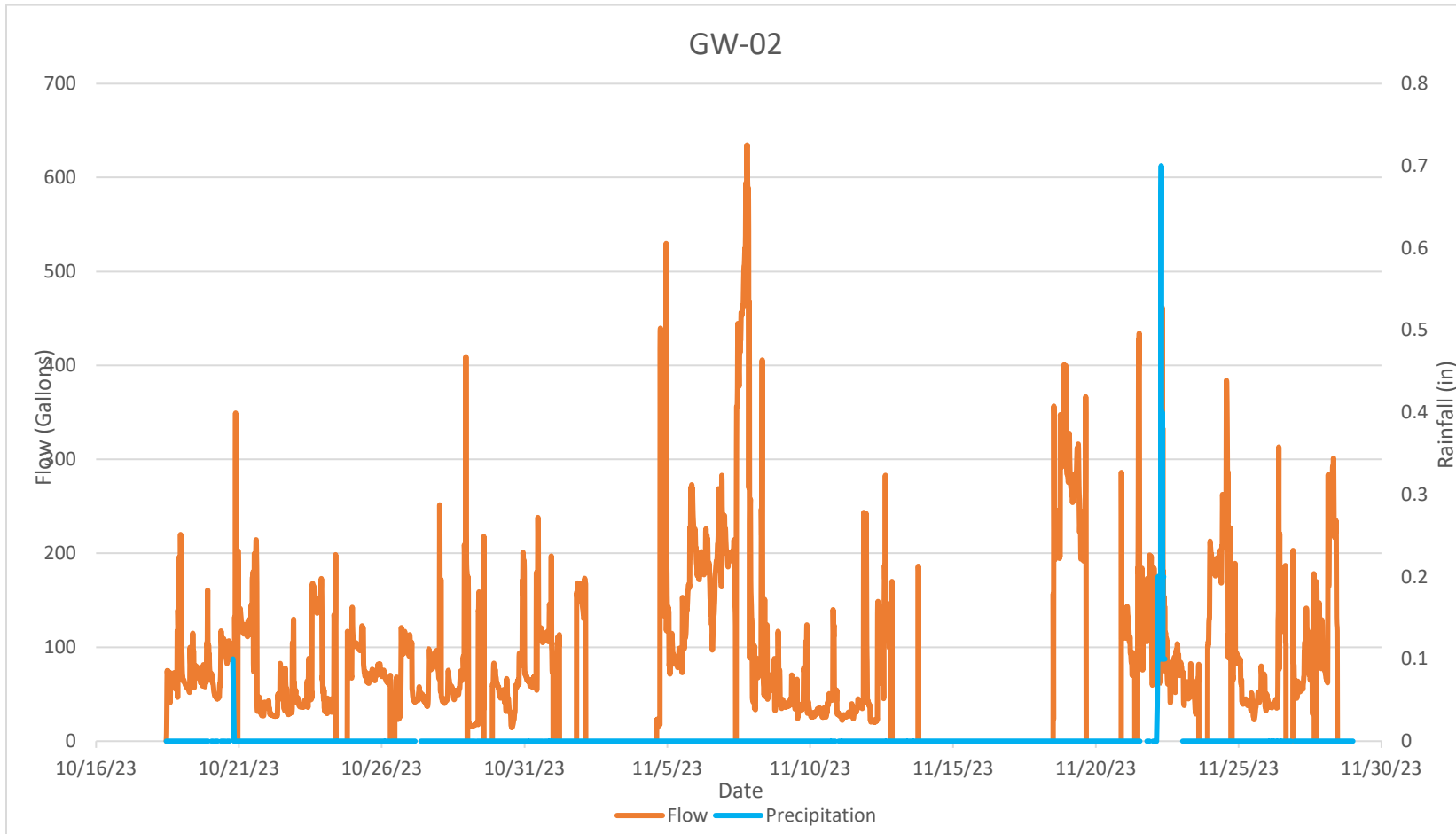
**Graph 3A: Falcon Location 03, Hourly Flow vs. Rainfall**



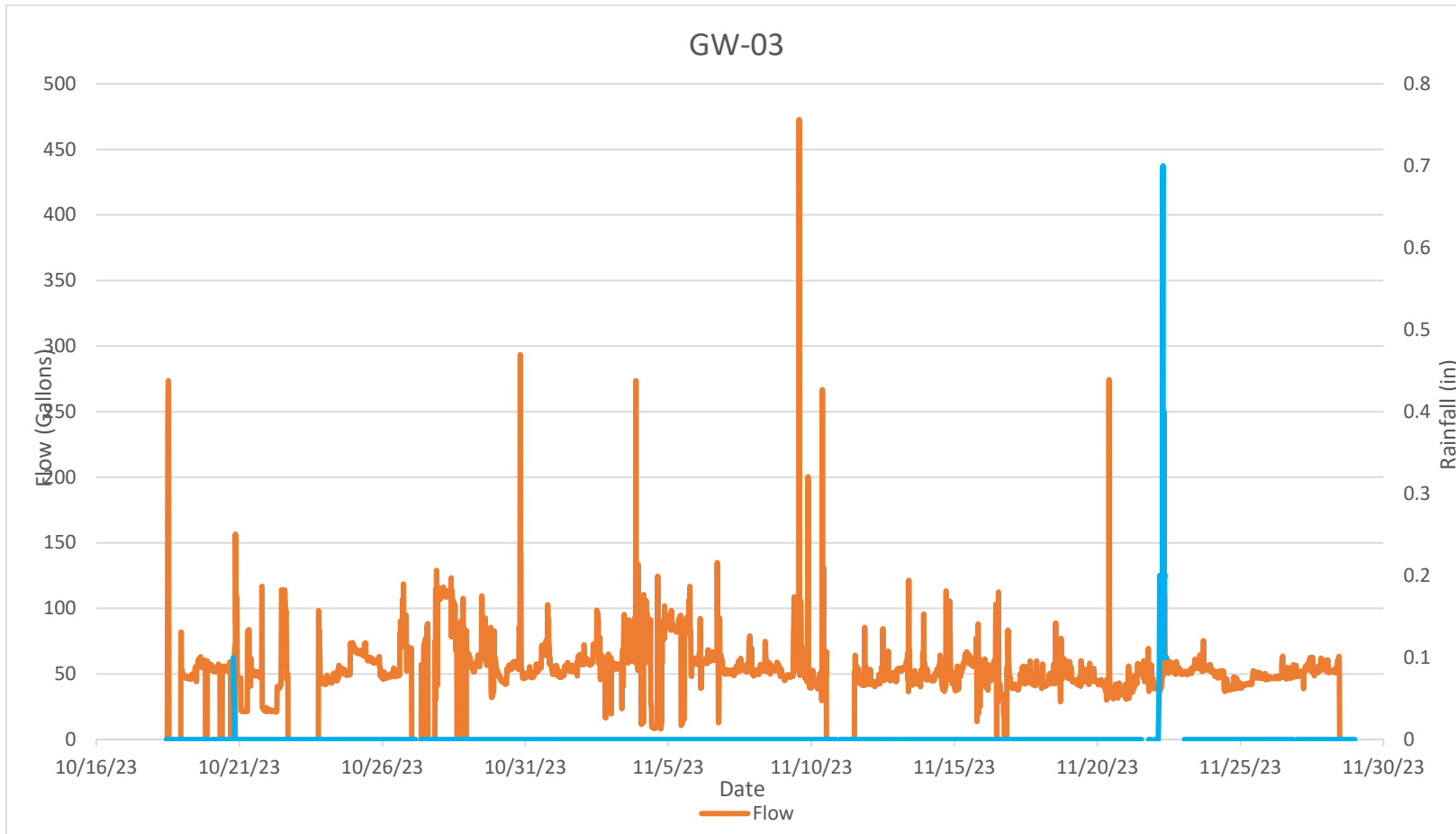
**Graph 4A: Godwin Location 01, Hourly Flow vs. Rainfall**



**Graph 5A: Godwin Location 02, Hourly Flow vs. Rainfall**



**Graph 6A: Godwin Location 03, Hourly Flow vs. Rainfall**



## **Appendix E**

### **Capital Improvement Project Product Data**





# HACH FL900 SERIES FLOW LOGGER -WIRELESS

**The wireless Hach FL900 Series Flow Logger revolutionizes open channel flow monitoring by providing reliable, innovative solutions for any sewer flow measurement challenge.**

From wireless communication with free data hosting to longer battery life, the FL900 is designed to reduce monitoring costs, increase efficiency, and provide better data 24/7 with less hassle than you ever thought possible. When combined with any of our full array of smart sensors, the FL900 wireless flow monitoring system will provide reliable flow data for any wastewater flow monitoring application. And with the FL900's included software tool, *fsDATA*® Online Data Manager, site time is reduced dramatically, allowing for increased time for data analysis and proactive actions for solving any flow related issue.

## Plug and Play Sensor Ports

The FL900 is available with 1, 2 or 4 sensor ports. The sensor ports are "plug and play"; the logger auto detects the type of sensor connected to allow customers maximum flexibility for their Hach flow sensor inventories.

Compatible FL900 Flow Logger sensors include:

- *FLO-DAR*® AV Sensor with optional Surcharge Velocity Sensor
- *FLO-TOTE*® 3 AV Sensor
- *Sigma Submerged AV Sensor*
- *Hach US9001 Down-Looking Ultrasonic Sensor*
- *Hach US9003 In-Pipe Ultrasonic Sensor*

## Quick Installation/On-Site Confirmation

Not only is the FL900 easy to install with a variety of mounting options, it also includes an LED status light so that you know it's fully functional before leaving the site.



## Applications

- Wastewater
- Collection Systems
- Industrial Water

## Affordable Alarming Capabilities

User-selectable alarms can be sent by email or text (SMS) to specified recipients to keep you continuously informed on your monitoring sites. Up to 16 channel alarms can be selected, as well as alarms for low battery, low RTC battery, low slate memory, slate memory full, sensor timeout, sensor ID error or missed call.

## Wireless Data Available 24/7 with *fsDATA*

Eliminate risk and make smarter, more-timely decisions with your sewer flow data. The *fsDATA* Online Data Manager provides secure 24/7 access to your flow data and wireless meter from the comfort of the internet. With *fsDATA*, site visits to collect flow data or to adjust meter settings are eliminated, decreasing maintenance costs. Set alarms and view sensor diagnostics remotely to maximize uptime. Multiple users can be granted different data access levels based on job function.

## Redundant-Level Flow Monitoring

With FL900 Series plug-and-play flow meters, you can pair a Sigma Submerged AV Sensor with a Hach US9003 In-Pipe Ultrasonic Sensor for integrated redundant-level flow monitoring.

## Specifications\*

### Portable DC Powered Electronics (Includes Models FL901, FL902 & FL904)

<b>Dimensions (W x D x H)</b>	25.4 x 22 x 40 cm (10.0 x 8.7 x 16.0 in.)
<b>Enclosure</b>	PC/ABS structural foam
<b>Environmental Rating</b>	NEMA 6P (IP68)
<b>Weight (Using Model FL900)</b>	4.5 kg (10 lb)—no batteries; 6.3 kg (14 lb)—2 batteries; 8.2 kg (18 lb)—4 batteries
<b>Operating Temperature</b>	-18 to 60°C (0 to 140°F) at 95% RH
<b>Storage Temperature</b>	-40 to 60°C (-40 to 140°F)
<b>Power Requirements</b>	8 to 18 Vdc from batteries or external power source, 2.5W max.

#### Battery Life

Varies with sensor type, logging intervals, telemetry and environment.

For a 15-minute logging interval, 60 minute call frequency, four 6 V lantern batteries at room temperature:  
130 days with 4 lantern batteries and a FLO-DAR sensor  
180 days with 4 lantern batteries and a FLO-TOTE 3 sensor  
160 days with 4 lantern batteries and a Sigma Submerged AV sensor with AV9000 Analyzer  
200 days with 4 lantern batteries and Ultrasonic Down-Looking or In-Pipe sensor

The optional long life alkaline battery pack can be used to extend battery life, if the Flow Logger is ordered with the external power option connector.

#### LED Status Indicator

- Green Flashes every 3 seconds during normal operation.  
Flashes every 15 seconds during sleep mode.
- Red Flashes when an attached sensor does not agree with the logger program, when an expected sensor is not found or the sensor is not working properly.

#### LED Modem Indicator

- Stays green during a call to the server. Goes blank after the call is successfully completed and terminated.
- Flashes red if the call to the server failed.

**Sensor Ports** 1, 2 or 4 ports

**Connectors** Stainless steel connectors

**Datalog Channels** 16 maximum

#### Alarms

Maximum of 16 channel alarms including high/high, high, low, low/low and system alarms including low battery, low RTC battery, low slate memory, slate memory full, sensor timeout, sensor ID error.

#### Alarm Actions

Trigger sampler, change logging interval, change call interval, send an e-mail, or send text message (SMS).

#### Call Monitor

Sends a message by e-mail or text (SMS) if a logger has not called the server within an user-defined amount of time.

#### Logging Intervals

1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30 or 60 minutes  
Primary and secondary intervals for dynamic logging.

#### Data Storage

Event Log: 1,000 events maximum in non-volatile flash memory  
Sample History: 2,000 sample events maximum in non-volatile flash memory  
Datalog: 325,000 data points; 1128 days for 3 channels at 15-minute log intervals

#### Data Storage

Event Log: 1,000 events maximum in non-volatile flash memory  
Sample History: 2,000 sample events maximum in non-volatile flash memory  
Datalog: 325,000 data points; 1128 days for 3 channels at 15-minute log intervals

#### Local Communication

USB  
RS232 (Baud rates: 9600, 19200, 38400, 57600, 115200)

#### Remote Communication

Wireless modem; CDMA or GPRS technology with a mobile provider.

#### Protocols

Local Modbus RTU

#### Timebase Accuracy

±0.002%, synchronized every 24 hours with server software and modem

#### Supported Sensors

FLO-TOTE 3, FLO-DAR, FLO-DAR with SVS, Sigma Submerged AV Sensor†, Sigma 950†, and Rain Gauge

#### Sampler Interface

Compatible with Sigma 900 Standard, Sigma 900MAX, Sigma SD900 to support set-point sampling, flow pacing, and logging sample history.

#### Desktop Software

FLO-WARE software is required for programming the logger and can be used for data management and report generation. It is compatible with desktop/lap top computers utilizing Windows operating system. Minimum resolution needed is 1024x768.

#### Internet Application Software

FSDATA web-based software for flow meter programming, data management and report generation for wireless flow meters.

#### Certifications

Logger: CE; optional AC power supply: UL/CSA/CE

#### Warranty

1 year

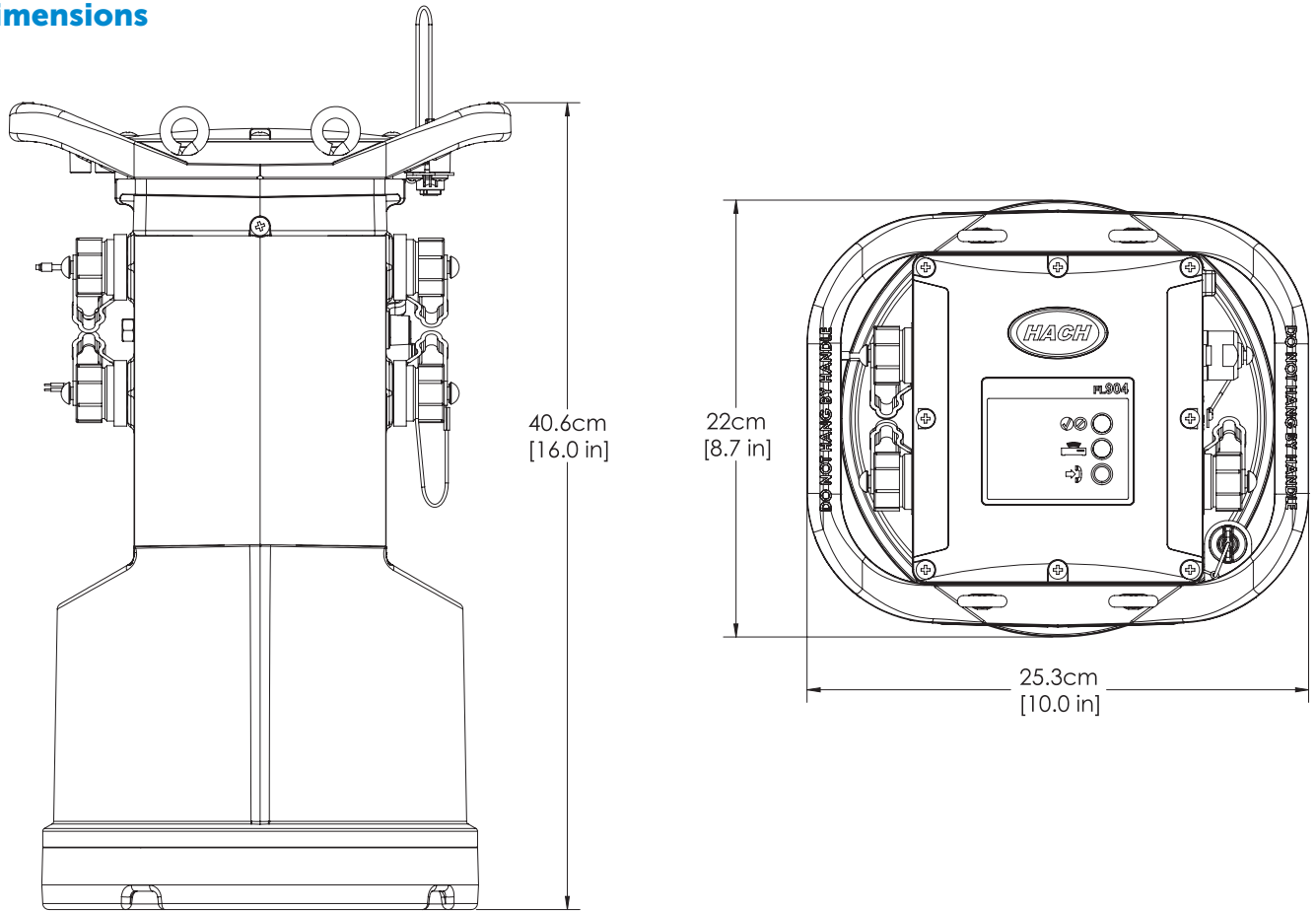


The FL900 Series Loggers meet CE requirements.

†Requires external module.

\*Subject to change without notice.

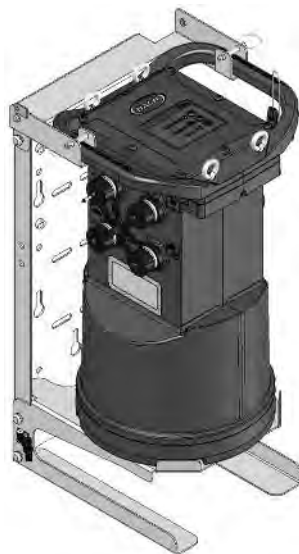
### Dimensions



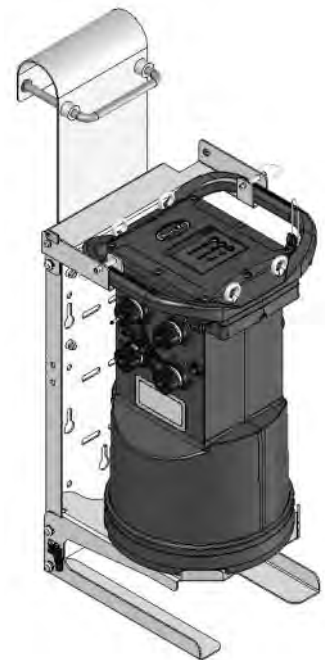
### Installation/Mounting Options



*Flow Logger Suspension Cable with Carabiner (Standard)*



*Flow Logger Wall Mount Prod. No. 8542700 (Optional)*



*Flow Logger Ladder Rung Mount Prod. No. 8544500 (Optional)*

## Ordering Information

FL90X Electronics (Flow Logger)	Model FL90	Sensor Connector(s)	Country Code	Modem	Rain Gauge
1 Sensor Connector		1	97		
2 Sensor Connectors		2			
4 Sensor Connectors		4			
None				X	
AT&T (Activated)				A	
GPRS no SIM				G	
Sprint (Inactive)				R	
Sprint (Activated)				S	
Verizon (Inactive)				U	
Verizon (Activated)				V	
No Rain Gauge Connector					X
With Rain Gauge Connector					R

### External Modules

- 8531300** AV9000 Area Velocity Analyzer module (required to attach a Sigma Sub AV sensor)
- 8549800** IM9001 Interface module (required to attach a Sigma 950 flow meter)

### Cables

- 8528700** Cable, External power, 2 wire, 9 ft.
- 8528200** Cable, Communication, RS232
- 8528300** Cable, Communication, USB
- 8528400** Cable, Aux, 7pin MIL 5015 (Connect to Sigma Sampler), 9 ft.
- 8528401** Cable, Aux, 7pin MIL 5015 (Connect to Sigma Sampler), 25 ft

### Software

- Model T200-900** FLO-WARE Desktop Software
- FS-HOSTING** Monthly data hosting service for FS-DATA
- FS-DATAFR** Monthly wireless service

### Mounting Hardware

- 8543800** Wall mount bracket (304 Stainless)
- 8545600** Wall mount bracket with ladder hanger (304 Stainless)
- 8542700** Wall mount bracket with AC Power Supply shelf (304 Stainless)
- 8544500** Wall mount bracket with AC Power Supply Shelf with ladder hanger (304 Stainless)

### Replacement Parts

- 8755500** Desiccant refill beads, Bulk 1.5 lb
- 11013M** Battery, 6V lantern
- 8542900** Battery, long-life alkaline
- 8543000** Battery pack top cap adaptor and cable (for long-life alkaline battery pack 800017701)
- 8542800** Rain Gauge with 100 ft. cable

For additional information on products mentioned in this data sheet, request the following data sheets:

**FS-DATA® Online Data Manager (LIT2707)**

**FLO-DAR® AV Sensor (LIT2708)**

**FLO-TOTE® 3 AV Sensor (LIT2712)**

**HACH US9000 Ultrasonic Sensors (LIT2804)**

**HACH Redundant Flow Monitoring System (LIT2805)**

**HACH Wireless Level Alarming System (LIT2806)**

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In the interest of improving and updating its equipment,

Hach Company reserves the right to alter specifications to equipment at any time.



Be Right™

# Marsh-McBirney FLO-DAR® Area/Velocity Radar Flow Meter Sensor



*The Flo-Dar Sensor provides an ideal solution for non-contact, maintenance-free portable or permanent sewer flow monitoring.*

## Features and Benefits

The Flo-Dar Area/Velocity Radar Flow Meter provides a revolutionary approach to open channel flow monitoring. The sensor combines advanced Digital Doppler Radar velocity sensing technology with ultrasonic pulse echo depth sensing to remotely measure open channel flow. Use with FL900 Series Flow Logger or Flo-Logger/Logger XT for portable monitoring; for permanent monitoring sites, the Flo-Dar can be connected to the Flo-Station which displays flow rate, velocity, and level. (See Lit. No. 2709 [standard] or Lit. No. 2711 [wireless] for Flow Logger product information, or Lit. No. 2616 for Flo-Station product information). Intrinsically safe models available.

### Accurate Flow Measurement

Flo-Dar provides the user with highly accurate flow measurements under a wide range of flows and site conditions. By measuring the velocity of the fluid from above, Flo-Dar eliminates accuracy problems inherent with submerged sensors including sensor disturbances, high solids content and distribution of reflectors.

### Non-Contact Sensor Eliminates Lost Data

No lost data with non-contact, above the flow sensor that is unaffected by fouling due to debris and grease.

### Easy Installation and Maintenance

As the sensor is mounted above the flow, personnel have little or no contact with the flow during installation. Future sensor removal can be done without the need for confined space entry.

### Independent Accuracy / Long-Term Stability Verification

Flo-Dar sensor accuracy and long-term stability (up to 3 years without need for site calibration) from low flow depths up to surcharge conditions has been independently verified

many times over the years including a formal evaluation by the Alden Research Laboratory, Inc. and recent field evaluations done by municipalities and consulting engineering firms.

### Perfect Solution for Difficult Flow Conditions

Operates in the most difficult conditions including flows with high solids content, high temperature, shallow and caustic flows, large man-made channels, and high velocities up to 20 ft/s.

### Optional Surcharge Velocity Sensor

During surcharge events Flo-Dar's optional electromagnetic sensor will continue to provide uninterrupted and accurate flow monitoring through dry and wet weather flows without the need for routine sensor cleaning or maintenance.

### Applications

#### Municipal

- Sanitary Sewer Evaluation Studies
- Collection Systems
- Capacity Studies
- Combined Sewer Overflows
- Inflow and Infiltration (I&I) Studies
- Billing / Custody Transfer
- Plant Influent and Effluent

#### Industrial

- Process Waste
- Plant Influent
- Plant Effluent
- Non-contact Cooling Water
- Stormwater Monitoring and Compliance

DW = drinking water WW = wastewater municipal PW = pure water / power  
IW = industrial water E = environmental C = collections FB = food and beverage



Be Right™

WW

IW

C



## Specifications\*

### FLO-DAR SENSOR

#### Enclosure

IP68 Waterproof rating, Polystyrene

#### Dimensions

160.5 W x 432.2 L x 297 D mm (6.32 x 16.66 x 11.7 in.), with SVS, D = 387 mm (15.2 in.)

#### Weight

4.8 kg (10.5 lbs.)

#### Operating Temperature

-10 to 50°C (14 to 122°F)

#### Storage Temperature

-40 to 60°C (-40 to 140°F)

#### Power Requirements

Supplied by FL900 Flow Logger, Flo-Logger, or Flo-Station

#### Interconnecting Cable

**-Disconnectable at both sensor and logger or Flo-Station**

Polyurethane, 0.400 (±0.015) in. diameter; IP68  
Standard length 9M (30 ft), maximum 305 m (1000 ft)

Cables are available in two styles:

- connectors both ends
- connector from sensor with open leads to desiccant hub, desiccant hub with connector to logger. A potting/sealant kit will be included. This can be used to run the cable through conduit.

Important Note: The sensor cable assembly with desiccant hub is compatible with either the Marsh-McBirney Flo-Logger/Logger XT or the Hach FL900 Series Flow Loggers. When using this cable assembly with the Marsh-McBirney Flo-Logger, do not disconnect the desiccant cartridge that is attached to the Flo-Logger itself. It is important to keep the air tube plugged.

If using Flo-Dar cable with Flo-Station, the cable will have bare leads to the Flo-Station (30 to 1000 ft. lengths) and there will be no desiccant hub, as the air tube terminates inside of the Flo-Station housing.

#### Warranty

1 year

#### Set-up/Data Retrieval

Flo-Ware for Windows software is the user on-site set-up, data management, and report generation software. It is compatible with desktop/laptop computers utilizing Windows operating system.

#### Certification

The Flo-Dar Transmitter is certified to the following requirements:

- Transmitter type: Field Disturbance Sensor
- Frequency: 24.125 GHz - Doppler pulse
- Maximum rated power output: 128 dbuV (ave) @ 3 meters

Certified to: FCC Part 15.245: FCC ID: VIC-FLODAR24  
Industry Canada Spec. RSS210. v7: IC No.: 6149A-FLODAR24

Use of this device is subject to the following conditions:

1. There are no used serviceable items inside this device.
2. The user must install this device in accordance with the supplied installation instructions and must not modify the device in any manner whatsoever.
3. Any service involving the transmitter must only be performed by Hach Company.
4. The user must ensure that no one is within 20 cm of the face of the transmitter when operating.

### SURCHARGE DEPTH MEASUREMENT

Auto zero function maintains zero error below 0.5 cm (0.2 in.)

#### Method

Piezo-resistive pressure transducer with stainless steel diaphragm

#### Range

3.5 m (138 in.), overpressure rating 2.5 x full scale

### VELOCITY MEASUREMENT

#### Method

Radar

#### Range

0.23 to 6.10 m/s (0.75 to 20 ft/s)

#### Frequency Range

24.075 to 24.175 G-Hz, 15.2mW (max.)

#### Accuracy

±0.5%; ±0.03 m/s (±0.1 ft/s)

### DEPTH MEASUREMENT

#### Method

Ultrasonic

#### Standard Operating Range from Flo-Dar Housing to Liquid

0 to 152.4 cm (0 to 60 in.)

#### Optional Extended Level Operating Range from Transducer Face to Liquid

0 to 6.1 m (0 to 20 ft.) with 43.18 cm (17 in.) dead band, temperature compensated.

#### Accuracy

±1%; ±0.25 cm (±0.1 in.)

### FLOW MEASUREMENT

#### Method

Based on Continuity Equation

#### Accuracy

±5% of reading typical where flow is in a channel with uniform flow conditions and is not surcharged, ±1% full scale max.

### SURCHARGE CONDITIONS DEPTH/VELOCITY

#### DEPTH (Std with Flo-Dar Sensor)

Surcharge depth supplied by Flo-Dar sensor.

#### VELOCITY (Optional Surcharge Velocity Sensor)

#### Method

Electromagnetic

#### Range

±4.8 m/s (±16 ft/s)

#### Accuracy

±0.15 ft/s or 4% of reading, whichever is greater.

#### Zero Stability

> ±0.05 ft/s

### CERTIFICATION INTRINSICALLY SAFE

The Flo-Dar and Surcharge Velocity Sensors are certified to Class I, Zone 1 Standards. They conform to ANSI/UL 60079-11 and are certified to CAN/CSA E60079-11 and EN 60079-11 standards.



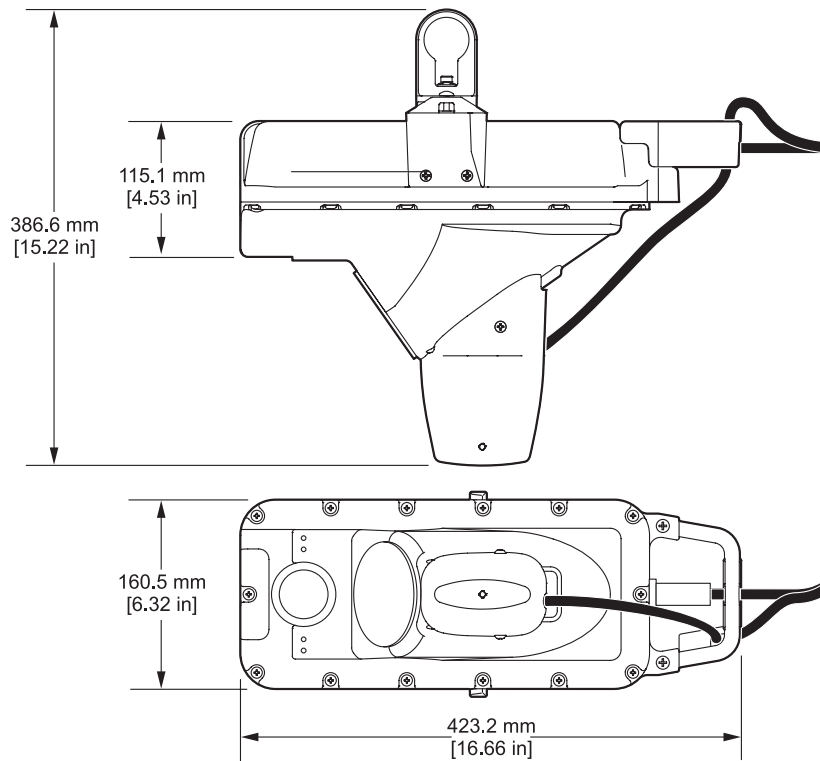
The Flo-Dar sensor meets CE requirements.



## Engineering Specifications

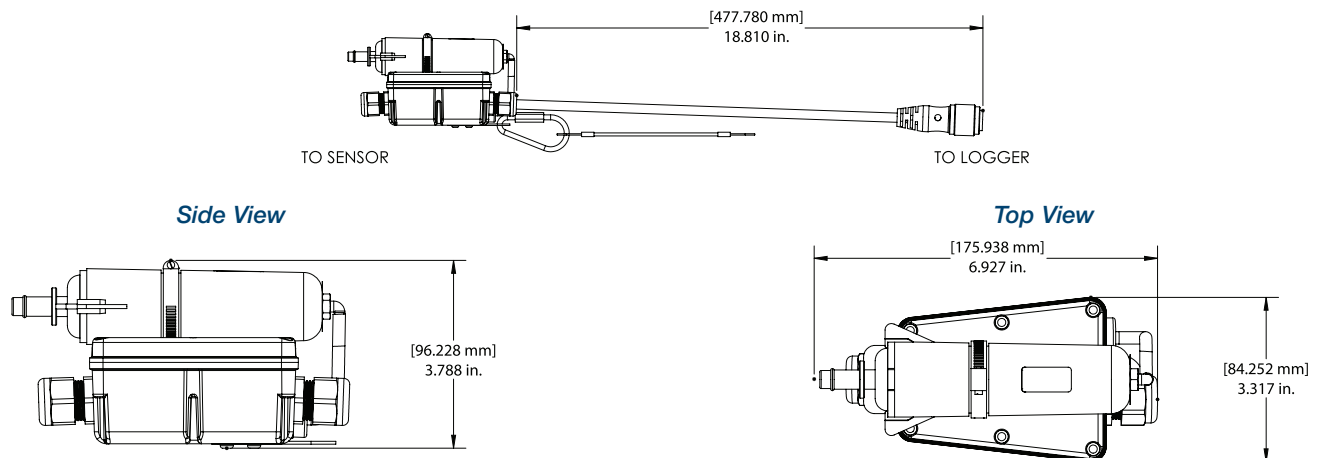
- The flow meter shall be capable of measuring level, average velocity and surcharge depth.
- The method of velocity measurement shall be Doppler radar.
- The sensor shall combine advanced Doppler Radar velocity sensing technology with ultrasonic pulse echo depth sensing to remotely measure open channel flow.
- Flow shall be calculated based on the Continuity Equation ( $Q=V \times A$ ), where  $Q$ =Flow,  $V$ =Average Velocity and  $A$ =Area.
- The range of velocity measurement shall be 0.23 to 6.10 m/s (0.75 to 20 ft/s).
- The method of depth measurement shall be ultrasonic.
- The standard operating range for depth measurement shall be 0 to 152.4 cm (0 to 60 in.) with an optional operating range of 0 to 6.1 m (0 to 20 ft.) with 43.18 cm (17 in.) deadband, temperature compensated.
- The flow meter shall have a surcharge condition velocity sensor option.
- Exterior dimensions of the sensor shall not exceed 160.5 W x 432.2 L x 297 D mm (6.32 W x 16.66 L x 11.7 D in.) or 160.5 W x 432.2 L x 387 D mm (6.32 W x 16.66 L x 15.2 D in.) with Surcharge Velocity option.
- The sensor shall be able to measure bi-directional surcharge flow.
- Optional Intrinsically Safe models available for flow monitoring in hazardous locations.
- The model shall be the Marsh-McBirney Flo-Dar Open Channel Flow Meter Sensor.

## Dimensions



*Flo-Dar Area/Velocity Radar Flow Meter*

The desiccant hub assembly includes a junction box to connect sensor cable to the desiccant and subsequently to the FL900 Logger. The desiccant can easily be replaced without need to purchase a separate desiccant module.



*Desiccant Hub Assemblies for use with portable FL900 Series Loggers and Flo-Logger.  
(Sensor cable for use with Flo-Station will not contain a desiccant hub and will have bare wires on cable end.)*

## Ordering Information

### Configure FLO-DAR Sensor to Logger (Portable)

Flo-Dar Sensor	Model 4000	-	4	X	X
<b>Flo-Dar Sensor with specified cable length</b> (need to add cable as separate line item)			4		
<b>Non Intrinsically Safe</b> <b>Surcharge Velocity Sensor Option</b> (IMPORTANT NOTE: SVS cable length MUST MATCH FloDar Sensor Cable length)				0 3	
<b>Non Extended Range</b> <b>Extended Range Option</b> —Allows use in flow depths up to 18 feet. Allow for 18" deadband. Standard unit max depth is 60". SVS Option requires Remote Extended Range below. <b>Remote Extended Range Option with 6' sensor cable</b> —Flow depths up to 18 feet. Allow for 18" deadband. Standard unit max depth is 60".					0 1 2

### Configure FLO-DAR Sensor to Flo-Station (Permanent)

Flo-Dar Sensor	Model 4000	-	9	X	X
<b>Flo-Dar Sensor with specified cable length</b> (need to add cable as separate line item)			9		
<b>Non Intrinsically Safe</b> <b>Surcharge Velocity Sensor Option</b> (IMPORTANT NOTE: SVS cable length MUST MATCH Flo-Dar Sensor Cable length)				0 3	
<b>Non Extended Range</b> <b>Extended Range Option</b> —Allows use in flow depths up to 18 feet. Allow for 18" deadband. Standard unit max depth is 60". SVS Option requires Remote Extended Range below. <b>Remote Extended Range Option with 6' sensor cable</b> —Flow depths up to 18 feet. Allow for 18" deadband. Standard unit max depth is 60".					0 1 2

### Cables

<b>FD9000CBL-XXX*</b>	FL900 Series Logger to Flo-Dar sensor. Cable w/two connectors.
<b>FDJCTBOXCBL-XXX*</b>	FL900 Series Logger to Flo-Dar sensor. Cable with connector to sensor, open end to desiccant hub, desiccant hub with connector to sensor. Includes finishing kit for potting/sealing desiccant hub. For use with conduit.
<b>6000062XX*</b>	SVS Sensor with connector for use with FL900 Series Logger.
<b>570011800-XXX*</b> <b>Model 4000-9</b>	Flo-Station to Flo-Dar sensor Cable with one connector and bare leads.
<b>6000059XX*</b>	SVS Sensor with bare leads for use with Flo-Station. *Contact customer service for product numbers.
Available Cable Lengths (in feet)	
30	125 225 400 700
60	150 250 450 800
75	175 300 500 900
100	200 350 600 1000

See Lit. No. 2709 (standard models) and Lit. No. 2711 (wireless models) for FL900 Series Flow Logger ordering information. See Lit. No. 2616 for Flo-Station ordering information.

### Mounting Hardware

<b>800016701</b>	Permanent Sensor Mount—Includes sensor frame & all mounting hardware. Portable Sensor Mounts Available (Sizes 34-107") Contact Sales.
------------------	---

### Accessories & Spares

<b>245000501</b>	Sensor Retrieval Pole - Used to place and retrieve sensor from mounting bracket. Pole extends to 7.3 m (21 ft.)
<b>510012701</b>	Sensor Retrieval Hook - Used with Sensor Retrieval Pole
<b>570011401</b>	Grounding Strap (required with Retrieval Pole and Hook when used with IS units)
<b>8755500</b>	Bulk desiccant beads (1.5 pounds)

Lit. No. 2708 Rev 2  
K11 Printed in U.S.A.

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In the interest of improving and updating its equipment, Hach Company reserves the right to alter specifications to equipment at any time.



*At Hach, it's about learning from our customers and providing the right answers. It's more than ensuring the quality of water—it's about ensuring the quality of life. When it comes to the things that touch our lives...*

*Keep it pure.*

*Make it simple.*

*Be right.*

*For current price information, technical support, and ordering assistance, contact the Hach office or distributor serving your area.*

*In the United States and all other countries except Europe, contact:*

HACH COMPANY  
4539 Metropolitan Court  
Frederick, MD 21704-9452, U.S.A.  
Telephone: 800-368-2723  
Fax: 301-874-8459  
E-mail: hachflowsales@hach.com  
[www.hachflow.com](http://www.hachflow.com)

*In Europe contact:*

Flow-Tronic  
Rue J.H. Cool 19a  
B-4840 Welkenraedt Belgium  
Telephone: +32-87-899799  
Fax: +32-87-899790  
E-mail: site@flow-tronic.com  
[www.flow-tronic.com](http://www.flow-tronic.com)



**Be Right™**

# US3 Rain Gauge

## Rain Gauge Tipping Bucket With Leaf Filter



The US3 Rain Gauge tipping bucket uses a standard tipping bucket mechanism that allows for straightforward and effective rainfall measurement. The geometry and material selection of the bucket, along with the inclusion of a leaf filter, help minimize contamination and errors in the measurement process.

The rain gauge features a 8" (200mm) diameter collector funnel. The tipping bucket device is divided into two compartments to enable the measurement of rainfall in fixed increments. The bucket is pivoted at its center and has a preset calibration to tip for a specific amount of rainfall, either 0.5 mm or 1 mm. The tipping action of the bucket magnetically opens and closes a reed switch. When the bucket is full and tips, it triggers the reed switch, generating a pulse signal. The pulse signal from the reed switch is sent to a data logger or RTU.

### Ordering information

**Code**            **US3-RGTB**

### Applications

- Water management
- Rain Measurement
- Flood Control Monitoring
- Environmental telemetry
- Intelligent Irrigation systems
- Integrates with Most Loggers/PLCs

### Technical characteristics

Item	Specification
Measurement object	Rain
Measured rainfall intensity	0-9.5 inch/hour
Sample interval	1s
Resolution	0.004 inch
Accuracy(0.08 inch/min)	±4%
Power consumption	1.6W
Supply	7-24VDC
Output	RS485, RS232, SDI-12 optional
Operating temperature	-40-+176F -40-+80°C
Main material	SS+ABS
Weight (unpacked)	1.4 lbs (0.65kg)



## **Appendix F**

### **PWC Agreement**

THIS AGREEMENT, made this 2nd day of FEBRUARY, 2004 by and between the NORCRESS WATER AND SEWER DISTRICT (hereinafter referred to as "NORCRESS"); and the PUBLIC WORKS COMMISSION of the City of Fayetteville, North Carolina (hereinafter referred to as "COMMISSION").

WITNESSETH THAT

WHEREAS, NORCRESS has contracted with COMMISSION to furnish sanitary sewer treatment service to NORCRESS as per an agreement dated October 14, 2002; and

WHEREAS, both COMMISSION and NORCRESS recognize the complexity of providing sanitary sewer utility service; and

WHEREAS, NORCRESS requests that COMMISSION operate and maintain NORCRESS's proposed sanitary sewer collection system; and

WHEREAS, COMMISSION agrees to operate and maintain said sanitary sewer collection system.

NOW THEREFORE, and in consideration of the benefits each shall derive, the parties mutually agree as follows:

I. COMMISSION will provide the following services:

A. Basic Operation and System Maintenance, to include:

- (1) Repairing damaged, deteriorated, or broken sanitary sewer mains, not to include outright system replacement of large segments (more than 500') of the sanitary sewer collection system which cannot be repaired due to structural failure, natural or manmade disasters, or were not installed with COMMISSION approved plans and specifications;
- (2) Repairing damaged, deteriorated, or broken sanitary sewer service laterals from the main to edge of road right-of-way or easement;
- (3) Routine maintenance and repair of pump station equipment, if any, not to include replacement of major components (parts and/or equipment valued over \$1,000);
- (4) Cleaning and rodding of clogged sewer mains;
- (5) Repairing of manholes, including rings and covers;
- (6) Other routine maintenance and repairs as needed;



- (7) Administrative and engineering support of above, as required;
- (8) 24 hours, 7 days per week on-call dispatch with appropriate response forces;
- (9) Responding to inquiries by existing and potential users of sanitary sewer service;
- (10) Investigating and working to resolve complaint issues;
- (11) Keeping NORCRESS abreast of changes in regulations concerning sanitary sewer utility services;
- (12) Maintaining metered electric service at pumping stations as well as chemicals associated with pump station operation. The cost of metered electric service shall be a recoverable expense to be included in the monthly billing statement;
- (13) Plan review by COMMISSION engineering staff of NORCRESS's plans and/or plans submitted to NORCRESS by others to ensure utility extensions are designed to meet COMMISSION specifications and are compatible with NORCRESS's goals and objectives for meeting overall system needs.

B. COMMISSION will provide other services, upon request, but which will be billed separately and not included in the monthly basic operation and maintenance billing. A partial list of the "other services" that may be available to NORCRESS include the following:

- (1) Sanitary sewer service lateral installation;
- (2) Promote participation agreements with other benefited parties;
- (3) Preparation and administration of utility extension contracts;
- (4) Right-of-way acquisition services for land and easement requirements to be secured in the name of NORCRESS within the limits permitted by law but not to include actions in eminent domain;
- (5) Inspection services during construction;
- (6) Meter reading and billing;
- (7) Miscellaneous services such as GIS mapping as requested.

II. OPERATION AND MAINTENANCE COST – COMMISSION shall render accurate monthly bills to NORCRESS. Such bills shall be computed by multiplying NORCRESS's sewer flow, expressed in thousand (M) gallons, by the applicable rate per thousand (M) gallons for this customer class. The rate per thousand (M) gallons shall be subject to change annually. In addition, COMMISSION shall submit an itemized statement monthly for the



actual cost associated with metered electric service and "other services" as set forth in Paragraph I-B performed by COMMISSION, reflecting the appropriate regular hourly or overtime rate for labor, equipment, and materials (to include an amount for all direct and indirect charges plus profit at 10%).

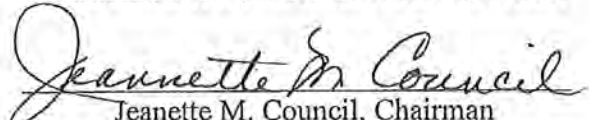
- III. REPAIRS - COMMISSION shall not be financially responsible for any repairs or cost of repairs needed to the sanitary sewer collection system unless such repairs are due to negligence of COMMISSION or its employees. However, COMMISSION will repair or arrange for all repair services. If not covered under Basic Operation and Maintenance (Paragraph I-A), COMMISSION will seek prior approval from NORCRESS if the anticipated cost of such repairs exceeds \$1,000, unless delay in making repairs could create or prolong discontinuance of sanitary sewer utility services, or create unsafe conditions for customers, COMMISSION's employees or other persons, or create an environmental hazard.
- IV. PAYMENT - Monthly bills rendered for services as provided hereunder are payable within 10 days from their date, at COMMISSION's office, Robert C. Williams Business Center, 201 Hay Street, (28301) P.O. Box 7000, Fayetteville, NC 28302. A late charge of one percent per month from final payment date shall apply to all such bills.
- V. TERM OF AGREEMENT - NORCRESS and COMMISSION mutually agree that the term of this Agreement shall be ten years from the date of COMMISSION's execution thereof, and continuing annually thereafter until terminated by either party's written notice at least three months prior to the end of any such annual term.
- VI. TERMINATION OF AGREEMENT - If NORCRESS or COMMISSION fails to fulfill in a timely and proper manner the obligations under this Agreement, either party shall have the right to terminate this Agreement by specifying the reason for termination in written notice to the other party at least 60 days prior to the date of termination.
- VII. AMENDMENTS - This Agreement shall not be modified, amended, or changed in any respect except in a writing, duly signed by the parties hereto. Each party hereby waives any right to amend the Agreement in any other manner.
- VIII. ASSIGNMENT - This Agreement shall be binding upon and shall inure to the benefit of NORCRESS and its successors and assigns. COMMISSION may only assign this agreement with the written consent of NORCRESS.
- IX. LIABILITY - COMMISSION shall not be liable for injury or damage to NORCRESS or

persons or property, unless such injury or damage was caused by the negligence or willful misconduct by COMMISSION or its employees. COMMISSION shall not be responsible for any injuries or damages resulting from acts, omissions, or occurrences, which occurred prior to the date COMMISSION, began operations pursuant to this Agreement. NORCRESS shall indemnify, defend, and save COMMISSION harmless against other/all liability, claims, judgments, losses, costs and expenses for injury, loss, or damage to persons or property, including fines by any federal or state agency, and also including personal injury or property damage to NORCRESS, its employees, sanitary sewer customers, and citizens on account of operation and maintenance of NORCRESS's sanitary sewer system, including any defective construction (other than by COMMISSION or its agents) or equipment of NORCRESS's sanitary sewer system, on NORCRESS's side of the point of delivery from COMMISSION's facilities or on its sanitary sewer customers' side of the service lateral. COMMISSION assumes responsibility for and shall indemnify, defend, and save NORCRESS harmless against all liability, claims, judgments, losses, costs and expenses for injury loss, or damage to persons or property, including fines by any federal or state agency, and also including personal injury or property damage to sanitary sewer customers and citizens on account of operation of NORCRESS's sanitary sewer system on the NORCRESS's side of the point of delivery of sanitary sewer service (metering point) due to the negligence or willful misconduct of COMMISSION.

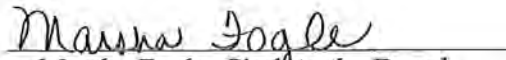
- X. ENTIRE AGREEMENT - This writing embodies the entire Agreement and understanding between the parties hereto and there are no other agreements or understandings, oral or written, with reference to the subject matter hereof that are not merged herein and superseded hereby.

IN TESTIMONY WHEREOF, NORCRESS has executed this instrument by its Chairman and COMMISSION has executed this instrument by its Chairman, each being duly authorized to execute this Agreement.

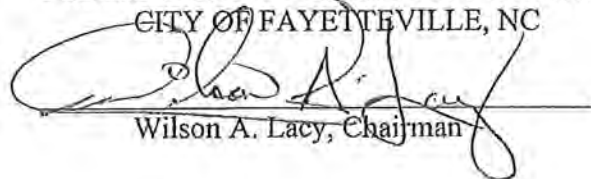
NORCRESS WATER & SEWER DISTRICT

  
Jeanette M. Council, Chairman

ATTEST:

  
Marsha Fogle, Clerk to the Board

PUBLIC WORKS COMMISSION OF THE  
CITY OF FAYETTEVILLE, NC

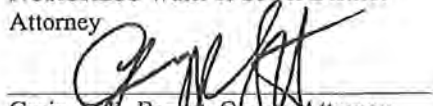
  
Wilson A. Lacy, Chairman

ATTEST:

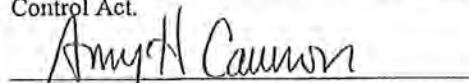
  
Terri Union, Secretary

NORCRESS:

APPROVED for Legal Sufficiency  
NORCRESS Water & Sewer District  
Attorney

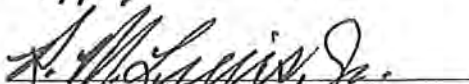
  
Grainger L. Barrett, County Attorney  
Attorney for NORCRESS

This instrument has been pre-audited in the manner  
required by the Local Government Budget and Fiscal  
Control Act.

  
Amy H. Cannon, Assistant County Manager  
Finance Officer for NORCRESS

COMMISSION:

APPROVED as to form this 14<sup>th</sup> day of  
MAY, 2004

  
Richard M. Lewis, Jr., Attorney  
Public Works Commission

This instrument has been pre-audited in the manner  
required by the Local Government Budget and Fiscal  
Control Act.

  
Dwight Miller, Chief Financial Officer  
Public Works Commission

---

NORTH CAROLINA – CUMBERLAND COUNTY

I, Anna L. Hymes, a Notary Public of said County and State do hereby certify that Marsha Fogle personally appeared before me this day and acknowledged that he/she is Clerk of NORCRESS Water and Sewer District, and that the authority duly given and as the act of said, the foregoing instrument was signed in its name by its Chairman, sealed with its corporate seal, and attested by himself/herself as its Clerk.

WITNESS my hand and Notarial Seal, this the 2nd day of Feb., 2004.

My COMMISSION Expires: 8-13-08

Anna L. Hymes  
Notary Public

---

NORTH CAROLINA - CUMBERLAND COUNTY

I, Joan D. Starling, a Notary Public of said County and State do hereby certify that TERRI WATSON, personally appeared before me this day and acknowledged that he is Secretary of The Public Works Commission, an agency of the City of Fayetteville, North Carolina, and that the authority duly given and as the act of the agency, the foregoing instrument was signed in its name by its Chairman, sealed with its seal, and attested by himself as its Secretary.  
herself

WITNESS my hand and Notarial Seal, this the 26 day of May, 2004.

My COMMISSION Expires: April 1, 2007

Joan D. Starling  
Notary Public



## **Appendix G**

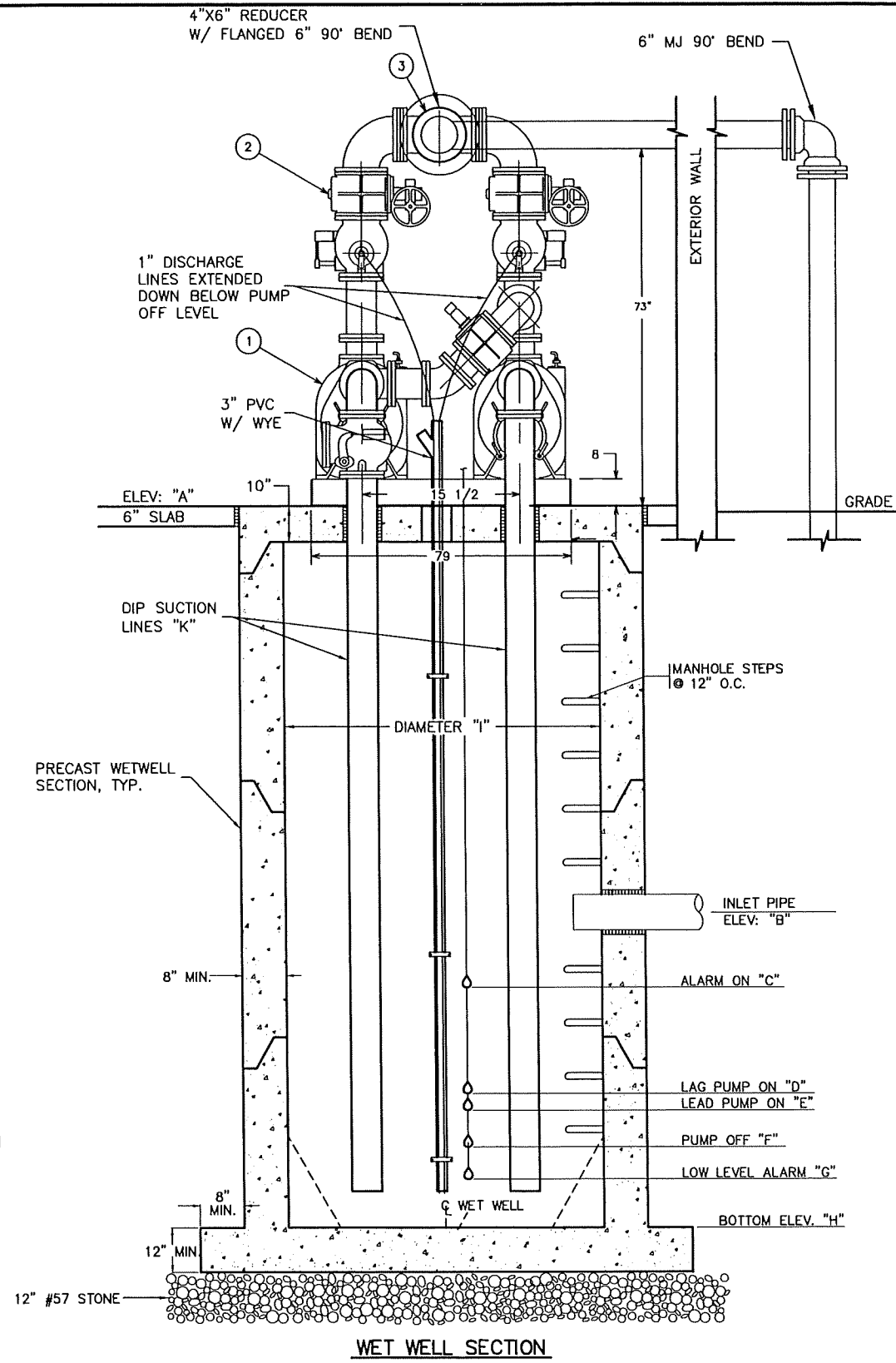
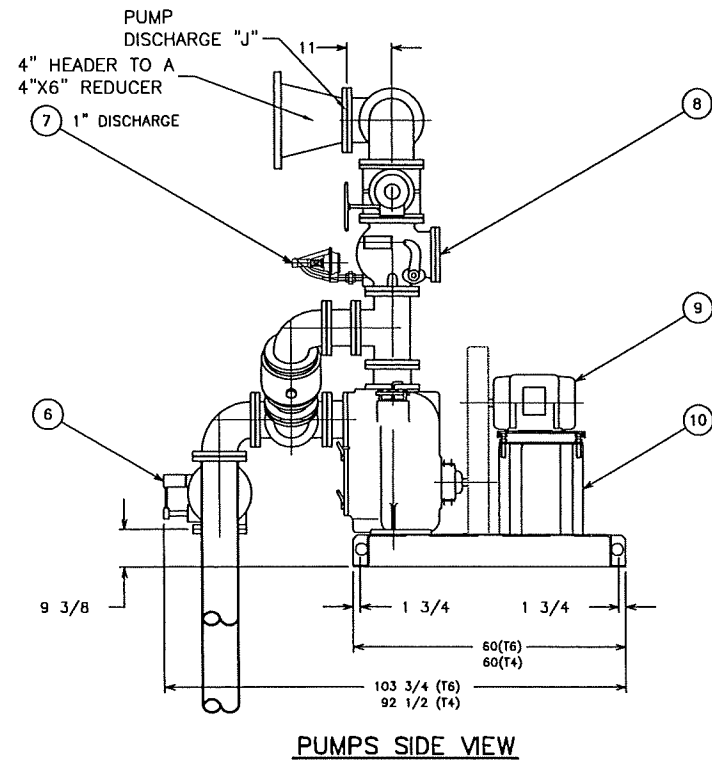
### **Lift Station Record Drawings**





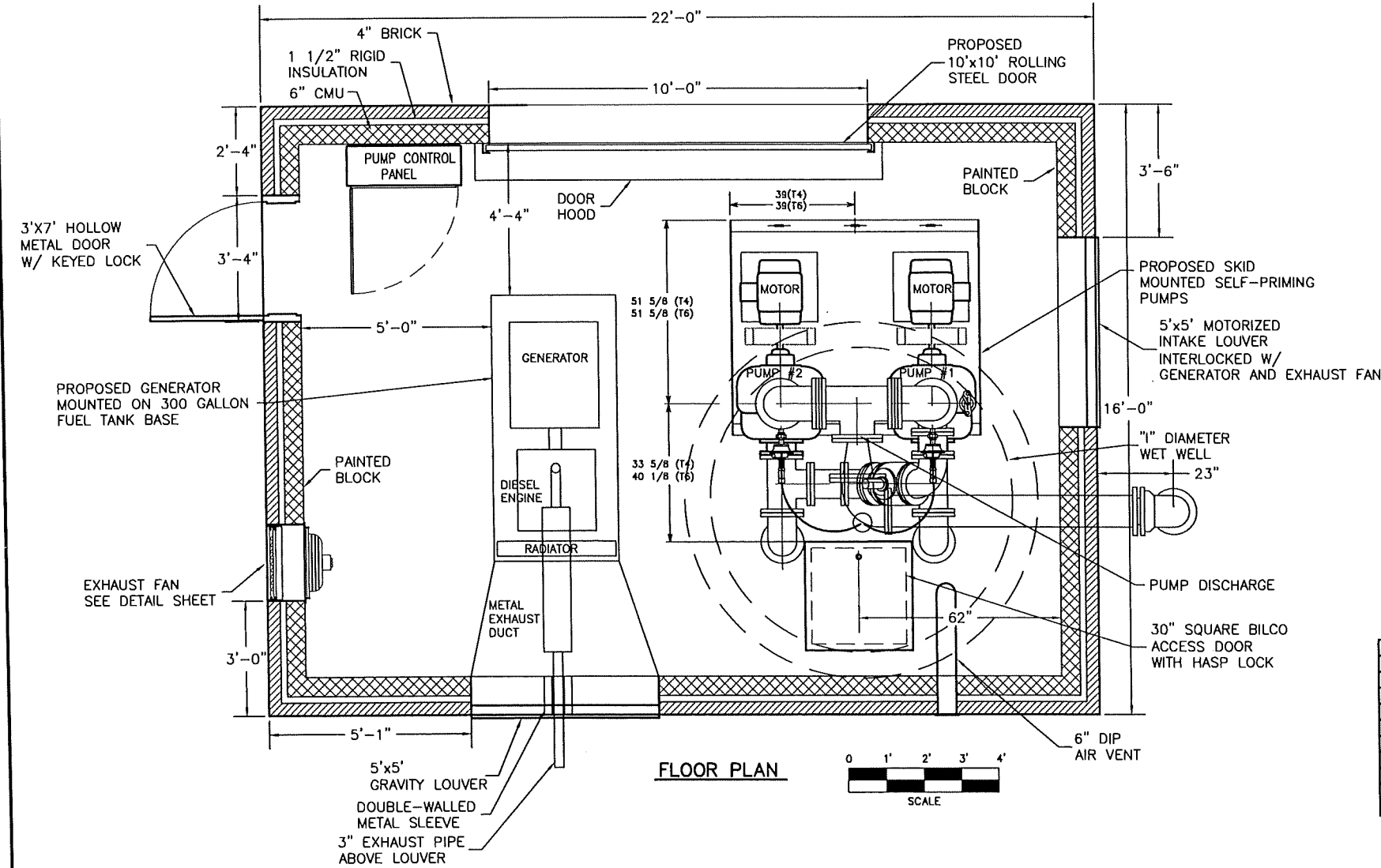


BASE BID-SELF PRIMING PUMP STATION DATA	
	PUMP STATION F-1
DESIGN FLOW	70,000 GPD
PUMP CAPACITY	350 GPM
TDH	108
FM SIZE	8 IN
FM EFFECTIVE LENGTH	18,225
FM HIGH POINT	175.5
VEL. @ PUMP RATE	2.24 FT/SEC
PUMP ON TIME	2.63 MIN
PUMP OFF TIME	16.31 MIN
SELECTED PUMP (OR EQUAL)	GORMAN RUPP T4A-B
RPM	1950
MIN HORSEPOWER	30
MIN EFFICIENCY	44%
IMPELLER	9.75
DISCHARGE	4 IN
WET WELL DIMENSIONS:	
A-RIM	125.28
B-INLET PIPE/ INVERT	EL 116.11 FT
C-HIGH WATER ALARM	EL 115.1 FT
D-LAG PUMP ON	EL 114.8 FT
E-LEAD PUMP ON	EL 113.8 FT
F-LEAD PUMP OFF	EL 111.80 FT
G-LOW LEVEL ALARM	EL 111.10 FT
H-BOTTOM WET WELL	EL 109.80 FT
I-DIAM WET WELL	8 FT
J-DISCHARGE PIPING	6 IN
K-SUCTION PIPING	6 IN

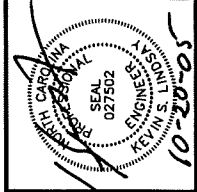


ITEM	DESCRIPTION	MATERIAL
1	PUMP	CAST IRON
2	DISCHARGE PLUG VALVE	CAST IRON
3	DISCHARGE TEE	CAST IRON
4	INTERCONNECT PLUG VALVE	CAST IRON
5	BELT GUARD ASSY	STEEL
6	SUCTION CHECK VALVE	CAST IRON
7	AIR RELEASE VALVE	CAST IRON 1" (SHIPPED LOOSE)
8	DISCHARGE CHECK VALVE	CAST IRON
9	MOTOR	CAST IRON
10	PUMP & MOTOR BASE ASSY	STEEL

**NOTE:**  
CONTROL PANELS PROVIDED BY OWNER  
ALONG WITH TELEMETRY CONTROL  
UNIT, REMOTE TERMINAL UNIT  
WITH ANTENNA, FLOATS AND  
FLOAT SUPPORTS.



REVISIONS	DATE	BY
REVISED	10-23-04	DFW



**Hobbs, Upchurch & Associates, P.A.**  
Consulting Engineers  
SOUTHERN PINES, NC - CHARLOTTE, NC  
MAGS HEAD, NC - RALEIGH, NC  
MYRTLE BEACH, SC - BEAUFORT, SC  
300 S.W. Broad Street, Southern Pines, North Carolina 28387  
Phone: (910) 692-5616 - Fax: (910) 692-4795



PUMP STATIONS  
FOR THE  
NORCROSS WATER AND SEWER DISTRICT  
CUMBERLAND COUNTY, NORTH CAROLINA  
SELF PRIMING PUMP STATION F1

DATE:	JAN., 2004
DESIGNED:	DFW
DRAWN:	DFW
CHECKED:	KSL
SCALE:	SCALE
SHEET NO.	58
OF:	68

H:\CU10103-95\PUMP\BLOG\001\PPBLDGSrev.dwg, FLOORPLAN-FALCON, 10/20/2005 9:12:45 AM, DWG, \\exchange\HPLJ3500, 1,2

# LEGEND

- GFI 20A, 120V, DUPLEX RECEPT, GFI
- WP WEATHERPROOF
- JUNCTION BOX
- S 20A, 120V, SINGLE POLE SWITCH
- DISCONNECT RATING AS SHOWN
- POWER PANEL
- AUTOMATIC TRANSFER SW
- FLOW TRANSMITTER

PANEL TYPE: SQ D I-LINE TYPE HCM  
 VOLTS: 120/240  
 PHASE: 3 PHASE, 4 WIRE  
 30 KAIC

250 AMP MLO  
**"MDP"**

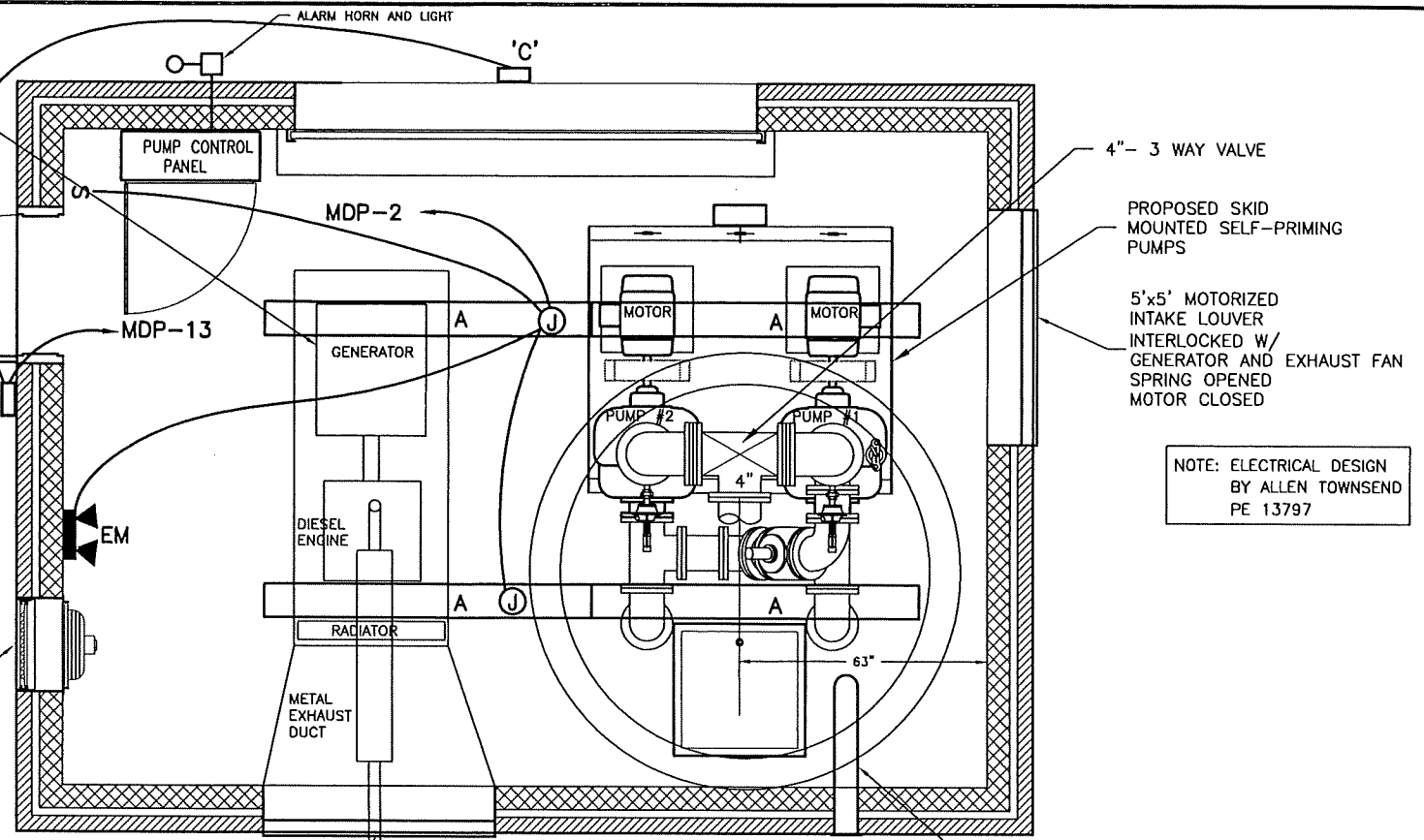
PROVIDE GROUND BAR  
 NEMA 1 ENCLOSURE

W	LOAD DESCRIPTION	WIRE SIZE	BKR. SIZE	CKT. NO.	L1 L2 L3	CKT. NO.	BKR. SIZE	WIRE SIZE	LOAD DESCRIPTION	W
980	EXHAUST FAN / LOUVER	12	20	1		2		4/0	PUMP CONTROL PANEL	26600
984	LIGHTS	12	20	3		4	200	4/0	PUMP CONTROL PANEL	26600
3000	RECEPTACLES	12	20	5		6	3	4/0	PUMP CONTROL PANEL	26600
1500	GEN. BLOCK HEATER	12	20	7		8		10	UNIT HEATER	1666
400	GEN. BATTERY CHARGER	12	20	9		10	30	10	UNIT HEATER	1666
800	SCADA PANEL	12	20	11		12	3	10	UNIT HEATER	1666
300	EXTERIOR LIGHTS	12	20	13		14			SPACE	
				15		16			SPACE	
				17		18			SPACE	
				19		20			SPACE	

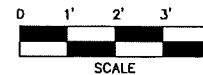
PROPOSED GENERATOR MOUNTED ON 300 GALLON FUEL TANK BASE

PROVIDE PHOTOCELL B IN THIS LIGHT TO CONTROL BOTH OUTSIDE LIGHT FIXTURES

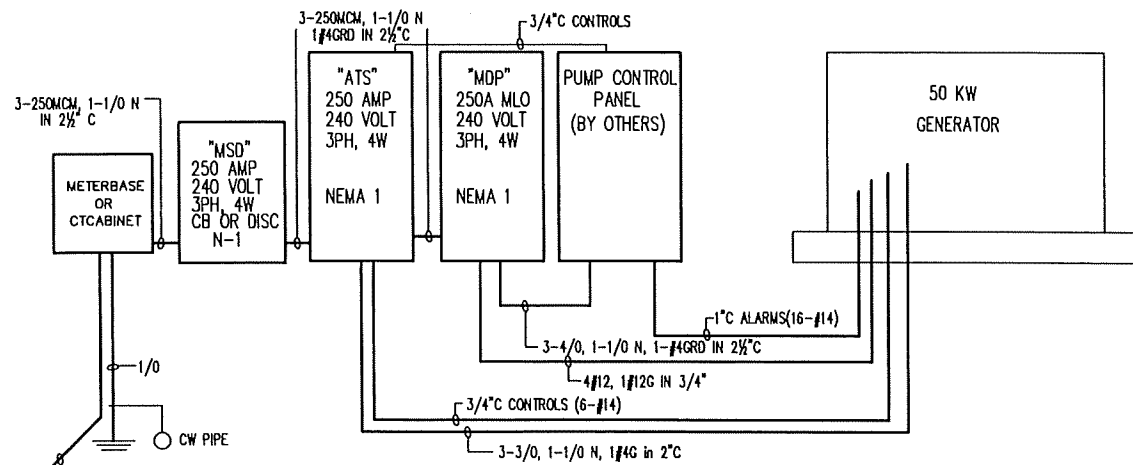
EXHAUST FAN SEE DETAIL SHEET



LIGHTING PLAN



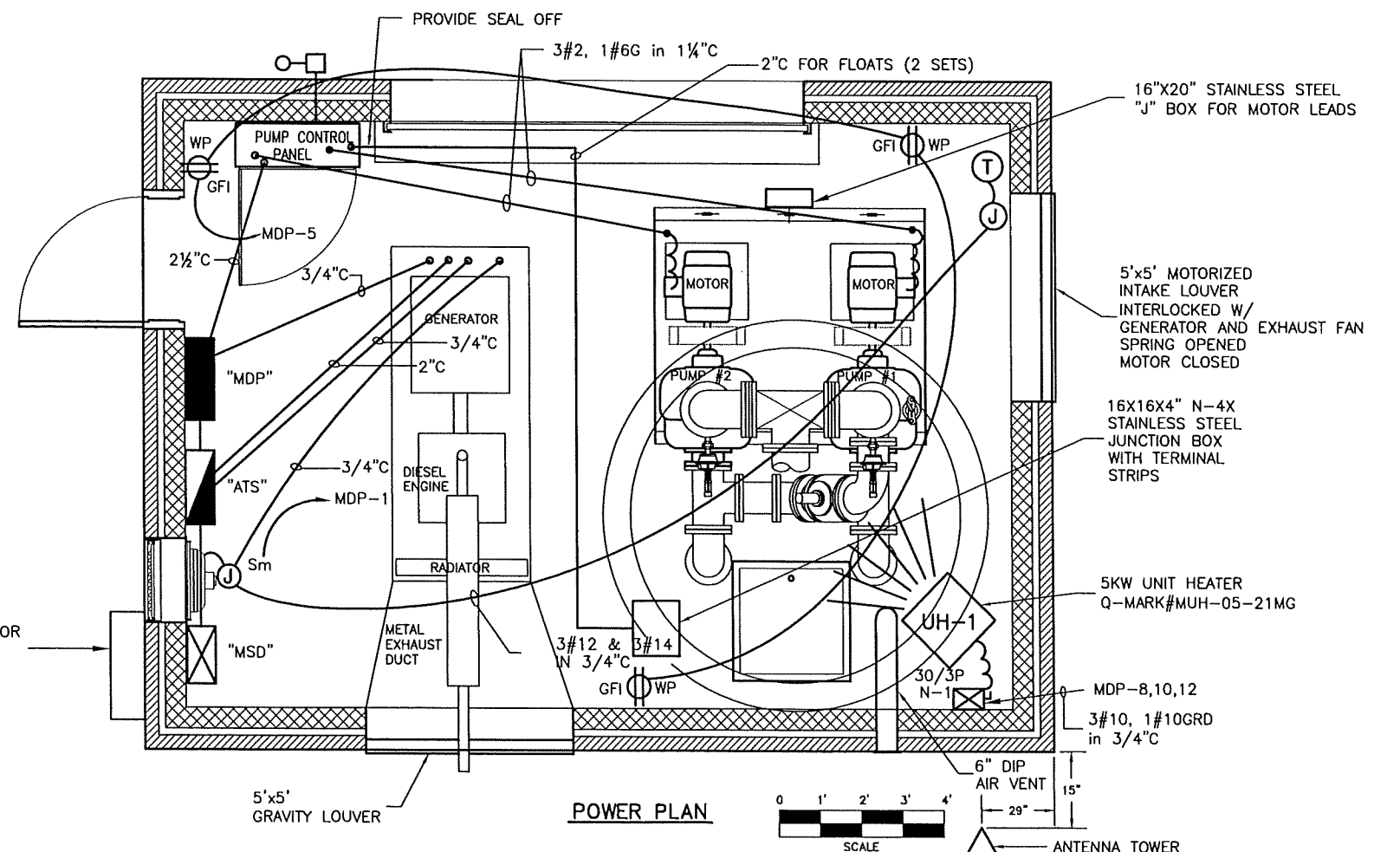
NOTE: ELECTRICAL DESIGN BY ALLEN TOWNSEND PE 13797



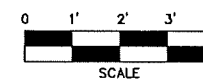
ELECTRICAL RISER DIAGRAM  
 NTS

### FIXTURE SCHEDULE

SYMBOL	MANUF.	CAT NO.	LAMPS	REMARKS
A	COLUMBIA	LU8-296HO-120	2-F96T12HO (110 WATT)	PROVIDE SPACER BETWEEN LIGHT & CEILING
B	SPAULDING	WGS1-M100PS-MT	1-100WMH	MOUNT 10'0" AFG
C	SPAULDING	WGST-M175-MT	1-175MH	MOUNT OVER DOOR 12'0" AFG
EM	PRESCOLITE	LMP-16	2-7.2W	MOUNT 10'0" AFF

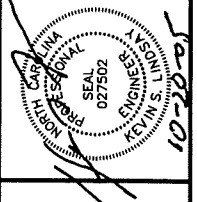


POWER PLAN



RECORD DRAWINGS OCTOBER 2005

REV.	DATE	DESCRIPTION
1	11-23-04	DFW



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 MYRTLE BEACH, SC - BEAUFORT, SC  
 300 S.W. Broad Street, Southern Pines, North Carolina 28387  
 Phone: (910) 692-5616 - Fax: (910) 692-4795

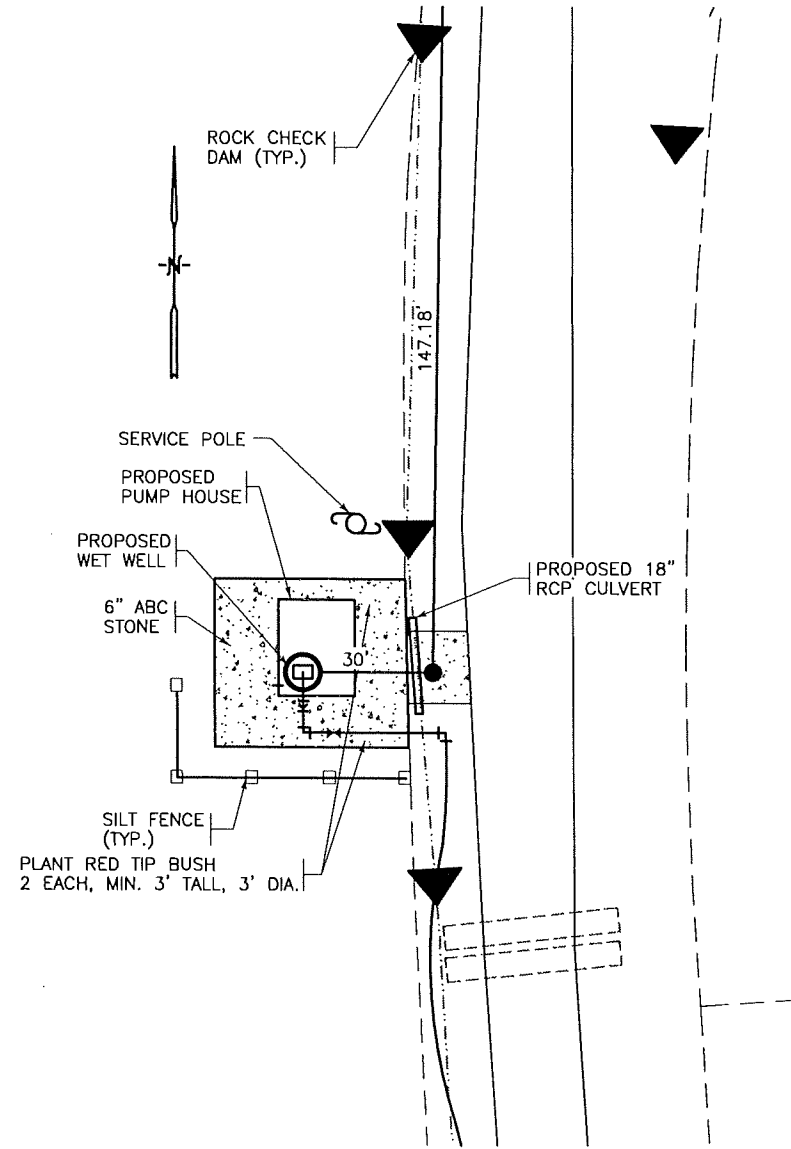


PUMP STATIONS FOR THE  
 NORCRESS WATER AND SEWER DISTRICT  
 CUMBERLAND COUNTY, NORTH CAROLINA  
 PUMP STATION F-1 POWER  
 AND LIGHTING PLANS

DATE:	DEC., 2003
DESIGNED:	DFW
DRAWN:	DFW
CHECKED:	KSL
SCALE:	SCALE
SHEET NO.:	E1

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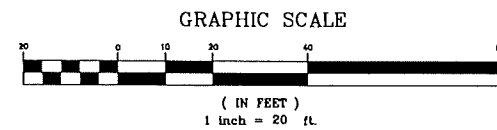
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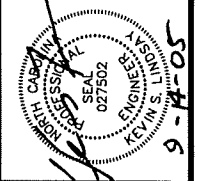
NOTE:  
CONTRACT 3 INCLUDES  
MANHOLE AND 5' STUBOUT  
FOR PUMP STATION

PROPOSED PUMP STATION G-1  
SITE PLAN

SITE ELEVATION 127.67'



SY. NO.	REVISIONS DESCRIPTION	DATE	BY



**Hobbs, Upchurch & Associates, P.A.**  
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TOWN OF GODWIN SANITARY SEWER SYSTEM  
FOR THE  
NORCRESS WATER AND SEWER DISTRICT  
CUMBERLAND COUNTY, NORTH CAROLINA

LAYOUT PUMP STATION G-1

DATE:	DECEMBER, 2002
DESIGNED:	KSL
DRAWN:	HMW3
CHECKED:	KSL
SCALE:	AS SHOWN
SHEET NO.	48
OF:	59

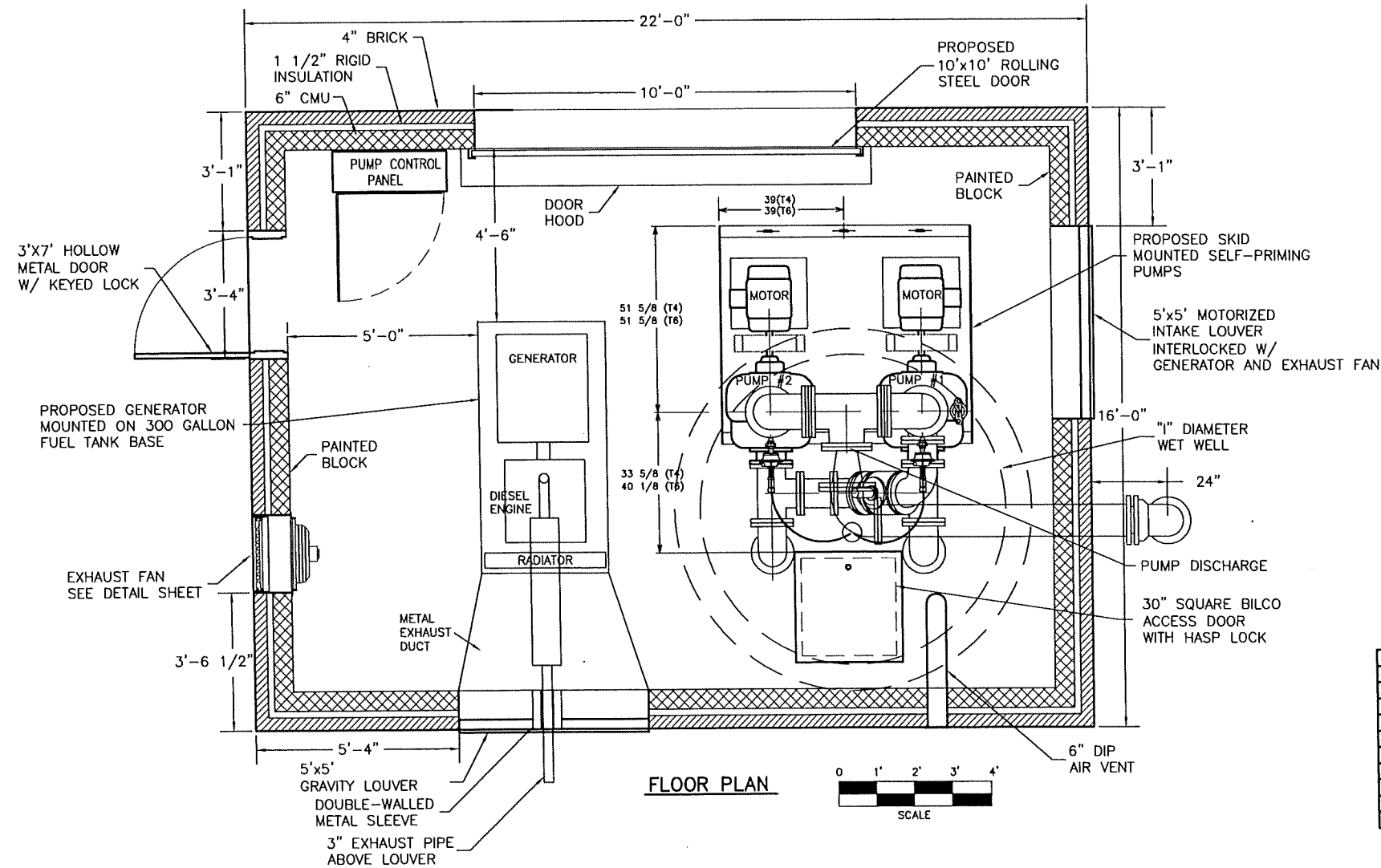
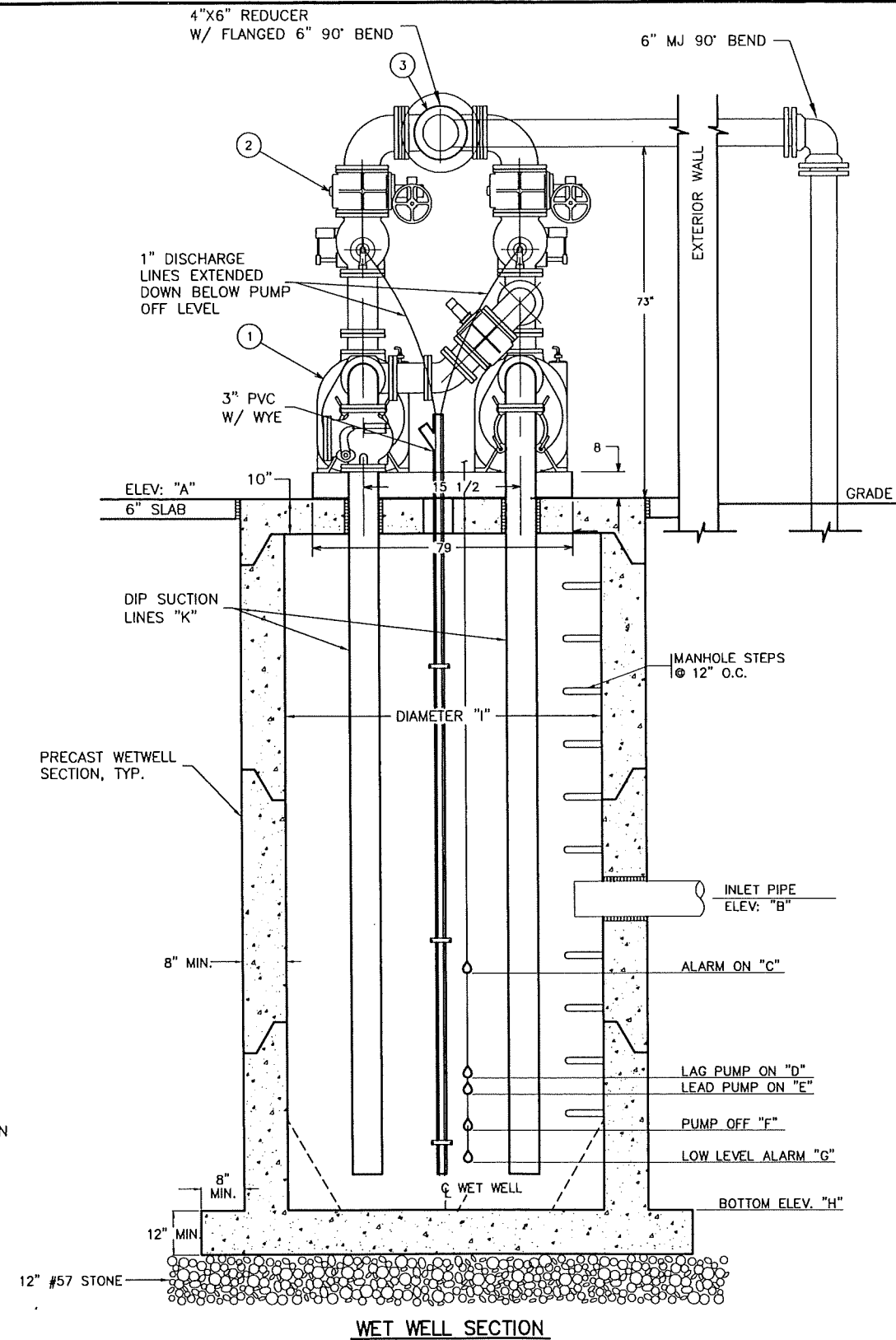
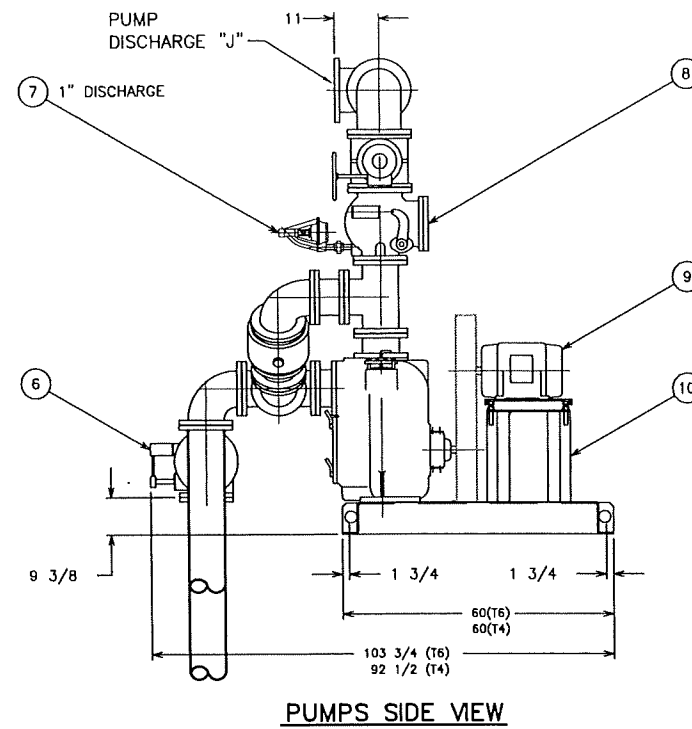








BASE BID--SELF PRIMING PUMP STATION DATA		
	PUMP STATION W-1	PUMP STATION W-2
DESIGN FLOW	45,000 GPD	125,000 GPD
PUMP CAPACITY	200 GPM	700 GPM
TDH	87 FT	82 FT
FM SIZE	6 IN	10 IN
FM LENGTH	6,081 FT	17,941 FT
FM HIGH POINT	147.5 FT	140.5 FT
VEL. @ PUMP RATE	2.27 FT/SEC	2.86 FT/SEC
PUMP ON TIME	2.23 MIN	1.84 MIN
PUMP OFF TIME	12.03 MIN	12.99 MIN
SELECTED PUMP (OR EQUAL)	GORMAN RUPP T4A3S-B	GORMAN RUPP T6A3S-B
RPM	1700	1400
MIN HORSEPOWER	20	40
MIN EFFICIENCY	35%	55%
IMPELLER	9.75 IN	12.375 IN
DISCHARGE	4 IN	6 IN
WET WELL DIMENSIONS:		
A-RIM	103.57	124.56
B-INLET PIPE/INVERT	12 INCH, @ EL. 91.30 FT	15 INCH, @ EL. 118.30 FT
C-HIGH WATER ALARM	EL. 90.0 FT	EL. 116.5 FT
D-LAG PUMP ON	EL. 89.5 FT	EL. 115.5 FT
E-LEAD PUMP ON	EL. 89.0 FT	EL. 115.0 FT
F-LEAD PUMP OFF	EL. 86.5 FT	EL. 112.5 FT
G-LOW LEVEL ALARM	EL. 85.5 FT	EL. 111.5 FT
H-BOTTOM WET WELL	EL. 84.5 FT	EL. 110.5 FT
I-DIAM WET WELL	8 FT	8 FT
J-DISCHARGE PIPING	4 IN	6 IN



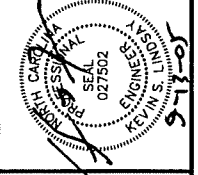
SELF PRIMING PUMPS WITH PARALLEL SERIES PIPING

ITEM	DESCRIPTION	MATERIAL
1	PUMP	CAST IRON
2	DISCHARGE PLUG VALVE	CAST IRON
3	DISCHARGE TEE	CAST IRON
4	INTERCONNECT PLUG VALVE	CAST IRON
5	BELT GUARD ASSY	STEEL
6	SUCTION CHECK VALVE	CAST IRON
7	AIR RELEASE VALVE	CAST IRON 1" (SHIPPED LOOSE)
8	DISCHARGE CHECK VALVE	CAST IRON
9	MOTOR	CAST IRON
10	PUMP & MOTOR BASE ASSY	STEEL

**NOTE:**  
CONTROL PANELS PROVIDED BY OWNER ALONG WITH TELEMETRY CONTROL UNIT, REMOTE TERMINAL UNIT WITH ANTENNA, FLOATS AND FLOAT SUPPORTS.

RECORD DRAWINGS SEPTEMBER 2005

SY. NO.	DESCRIPTION	DATE	BY
1	REVISED WIDTH 30' TO 22'	1-23-04	DFW



**Hobbs, Upchurch & Associates, P.A.**  
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PUMP STATIONS FOR THE  
NORCROSS WATER AND SEWER DISTRICT  
CUMBERLAND COUNTY, NORTH CAROLINA

SELF PRIMING PUMP STATION W1, W2

DATE:	JAN., 2004
DESIGNED:	DFW
DRAWN:	DFW
CHECKED:	KSL
SCALE:	SCALE
SHEET NO.	77
OF:	89



# LEGEND

- GFI 20A, 120V, DUPLEX RECEPT, GFI
- WP WEATHERPROOF
- JUNCTION BOX
- S 20A, 120V, SINGLE POLE SWITCH
- DISCONNECT RATING AS SHOWN
- POWER PANEL
- AUTOMATIC TRANSFER SW
- FLOW TRANSMITTER

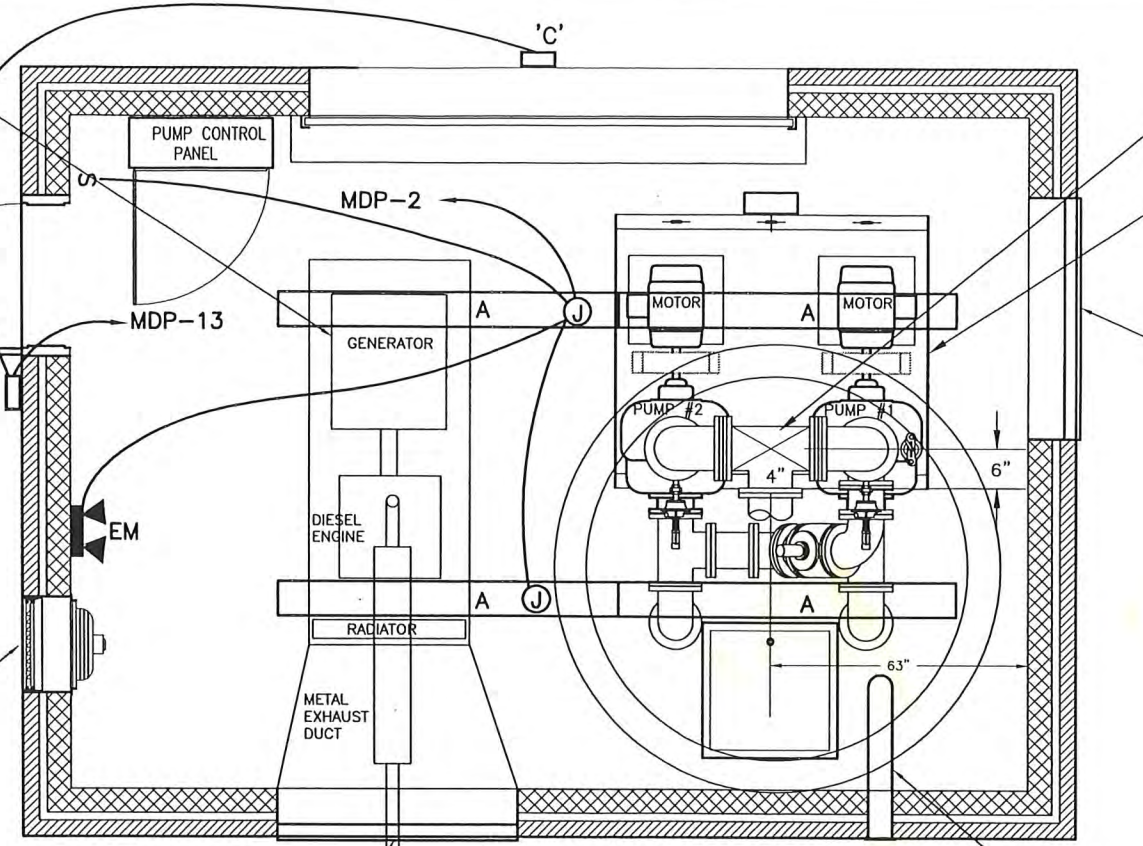
PANEL TYPE: SQ D I-LINE TYPE HCM 225 AMP MLO PROVIDE GROUND BAR  
 VOLTS: 120/240 "MDP" NEMA 1 ENCLOSURE  
 PHASE: 3 PHASE, 4 WIRE 30 KAIC

W	LOAD DESCRIPTION	WIRE SIZE	BKR. SIZE	CKT. NO.	L1	L2	L3	CKT. NO.	BKR. SIZE	WIRE SIZE	LOAD DESCRIPTION	W
980	EXHAUST FAN / LOUVER	12	20	1				2	2/0	2/0	PUMP CONTROL PANEL	18600
984	LIGHTS	12	20	3				4	2/0	2/0	PUMP CONTROL PANEL	18600
3000	RECEPTACLES	12	20	5				6	2/0	2/0	PUMP CONTROL PANEL	18600
1500	GEN. BLOCK HEATER	12	20	7				8	10	10	UNIT HEATER	1666
400	GEN. BATTERY CHARGER	12	20	9				10	3/0	10	UNIT HEATER	1666
800	SCADA PANEL	12	20	11				12	10	10	UNIT HEATER	1666
300	EXTERIOR LIGHTS	12	20	13				14			SPACE	
	SPACE							16			SPACE	
	SPACE							18			SPACE	
	SPACE							20			SPACE	

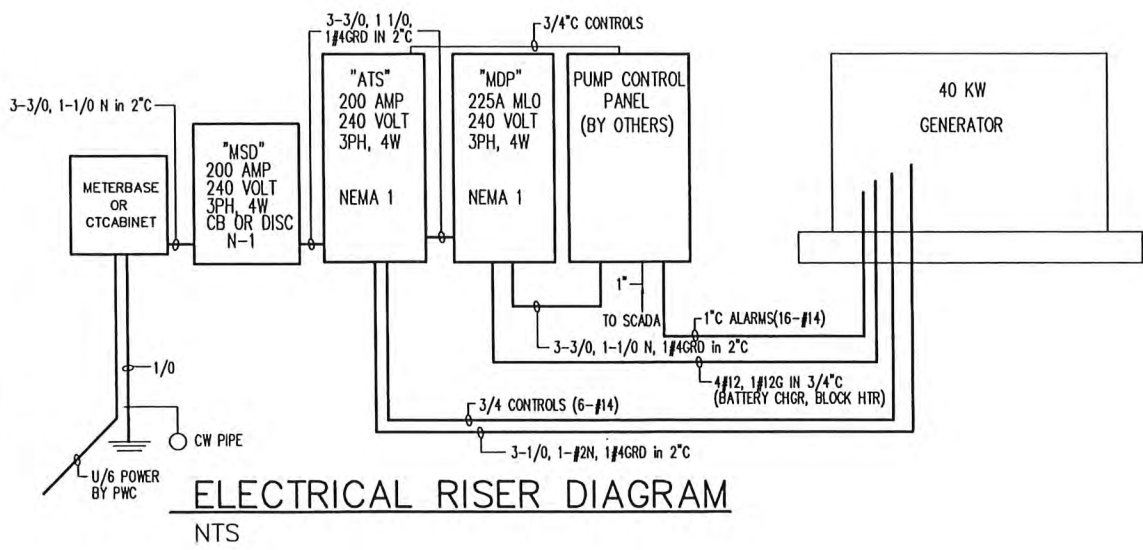
PROPOSED GENERATOR MOUNTED ON 300 GALLON FUEL TANK BASE

PROVIDE PHOTOCELL B IN THIS LIGHT TO CONTROL BOTH OUTSIDE LIGHT FIXTURES

EXHAUST FAN SEE DETAIL SHEET

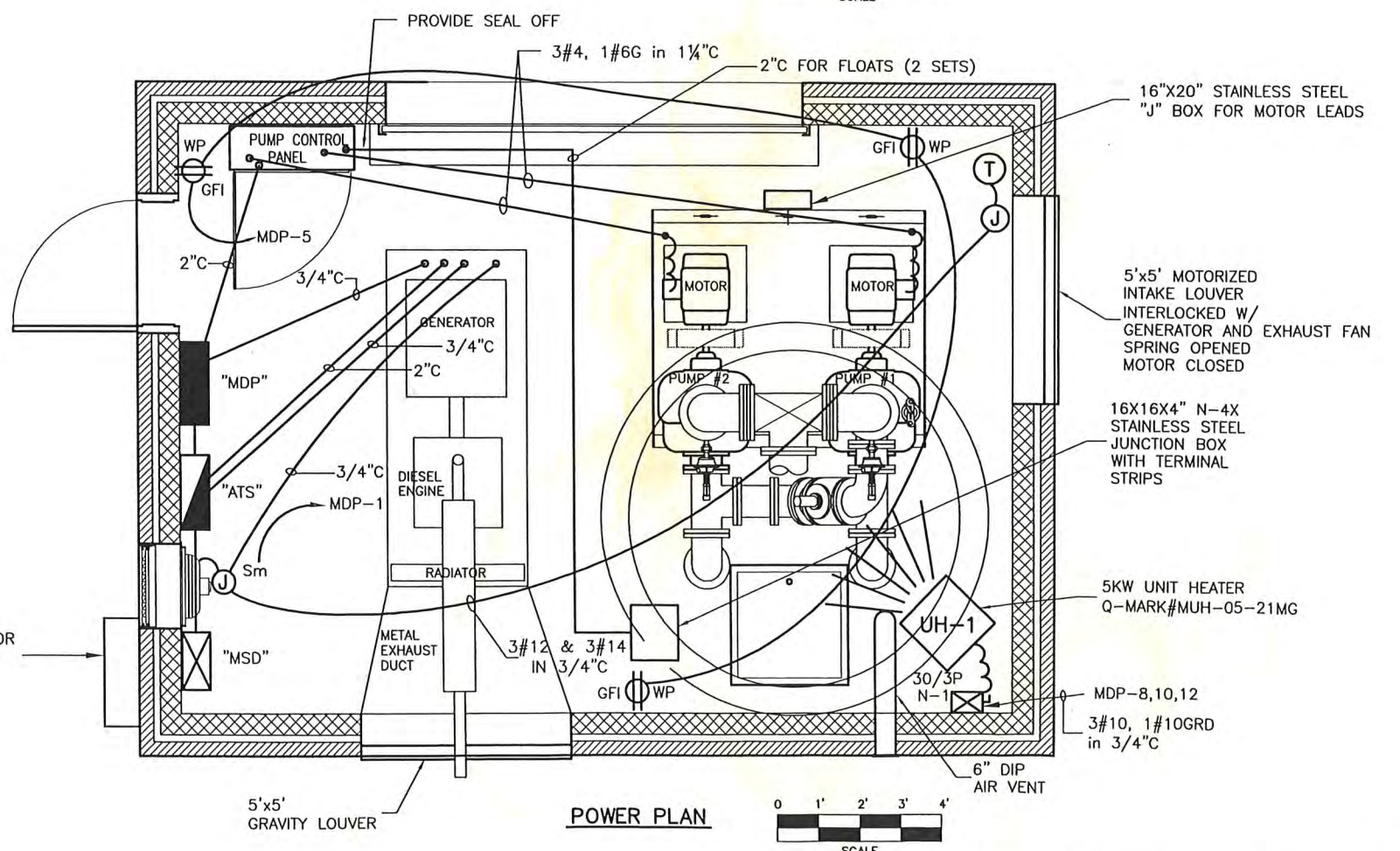


NOTE: ELECTRICAL DESIGN BY ALLEN TOWNSEND PE 13797



### FIXTURE SCHEDULE

SYMBOL	MANUF.	CAT NO.	LAMPS	REMARKS
A	COLUMBIA	LUB-296HO-120	2-F96T12HO (110 WATT)	PROVIDE SPACER BETWEEN LIGHT & CEILING
B	SPAULDING	WGS1-M100PS-MT	1-100WMH	MOUNT 10'0" AFG
C	SPAULDING	WGST-M175-MT	1-175MH	MOUNT OVER DOOR 12'0" AFG
EM	PRESCOLITE	LMP-16	2-7.2W	MOUNT 10'0" AFF



NO.	DESCRIPTION	DATE	BY
1	REVISED WITH 20 TO 22	11-23-04	DFW

**Hobbs, Upchurch & Associates, P.A.**  
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PUMP STATIONS FOR THE NORCROSS WATER AND SEWER DISTRICT CUMBERLAND COUNTY, NORTH CAROLINA

PUMP STATION W-1 POWER AND LIGHTING PLANS

DATE:	DEC., 2003
DESIGNED:	DFW
DRAWN:	DFW
CHECKED:	KSL
SCALE:	SCALE
SHEET NO.	E1

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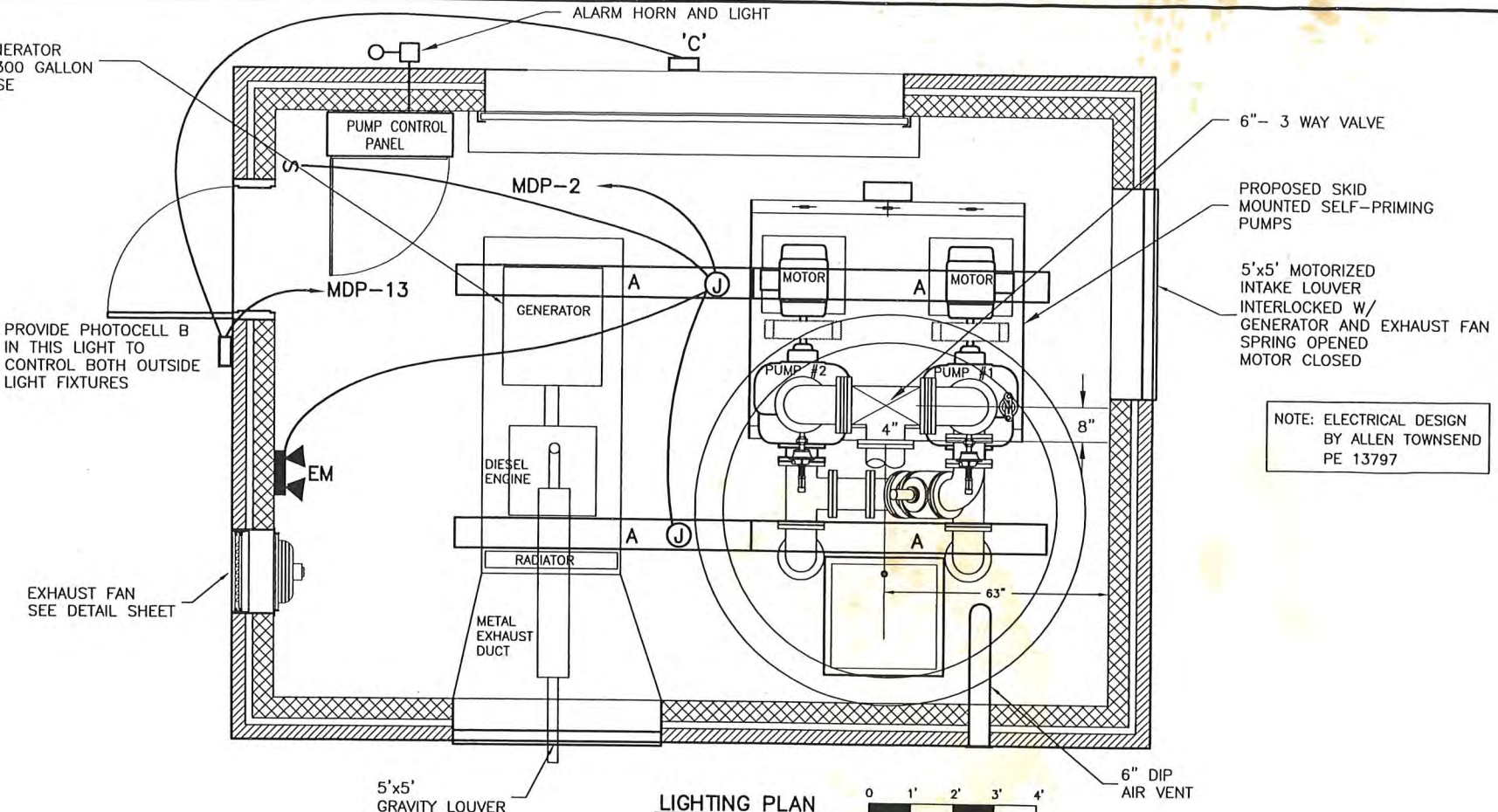
# LEGEND

- GFI 20A, 120V, DUPLEX RECEPT, GFI
- WP WEATHERPROOF
- J JUNCTION BOX
- S 20A, 120V, SINGLE POLE SWITCH
- DISCONNECT RATING AS SHOWN
- POWER PANEL
- AUTOMATIC TRANSFER SW
- FLOW TRANSMITTER

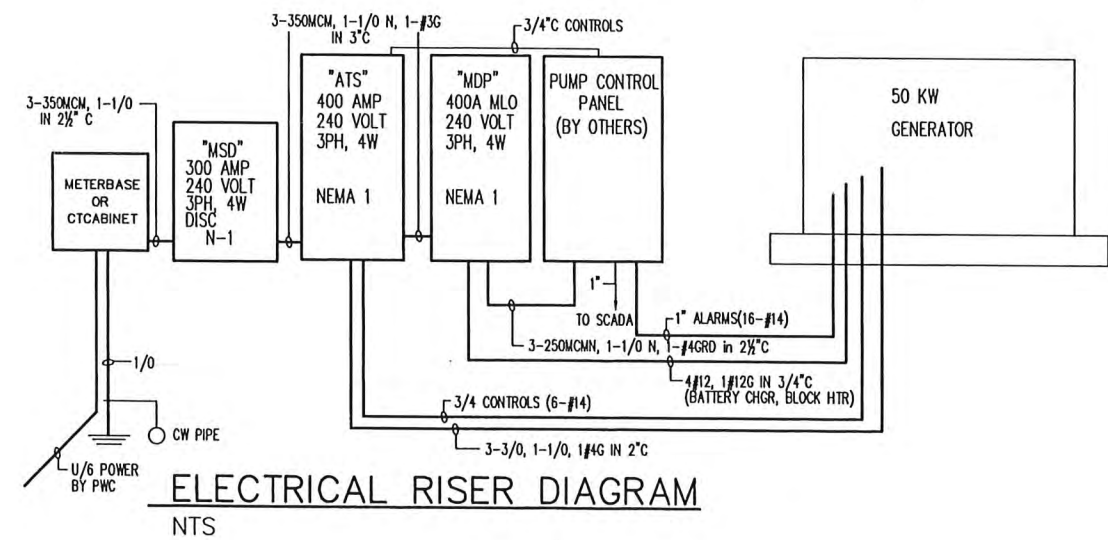
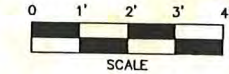
PANEL TYPE: SQ D I-LINE TYPE HCM		400 AMP MLO		PROVIDE GROUND BAR	
VOLTS: 120/240		"MDP"		NEMA 1 ENCLOSURE	
PHASE: 3 PHASE, 4 WIRE					
		42 KAIC			

W	LOAD DESCRIPTION	WIRE SIZE	BKR. SIZE	CKT. NO.	L1 L2 L3	CKT. NO.	BKR. SIZE	WIRE SIZE	LOAD DESCRIPTION	W
980	EXHAUST FAN / LOUVER	12	20	1		2		250	PUMP CONTROL PANEL	34100
984	LIGHTS	12	20	3		4	250	250	PUMP CONTROL PANEL	34100
3000	RECEPTACLES	12	20	5		6	250	250	PUMP CONTROL PANEL	34100
1500	GEN. BLOCK HEATER	12	20	7		8	10	10	UNIT HEATER	1666
400	GEN. BATTERY CHARGER	12	20	9		10	30/3	10	UNIT HEATER	1666
800	SCADA PANEL	12	20	11		12	10	10	UNIT HEATER	1666
300	EXTERIOR LIGHTS	12	20	13		14	20	12	FLOWMETER	50
	SPACE			15		16			SPACE	
	SPACE			17		18			SPACE	
	SPACE			19		20			SPACE	

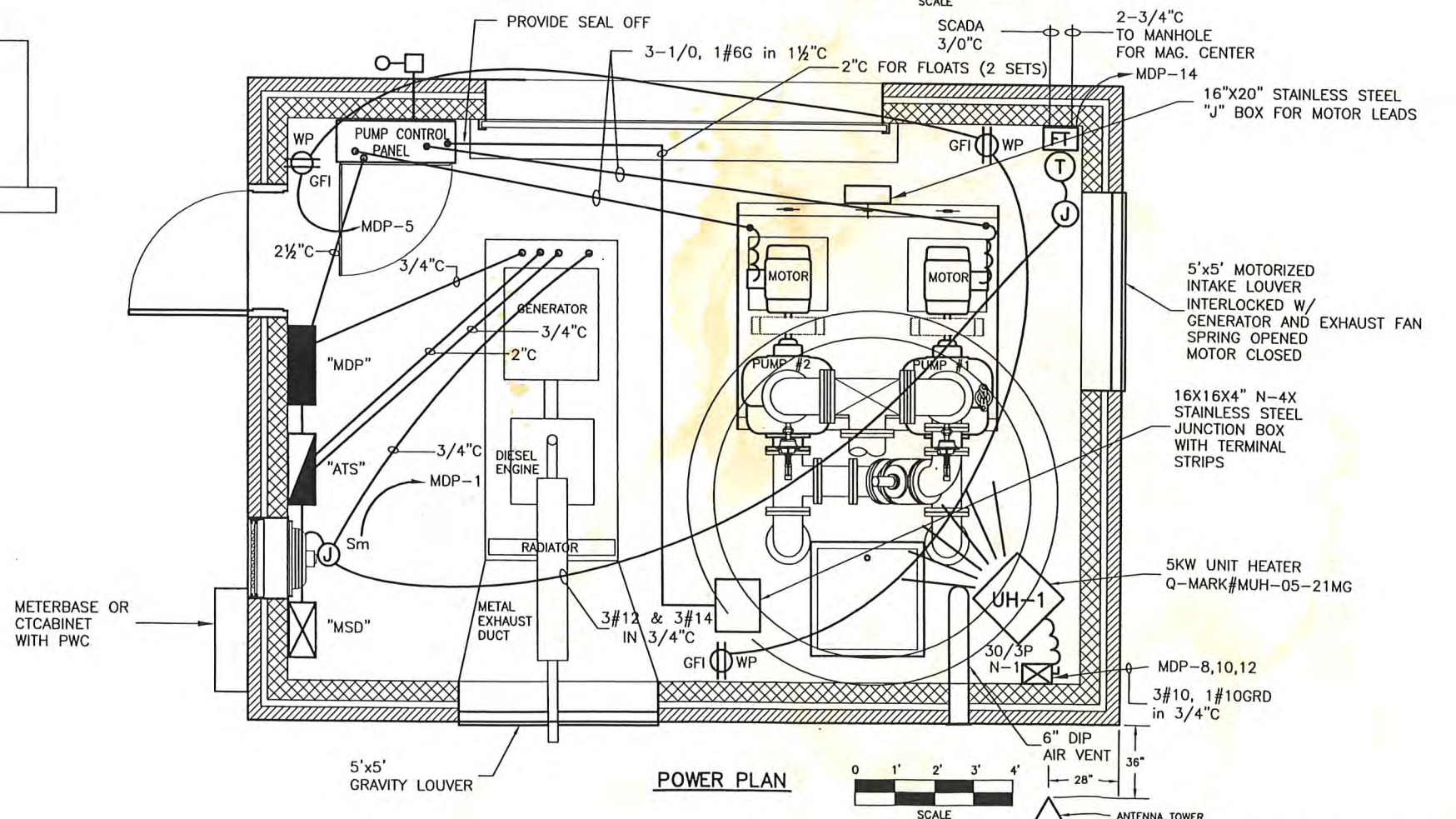


**LIGHTING PLAN**

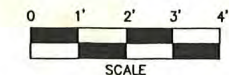


**ELECTRICAL RISER DIAGRAM**  
NTS

FIXTURE SCHEDULE				
SYMBOL	MANUF.	CAT NO.	LAMPS	REMARKS
A	COLUMBIA	LUB-296HO-120	2-F96T12HO (110 WATT)	PROVIDE SPACER BETWEEN LIGHT & CEILING
B	SPAULDING	WCSI-M100PS-MT	1-100WMH	MOUNT 10'0" AFG
C	SPAULDING	WGST-M175-MT	1-175MH	MOUNT OVER DOOR 12'0" AFG
EM	PRESCOLITE	LMP-16	2-7.2W	MOUNT 10'0" AFF



**POWER PLAN**



REVISIONS	DATE	BY
REVISED	10-22-04	DFW

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**PUMP STATIONS FOR THE**  
**NORCRESS WATER AND SEWER DISTRICT**  
 CUMBERLAND COUNTY, NORTH CAROLINA  
**PUMP STATION W-2 POWER AND LIGHTING PLANS**

DATE:	DEC., 2003
DESIGNED:	DFW
DRAWN:	DFW
CHECKED:	KSL
SCALE:	SCALE
SHEET NO.	E2

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**SEWER ASSET MANAGEMENT PLAN**

**OVERHILLS  
WATER AND SEWER DISTRICT**

**CUMBERLAND COUNTY, NC**



PINEHURST, NORTH CAROLINA

**SEWER ASSET MANAGEMENT PLAN**

**OVERHILLS  
WATER AND SEWER DISTRICT**

**CUMBERLAND COUNTY, NC**

**MATTHEW JONES, PE**  
matthew.jones@mcgillassociates.com



5 Regional Circle, Suite A  
Pinehurst, North Carolina 28374  
910.295.3159

**AUGUST 2025**

**PROJECT NO. 20.02507**

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- Appendix A – Smoke Testing Results List**
- Appendix B – Manhole Inspection List**
- Appendix C – Overhills Spring Lake Agreement**
- Appendix D – Lift Station Record Drawings**



## **EXECUTIVE SUMMARY**

---

The purpose of this Asset Management Plan (AMP) is to document the condition of the Overhills District sewer system infrastructure to assist the County with becoming more proactive in the management and financing of its sewer collection system. The Overhills Sewer District serves approximately 107 residential connections in the northern area of Cumberland County. There are 318 properties within the district are not currently connected and are paying the sewer availability fee. The District's wastewater collection system consists of approximately three miles of gravity sewer and force main with 119 manholes. Collected wastewater is pumped from the Collingwood Street Lift Station and the Brinkley Drive Lift Station, both of which are owned by Cumberland County and operated by the Town of Spring Lake. Flow generated from the district is ultimately treated at the Spring Lake Wastewater Treatment Plant (NC0030970), which is owned and operated by the Town of Spring Lake.

This asset inventory and assessment consisted of assembling data on sewer pipes, manholes, and other appurtenances in the collection system. This assessment included performing inspections of selected manholes, performing smoke testing throughout the system, and reviewing existing data with County Staff. This information was evaluated and is summarized in this document which includes the asset management plan and capital improvements plan. This process resulted in the development of a 10-year Capital Improvements Plan (CIP) to guide the District with scheduling and financing the capital projects and equipment purchases necessary to maintain and improve its wastewater collection system. Through the AMP process, no significant rehabilitation is currently needed, but additional monitoring and investigation is recommended.

The CIP includes a focused improvement to critical components within the sewer system that need rehabilitation or replacement based on existing condition, and on improvements that could improve management of the sewer system for staff. These planned projects will bring the County into a better position to serve its customers by improving the reliability of the collection system. The County should look to its CIP to guide its next

projects, and the CIP should be updated regularly as priorities change and as projects are completed. It is noted that many factors may impact the priorities including failures, and funding availability both locally and through grant and loan programs. This assessment project provides evidence for the prioritization of manhole rehabilitation and improvement projects in the CIP.

### ***System Evaluation***

All of the pipe material in the Overhills system is PVC and Ductile pipe. The collection system was first put into service in 2019, therefore the relative age of the system is low. All the piping in this system is SDR-26 PVC pipe, which is the most common material used for sewer systems today. The typical useful life for PVC pipe is anywhere from 40 to 60 years.

As part of the AMP, McGill Associates, PA (McGill) assisted the District with evaluating the condition of its sewer infrastructure to identify projects in line with these goals. The following items were included in the AMP scope:

- Identify areas to conduct smoke testing to identify potential sources of I/I into the sewer system;
- Review and analyze County-provided information for the Overhills lift station;
- Inspect selected sewer manholes within the system to establish overall system condition;
- Identify and evaluate potential sewer system improvements;
- Prioritize sewer system improvements;
- Prepare opinions of probable costs for sewer system improvements; and
- Create a Capital Improvements Plan;

### **Manhole Inspections**

All manholes in the Overhills sewer system are precast concrete based on information provided by County staff. The results of the selected manhole inspections performed as a part of this inventory were used to develop an assessment of manhole conditions in the

system. Based on the inspections performed, manholes that were inspected were assigned a condition score, and these scores were combined into an overall condition rating for each manhole- excellent, good, fair, or poor. The results of manhole inspections are summarized in Figures 8 and 9, and the full inventor is included in Appendix A.

### Lift Station Inspection

All sewer flow from the Overhills District is pumped through one of two lift stations to the Town of Spring Lake. The lift stations are on Brinkley Drive and Collingwood Street. Full inspection and assessment of the stations were not included as a part of this assessment.

### Findings and Recommendations

The system evaluation allowed McGill to assemble a list of general recommendations and high priority projects to guide the County in the next 10 years. General recommendations to the District included establishing its own flow monitoring and smoke testing programs in high priority areas to determine sewer rehabilitation needs and inspecting sewer lines and manholes with CCTV equipment during routine cleanings to track the condition of these items. McGill also recommended the County begin rehabilitation of existing manholes within the collection system in order to reduce the risk of I/I. Additionally, we made recommendations for improving the performance of the existing pumps at the Brinkley Road lift station.

Data and field investigation reporting were utilized to identify the priority projects within the collection system, focusing on manhole rehabilitation.

Table 1 summarizes projects identified during this assessment, centering around manhole rehabilitation projects. A project to install flow monitors is included to give greater control and understanding of flows from the collection system.

**Table 1: Summary of Capital Improvements Projects**

No.	Project Name	Cost
1	Manhole Rehabilitation Project 1	\$84,100.00
2	Brinkley Lift Station Improvements	\$33,100.00
3	Manhole Rehabilitation Project 2	\$84,100.00
3	Manhole Rehabilitation Project 3	\$84,100.00
<b>10-Year CIP Total Project Cost</b>		<b>\$285,400.00</b>

***Capital Improvements Plan***

The purpose of this asset inventory and assessment was to document the condition of the District’s inventoried infrastructure to assist the County with becoming proactive in the management of its wastewater system, to include capital project planning. The County does not currently have a Capital Improvements Plan (CIP) for its wastewater system. The CIP being developed from this current assessment will guide the County through its planning for projects within the 10-year window. The CIP will remain a living document and be updated in the future so that it remains current to the Districts’ highest priorities and provides accurate cost estimates. The CIP included in this assessment includes projects focused on rehabilitation of existing manholes, which have been identified to be potential sources for I/I into the system. Through discussion with County staff, field investigation, and review of existing system data, the specific defects and general problematic areas within the wastewater system have been summarized. These results were used to develop the CIP and formulate a ten-year plan.

The complete asset inventory and assessment task consisted of five parts culminating in the development of the Overhills Water and Sewer District’s CIP.

McGill developed cost estimates for all projects based on current 2024 materials and construction costs. The updated CIP is intended to be adopted by the County to guide its selection of sewer system improvement projects over the next decade. This plan also includes a budget-level recommendation for staffing associated with system operations and maintenance for all County utility districts.

### 1.1 BACKGROUND

The Overhills District is located on E. Manchester Road, just outside of the Town of Spring Lake municipal limits in Cumberland County, North Carolina. It is owned by Cumberland County and maintained by the Town of Spring Lake. The District includes a wastewater collection system that currently serves 107 residential customers as of August 2025. The collection system consists of approximately three miles of gravity sewer mains that are 8-inch in diameter and force main that is 6-inch in diameter. These gravity and force main sewer lines are constructed of PVC and were constructed in 2019. Figure 1 shows the existing sewer collection system.

Creating a Capital Improvements Plan (CIP) will allow the County to update its current rate setting model to better estimate future revenue and expenses, capital outlay, indebtedness, and overall health of the sewer system enterprise fund reserves. A model of this nature would continue to balance revenues and expenditures with a longer-term approach to rate setting and establish a financially sound framework for the County to follow.

Even with the relatively young age of the Overhills system, County staff remains cognizant that infiltration and inflow (I/I) is always a concern, particularly in a scenario where the County's operation costs are based on the gallons of flow that enter into the existing lift station. Therefore, the top challenges for the Overhills sewer system are mitigating I/I that results from deteriorating infrastructure and collecting reliable data on existing sewer flows for operations and maintenance planning. The information collected through this assessment project will help identify system deficiencies and develop improvement projects to reach these goals.

This process resulted in the development of a 10-year CIP to guide the County with scheduling and financing the capital projects and equipment purchases necessary to restore its wastewater collection system.

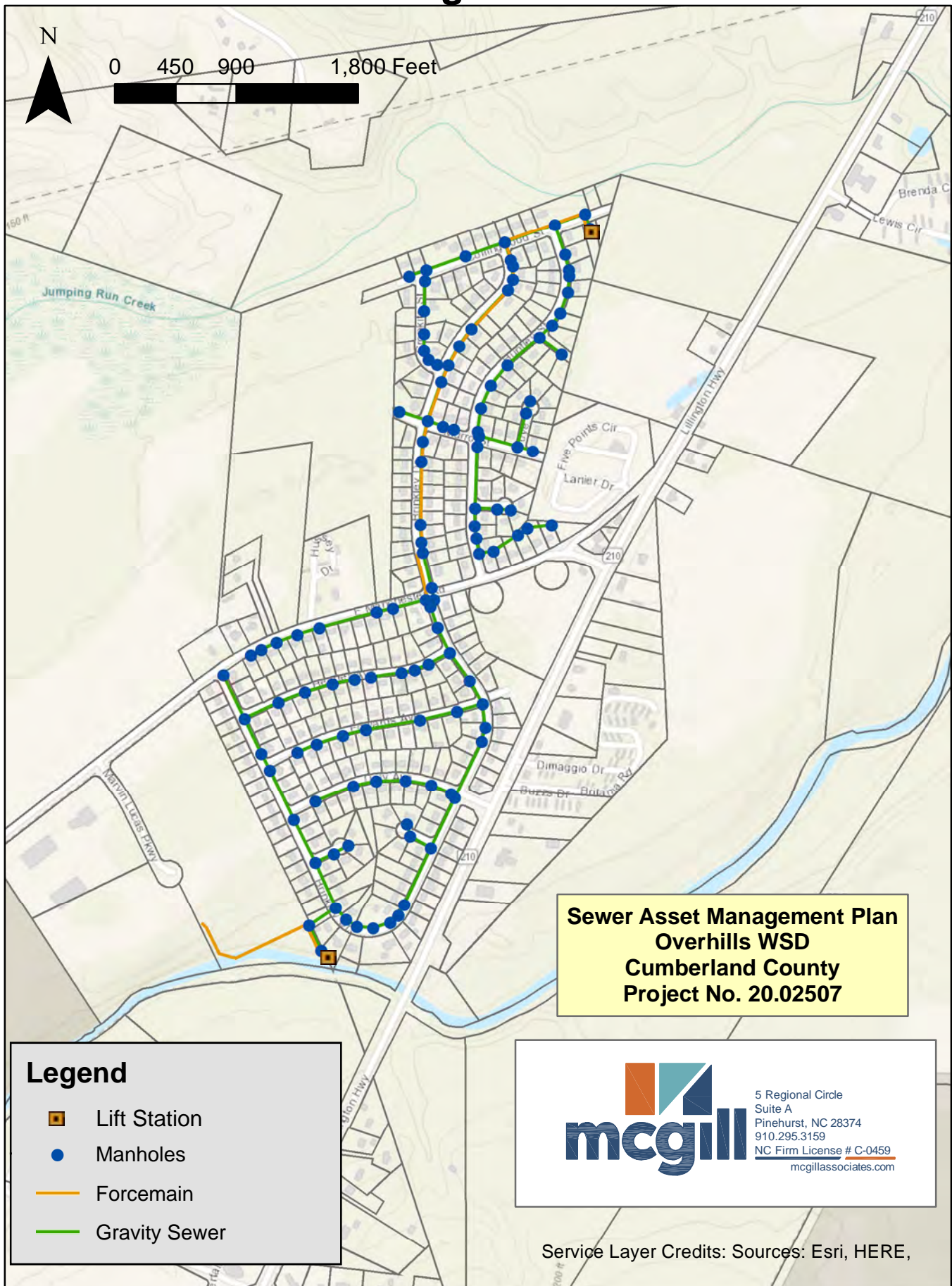
The purpose of this Asset Management Plan (AMP) is to document the condition of the Districts' inventoried infrastructure to assist the District with becoming more viable and proactive in the management and financing of its wastewater system. The District continues to look to its CIP to guide its next projects; therefore, it is vital that the CIP remains current to the Districts' highest priorities and provides accurate cost estimates. This assessment project was utilized for the prioritization of replacement of lines and improvement projects in the CIP.

**Table 2: Summary of Customers by Use**

<b>Diameter</b>	<b>Total</b>	<b>% of System</b>
<b>Flat Rate</b>	<b>107</b>	<b>100%</b>
<b>Total LF</b>	<b>107</b>	<b>100%</b>



# Overhills Overall System Map Figure 1





## 2.1 SMOKE TESTING

### 2.1.1 Overview

Smoke testing is one of the most cost-effective ways to locate defects in sewer mains and laterals. In this process, artificially produced non-harmful smoke is injected into the sewer line via a blower placed over a selected manhole. The pressurized smoke travels up and down the sewer line and connections and emerges at openings in the system. This visual aide allows test crews to easily identify, record, and mark locations where defects are present. If the sewer is in good condition, one should only see smoke rising from manhole lids and house roof vents. If the line has defects, such as breaks or illegal connections, the smoke will emerge at these points.

### 2.1.2 Investigation

McGill met with County staff to identify areas that would benefit most from smoke testing. Based on the size of the Overhills District, it was determined that the entire system could be smoke tested. McGill prepared a detailed map of the area based on the County's GIS database. The Fire Department and customers along the route were alerted to the upcoming testing.

### **2.1.3 Methodology**

McGill and County staff smoke tested all three miles of gravity sewer lines over a period of two days to determine locations where I/I enter the wastewater collection system. For each line to be tested, County staff recommended a centrally located manhole on which to place the blower based on the manhole's accessibility and avoidance of traffic. The manhole nomenclature used by the County was utilized and the location, configuration, and condition of each one was recorded.

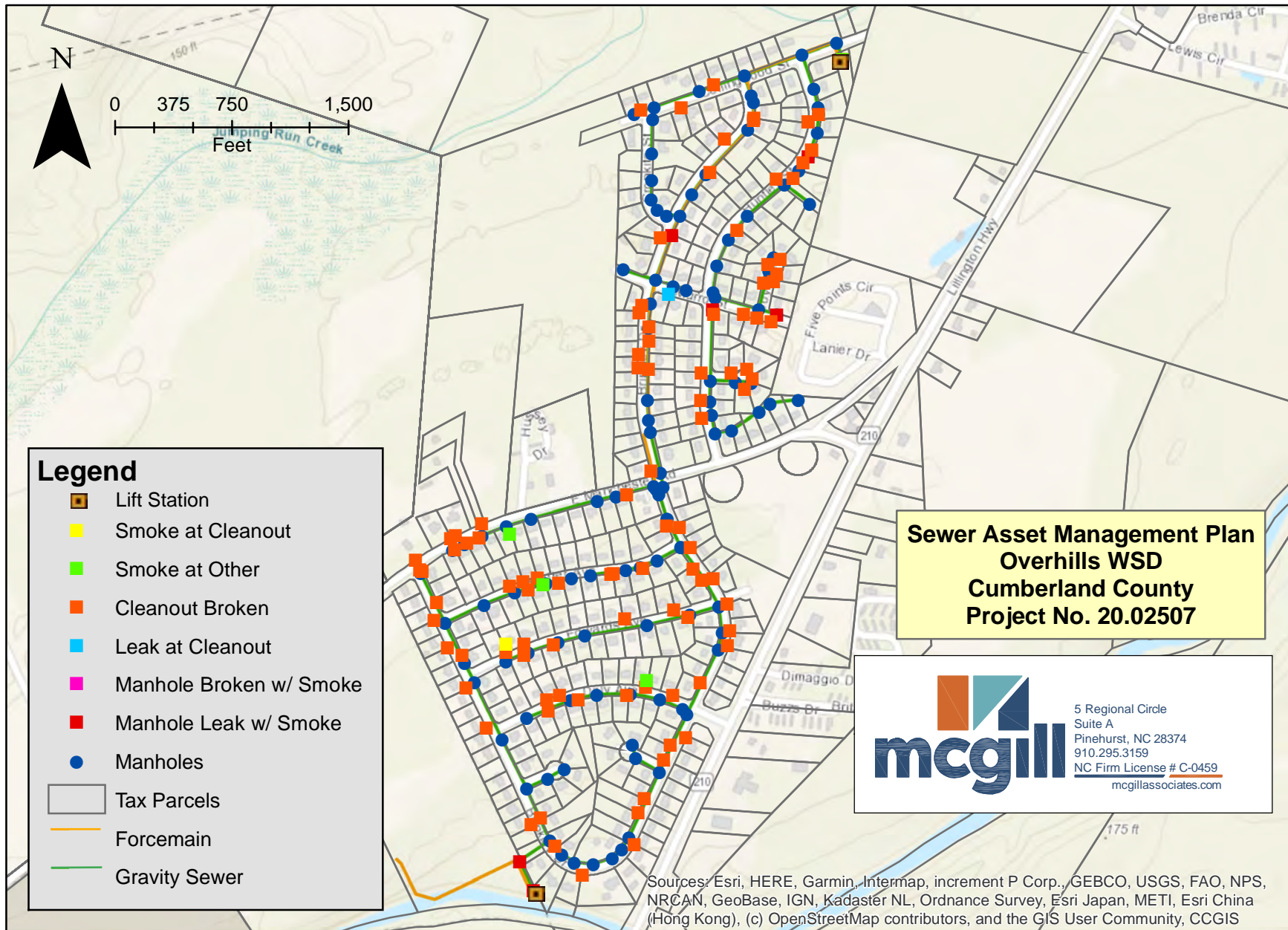
At each location, the following procedure was executed.

1. Place the blower on the manhole (with the rubber seal, if necessary).
2. Fill smoke pump up to  $\frac{3}{4}$  with liquid smoke.
3. Close all smoke pump valves.
4. Start blower and allow to warm up.
5. Open smoke pump valves.
6. Pressurize smoke pump by pumping the canister manually.
7. Once smoke begins emerging from roof vents, begin surveying for smoke emergences indicating defects or problem areas in the pipeline.
8. For each defect, record the opening type, address, manhole identifier, and notes.
9. Additionally, mark each defect with paint.

This process continued until all visible defects were marked and recorded. Figure 2 shows some problematic system openings.

# Overhills Smoke Testing Map

## Figure 2



### **2.1.4 Results**

The crew recorded 107 abnormal smoke outlets, which divided generally into four categories.

1. **Uncapped cleanouts or elder valves:** Several cleanout and elder valve caps were missing or broken. The cumulative number of broken cleanouts in the District can contribute to significant I/I. County staff had repair caps on hand during the testing and were able to install new caps where needed. Some caps on cleanouts and elder valves were unscrewed and were able to be re-affixed during the testing.
2. **Broken Cleanouts:** Ground smoke was detected adjacent to the cleanout, which appeared to be damaged or below grade. Replacement of the cleanout assembly will be needed.
3. **Ground Smoke:** Ground smoke can be the result of broken lines, joint separation, etc. Any of these problems can cause significant I/I.
4. **Unsealed manholes:** Some manholes emitted excess smoke indicating cracked concrete or offset rings. Manholes located in ditches are the most likely to contribute I/I.

A spreadsheet describing all smoke occurrences can be found in Appendix A and all locations were documented in the mapping information in ArcGIS for the County staff's use.

## **2.2 SEWER MAINS**

### **2.2.1 Overview**

Overhills sewer mains consist of polyvinyl chloride (PVC) and ductile iron pipe. The District's existing sewer lines are 8-inches in diameter. The age of the system and system materials were confirmed by the County based on records from construction of the system in 2019. Condition was determined based on visual inspection of select manholes and smoke testing of the system.

### **2.2.2 Investigation**

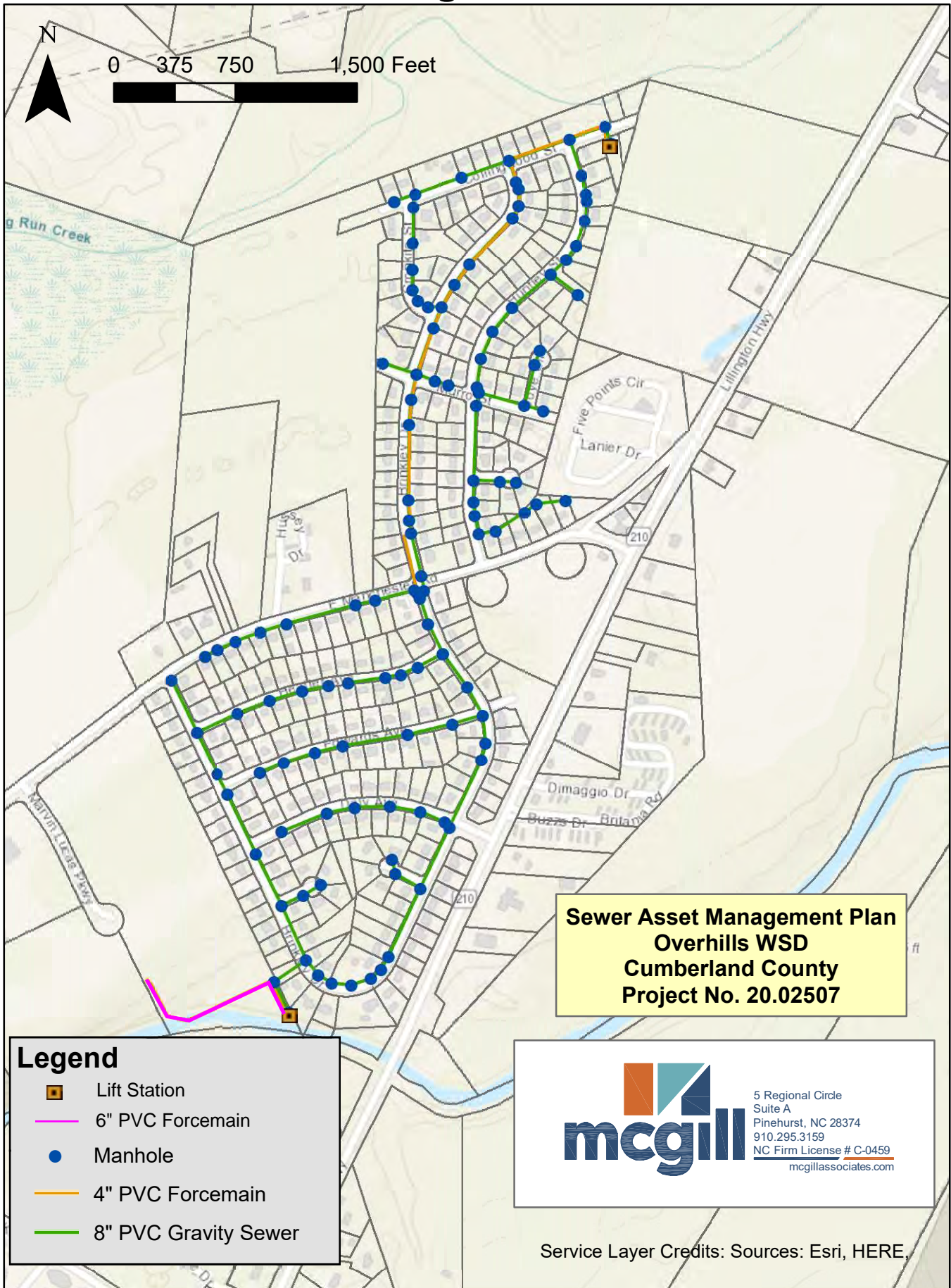
With District input from County staff, McGill has reviewed the district's data on the sewer mains throughout the District's collection system. The sewer main material and diameters were verified by the County and updated according to GIS records. Figure 3 shows the sewer line diameter and material in the system.

The purpose of this portion of the assessment was to create a working system inventory and then review which areas of Overhills District have system components in need of replacement or rehabilitation.



# Overhills Sewer Line Diameter Map

## Figure 3



### 2.2.3 Methodology

McGill reviewed the District's GIS data for the sewer collection system. County staff provided information on manholes where deterioration was suspected. Smoke testing was performed throughout the system. The County's GIS mapping was utilized to create maps that document the collection system by material and by diameter.

### 2.2.4 Results

The existing gravity sewer pipe in the sewer system is 8-inch in diameter based on Record Drawings for the system. All pipe diameters therefore do meet current NCDEQ minimum design standards. Based on the young age of the system, the PVC pipe installed in 2019 has not exceeded its useful life, and therefore replacement is not recommended outright. Recommendations will include planned CCTV inspections by the County of the existing piping in order to verify existing conditions and provide future updates to this AMP/CIP. Based on the age of the pipes and no documented issues from County staff, pipe in the system has been noted to be in good/excellent condition. Tables 3 through 6 show the assessment based on material and then broken out by diameter.

**Table 3: Summary of Gravity Sewer Main by Material**

<b>Material</b>	<b>Diameter Range (in)</b>	<b>Total LF</b>	<b>% of GS</b>
<b>Polyvinyl Chloride Pipe</b>	8	<b>17,420</b>	<b>100%</b>
<b>Total LF</b>	<i>N/A</i>	<b>17,420</b>	<b>100%</b>



**Table 4: Summary of Gravity Sewer Main by Diameter**

<b>Diameter</b>	<b>Total LF</b>	<b>% of System</b>
<b>8"</b>	<b>17,420</b>	<b>100%</b>
<b>Total LF</b>	<b>17,420</b>	<b>100%</b>

**Table 5: Summary of Force Main by Material**

<b>Material</b>	<b>Diameters (in)</b>	<b>Total LF</b>	<b>% of System</b>
<b>Polyvinyl Chloride</b>	<b>4, 6</b>	<b>3,948</b>	<b>100%</b>
<b>Total LF</b>	<b>N/A</b>	<b>N/A</b>	<b>100%</b>

**Table 6: Summary of Force Main Sewer Main by Diameter**

<b>Diameter</b>	<b>Total LF</b>	<b>% of System</b>
<b>4"</b>	<b>2,994</b>	<b>76%</b>
<b>6"</b>	<b>954</b>	<b>24%</b>
<b>Total LF</b>	<b>3,948</b>	<b>100%</b>

**Table 7: Summary of Force Main Sewer Main Conditions by Age**

<b>Year Put Into Service</b>	<b>Total LF</b>	<b>% of GS</b>
<b>2019</b>	<b>3,948</b>	<b>100%</b>
<b>Total LF</b>	<b>3,948</b>	<b>100%</b>

## **2.3 MANHOLE INSPECTIONS**

### **2.3.1 Overview**

Manholes are the primary access points to the sanitary sewer system and are essential for its operation and maintenance. As they allow personnel access to the sewer system, manholes are also likely culprits for allowing I/I to enter the sewer system. Manholes in low-lying areas with improperly sealed lids, manhole joints, and poor connection practices can all be sources of I/I. Storm drains or the presence of manholes in ditches and low-lying areas in Overhills frequently allow standing water to remain for hours or days after a storm event which can exacerbate inflow through manhole lids. Reports from construction of the sewer system noted that the existing water lines in the Overhills neighborhood experienced several breaks due to asbestos cement (AC) water lines that are heavily deteriorated in some areas. Additionally, during construction I/I was observed from either groundwater or leaking water lines into various manholes and wetwells in the project area.

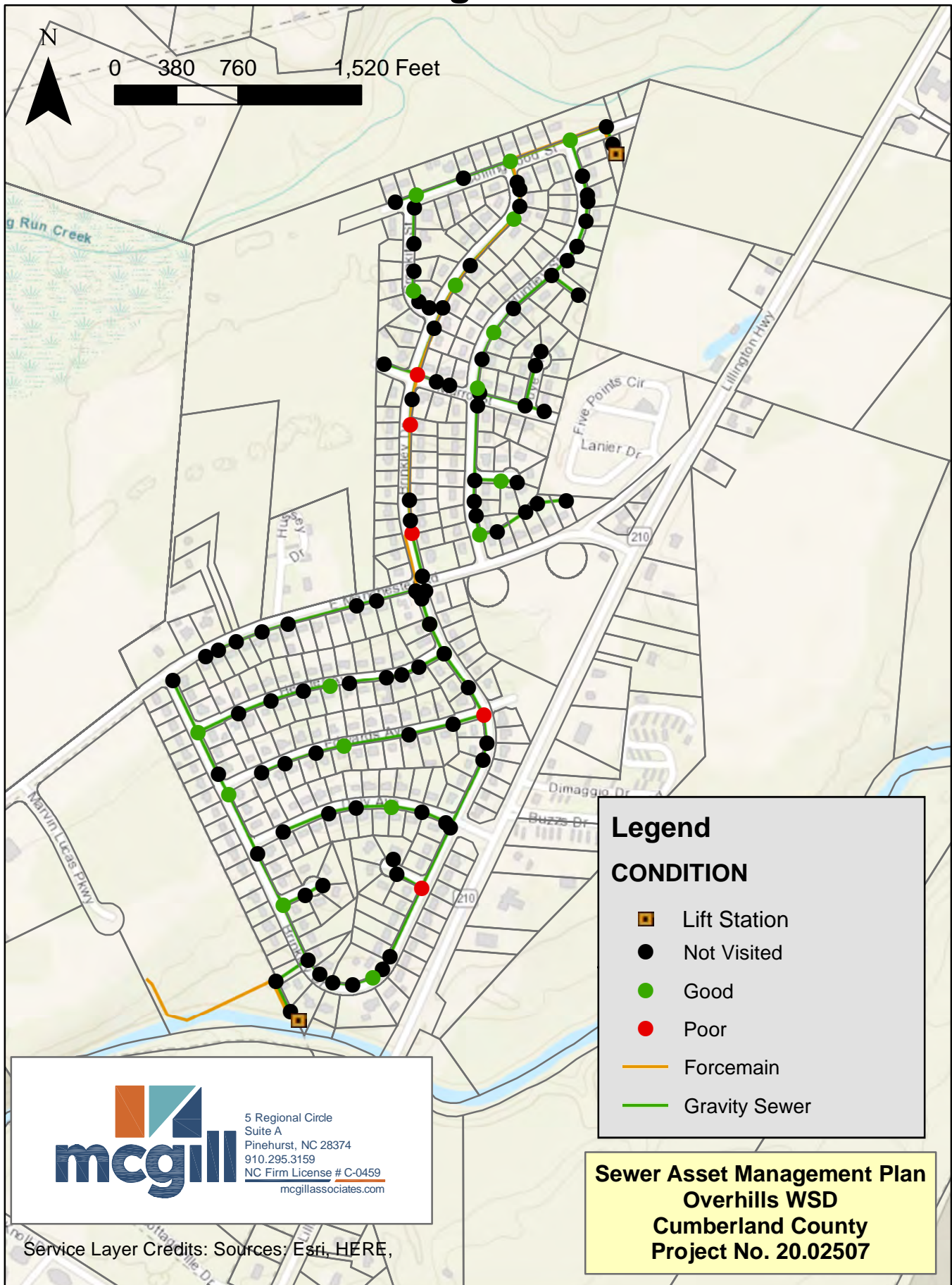
One of the most cost-effective practices for managing this intrusion is visual manhole inspections, where the various components of the manhole are rated according to their condition. Some examples of noticeable deficiencies are benches which have deteriorated from abrasion and corrosion and rings which can be moved by traffic, soil, and the freeze/thaw cycle. Defects in any aspect of the manhole can lead to I/I, structural instability, and manhole failure.

### **2.3.2 Investigation**

After the Overhills system was put into service, the GIS record was created in 2019. The purpose of this portion of the assessment was to perform selected field inspections to determine an overall system assessment. A total of one hundred and nineteen (119) manholes are currently inventoried by the District. A total of 23 manholes were inspected as a part of this inventory and assessment. The map showing which manholes were inspected is shown in Figure 4.

# Overhills Manhole Inspection Map

## Figure 4



**Legend**

**CONDITION**

- Lift Station
- Not Visited
- Good
- Poor
- Forcemain
- Gravity Sewer



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**Sewer Asset Management Plan**  
**Overhills WSD**  
**Cumberland County**  
**Project No. 20.02507**

Service Layer Credits: Sources: Esri, HERE,

### **2.3.3 Methodology**

The District of Overhills sewer collection system contains 119 sewer manholes. Working with County staff, McGill inspected selected manholes within the sewer system to obtain a representative condition sampling. County staff determined which manholes to inspect in each area based on manhole location and orientation. Manholes prioritized for inspection include those located in existing ditches or low-lying areas where the manhole would be susceptible to degradation and inflow from surface water. At each manhole, the inspector recorded the manhole's location, dimensions, material, and condition of its various components. All information including photographs of the interior of the manhole and top area were uploaded into the GIS mapping.

Some typical distresses include:

- Wear and asphalt paving on the cover;
- Corrosion and mud seepage on the ring and frame;
- Gas residue, corrosion, seepage, and deteriorating concrete on the cone and riser;
- Wetness, silt, root intrusion, and deteriorating concrete on the barrel;
- Dirt and corrosion on the rings;
- Silt accumulation on the bench; and
- Misaligned pipes, obstructions, trough deteriorating, standing water, and no flow in the channel.

Based on the recorded comments, each component was assigned a condition score, and these scores were combined into an overall condition rating for each manhole- excellent, good, fair, or poor. The images below depict the interiors of various condition manholes.



MH FID 30, BRINKLEY DRIVE, GOOD.



MH FID 43, BRINKLEY DRIVE, POOR.



### 2.3.4 Results

All of the 23 inspected manholes are precast manholes. Due to the relative low age of the system, County staff confirmed that all the existing manholes in Overhills are precast sewer manholes. The manholes observed were noted as poor or good to excellent condition, which is to be expected based on their age. However, evidence of I/I was observed in several manholes. Based on the condition of those observed, it is suspected that the remaining manholes not inspected would have similar condition to those observed. Tables 8 and 9 summarize the manhole materials and condition.

**Table 8: Summary of Manholes by Material**

<b>Material</b>	<b>Total</b>
<b>Precast Concrete</b>	<b>119</b>
	<b>119</b>

**Table 9: Summary of Manholes by Condition**

<b>Material</b>	<b>Total</b>
<b>Good/Excellent</b>	<b>18</b>
<b>Poor</b>	<b>5</b>
	<b>23</b>

The County maintains its collection system using the ESRI platform and includes the attribute data for each manhole. A spreadsheet including condition comments for each manhole can be found in Appendix B.

## 2.4 LIFT STATION

### 2.4.1 Overview

The Overhills sewer system includes two lift stations, one on Collingwood Street and the other on Brinkley Drive. The Collingwood Lift Station collections flow from the area north of Manchester Road and pumps to a manhole on the south side of Manchester. The Brinkley Lift Station receives all flow for the Overhills system and pumps to a manhole inside of the Spring Lake Sewer Collection System in an existing sewer easement off of Marvin Lucas Parkway.

Both lift stations include flow meters that are used for monitoring and recording flow generated by the Overhills sewer system. The monthly records from the Brinkley station are used for billing and have been used to calculate the average use per user for the system.

Collingwood Street Lift Station:

Lift Station Design Capacity	216,000 GPD
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Brinkley Drive Lift Station:

Lift Station Design Capacity	367,200 GPD
------------------------------	-------------

Overhills Sewer System:

FY 2025 Estimated Average Daily Use per User*	165 GPD
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\*Note: Estimated based on FY 2025 monthly usage, metered at Brinkley Lift Station and data provided to Cumberland County by Town of Spring Lake. Average GPD for Overhills System is 17,606 GPD, with 107 customers as of June 2025.



Recommendations for various sewer system improvements to include the gravity sewer pipe and manholes in the collection system include general recommendations, high priority projects (within 10-years) and future projects (past the 10-year planning window). General recommendations are typically less costly and can be implemented more quickly, whereas high priority projects may require financial assistance and be undertaken in phases.

### **3.1 GENERAL RECOMMENDATIONS**

#### **3.1.1 *Smoke Testing***

Smoke testing is a valuable tool that can be used to locate broken pipe, cleanouts, or manholes that need repair. Any of these issues can be a source for the inflow and infiltration (I&I) of surface water into the sewer collection system. The most common repairs that result from smoke testing include replacing missing or broken cleanout caps and removing buildup from manholes. Other repairs that can be performed at this time are patching the exterior concrete or replacing the rings/lids of manholes identified to be leaking during smoke testing. These may be contributing significant I/I into the wastewater collection system. Similarly, line breaks in flooded areas should also be addressed promptly. It is also recommended that the District continue to perform regular smoke testing to monitor the system's ongoing wear and identify specific areas for improvement. However, if there is a suspected problem in a specific area the District should utilize smoke testing on a more "as needed" basis to troubleshoot possible problem areas.

#### **3.1.2 *Video Evaluations***

Based on information provided by the County, video evaluations were not performed as part of the system inventory. County staff reports that no video evaluations have been performed on the collection system to date. It is recommended that the County plan to perform video evaluation of the system as a part of O&M in order to stay vigilant concerning potential issues within the collection system.

### **3.1.3 Manhole Inspections**

Manhole inspections uncovered some infrastructure deficiencies which can be repaired immediately to improve the condition and function of the wastewater collection system. The full list of manholes and their field assessment is included in Appendix A. Manhole rehabilitation and replacement is the priority work that is targeted by the CIP. The proposed projects are divided out on an annual basis in order to include the improvements as a reasonable component of annual budgeting.

### **3.1.4 Flow Monitoring**

The District and McGill have discussed that flow monitoring is not needed at this time. Should the County begin to suspect the presence of significant I&I, they will engage with a subcontractor to perform flow monitoring to verify as needed. Both existing lift stations have 8-inch flow meters on the lift station discharge, which provide metering of flow received within the district. The flow recorded from these meters are utilized by the County to determine the monthly quantity of wastewater sent for treatment to the Town of Spring Lake.

## **3.2 PRIORITY PROJECTS**

### ***3.2.1 Manhole Rehabilitation Projects***

In these projects for the Overhills system, manholes will be lined where possible, unless a significant amount of deterioration has occurred that would necessitate replacement. The projects are scoped to be undertaken every 2 years. Each project is priority targeting any manhole deficiencies based on the results of the smoke testing performed. There are a range of issues from broken risers to cracks in the frame of the manhole that warrant various repairs. To reduce the amount of I/I that enters the system it is imperative to repair these manholes. The project will be ongoing to spread out the cost for the County over a ten-year period. With 119 manholes in the system, it is estimated that approximately 40% of the manholes in the system would benefit from rehabilitation through lining. As a result, manhole rehabilitation is broken into three projects, which are included in the CIP separately, but can be combined or modified as needed given annual budgetary considerations. The projects also include replacement of existing cleanout assemblies for select residences. The results of the smoke testing identified that some cleanouts were damaged below grade, therefore replacement of the assembly would be necessary.

This project is recommended to be pursued with a manhole rehabilitation specialty company with scopes large enough to get competitive pricing for each mobilization. The manholes proposed for rehabilitation or replacement range in depth; therefore, an average depth of 7 vertical feet (VF) was used per manhole for estimating purposes. The capital improvements plan breaks this project into 3 projects with a budget of approximately \$84,100 every 3 years over a 10-year span, as outlined in Table 10. A preliminary cost estimate for a single project is included in Table 8. The total cost of the manhole rehabilitation/replacement projects is estimated to be \$252,300.

**Table 10: Preliminary Opinion of Probable Cost for Manhole Rehabilitation Projects**

<b>Item</b>	<b>Description</b>	<b>Units</b>	<b>Quantity</b>	<b>Unit Price</b>	<b>Total Cost</b>
1	Mobilization	LS	3%	N/A	\$1,900
2	Rehabilitate Existing Manhole	VF	112	\$500	\$56,000
3	Additional Manhole Repairs	LS	1	\$10,000	\$10,000
<b>Construction Subtotal</b>					<b>\$ 67,900</b>
Construction Contingency (15%)					\$ 10,200
Engineering Assistance (If needed)					\$ 6,000
<b>Total Base Project Cost</b>					<b>\$ 84,100</b>

*\*Cost estimates are based on the knowledge of a professional engineer based on 2024 construction costs and are subject to change due to bidding environment and other factors.*

### 3.2.2 Brinkley Lift Station Improvements Project

This project includes installing a p-trap on the discharge force main line to help allow the pumps to maintain prime with consistent downstream head. The work would involve installing a 4-inch p-trap in the existing force main, as well as a ¾-inch water service line to the trap to provide a drip supply to the trap to keep it full.

The project includes one 4-inch p-trap connected to the existing force main with associated excavation, compaction and backfill. The trap will be installed on the existing force main on the current lift station site. The preliminary cost estimate for this project is \$33,100 as outlined in Table 11 below.

**Table 11: Preliminary Opinion of Probable Cost for Brinkley LS Improvements**

Item	Description	Units	Quantity	Unit Price	Total Cost
1	Mobilization	LS	3%	N/A	\$ 800
2	4-inch P-Trap	LS	1	12,000	\$ 12,000
3	¾" Service Line and Tap	LS	1	16,000	\$ 16,000
<b>Construction Subtotal</b>					<b>\$ 28,800</b>
Construction Contingency (15%)					\$ 4,300
<b>Total Base Project Cost</b>					<b>\$ 33,100</b>

*\*Cost estimates are based on the knowledge of a professional engineer based on 2024 construction costs and are subject to change due to bidding environment and other factors.*

### **3.3 CIP PROJECTS SUMMARY**

The purpose of this asset management plan was to document the condition of the Overhills sewer infrastructure to assist the County with becoming more viable and proactive in the management and financing of its wastewater system. The County intends to look to its CIP to guide its next project; therefore, it is vital that the CIP be established as an accurate depiction of current conditions and reflect the Districts' highest priorities with accurate cost estimates. The development of this AMP will serve as a positive step towards ensuring that the District can maintain its level of service agreement.

Sewer manhole rehabilitation and cleanout replacement was evaluated based on current staff input and the results of the field inspections. The existing manholes and cleanouts were divided into projects recommended for the next 10 years.

McGill prepared cost estimates for all projects based on current materials and construction costs. The 10-year CIP is intended to be adopted by the District to guide its selection of sewer system improvement projects over the next two decades. The cost summary for the 10-year CIP is shown below in Table 12.

**Table 12: CIP Cost Summary**

<b>Year<sup>1</sup></b>	<b>Manhole Rehabilitation Project 1</b>	<b>Brinkley Lift Station Improvements</b>	<b>Manhole Rehabilitation Project 2</b>	<b>Manhole Rehabilitation Project 3</b>	<b>TOTAL COST</b>
1	\$ -	\$ 33,100.00	\$ -	\$ -	\$ 33,100.00
2	\$ 84,100.00	\$ -	\$ -	\$ -	\$ 84,100.00
3	\$ -	\$ -	\$ -	\$ -	\$ -
4	\$ -	\$ -	\$ -	\$ -	\$ -
5	\$ -	\$ -	\$ 84,100.00	\$ -	\$ 84,100.00
6	\$ -	\$ -	\$ -	\$ -	\$ -
7	\$ -	\$ -	\$ -	\$ -	\$ -
8	\$ -	\$ -	\$ -	\$ 84,100.00	\$ 84,100.00
9	\$ -	\$ -	\$ -	\$ -	\$ -
10	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL ESTIMATED CIP COST<sup>2</sup></b>					<b>\$ 285,400.00</b>

*Notes:*

- 1: Considering timeline for adoption of this plan and County budget planning cycle, Year 1 is anticipated to be FY 2026
- 2: Cost estimates are based on the knowledge of a professional engineer based on 2025 construction costs and are subject to change due to bidding environment and other factors



## 4.0

## OPERATIONS AND MAINTENANCE PLAN

### 4.1 GENERAL RECOMMENDATIONS

The purpose of an Operations and Maintenance (O&M) Program is to provide an organized and cost-effective approach to ongoing maintenance, repair and replacement activities that will maintain the sewer collection system, so it performs as intended and meets the requirements of the sewer utility's System-Wide Collection System Permit, issued under North Carolina General Statutes Article 21 of Chapter 143.

This section provides a general description of proactive O&M, which can be defined as scheduled maintenance activities (preventive maintenance), performed on a regular basis in order to achieve the highest level of system performance using available resources and minimizing failures that can result in Sewer System Overflows (SSOs)

Developing an O&M Program begins with accurate records of infrastructure inventory, asset locations, and physical condition. Coupled with work records and system performance history, preventive maintenance schedules can be developed to efficiently address general system needs, from cleaning and debris removal to site-specific maintenance work such as cutting and repair work.

The following elements provide the foundation for an effective O&M program:

- Maintain up-to-date wastewater treatment plant equipment documentation, sewer collection system maps and related work history and operational data.
- Develop a routine preventive O&M program and activities for staff and contractors maintaining the sewer collection system and a system to document scheduled activities.
- Develop a rehabilitation and replacement plan identifying and prioritizing system deficiencies and implement short- and long-term actions to address the deficiencies.
- Develop and implement training programs to build technical competence and emergency preparedness.
- Develop and provide equipment and replacement part inventories, including critical replacement parts.

## **Sewer System Mapping**

Sewer system maps and related databases are typically managed using a Geographic Information System (GIS). The District currently utilizes ESRI as the GIS platform from which to manage the utility systems. This GIS mapping is supported by a database that records sewer main size, material types, and locations of manholes and clean-out connections. The platform has the ability to store more information that is currently being utilized by the County, including invert and rim elevations and other attributes of system appurtenances. If County intends to utilize the GIS platform for managing and recording maintenance performed and planned, it is recommended that the County investigate alternative software to ensure that they are utilizing a software that meets their needs with respect to budget.

The GIS database should be updated on a regular basis. Software applications such as work order systems are available to allow field staff to update GIS data as inspection and maintenance activities are completed. Other applications can also allow staff to update and edit maps. Field information that was gathered by McGill and County staff as a part of this assessment is now included in the County's GIS system database for future reference.

GIS can organize work history along with operational data, inspection records and images to provide managers, operations staff and engineers with powerful data sets to track current resource allocations and forecast short and long-term operational and capital needs. Outcomes of detailed analysis such as recommended sewer main rehabilitation work versus sewer overflows can be mapped to present the relationship visually for ease of understanding.

## **Preventive Operation and Maintenance (O&M)**

Preventive maintenance is performing routine and scheduled maintenance activities before wastewater treatment plant and lift station equipment or buried infrastructure fails, for the purpose of extending useful life, reducing overall operating costs, and increasing system reliability. This proactive approach to maintenance work is more efficient and cost effective than reactive and curative operations. Preventive maintenance activities will also help operations staff to better understand the wastewater treatment plant equipment, lift station equipment, and collection system components and how they work under various conditions. This knowledge is essential to setting maintenance priorities and developing the scope and timing of long-term rehabilitation and replacement projects.

## **Scheduled Cleaning of Sewers**

EPA recommends, at a minimum, 100% of sewer mains should be cleaned every 5 years, or 20% of the system annually. The sewer utility's Collection System Operating Permit requires 10% of the gravity sewers to be cleaned annually. High pressure jetting is the most common approach using various spray nozzles for general cleaning and debris removal. Mechanical cutters are used to address root intrusion and cleaning agents can be added to help remove fats, oils, and grease (FOG).

More frequent cleaning is scheduled for areas with a history of heavy debris, grease buildup and roots. CCTV inspections are also used to identify areas to clean more often, such as sections with minor defects such as offset joints and service taps protruding into the main line. Sewer sections near siphons are cleaned more frequently to ensure continuous and uninterrupted operation.

As part of the O&M Program, a master list of cleaning operations, priority locations and scheduling can be incorporated into GIS. Maps can be produced to define work areas, schedule resources, including contracted services, track progress and task completion. Updating GIS maintenance operations data (partial blockages found, debris quantity, etc.)

will help managers adjust cleaning frequency and area boundaries as needed to increase program efficiency, reduce sewer blockages, and avoid SSOs.

## **Routine Visual Inspections**

Routine inspections are used to assess the condition of lift stations, manholes and surface facilities, recording general conditions and evidence of possible structural problems or failures (offset structures, etc.), corrosion, surcharging, overflows and excessive Inflow and Infiltration (I&I). Work orders are generated based on inspection records to effect operational adjustments, scheduling more detailed inspections and/or making necessary repairs.

## **Manhole Inspection Program**

Manhole inspections keep the asset inventory up-to-date and are used not only to update collection system maps, but to determine structural condition. During manhole inspections, a complete inventory is taken of each manhole including construction materials, ring size, depth to invert, flow conditions and evidence of problems. The National Association of Sewer Service Companies (NASSCO) Manhole Assessment and Certification Program (MACP) may be adopted or used as a guide to ensure consistency and reliability of evaluation and ranking methodology.

The results from routine manhole inspections and monitoring are used to prioritize areas needing CCTV inspections to assess pipe condition such as manholes with evidence of slow flow or surcharging. Information is recorded and used to schedule maintenance and repairs.

## **CCTV Inspection Program**

While routine cleaning and visual inspection are used to assess the condition of surface facilities and manholes, CCTV video inspections are the primary method used to assess the condition of the sewer pipes. Using conventional defect criteria is highly recommended to provide standardization and consistency in sewer pipe condition

assessment and ranking. The NASSCO Pipeline Assessment and Certification Program (PACP) may be adopted or used as a guide to ensure consistency and reliability of evaluation and ranking methodology.

## **Maintenance Activity Records**

Detailed records and daily logs of O&M work provide valuable information to help managers evaluate the effectiveness of maintenance activities and make adjustments to optimize the use of limited resources. Equipment, manpower and other resources are tracked along with detailed descriptions of defects and/or obstructions encountered including debris, FOG, structural failures, etc. Maintenance work resulting in system modifications or extensions is required to be incorporated into record drawings and system maps. Scheduled testing of emergency and standby equipment is also a requirement of the collection system permit.

These records are required to be reviewed periodically to identify problems that cannot be resolved in a short period of time in order to develop a plan to address the problem(s). Maintaining these records for an extended period of time (5-years or more) will also provide accurate reference points of maintenance investments made over time that will track the effectiveness of operation and maintenance activities.

In the event of a sewer spill or system overflow, maintenance records will need to provide sufficient detail to satisfy reporting requirements for the event, including location(s), volume of wastewater, corrective actions, etc. This data may also be integrated into GIS to allow mapping of these events over time in order to identify patterns and/or trends that will assist with scheduling maintenance and planning rehabilitation and other capital improvements.

## **Resolution of Customer Complaints**

Customer complaints are primarily for sewer backups and odors. Sewer backups require an immediate response to diagnose and resolve the problem. These complaints can occur outside normal business hours, significantly escalating costs. Detailed records of the problems found, and the resources needed to address the failed condition, provide valuable feedback for making adjustments to the preventive maintenance program that can reduce these types of calls and help lower overall maintenance costs.

These records can also identify areas where private service laterals frequently fail. Notifying customers in these areas will allow them the opportunity to address deficiencies proactively, which will also help reduce customer “emergency” calls.

## **Capital Improvements Plan**

A Capital Improvements Plan (CIP) is required by the collection system permit to identify rehabilitation, replacement and expansion needs of the system. The CIP is required to address the short and long-term needs of the system, covering at least a 3 to 5-year planning period, and must include the estimated cost of each capital project.

CIP development incorporates maintenance activity, cleaning and inspection records, and system performance data that may include flow monitoring and hydraulic modeling to evaluate the existing system and to recommend improvements needed to correct existing deficiencies, and ensure adequate capacity is maintained throughout the system.

Capital planning includes consideration of on-going funding for rehabilitation and replacement of the collection system as it wears out, and potential upgrades for expansion as needed.

## **Training Program**

Training programs provide a mechanism for educating employees and establishing their technical competence to perform operations, maintenance, and emergency responses safely and effectively. A combination of in-house skill training and specialized training purchased or provided through state and national associations, conferences and vendor training programs are typically used to build and enhance skills for performing daily work duties. Periodic training reinforces previous efforts, as people often overlook things that are used infrequently. It also provides an opportunity to train new staff and learn about new problems, new techniques, and changes in equipment.

Emergency training educates system personnel about emergency situations and resulting effects on the wastewater system, public health, and environmental impacts. It also provides an opportunity to practice responses. Good record keeping ensures personnel are properly trained and prepared to effectively operate and maintain the collection system under any given circumstance. Regular review of training records is essential for keeping content up-to-date and maintaining proper employee awareness.

## **Equipment and Replacement Parts**

A reasonable supply of equipment and replacement parts should be maintained to fully support all operations and maintenance activities. A detailed inventory is essential to ensure availability under normal operations and emergency conditions. Specialized equipment or parts may be too costly to keep in stock, so arrangements with vendors and/or contractors may be necessary to ensure availability during non-business hours or during emergencies.



## 4.2 STAFFING RECOMMENDATIONS

Cumberland County is responsible for three wastewater collection systems and one water system: NORCRESS, Overhills, Kelly Hills, and Southpoint Water System. While each of these districts maintains its own operating budget, the Board leadership and operational management is performed solely by Cumberland County. Therefore, in consideration of the typical utility system management and operations and maintenance that is necessary for maintaining each of the systems, McGill has considered all of the four (4) utility systems cumulatively. While each system could be analyzed separately, considering the systems together is more consistent with actual management of the systems.

Typical metrics for analyzing full-time equivalent (FTE, representing quantity full-time workers) are based on either the population served by the system or by miles of utility piping (water main or sewer line) within each system. For reference, Table 13 below summarizes the customers and piping in each of the County’s utility systems.

**Table 13: Utility System Comparison**

DISTRICT	Number of Connections		Paying Avail. Fee	Pipe in System (mi.)
	Water	Sewer		
<b>Southpoint</b>	84		129	2.8
<b>Kelly Hills</b>		102	166	4.5
<b>Overhills</b>		107	318	4.0
<b>NORCRESS</b>		452	666	41.1
<b>TOTALS</b>	<b>84</b>	<b>661</b>	<b>1279</b>	<b>52.4</b>

**Table 14: Typical Population vs. Pipe Length**

<b>Population</b>	<b>Pipe in System (mi.)</b>
0-100	5
101-500	5
501-3300	21
3301-10000	62

The typical sizes of utility systems from a community system EPA study<sup>1</sup> are shown in Table 14, and are generally consistent when compared to the County’s systems. This study was selected as a basis for comparison due to its comprehensive nature, having included water systems nationwide in its breadth. NORCRESS is the exception when compared to Table 14. This is mostly likely indicative of the system serving a more rural population where the connection density is less, and resulting from the length of force main piping in the system that increases the overall length but does not contribute to population density. Overall, these metrics were found to be reasonably consistent with the County’s systems. Similarly, the data is consistent regardless of whether the utility system is a water systems or wastewater collection system.

The objective is to make budget-level staffing recommendations for the County’s utility systems based on what is typical across the industry and other utility systems of comparable size. The EPA study utilized provides typical FTE for the roles of manager, plant operator, distribution (and collection, for our purposes), and administrative functions. All of these were considered applicable to management and operation of the County’s utility systems. Note: while the County is not responsible for plant operation in any system, the lift stations in the NORCRESS and Overhills systems are the County’s responsibility, therefore this metric was used, albeit in a smaller percentage, to account for the management of those resources.

---

<sup>1</sup> Analysis conducted using excerpts from US EPA document, “National Characteristics of Drinking Water Systems Serving 10,000 or Fewer People,” published July 2011.

Table 15 shows Further utilizing the EPA statistics as base for typical FTE for each of the positions, based on the system size in terms of miles of pipe main.

**Table 15: Average Community System Statistics**

Employee Category	System Size (miles of Main)		Mean	Cumberland County
	Pop. 500-3300	Pop. 3300-10000		
	21	62	41.5	51.7
<b>Manager FTE</b> per mile	0.6	1.1	0.85	1.06
	0.029	0.018	0.020	0.020
<b>Plant Operator FTE</b> per mile	0.6	1.3	0.95	1.03
	0.029	0.021	0.023	0.023
<b>Distribution FTE</b> per mile	0.8	2.5	1.65	2.06
	0.038	0.040	0.040	0.040
<b>Administrative FTE</b> per mile	0.6	1.5	1.05	1.31
	0.029	0.024	0.025	0.025

The green highlighted cells are the calculated FTEs that were applied to estimate staffing size based on the quantity of pipe across the County’s four utility systems. Those calculated FTEs are based on the size of systems managed by the County and reasonable estimate of staffing needed for these systems.

Each of the FTEs is applied to each respective employee category. McGill utilized wage information from Zip Recruiter and a benefits multiplier of 1.38 from the U.S. Bureau of Labor Statistics to develop the summary shown in Table 16.

**Table 16: Overall Salary Estimates**

Employee Category	Hourly Rate	Annual Salary	Ben. Mult.	Total	Applied FTE	Applied Budget Cost
Manager	\$38.50	\$80,080.00	1.38	\$110,510.40	1.06	\$117,000
Operator	\$24.52	\$51,001.60	1.38	\$70,382.21	1.03	\$72,700
Distribution	\$23.57	\$49,025.60	1.38	\$67,655.33	2.06	\$139,100
Administrative	\$21.33	\$44,366.40	1.38	\$61,225.63	1.31	\$80,100
<b>Total Applied Budget Cost Based FTEs</b>						<b>\$408,900</b>

Utilizing industry metrics and comparing to systems of comparable size, McGill offers the proceeding section as a general staffing recommendation. This section and these budget values are provided for preliminary planning purposes only.

Staffing levels appear to be reasonable based on the District's ability to operate and maintain the system while providing a reliable level service to its customers.

While this budget number is higher than the current budget staffing, consideration should also be given to the cumulative effect cost to the County for contracted operation and distribution support in the NORCRESS and Kelly Hills district.



# **APPENDICES**





## **Appendix A**

### **Smoke Testing Results List**



**Overhills Smoke Testing Cleanouts**

Date:		September 19th, 2024	
Facility ID	Status	Notes	
2	Broken		
3	Broken	Cap replaced	
5	Broken		
13	Broken	Smoking from c/o	
15	Broken	Smoking from c/o	
18	Broken		
23	Broken		
26	Broken	Smoking from c/o	
28	Broken		
29	Broken		
42	Broken		
48	Broken		
50	Broken		
10	Broken	No smoke but lid is broken	
53	Broken	Smoking lid needs to be replaced	
	Broken	Lateral broken, smoke around elder valve and ground	
58	Broken		
59	Broken		
66	Broken	Missing elder valve cap	
68	Broken	Both valves smoking and house	
69	Broken		
70	Broken	Cap missing on elder valve	
74	Broken	Smoking from valve	
79	Broken	Elder valve missing cap	
80	Broken		
82	Broken	Lid unscrewed	
87	Broken	Smoking, Replaced on site	
89	Broken	Smoking from c/o	
92	Broken		
94	Broken		
96	Broken	Smoking from c/o	
96	Broken		
97	Broken		
100	Broken	Smoking from valve	
101	Broken	Smoking from c/o	
107	Broken		
116	Broken	Smoking from valve and house	
119	Broken		
121	Broken	Valve and house smoking	
	Broken	Multiple clean outs smoking in yard and from house	
125	Broken		
127	Broken	Smoking from valve	
128	Broken	Smoking from valve	
129	Broken		
136	Broken	Smoking from valve and ground	
139	Broken	Smoking from house and valve	
142	Broken		
143	Broken	Smoking from c/o	
149	Broken		
150	Broken		
152	Broken	Smoking from c/o	
154	Broken	No smoke but cap broken	
157	Broken	Missing cap	
159	Broken	Cap broken no smoke	
160	Broken	Broken	
162	Broken	Broken	
163	Broken		
164	Broken	Broken valve smoking	
165	Broken		
168	Broken	Elder valve cap missing	
169	Broken		
170	Broken		
172	Broken	Lid bent	
175	Broken		
177	Broken	Lid unscrewed	
178	Broken		
180	Broken		
181	Broken		
183	Broken		
184	Broken		
187	Broken		
188	Broken		
201	Broken	Smoking from ground/co	
204	Broken		
206	Broken		
	Broken	Smoking, C/o broken and filled w/trash	
207	Broken		
208	Broken	C/o smoking	
210	Broken		
220	Broken		
225	Broken		
226	Broken	Elder valve lid	
235	Broken	Elder valve cap	
240	Broken		
243	Broken		
247	Broken	Lid loose	
260	Broken	Elder valve	
246	Broken		
266	Broken	Smoking c/o	
264	Broken		
267	Broken		
270	Broken	Smoking	
272	Broken		
273	Broken	Smoking c/o	
285	Broken	Smoking c/o replaced on site	
286	Broken	Cap missing	
317	Broken		
1112	Broken		
1512	Broken		
1513	Broken		
1514	Broken		
2712	Broken		
2713	Broken		

Overhills Smoke Testing Manholes		
Date:		September 19th, 2024
Facility ID	Status	Notes
53	Leak	
54	Leak	Smoking from MH and underneath lift station
62	Leak	
64	Leak	
73	Leak	
99	Leak	MH smoking (inside fence w/ lift station fence locked)
120	Leak	

## **Appendix B**

### **Manhole Inspection List**



# Overhills Manhole Inspection

Date: April 10th, 2024

Manhole/Facility ID	Condition	Notes
7	Good	
11	Good	
16	Good	
17	Good	
21	Good	
25	Good	
26	Good	
30	Good	
35	Poor	
43	Poor	
52	Poor	
56	Good	
60	Poor	
68	Poor	
74	Good	
80	Good	
81	Good	
86	Good	
94	Good	
96	Good	
101	Good	
104	Good	
110	Good	

Total Manhole Inspected	23
Total Good Comdition	18
Total Poor Condition	5





## **Appendix C**

### **Overhills Spring Lake Agreement**



THIS AGREEMENT made and entered into this 8<sup>th</sup> day of September, 2014 by and between the Town of Spring Lake, a North Carolina municipal corporation, (hereinafter referred to as "Spring Lake"), and the County of Cumberland, a North Carolina Body Politic, acting by and through its Overhills Park Water & Sewer District, (hereinafter referred to as "Overhills").

WITNESSETH

THAT WHEREAS, Overhills wishes to contract with Spring Lake to furnish sanitary sewer treatment and provide for the operation and maintenance of the Overhills Park Water & Sewer District in an area as shown on Exhibit "A" attached hereto; and

WHEREAS, Spring Lake has agreed to treat sanitary sewer for Overhills to include operation and maintenance of the sanitary sewer collection system installed by Overhills within the delineated service area according to the following terms and conditions:

1. The sanitary sewer collection system being constructed by Overhills shall be built in accordance with engineering plans and specifications and constructed by a contractor licensed to perform utility construction in North Carolina.

2. Overhills will be responsible for the cost of constructing the sanitary sewer collection system as sized accordingly to serve the delineated service area as approved by USDA with Spring Lake being responsible for upgrades, in materials and line sizing as it may deem necessary.

3. The cost of operation and maintenance of the sanitary sewer collection system is built into the sanitary sewer rate being charged to Overhills as shown on Exhibit "B". Spring Lake shall render accurate monthly bills to Overhills. Such bills shall be computed by multiplying Overhills' sewer flow, expressed in thousand (M) gallons, by the applicable rate per thousand (M) gallons for this customer class. The rate per thousand (M) gallons shall be subject to change annually. Routine operation and maintenance includes: (1) Repair damaged, deteriorated, or broken sewer mains; (2) Repair damaged, deteriorated, or broken sewer service laterals from the main to edge of road right-of-way or easement; (3) Routine maintenance and repair of pump station equipment; (4) Cleaning and rodding of clogged sewer mains; (5) Repair of manholes to include rings and covers; and (6) Other routine maintenance and repairs as needed; (7) Administrative and engineering support of above, as required; (8) 24 hours, 7 days per week on-call dispatch with appropriate response forces; (9) Responding to inquiries by existing and potential users of sanitary sewer service; (10) Investigating and working to resolve complaint issues; (11) Maintaining metered electric service at pumping stations, as well as, chemicals associated with pump station operation.

4. Monthly bills rendered for services as provided hereunder are payable within 30 days from their date, at Spring Lake's office, Town of Spring Lake, P.O. Box 617, Spring Lake, NC 28390.

5. Spring Lake will be responsible for the cost associated with upsizing mains within the delineated Overhills service as may be deemed necessary in order to meet Spring Lake's existing and future sanitary sewer needs which would not be otherwise required for the sanitary sewer collection system being installed by Overhills pursuant to this Agreement.

6. All sanitary sewer lines installed by Overhills that are funded with USDA loan and/or grant funds will not be charged a capacity or impact fee and shall be owned and operated by Overhills subject to Spring Lake's right to upsize such mains at its expense and to transmit sanitary sewer through such mains to areas beyond the Overhills area.

7. Overhills will acquire all rights-of-way and/or encroachments as may be needed for construction of the sanitary sewer collection system as referenced herein. Spring Lake currently controls an existing easement that was dedicated to the Town of Spring Lake for the sole purpose of constructing a lift station to serve the Overhills Park Subdivision. The Town of Spring Lake will not charge Overhills any fees for the use of the easement and Overhills will own the lift station.

8. Spring Lake reserves the right to extend or continue sanitary sewer mains from such mains as initially constructed by Overhills to points outside of the delineated Overhills service area. Future connections or main extensions that occur outside of the delineated Overhills area are not subject to this Agreement and shall be the property of Spring Lake unless the Overhills boundary is expanded by mutual agreement of the parties herein in order to serve development of contiguous properties.

9. The further extension of or connection to mains within the delineated Overhills service area will be pursuant to applicable extension and connection policies and procedures of Overhills in effect at the time a request for service is made.

10. Overhills may by resolution adopt a policy whereby future customers and/or extenders of sanitary sewer infrastructure in the Overhills service area will be subject to the then current applicable Spring Lake Policies and Procedures to simplify the application process for customers with the understanding that such customers remain responsible to Overhills for compliance with such policies and procedures.

11. Laterals not installed during the initial sanitary sewer collection system as constructed by Overhills will be subject to the applicable lateral charge and facility investment fee charged by Spring Lake. Overhills customers will not be charged a main charge by Spring Lake if located within the Overhills service area on mains installed by Overhills.

12. Annual Notification of Anticipated Usage and Restriction: (a) Spring Lake reserves the right and authority to limit the annual increase in usage by Overhills to an amount not greater than 20% of the previous calendar year's usage. However, additional limits may be imposed if an outside agency having jurisdiction over the treatment facilities requires restrictions on increases in usage on the Spring Lake's system. Consideration will be given on a case-by-case basis to address anticipated sanitary sewer needs in excess of the above stated 20% increase; (b) any limitations or restrictions on sanitary sewer usage due to situations beyond Spring Lake's control will also apply to Overhills. Overhills will be responsible to ensure the individual sanitary sewer customers on its system comply with these restrictions or limitations.

13. The term of this Agreement may be amended by written agreement between Spring Lake and Overhills. The term of this Agreement is for five years from Sept. 8, 2014, and at the end of each anniversary date of this Agreement, the termination date of the term of this Agreement shall automatically extend for an additional period of one year unless terminated by said parties giving not less than two years written notice to the other party including the initial term or by mutual consent of both parties.

14. *Severability*: It is hereby declared to be the intention of Spring Lake and Overhills that the paragraphs, sentences, clauses and phrases of this Agreement are severable. If one or more paragraphs, sections, sentences, clauses or phrases shall be declared void, invalid or otherwise unenforceable for any reason by valid and final judgment or decree of any court of competent jurisdiction, such judgment or decree shall not affect the remaining provisions of this Agreement and the same shall continue to be fully effective and enforceable on the basis that said remaining provisions would have been agreed to by Spring Lake and Overhills without the incorporation of such void, invalid or otherwise unenforceable paragraph, section, sentence, clause or phrase.

15. *Notices:* Whenever written notices are required under this Agreement, said notice shall be in writing and shall be delivered personally or shall be sent by prepaid registered or certified mail. If notice is mailed to Spring Lake, it should be addressed as follows:

Mayor, Town of Spring Lake  
P.O. Box 617  
Spring Lake, NC 28390

If notice is mailed to Overhills, it should be addressed as follows:

Chairman, Board of Governors  
Overhills Park Water & Sewer District  
P.O. Box 1829  
Fayetteville, NC 28302-1829

Either party may change its mailing address by giving written notice of the new address. Unless so changed, the addresses set forth above shall apply.

18. *Binding Effect:* This contract shall be binding upon and inure to the benefit of the parties hereto, their heirs, successors and assigns.

19. *Entire Agreement:* This contract contains the entire agreement of the parties and there are no representations, inducements or other provisions other than those expressed in writing.

20. *Governing Law:* This contract shall be governed by the laws of the State of North Carolina.



IN WITNESS WHEREOF, the parties hereto through their duly authorized officers has executed this contract as to the date and year first above written.

OVERHILLS PARK WATER & SEWER DISTRICT



ATTEST:

Candice White  
Candice White, Clerk to the Board

By: Jeannette M. Council  
Jeannette M. Council, Chair

APPROVED for Legal Sufficiency  
OVERHILLS PARK Water & Sewer District  
Attorney

Rick L. Moorefield  
Rick L. Moorefield, County Attorney  
Attorney for OVERHILLS PARK  
*it properly executed*

This instrument has been pre-audited in the manner required by the Local Government Budget and Fiscal Control Act.

Melissa Cardinali  
Melissa Cardinali, Finance Director  
Finance Officer for OVERHILLS PARK

THE TOWN OF SPRING LAKE



ATTEST:

Rhonda Webb  
Rhonda Webb, Town Clerk

By: Chris V. Rey  
Chris V. Rey, Mayor

APPROVED, as to form this 8<sup>th</sup> day of September, 2014.

Robert A. Buzzard  
Robert A. Buzzard  
Spring Lake Attorney

This instrument has been preaudited in the manner required by the Local Government Budget and Fiscal Control Act.

Tina J. West  
Allen L. Coats, Finance Director  
Financial Officer for Spring Lake  
Tina J. West, Interim Finance Director



NORTH CAROLINA - CUMBERLAND COUNTY

I, \_\_\_\_\_, a Notary Public of said County and State do hereby certify that \_\_\_\_\_ personally appeared before me this day and acknowledged that he/she is the Clerk to the Board of the OVERHILLS PARK Water and Sewer District, and that the authority duly given and as the act of said, the foregoing instrument was signed in its name by its Chairman, sealed with its corporate seal and attested by himself/herself as its \_\_\_\_\_.

WITNESS my hand and Notarial Seal, this the \_\_\_\_ day of \_\_\_\_\_, 2014.

My Commission Expires: \_\_\_\_\_

\_\_\_\_\_  
Notary Public

NORTH CAROLINA - CUMBERLAND COUNTY

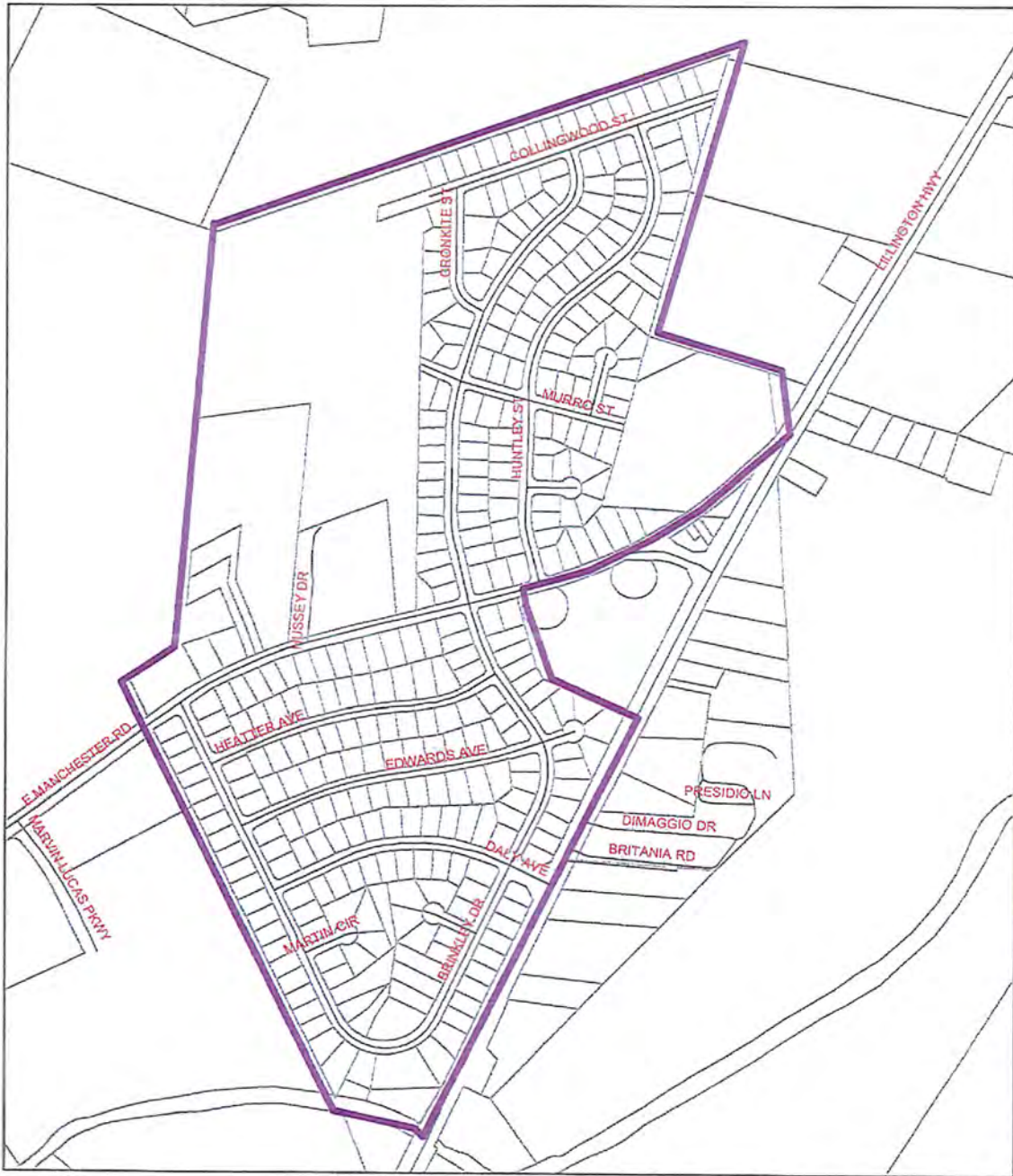
I, Patricia M. Hickman, a Notary Public of said County and State do hereby certify that Khonda D. Webb, personally appeared before me this day and acknowledged that she is Clerk of The Town of Spring Lake, North Carolina, and that the authority duly given and as the act of the agency, the foregoing instrument was signed in its name by its Mayor, sealed with its seal and attested by himself/herself as the Town Clerk.

WITNESS my hand and Notarial Seal, this the 8<sup>th</sup> day of September, 2014.

My Commission Expires:  
November 26, 2016

Patricia M. Hickman  
Notary Public  


Exhibit A



OVERHILLS PARK WATER & SEWER DISTRICT

## Exhibit B

### Rate Schedule

\$4.00 per thousand gallons

\$9.25 per tap

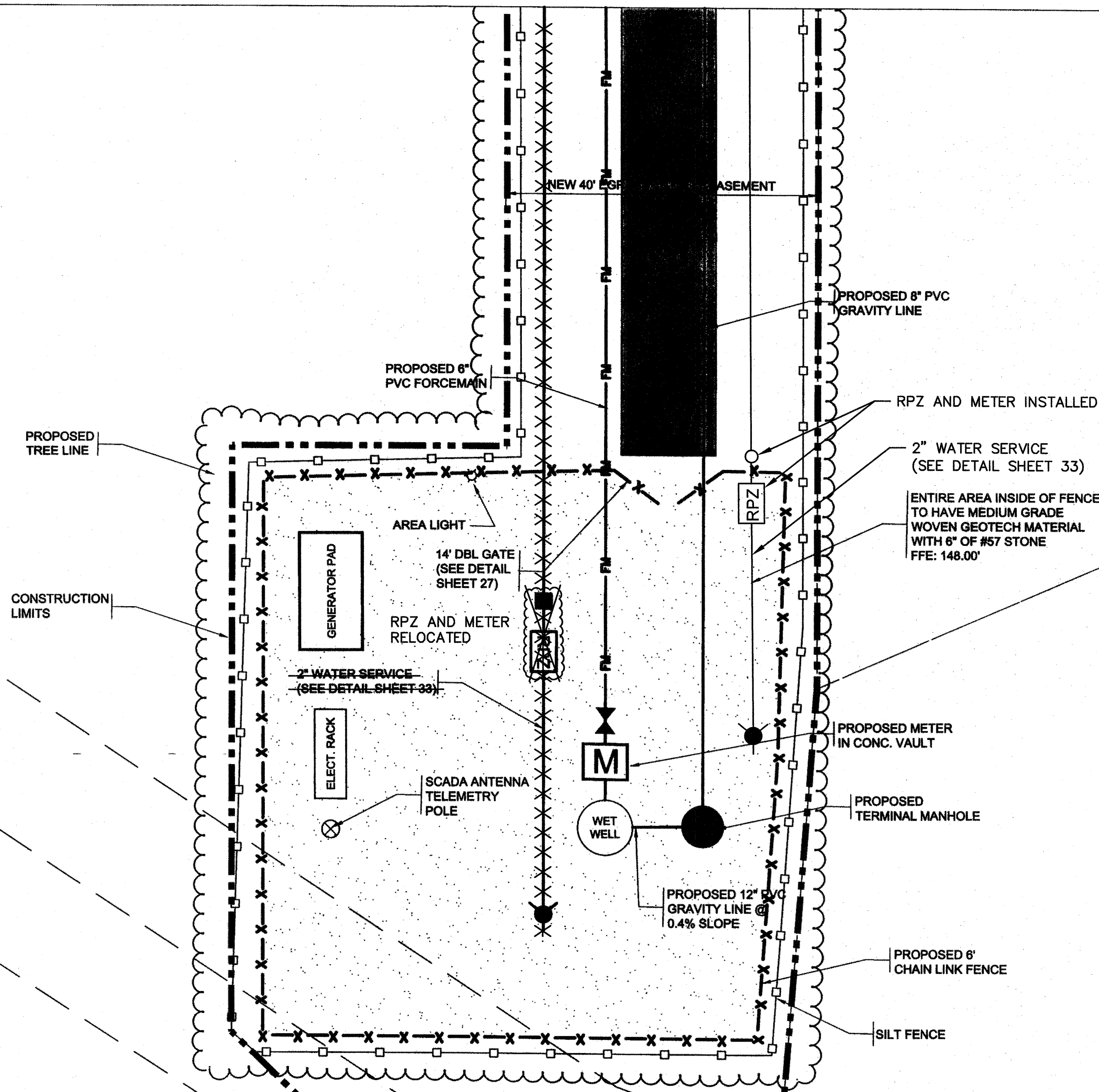


## **Appendix D**

### **Lift Station Record Drawings**



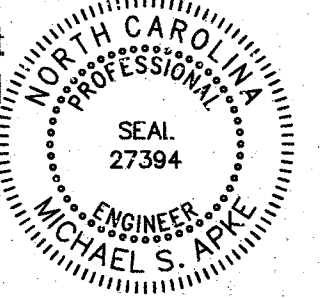
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148.5±



NOT A CERTIFIED DOCUMENT AS TO THE ORIGINAL DOCUMENT BUT ONLY AS TO THE REVISIONS. THIS DOCUMENT ORIGINALLY ISSUED AND SEALED BY CHARLES MCGOUGAN, PE 025942, ON AUGUST 12, 2015. THIS DOCUMENT IS ONLY CERTIFIED AS TO THE REVISIONS.

**RECORD DRAWING**

This Drawing has been modified to reflect changes made during construction based upon information provided by the Contractor and construction observations made by the Owner's Authorized Representative (McGill Associates).



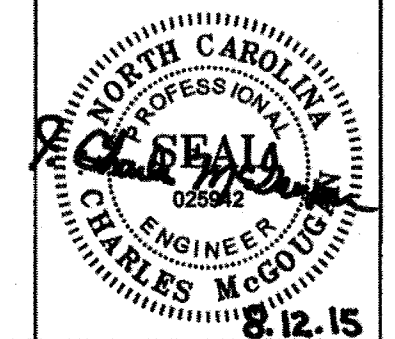
By Michael S. Apple Date 8/2/19

**McGill ASSOCIATES**  
ENGINEERING · PLANNING · FINANCE  
5 REGIONAL CIRCLE, SUITE A PINEHURST, NC 28374 PH. (910) 295-3159 FIRM # C-0459

LEGEND			
	NEW FORCEMAIN		WETLANDS
	NEW GRAVITY LINE		NEW ACCESS ROAD
	EASEMENT LINE		NEW 6" #57 STONE
	PROPERTY LINE		EXIST. ROAD
	WETLANDS BUFFER		NEW MANHOLE
	EXIST. WATER LINE		
	CHAIN LINK FENCE		
	NEW CONTOUR		
	EXIST. CONTOUR		

**PS-1  
BRINKLEY DRIVE PUMP STATION  
SITE PLAN**  
SCALE: 1"=10'

REVISIONS			
BY	DATE	DESCRIPTION	SYM.
JCM	6/15/15	ADDED CONST. LIMITS/CONST. ENTR. NOTES	



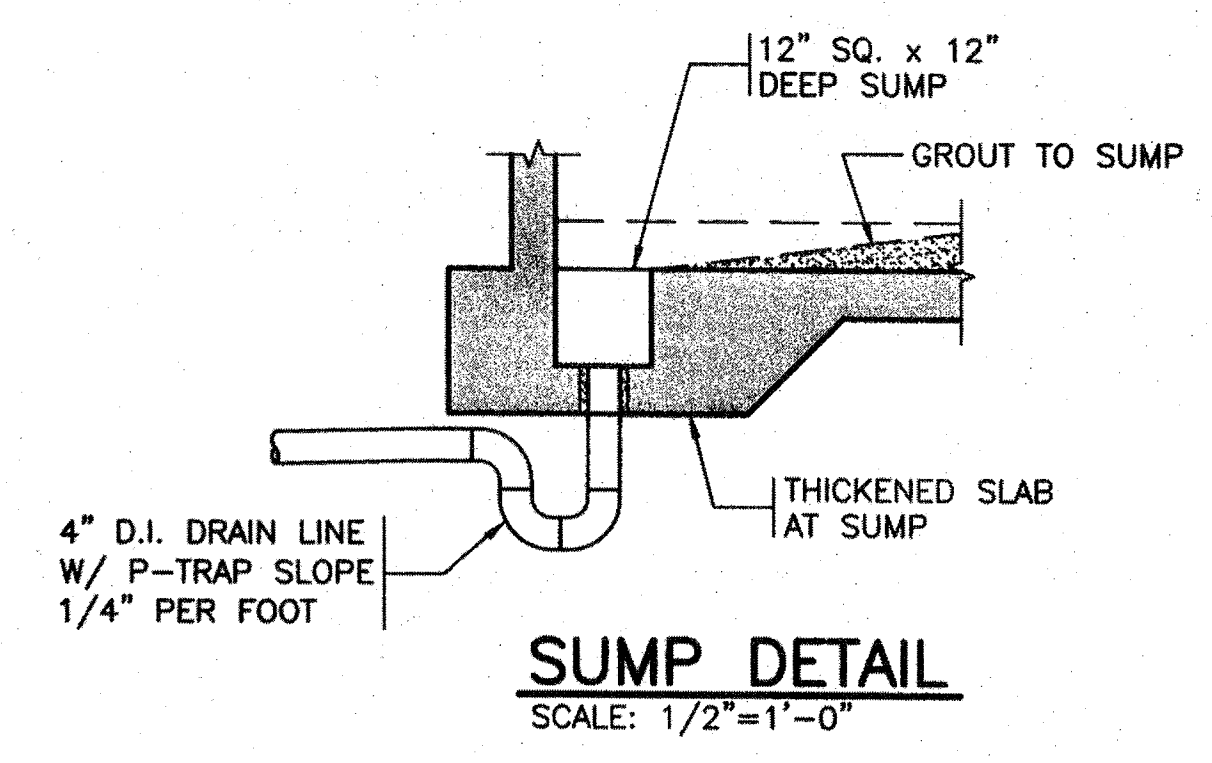
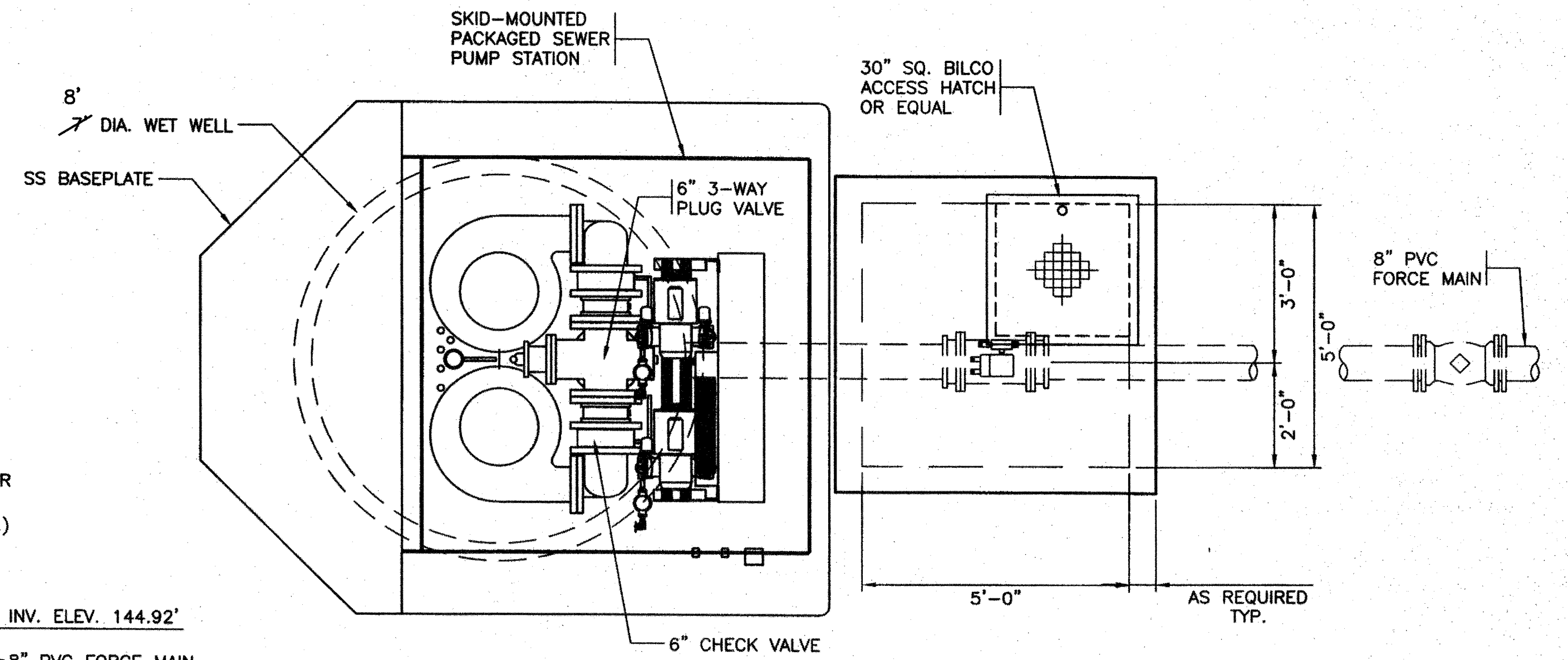
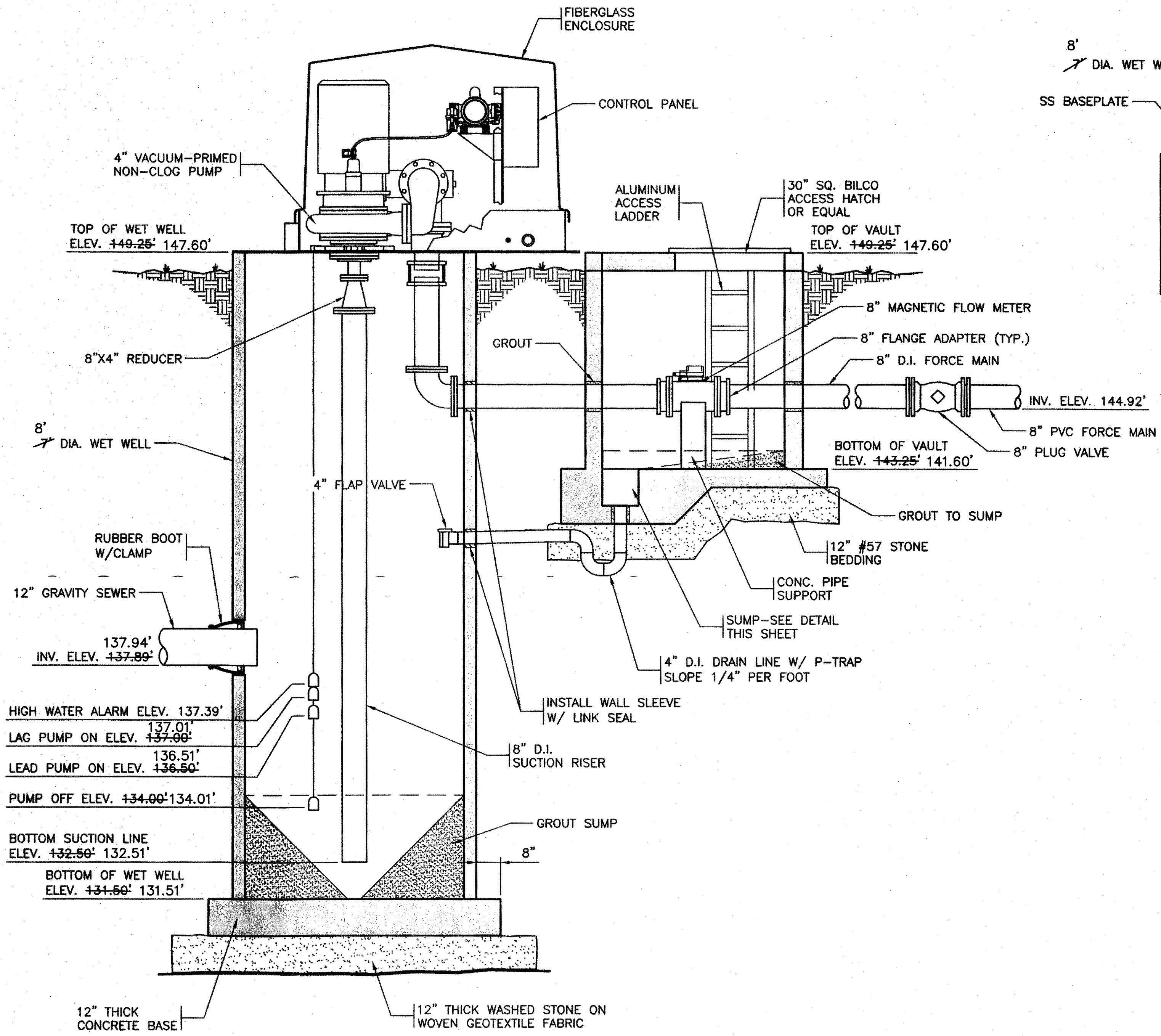
**MOBID CONSULTING ENGINEERS, P.A.**  
P.O. BOX 4428  
ASHEBORO, NC 27204  
Phone: (336) 629-3931  
Fax: (336) 629-3932  
NC License No. C-644

**BRINKLEY DRIVE PUMP STATION SITE PLAN**

**OVERHILLS SUBDIVISION WASTEWATER SERVICE**  
Cumberland County, North Carolina

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Date: AUG. 2015	3
Drawn: TLM	
Checked: HJM	
Job No.: 29001	Of: 33 Version: _____





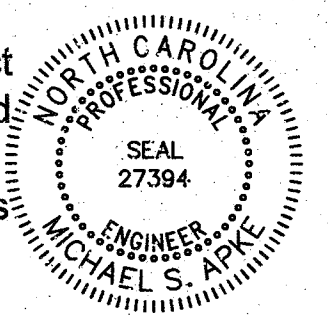
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**RECORD DRAWING**

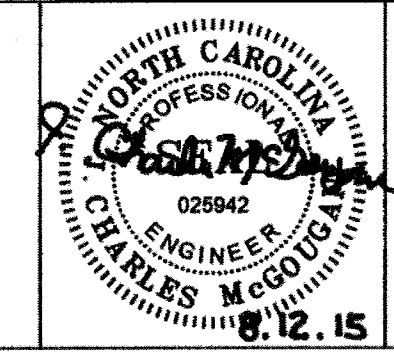
This Drawing has been modified to reflect changes made during construction based upon information provided by the Contractor and construction observations made by the Owner's Authorized Representative (McGill Associates).

By Michael S. Apple Date 8/2/19

**McGill ASSOCIATES**  
ENGINEERING · PLANNING · FINANCE  
5 REGIONAL CIRCLE, SUITE A PINEHURST, NC 28374 PH. (910) 295-3159 FIRM # C-0459



REVISIONS			
BY	DATE	DESCRIPTION	SYM.



**MOB**  
CONSULTING ENGINEERS, P.A.

P.O. BOX 4428  
ASHEBORO, NC 27204  
Phone: (336) 629-3931  
Fax: (336) 629-3932  
NC License No. C-644

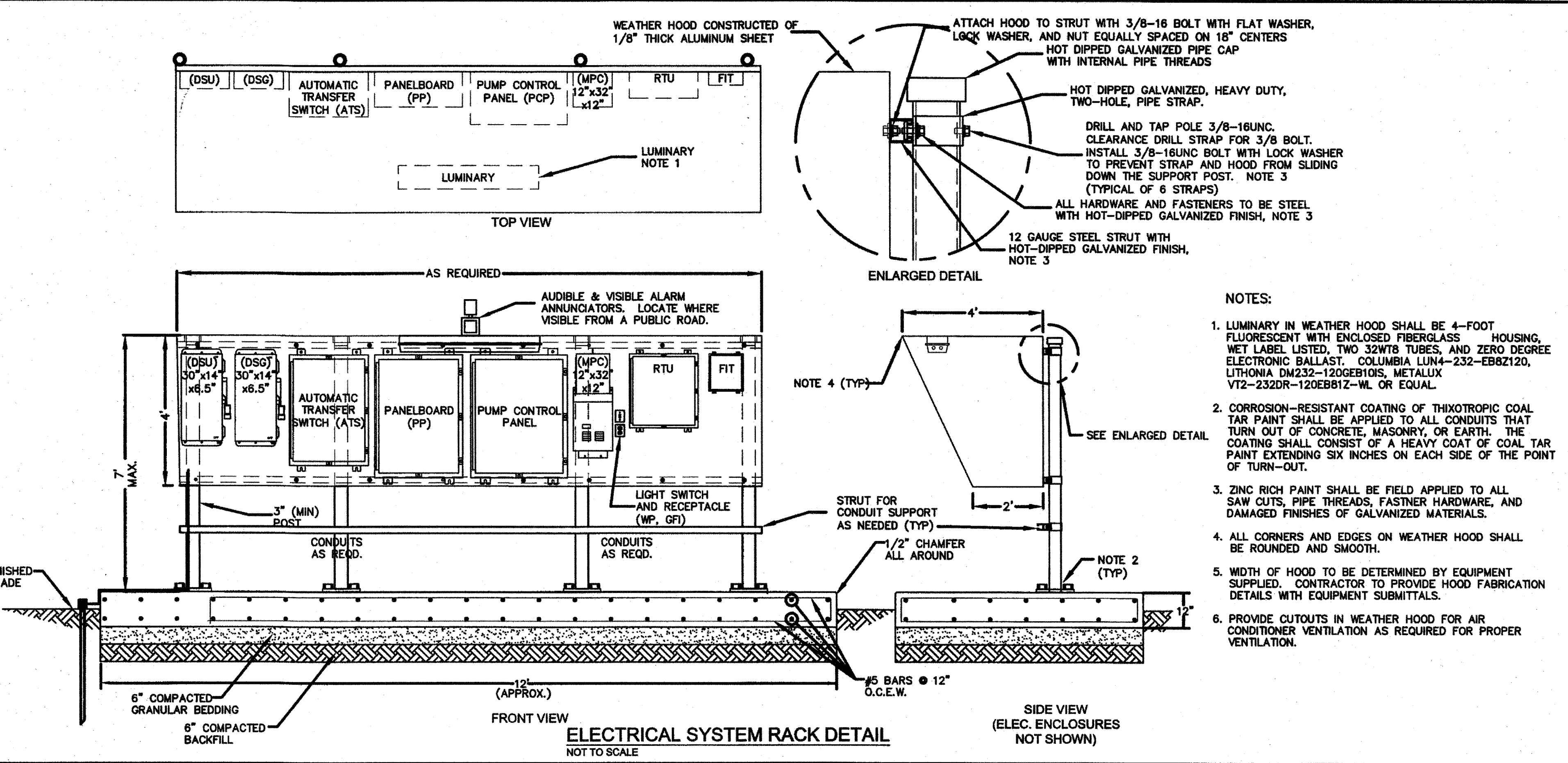
**BRINKLEY DRIVE  
PUMP STATION  
PLAN & DETAILS**

**OVERHILLS SUBDIVISION  
WASTEWATER SERVICE**  
Cumberland County, North Carolina

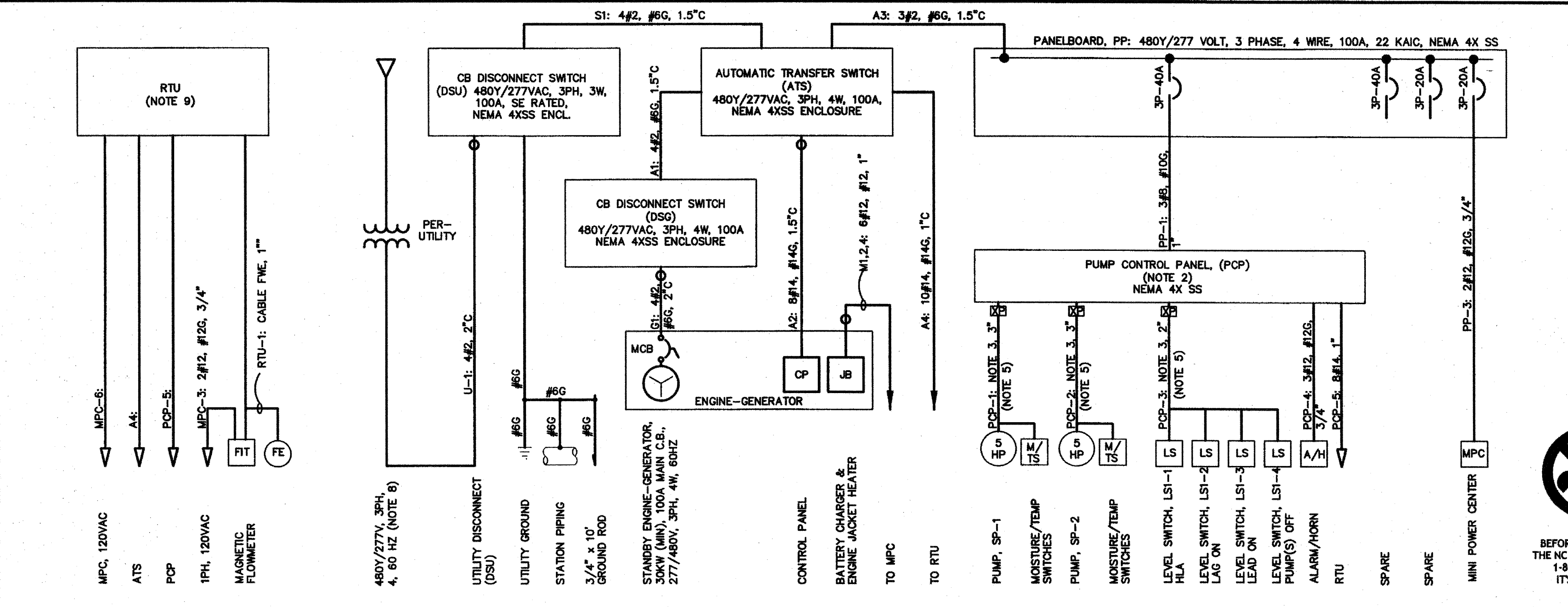
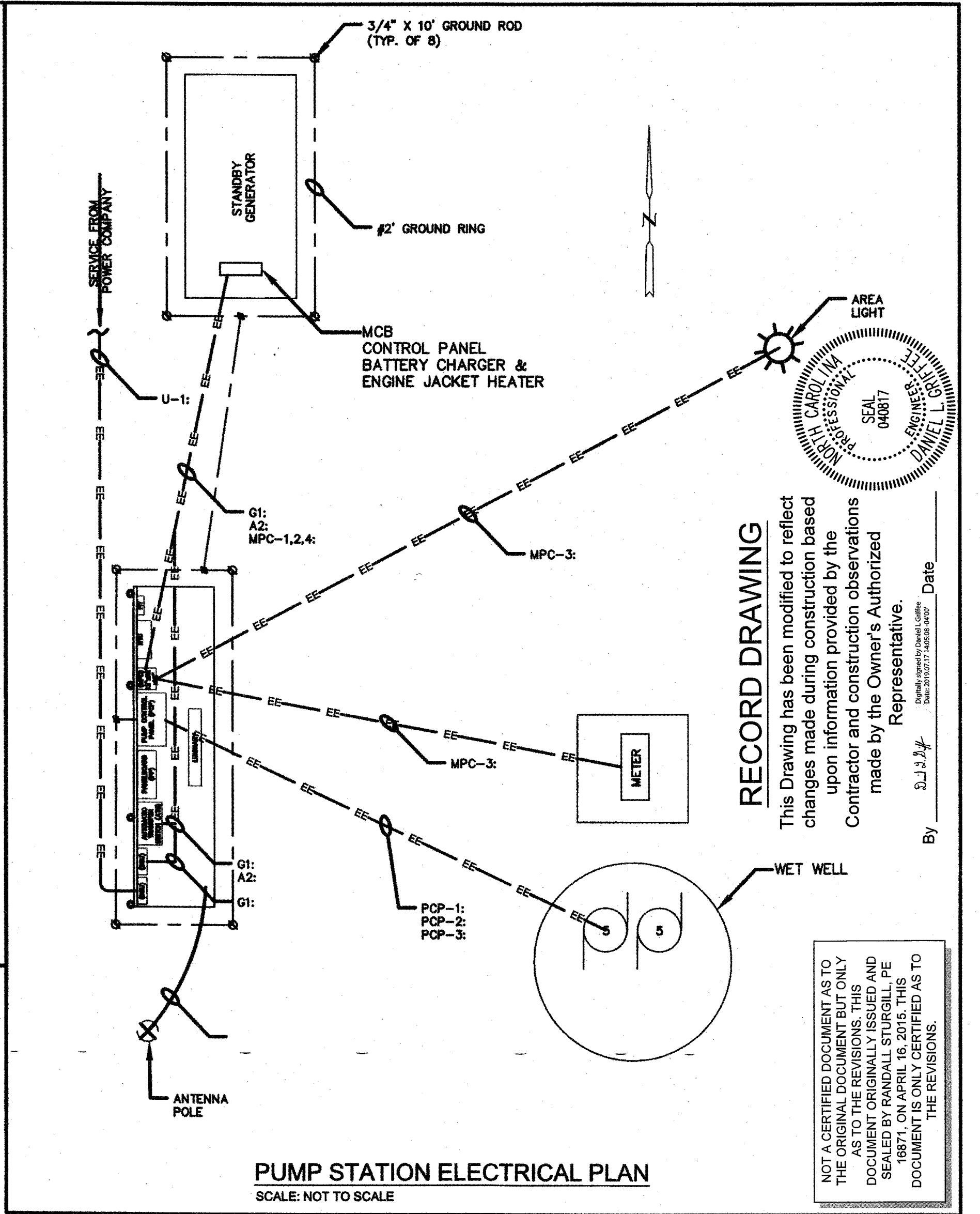
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18771 OVERHILLS SUBDIVISION WASTEWATER SERVICE PUMP STATION NO. 1 ELECTRICAL SITE PLAN AND ONE-LINE DIAGRAM - 01-1 APR 16, 2015 - 01:00



- NOTES:**
- LUMINARY IN WEATHER HOOD SHALL BE 4-FOOT FLUORESCENT WITH ENCLOSED FIBERGLASS HOUSING, WET LABEL LISTED, TWO 32W8 TUBES, AND ZERO DEGREE ELECTRONIC BALLAST. COLUMBIA LUN4-232-EB82120, LITHONIA DM232-120GB10IS, METALUX VT2-232DR-120EB81Z-WL OR EQUAL.
  - CORROSION-RESISTANT COATING OF THIXOTROPIC COAL TAR PAINT SHALL BE APPLIED TO ALL CONDUITS THAT TURN OUT OF CONCRETE, MASONRY, OR EARTH. THE COATING SHALL CONSIST OF A HEAVY COAT OF COAL TAR PAINT EXTENDING SIX INCHES ON EACH SIDE OF THE POINT OF TURN-OUT.
  - ZINC RICH PAINT SHALL BE FIELD APPLIED TO ALL SAW CUTS, PIPE THREADS, FASTNER HARDWARE, AND DAMAGED FINISHES OF GALVANIZED MATERIALS.
  - ALL CORNERS AND EDGES ON WEATHER HOOD SHALL BE ROUNDED AND SMOOTH.
  - WIDTH OF HOOD TO BE DETERMINED BY EQUIPMENT SUPPLIED. CONTRACTOR TO PROVIDE HOOD FABRICATION DETAILS WITH EQUIPMENT SUBMITTALS.
  - PROVIDE CUTOUTS IN WEATHER HOOD FOR AIR CONDITIONER VENTILATION AS REQUIRED FOR PROPER VENTILATION.



**RTU ONE-LINE DIAGRAM**  
NOT TO SCALE

BY	DATE	DESCRIPTION	SYM.

**REVISIONS**

BY	DATE	DESCRIPTION	SYM.

**MBD CONSULTING ENGINEERS P.A.**

PO BOX 4428  
ASHEBORO, NC 27204  
Phone: (336) 629-3931  
Fax (336) 629-3932

**PUMP STATION NO. 1  
BRINKLEY DRIVE  
ELECTRICAL SITE PLAN  
AND ONE-LINE DIAGRAM**

PANELBOARD: MPC	BUS: AS REQ'D	MAIN CB: 20A-2P XFMR PRIMARY
SERVICE: 480 - 120/240 VAC, 1PH	RATING: 5 KVA	MAIN CB: 30A-2P XFMR SECONDARY
MOUNTING: POST, NEMA 3R SS	LOCATION: PUMP STATION	

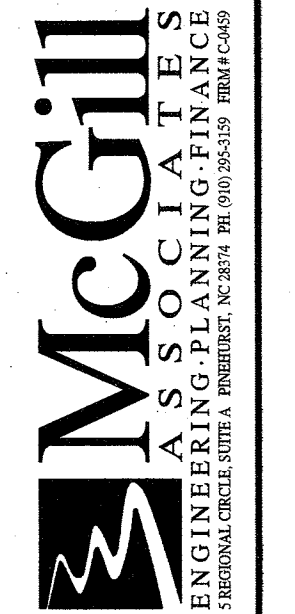
LOAD	AMP	POLE	CKT #	POLE	AMP	LOAD
BATTERY CHARGER	20	1P	1	2P	20	ENGINE JACKET HEATER
MAG METER	20	1P	3	4		
SPARE	20	1P	5	6	1P	20
SPARE	20	1P	7	8	1P	20
HOOD LIGHT AND RECEPTACLE	20	1P	9	10	1P	20
SPARE	20	1P	11	12	1P	20

**NOTES:**

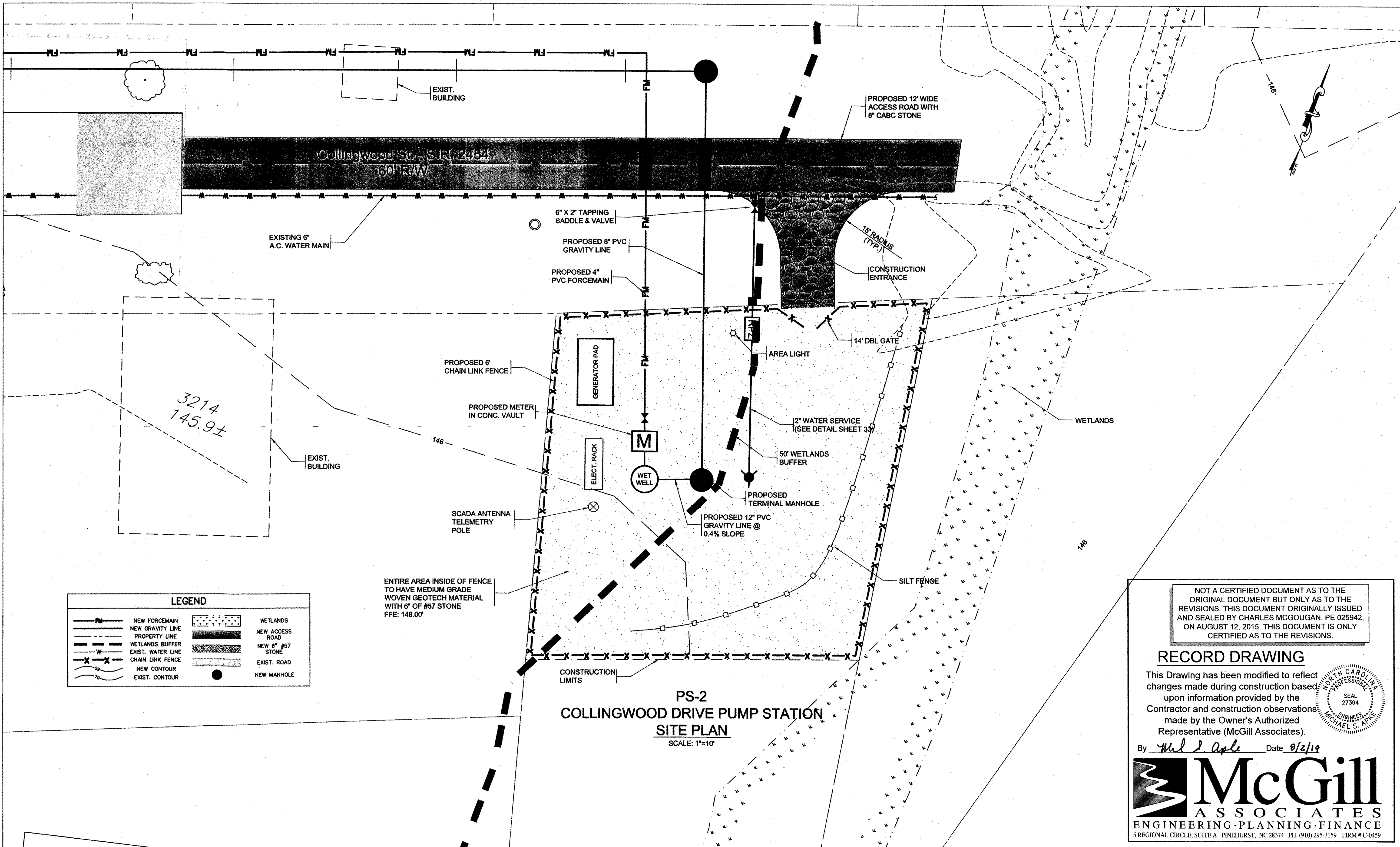
- SEE SHEET E1 FOR LEGEND, ABBREVIATIONS AND GENERAL NOTES.
- CONTROL PANEL PROVIDED WITH EQUIPMENT AND INSTALLED BY CONTRACTOR.
- CABLE PROVIDED WITH PUMPS, LEVEL PROBE, FLOATS. CONDUIT AND INSTALLATION BY CONTRACTOR.
- COORDINATE EXACT LOCATION OF EQUIPMENT PRIOR TO INSTALLATION.
- WETWELL AREA IS DEFINED HAZARDOUS, CLASS 1, DIVISION 1, GROUP D BY THE NEC. ALL CONDUITS ENTERING THE HAZARDOUS AREAS SHALL BE RIGID STEEL AND PROVIDED WITH SUITABLE SEAL-OFFS.
- ALL CONDUIT TURN-UPS SHALL BE RIGID STEEL.
- AS ALLOWED BY CODE AND UNLESS OTHERWISE NOTED, PVC SCHEDULE 40 OR 80 IS ACCEPTABLE FOR UNDERGROUND CONDUITS. UP SIZE SCHEDULE 80 AS REQUIRED.
- UNDERGROUND SERVICE REQUIRED FROM UTILITY TO SERVICE DISCONNECT. ANY UTILITY CHARGES TO BE PAID BY CONTRACTOR.
- RTU PANEL SHALL BE PER TOWN OF SPRING LAKE REQUIREMENTS.

**STOP!**  
BEFORE YOU DIG CALL  
THE NC ONE CALL CENTER  
1-800-632-4949  
IT'S THE LAW!

Scale: NTS	Sheet No.:
Date: DEC. 2014	5
Drawn: REH	
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Job No.: 29001	Of: 33 Version: 1







**PS-2  
COLLINGWOOD DRIVE PUMP STATION  
SITE PLAN**  
SCALE: 1"=10'

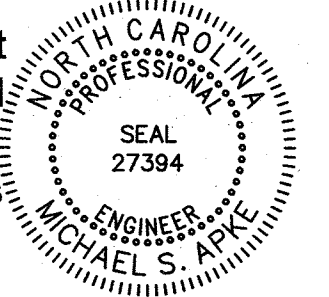
**LEGEND**

	NEW FORCEMAIN		WETLANDS
	NEW GRAVITY LINE		NEW ACCESS ROAD
	PROPERTY LINE		NEW 6" #57 STONE
	WETLANDS BUFFER		EXIST. ROAD
	EXIST. WATER LINE		NEW MANHOLE
	CHAIN LINK FENCE		
	NEW CONTOUR		
	EXIST. CONTOUR		

NOT A CERTIFIED DOCUMENT AS TO THE ORIGINAL DOCUMENT BUT ONLY AS TO THE REVISIONS. THIS DOCUMENT ORIGINALLY ISSUED AND SEALED BY CHARLES MCGOUGAN, PE 025942, ON AUGUST 12, 2015. THIS DOCUMENT IS ONLY CERTIFIED AS TO THE REVISIONS.

**RECORD DRAWING**

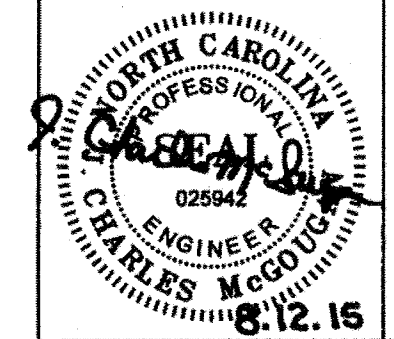
This Drawing has been modified to reflect changes made during construction based upon information provided by the Contractor and construction observations made by the Owner's Authorized Representative (McGill Associates).



By Michael S. Apple Date 8/2/19

**McGill ASSOCIATES**  
ENGINEERING · PLANNING · FINANCE  
5 REGIONAL CIRCLE, SUITE A PINEHURST, NC 28374 PH. (910) 295-3159 FIRM # C-0459

REVISIONS			
BY	DATE	DESCRIPTION	SYM.
JCM	6/15/15	ADDED CONST. LIMITS/CONST. ENTR. NOTES	SYM.



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**COLLINGWOOD DRIVE  
PUMP STATION  
SITE PLAN**

**OVERHILLS SUBDIVISION  
WASTEWATER SERVICE**  
Cumberland County, North Carolina

Scale: 1"=10'	Sheet No.:
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Job No.: 29001	Of: 33 Version: 1







**WATER ASSET MANAGEMENT PLAN**

**SOUTHPOINT SUBDIVISION WATER SYSTEM**  
**GRAYS CREEK WATER AND SEWER DISTRICT**

**CUMBERLAND COUNTY, NC**



PINEHURST, NORTH CAROLINA

**WATER ASSET MANAGEMENT PLAN**

**SOUTHPOINT SUBDIVISION WATER SYSTEM**  
**GRAYS CREEK WATER AND SEWER DISTRICT**

**CUMBERLAND COUNTY, NC**

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Firm License No.: C-0459

**AUGUST 2025**

**PROJECT NO. 20.02507**



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## **APPENDICES**

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<b>Appendix A – Excerpt from West Bladen County Water System SWAP</b>
<b>Appendix B – 2013 O&amp;M Plan for Cumberland County Water System</b>
<b>Appendix C – NC0309055 Well Treatment Process Summary</b>
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## EXECUTIVE SUMMARY

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The purpose of this Asset Management Plan (AMP) is to inventory and document the condition of the water infrastructure for Southpoint Subdivision's Water System within the Gray's Creek Water and Sewer District. This will assist the County in becoming more proactive in the management and financing of its water system. The Southpoint Subdivision is a community located in Cumberland County. Cumberland County purchases potable water from the Bladen County Regional Water System and distributes the water to the Southpoint Subdivision and the adjacent community in southern Cumberland County.

The County does not have a previous Asset Management Plan for the water system, therefore this development process has resulted in the assembly of an AMP and 10-year Capital Improvements Plan (CIP) to guide the County with prioritizing capital projects and equipment purchases necessary to rehabilitate and maintain its water system.

This Asset Management Plan seeks to provide a foundation for evaluating the Southpoint Subdivision's distribution system. To address existing system deficiencies and improve overall operations, capital improvement projects are recommended for implementation within a 10-year planning period. An operation and maintenance plan is also provided to ensure long-term system efficiency and reliability. This report was prepared per NCDEQ Division of Water Infrastructure Asset Management Guidance, system operator knowledge, field work conducted by McGill Associates (McGill), Local Water Supply Plan information, and system mapping information prepared by McGill as a result of the field work.

Developing a Capital Improvements Plan (CIP) will allow the County to update its current rate setting model to better estimate future revenue and expenses, capital outlay, indebtedness, and overall health of the water distribution system enterprise fund reserves. A model of this nature would continue to balance revenues and expenditures with a longer-term approach to rate setting and establish a financially sound framework for the County to follow. This plan also includes a budget-level recommendation for staffing associated with system operations and maintenance for all County utility districts.

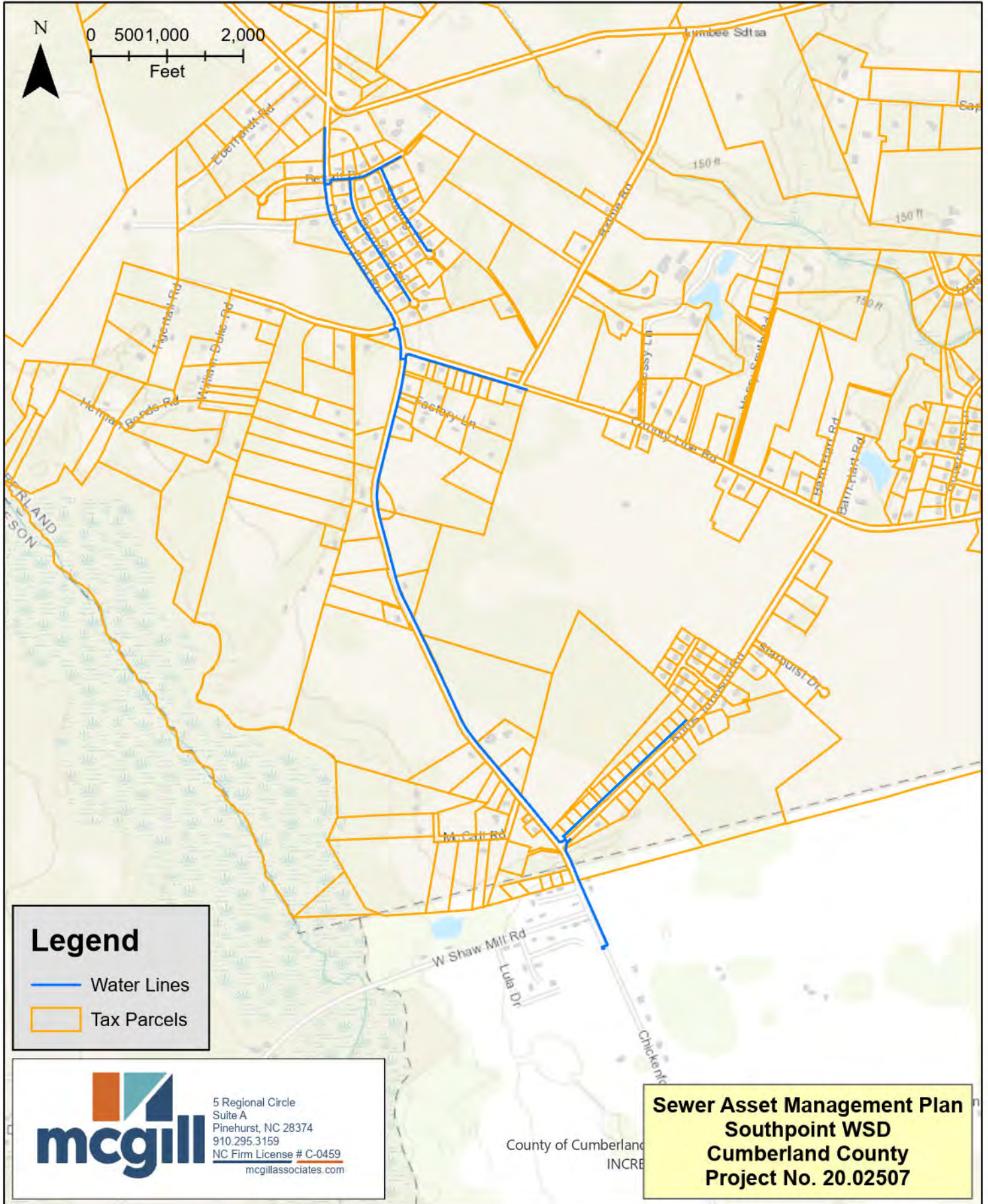
**1.1 BACKGROUND**

The Southpoint Subdivision Water System is in the Gray's Creek Water and Sewer District, located in Cumberland County, North Carolina, and is owned and operated by Cumberland County. The Southpoint Water District includes a water distribution system that currently serves 84 residential connections. Southpoint's Water Distribution System includes approximately 16,900 LF of 6-inch, 8-inch, and 12-inch water main, 12 hydrants, and 84 water meter service connections. The water mains are constructed of PVC pipe and were put into service in 2013. According to the 2022 Local Water Supply Plan (LWSP), the Southpoint community purchased a daily average of 0.0105 MGD of water from Bladen County. Figure 1 shows the current system.

The water source for the Southpoint water system is the Tobemory Well (#9) in the Bladen County Water Distribution-West Bladen water system, PWS ID 0309055. According to the Source Water Assessment Program (SWAP) Report for 2020, the well has a depth of 98 feet and yields water at 300 gallons per minute. Excerpted pages from the SWAP are included in orthophosphate used for corrosion control, Bladen County treats the water at Tobemory Well for iron through pressure sand filtration and for organics through granular activated carbon (GAC).



# Overall System Map Figure 1



## 1.2 EXISTING WATER DISTRIBUTION SYSTEM

The Southpoint water distribution system consists of 84 metered connections and approximately three miles of water distribution pipes, comprised of polyvinyl chloride, and ranging in size from 6-inches to 12-inches in diameter. Based on record drawing review and field work completed by McGill as part of this project, the system includes 12 fire hydrants and six valves. The system was put into service in 2013. The County reports no known issues with the existing system equipment.

Table 1 summarizes the existing assets within the water distribution system. Figure 2 shows the location of hydrants and valves within the system, and Figure 3 shows the diameter of existing water main.

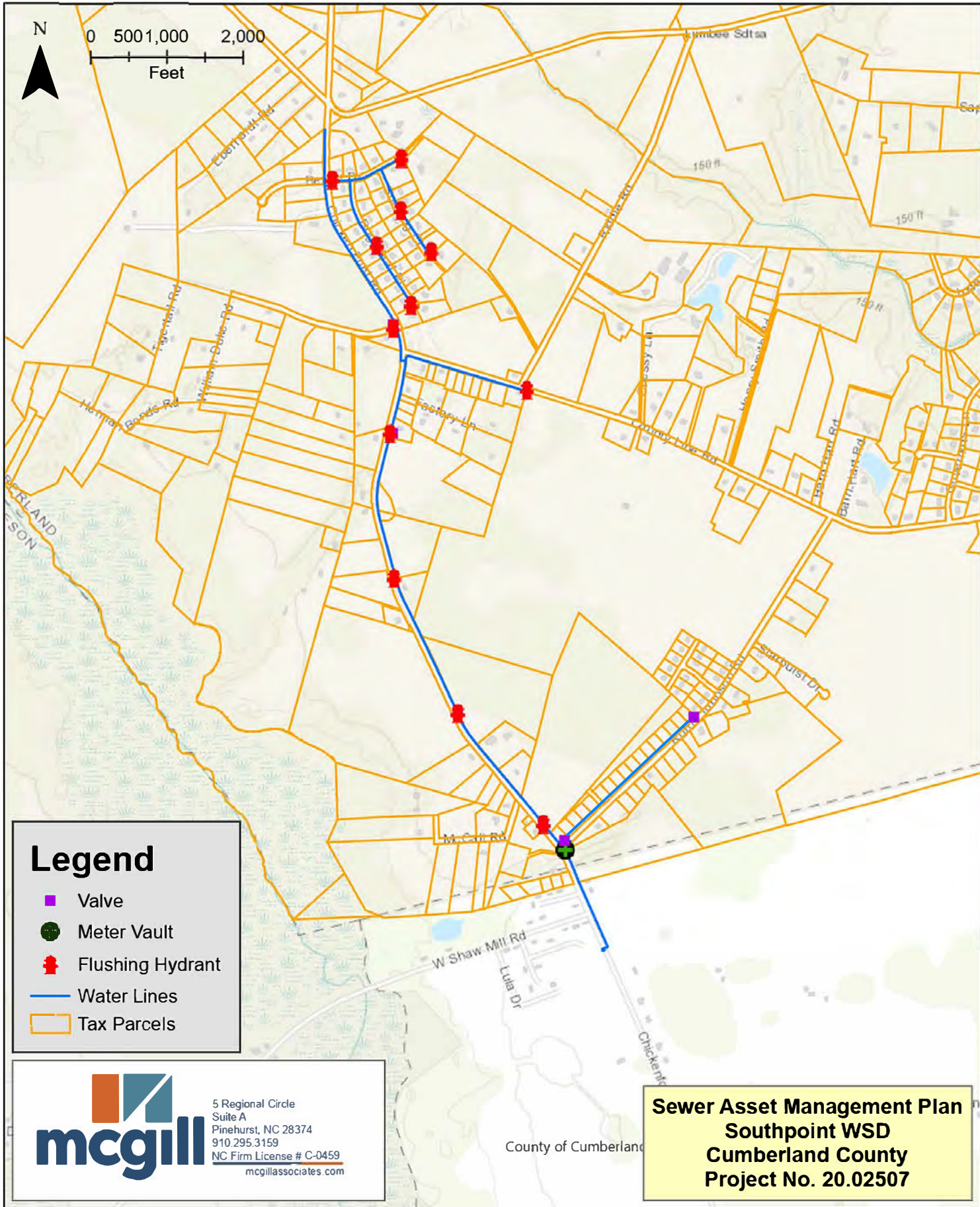
**Table 1: Water Distribution System Inventory**

<b>Asset</b>	<b>Size Range (in)</b>	<b>Estimated Length (feet)</b>
Polyvinyl Chloride Pipe	6-12	16,900
Valves	6-12	6
Fire Hydrants	N/A	12
Water Meters	N/A	81



# Hydrants and Valves Map

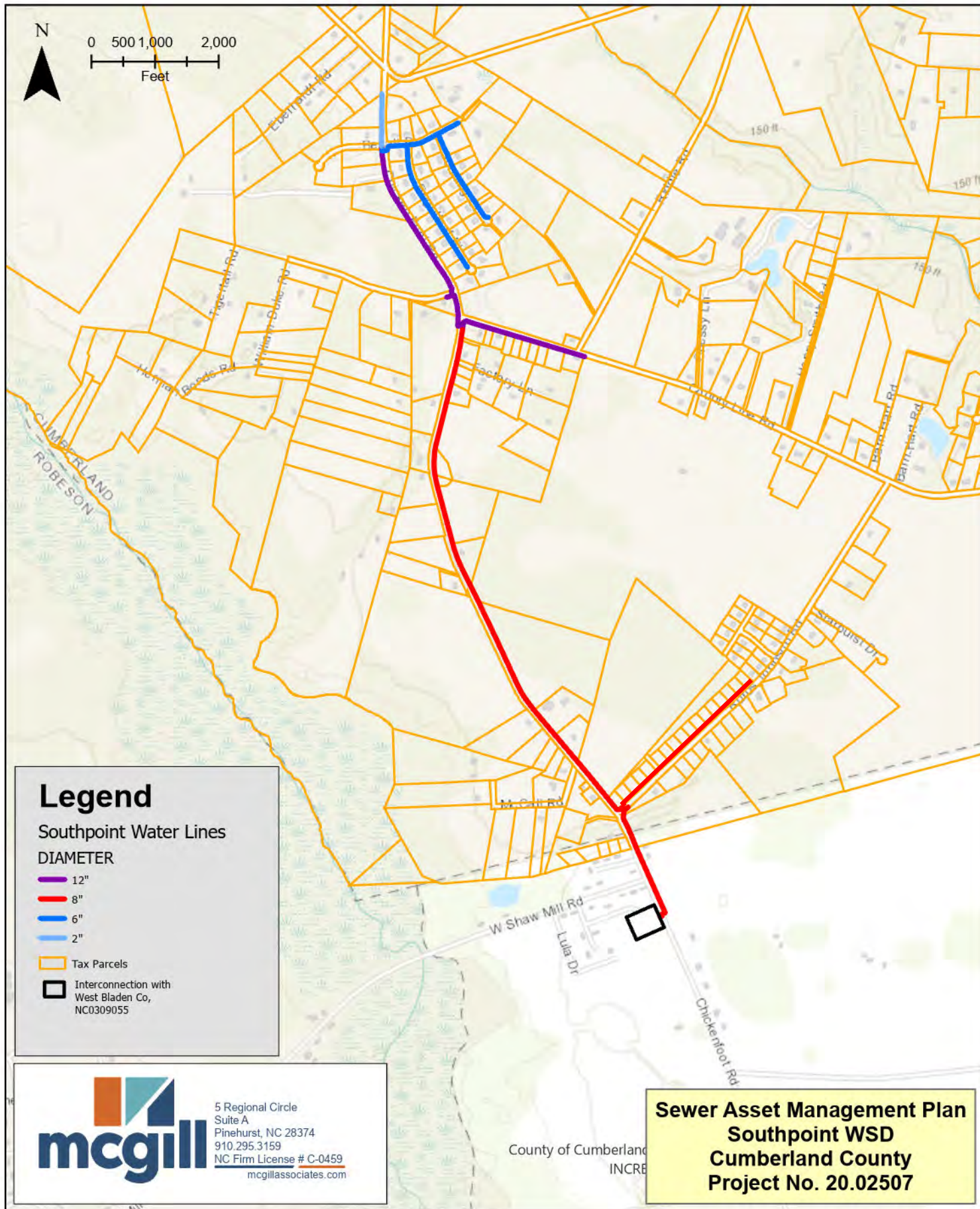
## Figure 2





# Water Line Diameter Map

## Figure 3



## 2.0

## CONDITION ASSESSMENT

### 2.1 WATER DISTRIBUTION SYSTEM

McGill Associates used a combination of water system GIS mapping, visual observations, record drawings, and operator/staff knowledge to assess the condition of the existing distribution system.

The analysis concluded that the general condition of the system is good, based on the low age of the system and primarily residential users connected to the system. The water meter condition is noted as good/fair, based on the age of the meters and the software no longer being supported.

**Table 2: Distribution System Condition Assessment**

Line Type	Size Range (in)	Quantity	% of System	Condition
PVC Pipe	6-12	16,900 LF	100%	Good
Meters	N/A	84 EA	100%	Good/Fair

**Table 3: Hydrant Condition Assessment**

Fire Hydrant Manufacturer	Average Age	Excellent	Good	Fair	Poor	Unknown	Total
American	20 years	-	12	-	-	-	12

**Table 4: Valve Condition Assessment**

Excellent	Good	Fair	Poor	Total
-	6	-	-	6

## **2.2 WATER SYSTEM HYDRAULICS AND CAPACITY**

The water system has an average pressure of 55 psi based on hydrant testing conducted by the McGill and County staff. The lowest static pressure noted during any test was 51 psi, which is still well above the minimum pressure of 30 psi for a public water system under peak flow conditions. Ground elevations within the area are relatively consistent from 160 to 165-ft above sea level.

The water system is not designed to provide fire protection. For the purposes of this report, fire hydrant flow tests were performed in the field to understand the characteristics of the system.

The Southpoint water system has 45,000 GPD of total capacity under the County's current operating agreement with Bladen County. As of March 2024, the County has approximately 10,900 GPD of remaining capacity that is currently unobligated. The County has seen a recent increase in requests from residential developers for properties that would be served by the water system. As a result, the County is interested in in-ground storage to increase its available capacities. Based on existing treatment at the source well in the Bladen County system, Cumberland County may choose to implement additional filtration ahead of proposed water storage.

The County has worked for several years to provide public water to citizens in the Gray's Creek Area, of which the Southpoint S/D water system is a part. As a part of this investigation, the County contracted with HDR to pursue funding for construction of deep wells, treatment, and distribution lines. This project would provide benefit to both the existing customers in the Southpoint S/D water system with increased hydraulic reliability and fire protection, as well as making public water available to the broader Gray's Creek area. This project with cost estimate prepared by HDR is included in the CIP for this report.

## 2.2 CONCLUSION

The existing distribution system is relatively young, and therefore the County does not face the challenge of replacing aging infrastructure at this point. Recommendations for operations and maintenance are included in this report that will serve to extend the life of the existing equipment and infrastructure in the system. Therefore, the focus of the County's needs in this system relate to other operational needs that stem from having only one full-time staff person who oversees the management of the County's three existing sewer systems and this Southpoint water system. The recommended improvements to the system are targeted at improving operational capabilities and developing resiliency within the system:

- Replacing AMR water meters with new AMI water meters and updated meter reading system
- Procure new billing software
- Construct ground-level storage tank with water filtration.

These items have been addressed in the Capital Improvements Plan.

## **3.0**

## **CAPITAL IMPROVEMENTS PLAN**

---

The fieldwork, asset inventory, review of existing documentation, and consideration of staff input provided evidence for various water system improvements including specific and general recommendations. Specific recommendations determined the imminent projects in the next few years, and general recommendations are primarily maintenance and further investigation and can be implemented at minimal cost.

### **3.1 GENERAL RECOMMENDATIONS**

#### **3.1.1 Valve Turning**

EPA recommends exercising all mainline valves in the system once per year to ensure valves can be located and opened/closed properly during emergency shut-down periods. Recording the number and direction of turns to open/close will help identify problems and need for maintenance. During valve exercising, a complete evaluation of the asset should be made including difficulty accessing the valve, excessive force needed to operate and leaking during operation. Also, when exercising, complete inventory should be taken of each valve including size, type, valve box/manhole condition, depth of cover, operating condition, and evidence of other potential problems.

#### **3.1.2 Hydrant Testing**

It is recommended to continue testing hydrants throughout the year to verify that the pressures at each hydrant in the system can meet the current fire flow requirements. Hydrant tests can also give valuable information in order to find existing or additional deficiencies in the system.



### **3.1.3 Mapping**

The mapping completed as part of the AIA has been provided to the County on ArcGIS online such that the County staff can maintain and update as needed in the future. It is recommended that the County update materials for water lines where known and as maintenance and replacements are completed. Any age information should be inserted as well as keeping the system map up-to-date and providing information for future work.

## 3.2 PRIORITY PROJECTS

### 3.2.1 Water Meter Replacement Project

This project includes replacement of existing AMR meters with AMI based water meters, as well as new meter reading equipment, installation, startup and training for the associated water meter reading software and data logging software.

**Table 5: Preliminary Opinion of Probable Cost for Water Meter Replacement Project**

Item	Description	Units	Quantity	Unit Price	Total Cost
1	AMI Residential Water Meter	EA	84	\$ 500	\$ 42,000
2	Water Meter Reading System and Startup	LS	1	\$ 20,000	\$ 20,000
<b>Construction Subtotal</b>					<b>\$ 62,000</b>
Contingency (15%)					\$ 9,300
<b>Total Base Project Cost</b>					<b>\$ 71,300</b>

*\*Cost estimates are based on the knowledge of a professional engineer based on 2024 construction costs and are subject to change due to bidding environment and other factors.*



### 3.2.2 Water Storage Tank and Filtration Project

This project includes the construction of a ground storage tank to provide additional capacity for the water system, as well as additional filtration equipment.

**Table 6: Preliminary Opinion of Probable Cost for Water Storage Tank Project**

Item	Description	Units	Quantity	Unit Price	Total Cost
1	22,500 Gallon Ground Storage Tank	LS	1	\$ 55,000	\$ 55,000
2	Greensand Iron Manganese Filter	LS	1	\$ 175,000	\$ 175,000
<b>Construction Subtotal</b>					<b>\$ 230,000</b>
Contingency (15%)					\$ 43,500
Engineering Assistance (If Needed)					\$ 30,000
<b>Total Base Project Cost</b>					<b>\$ 303,500</b>

*\*Cost estimates are based on the knowledge of a professional engineer based on 2024 construction costs and are subject to change due to bidding environment and other factors.*

### 3.2.3 Construct New Wells and Water Main

This project includes approximately 25,550 linear feet of 12-inch distribution pipeline to help reduce the contamination in private drinking water wells. This project will provide well pumps and wellheads, the transmission of raw water from production wells to a treatment unit for a variety of cleaning processes, and then to distribute the water to a maximum of 100 connections throughout Gray’s Creek.

Item	Description	Units	Quantity	Unit Price	Total Cost
1	Source (pumps and wellheads for 2 existing wells, 3,660 LF raw water main)	LS	1	\$ 2,861,732	\$ 2,861,732
2	Treatment (pre-filtration, IX, GAC, disinfection, ground storage, booster pumps)	LS	1	\$ 3,447,158	\$ 3,447,158
3	Distribution Lines (25,500 LF, 12” distribution line)	LS	1	\$ 8,203,417	\$ 8,203,417
<b>Construction Subtotal</b>					<b>\$ 14,512,307</b>
Contingency (10%)					\$ 1,451,231
Engineering Assistance (If Needed)					\$ 1,915,625
Administration Cost					\$ 1,734,974
<b>Total Base Project Cost</b>					<b>\$ 19,614,136</b>

### **3.3 CIP PROJECTS SUMMARY**

Cumberland County's goal is to provide clean, safe and economical water service to current and future customers. The customers include primarily residential households and businesses within the County. The County intends to provide and maintain a reliable and safe water supply and water distribution system in the Southpoint water system, which exceeds the standards imposed to protect the public health and the quality of the receiving waters.

Throughout the AIA process, the Southpoint water system was evaluated through visual inspections, hydrant testing, and water modeling. The highest priorities were collected and put into a 10-year capital improvements plan. In this plan, projects were prioritized based on existing conditions and providing operational benefit to the County.

A Capital Improvements Plan (CIP) is a plan and schedule of anticipated and required capital expenditures for public utility facilities with descriptions of project needs, estimated project costs, and timing of work over a planning period. Thus, a CIP is an important planning tool that allows a public utility to prepare for upcoming projects and to proactively determine how and when to fund them.

**Table 7: CIP Cost Summary**

Year	Water Meter Replacement	Ground Storage Tank and Filter	Construct New Wells and Water Main	TOTAL COST
1	\$ -	\$ -	\$ -	\$ -
2	\$ 71,300	\$ -	\$ -	\$ 71,300
3	\$ -	\$ -	\$ 19,614,136	\$ 19,614,136
4	\$ -	\$ -	\$ -	\$ -
5	\$ -	\$ 303,500	\$ -	\$ 303,500
6	\$ -	\$ -	\$ -	\$ -
7	\$ -	\$ -	\$ -	\$ -
8	\$ -	\$ -	\$ -	\$ -
9	\$ -	\$ -	\$ -	\$ -
10	\$ -	\$ -	\$ -	\$ -
<b>TOTAL ESTIMATED CIP COST</b>				<b>\$ 19,988,936</b>

**4.1 GENERAL RECOMMENDATIONS**

The purpose of an Operations and Maintenance (O&M) Program is to provide an organized and cost-effective approach to ongoing maintenance, repair and replacement activities that will maintain the water distribution system, so it performs as intended and adheres to applicable sections of the of the Water System Management Plan, set forth under North Carolina Office of Administrative Hearings, Subchapter 18c of Title 15A.

This section provides a general description of proactive O&M, that can be defined as scheduled maintenance activities (preventive maintenance), performed on a regular basis in order to achieve the highest level of system performance using available resources and minimizing failures that can result in low pressure, degraded quality, service interruptions and possible contamination.

Developing an O&M Program begins with accurate records of infrastructure inventory, asset locations and physical condition. Coupled with work records and system performance history, preventive maintenance schedules can be developed to efficiently address general system needs, from regular flushing of stagnate water to site-specific maintenance work such as leak repairs.

The following elements provide the foundation for an effective O&M program:

- Maintain up-to-date water distribution system maps and related work history and operational data.
- Develop a routine preventive O&M program and activities for staff and contractors maintaining the water distribution system and a system to document scheduled activities.
- Develop a rehabilitation and replacement plan identifying and prioritizing system deficiencies and implement short- and long-term actions to address the deficiencies.
- Develop and implement training programs to build technical competence and emergency preparedness.

- Develop and provide equipment and replacement part inventories, including critical replacement parts.

The County has an Operations and Maintenance Plan for the water system that was developed by Koonce, Noble and Associates in 2013. The plan focuses on six areas, including: Frost Prevention, Leak Detection and Repair, Meter Calibration, Flushing, Valve Exercise, and Control of Authorized Use. A copy of this plan is included in Appendix B of this report. In addition to and as an elaboration on that plan, McGill suggests the following as critical elements to proactive O&M.

### **Water System Mapping**

Water system maps and related databases are typically managed using a Geographic Information System (GIS). These maps and datasets can be viewed through a GIS desktop program (i.e. ArcGIS), or by creating digital (typically pdf format) maps and tables to be viewed on screen, exported to other software (excel) for analysis, or printed for manual markup, editing, etc. GIS mapping is supported by a database that records water main size, material types, locations of valves, meters, service connections and other attributes of system appurtenances. It can also attach images and records such as field inspections to specific asset(s) or location(s) and attach performance data such as operating pressure or fire flow to sections of the distribution system. GIS provides a powerful tool to build, organize and display the physical and operational attributes of the water distribution system.

The GIS database should be updated on a regular basis. Software applications such as work order systems are available to allow field staff to update GIS data as inspection and maintenance activities are completed. Other applications can also allow staff to update and edit maps.

GIS can organize work history along with operational data, inspection records and images to provide managers, operations staff and engineers with powerful data sets to track current resource allocations and forecast short and long-term operational and capital needs. Outcomes of detailed analysis such as recommended water main rehabilitation work versus water main break history can be mapped to present the relationship visually for ease of communicating and understanding.

### **Preventive Operation and Maintenance (O&M)**

Preventive maintenance is performing routine and scheduled maintenance activities before equipment or buried infrastructure fails, for the purpose of extending useful life, reducing overall operating costs, and increasing system reliability. This proactive approach to maintenance work is more efficient and cost effective than reactive and curative operations.

Preventive maintenance activities will also help operations staff to better understand the distribution system and how it works under various conditions. This knowledge is essential to setting maintenance priorities and developing the scope and timing of long-term rehabilitation and replacement projects.

### **Scheduled Flushing/Cleaning of Water Mains**

A regular flushing schedule for maintaining or improving water quality, primarily by raising chlorine residual, in key locations is typically developed based on the history of regular sampling and/or customer complaints. Care must be taken to flow sufficient volume to remove stagnant water at a rate of flow capable of removing sediments that contribute to degraded water quality. Monitoring chlorine residuals will provide a good indicator that water quality has reached the desired level to complete the task. Automatic flushing valves may be installed to reduce labor costs and ensure regular flushing at appropriate intervals and duration to accomplish the desired results.



More frequent flushing may be necessary during summer months when temperature will speed up degradation and possible formations of disinfectant byproducts. Unidirectional flushing should also be considered on a periodic basis to enhance sediment removal as needed. Mechanical cleaning, forcing a “pig” through the pipe network may be considered where extensive sedimentation and tuberculation occurs.

As part of the O&M Program, a master list of flushing/cleaning operations, priority locations and scheduling can be incorporated into GIS. Maps can be produced to define work areas, schedule resources, including contracted services, track progress and task completion. Updating GIS maintenance operations data (water quality monitoring, sediment quantity, etc.) will help managers adjust cleaning frequency and area boundaries as needed to increase program efficiency, maintain water quality and reduce customer complaints.

### **Routine Visual Inspections**

Routine inspections are used to assess the condition of valve structures, hydrants and other surface facilities, recording general conditions and evidence of water leaks, possible structural problems or failures (offset structures, etc.), corrosion and other damage. Work orders are generated based on inspection records to effect operational adjustments, scheduling more detailed inspections and/or making necessary repairs.

### **Valve Exercising Program**

EPA recommends exercising all mainline valves in the system once per year to ensure valves can be located and opened/closed properly during emergency shut-down periods. Recording the number and direction of turns to open/close will help identify problems and need for maintenance. During valve exercising, a complete evaluation of the asset is made including difficulty accessing the valve, excessive force needed to operate and leaking during operation.

During valve exercising complete inventory is taken of each valve including size, type, valve box/manhole condition, depth of cover, operating condition, and evidence of other potential problems.

Develop a standard form for recording information to ensure consistency of work and accuracy of records. These records are used to prioritize maintenance and repair scheduling and provide a history of condition assessments that will help develop the scope of rehabilitation and replacement work.

### **Leak Detection and Water Loss Reduction**

Proactively identifying and repairing system leaks will reduce the amount of finished water that does not reach the customer and would also increase the overall cost of water delivered to the customer. Reducing water system loss will help to contain utility costs, reduce the need and frequency of rate increases, and preserve a valuable natural resource.

Developing a water loss control program is essential to meeting these goals. Two options are the small system water audit, which was developed from the N.C. Division of Water Resources' Local Water Supply Plan (LWSP), and the American Water Works Association (AWWA) water loss control committee's free water audit. While the AWWA water audit applies to all systems, smaller systems (less than 10,000 people) with more limited resources may elect to complete a slightly less comprehensive audit. DWR has developed an alternative water audit that is available on the division's website.

## **Maintenance Activity Records**

Detailed records and daily logs of O&M work provide valuable information to help managers evaluate the effectiveness of maintenance activities and make adjustments to optimize the use of limited resources. Equipment, manpower and other resources are tracked along with detailed descriptions of defects and other repair needs encountered. Maintenance work resulting in system modifications or extensions should be incorporated into record drawings and system maps. Scheduled testing of emergency and standby equipment is also recommended.

These records should be reviewed periodically to identify problems that cannot be resolved in a short period of time in order to develop a plan to address the problem(s). Maintaining these records for an extended period of time (5 years or more) will also provide accurate reference points of maintenance investments made over time that will track the effectiveness of operation and maintenance activities.

In the event of pressure loss or boil water notice, maintenance records will need to provide sufficient detail to satisfy reporting requirements for the event, including location(s), corrective actions, testing and monitoring, etc. This data may also be integrated into GIS to allow mapping of these events over time in order to identify patterns and/or trends that will assist with scheduling maintenance and planning rehabilitation and other capital improvements.

## **Resolution of Customer Complaints**

Customer complaints are primarily for low pressure, tastes and odors. These conditions require an immediate response to diagnose and resolve the problem. These calls can occur outside normal business hours, significantly escalating costs. Detailed records of the problems found, and the resources needed to address the conditions provide valuable feedback for making adjustments to the preventive maintenance program that can reduce these types of calls and help lower overall maintenance costs.

## **Capital Improvements Plan**

A Capital Improvements Plan (CIP) identifies rehabilitation, replacement and expansion needs of the system. The CIP should address the short and long-term needs of the system, covering at least a 5 to 10-year planning period, and includes the estimated cost of each capital project.

CIP development incorporates maintenance activity, cleaning and inspection records, and system performance data that may include flow monitoring and hydraulic modeling to evaluate the existing system and to recommend improvements needed to correct existing deficiencies, and ensure adequate capacity is maintained throughout the system.

Capital planning includes consideration of on-going funding for rehabilitation and replacement of the collection system as it wears out, and potential upgrades for expansion as needed.

## **Training Program**

Training programs provide a mechanism for educating employees and establishing their technical competence to perform operations, maintenance, and emergency responses safely and effectively. A combination of in-house skill training and specialized training purchased or provided through state and national associations, conferences and vendor training programs are typically used to build and enhance skills for performing daily work duties. Periodic training reinforces previous efforts, as people often overlook things that are used infrequently. It also provides an opportunity to train new staff and learn about new problems, new techniques, and changes in equipment.

Emergency training educates system personnel about emergency situations and resulting effects on the wastewater system, public health and environmental impacts. It also provides an opportunity to practice responses. Good record keeping ensures personnel are properly trained and prepared to effectively operate and maintain the collection system under any given circumstance. Regular review of training records is essential for keeping content up-to-date and maintaining proper employee awareness.

## **Equipment and Replacement Parts**

A reasonable supply of equipment and replacement parts should be maintained to fully support all operations and maintenance activities. A detailed inventory is essential to ensure availability under normal operations and emergency conditions. Specialized equipment or parts may be too costly to keep in stock, so arrangements with vendors, contractors and other utilities (under mutual aid agreements) may be necessary to ensure availability during non-business hours or during emergencies.

## 4.2 STAFFING RECOMMENDATIONS

Cumberland County is responsible for three wastewater collection systems and one water system: NORCRESS, Overhills, Kelly Hills, and Southpoint Water System. While each of these districts maintains its own operating budget, the Board leadership and operational management is performed solely by Cumberland County. Therefore, in consideration of the typical utility system management and operations and maintenance that is necessary for maintaining each of the systems, McGill has considered all of the four utility systems cumulatively. While each system could be analyzed separately, considering the systems together is more consistent with actual management of the systems.

Typical metrics for analyzing full-time equivalent (FTE, representing quantity full-time workers) are based on either the population served by the system or by miles of utility piping (water main or sewer line) within each system. For reference, Table 6 below summarizes the customers and piping in each of the County's utility systems.

**Table 6: Utility System Comparison**

DISTRICT	Number of Connections		Paying Avail. Fee	Pipe in System (mi.)
	Water	Sewer		
<b>Southpoint</b>	84		129	2.8
<b>Kelly Hills</b>		102	166	4.5
<b>Overhills</b>		107	318	4.0
<b>NORCRESS</b>		452	666	41.1
<b>TOTALS</b>	<b>84</b>	<b>661</b>	<b>1279</b>	<b>52.4</b>

**Table 7: Typical Population vs. Pipe Length**

<b>Population</b>	<b>Pipe in System (mi.)</b>
0-100	5
101-500	5
501-3300	21
3301-10000	62

The typical sizes of utility systems from a community system EPA study<sup>1</sup> are shown in Table 7, and are generally consistent when compared to the County’s systems. This study was selected as a basis for comparison due to its comprehensive nature, having included water systems nationwide in its breadth. NORCRESS is the exception when compared to Table 7. This is mostly likely indicative of the system serving a more rural population where the connection density is less, and resulting from the length of force main piping in the system that increases the overall length but does not contribute to population density. Overall, these metrics were found to be reasonably consistent with the County’s systems. Similarly, the data is consistent regardless of whether the utility system is a water systems or wastewater collection system.

The objective is to make budget-level staffing recommendations for the County’s utility systems based on what is typical across the industry and other utility systems of comparable size. The EPA study utilized provides typical FTE for the roles of manager, plant operator, distribution (and collection, for our purposes), and administrative functions. All of these were considered applicable to management and operation of the County’s utility systems. Note: while the County is not responsible for plant operation in any system, the lift stations in the NORCRESS and Overhills systems are the County’s responsibility, therefore this metric was used, albeit in a smaller percentage, to account for the management of those resources.

---

<sup>1</sup> Analysis conducted using excerpts from US EPA document, “National Characteristics of Drinking Water Systems Serving 10,000 or Fewer People,” published July 2011.



Table 8 shows Further utilizing the EPA statistics as base for typical FTE for each of the positions, based on the system size in terms of miles of pipe main.

**Table 8: Average Community System Statistics**

Employee Category	System Size (miles of Main)		Mean	Cumberland County
	Pop. 500-3300	Pop. 3300-10000		
	21	62	41.5	51.7
<b>Manager FTE</b>	0.6	1.1	0.85	1.06
per mile	0.029	0.018	0.020	0.020
<b>Plant Operator FTE</b>	0.6	1.3	0.95	1.03
per mile	0.029	0.021	0.023	0.023
<b>Distribution FTE</b>	0.8	2.5	1.65	2.06
per mile	0.038	0.040	0.040	0.040
<b>Administrative FTE</b>	0.6	1.5	1.05	1.31
per mile	0.029	0.024	0.025	0.025

The green highlighted cells are the calculated FTEs that were applied to estimate staffing size based on the quantity of pipe across the County’s four utility systems. Those calculated FTEs are based on the size of systems managed by the County and reasonable estimate of staffing needed for these systems.

Each of the FTEs is applied to each respective employee category. McGill utilized wage information from Zip Recruiter and a benefits multiplier of 1.38 from the U.S. Bureau of Labor Statistics to develop the summary shown in Table 9.

**Table 9: Overall Salary Estimates**

Employee Category	Hourly Rate	Annual Salary	Ben. Mult.	Total	Applied FTE	Applied Budget Cost
Manager	\$38.50	\$80,080.00	1.38	\$110,510.40	1.06	\$117,000
Operator	\$24.52	\$51,001.60	1.38	\$70,382.21	1.03	\$72,700
Distribution	\$23.57	\$49,025.60	1.38	\$67,655.33	2.06	\$139,100
Administrative	\$21.33	\$44,366.40	1.38	\$61,225.63	1.31	\$80,100
<b>Total Applied Budget Cost Based FTEs</b>						<b>\$408,900</b>

Utilizing industry metrics and comparing to systems of comparable size, McGill offers the proceeding section as a general staffing recommendation. This section and these budget values are provided for preliminary planning purposes only.

Staffing levels appear to be reasonable based on the District's ability to operate and maintain the system while providing a reliable level service to its customers.

While this budget number is higher than the current budget staffing, consideration should also be given to the cumulative effect cost to the County for contracted operation and distribution support in the NORCRESS and Kelly Hills district.

# **APPENDICES**



## **Appendix A**

**Excerpt from West Bladen County Water System SWAP**



**Source Water Assessment Program Report for  
BLADEN CO WTR DIST-WEST BLADEN**  
*Community Water System*

**Introduction: What is a Source Water Assessment?**

The North Carolina Division of Water Resources, Public Water Supply (PWS) Section is responsible for implementing the Source Water Assessment Program (SWAP) and completing assessments for all public drinking water supplies in the state. The 1996 amendments to the Safe Drinking Water Act provided federal support and required states to conduct assessments of all public water systems. A source water assessment is a qualitative evaluation of the potential of a drinking water source to become contaminated by the identified potential contaminant sources (PCS) within the delineated area. In North Carolina there are approximately 8,000 public water supply sources that were assessed by the state. The PWS Section has gathered information for each water supply and developed a process for completing the assessments. This process is summarized in the next few pages and detailed in Section 6 of this report.

This report provides a summary of the results for the **Source Water Assessment** for your drinking water source(s).

**What is the Source of Your Drinking Water?**

Everyone wants clean, safe drinking water and we assume this natural resource will always be available to us. However, drinking water sources can be threatened by many potential contaminant sources, including underground storage tanks for gasoline, permitted wastewater discharges and other waste disposal sites, improper handling of hazardous materials, urban storm water runoff, or other types of non-point source contamination such as runoff produced by agricultural activities and land clearing for development. Your drinking water source(s) is listed in Table 1. Protecting your drinking water from becoming contaminated is a wise investment in public health and your community's future.

**Table 1. Public Water Supply System Information**

System Name	BLADEN CO WTR DIST-WEST BLADEN
City	ELIZABETHTOWN
PWS ID	NC0309055
Source Name	WELL #10 MT HOREB WELL
Source Name	WELL #11
Source Name	WELL #13
Source Name	WELL #4/ABBOTTSBURG
Source Name	WELL #5/WHITE'S XRD
Source Name	WELL #8
Source Name	WELL #9 TOBEMORY

In addition to the sources listed in Table 1 above, this water supply system has interconnections to allow for the purchase of water from the following water system(s) or "Seller" system(s):

**BLADENBORO, TOWN OF  
CLARKTON, TOWN OF  
EAST ARCADIA, TOWN OF  
ELIZABETHTOWN, TOWN OF**



## TAR HEEL WATER CORP

Please refer to the Source Water Assessment Program Report for the "Seller" system(s) to review the assessment results for the purchased water supply sources that provide drinking water for this water system.

### Assessment Report Contents

This assessment report includes the following sections:

- Section 1: Assessment Area Delineation
- Section 2: Potential Contaminant Source Inventory and Map
- Section 3: What is a Susceptibility Rating?
- Section 4: Reviewing Your SWAP Results
- Section 5: Maps, Tables and Figures for your Drinking Water Source(s)
- Section 6: North Carolina's SWAP Approach

### Section 1: Assessment Area Delineation

The area delineated for your well(s) for the purpose of this assessment is the contributing area for the well(s). When a well is pumped, it begins to influence groundwater that is flowing through the subsurface and towards the well. The pumping of the well creates a contributing area around the well that supplies water to the well. This is the area through which contaminants, if released to the environment, can be reasonably expected to move through the ground and reach the well.

### Section 2: Potential Contaminant Source Inventory and Map

The potential contaminant source inventory map shows the delineated area for your drinking water source(s). This is the area where potential contaminant sources, if released to the environment, could reasonably be expected to be a risk or a potential for contamination of your drinking water supply. A PCS in this assessment report is a facility or site regulated under a state or federal regulatory program. These facilities are identified in electronic databases that contain location information for each facility. Only databases that include statewide information were used for this source water assessment. Included in this report are:

- 1) A table of any PCS identified within the delineated assessment area; and
- 2) A map of the delineated assessment area showing PCSs, roads, jurisdictional boundaries and other pertinent information.

It is important to note that the PCSs identified in this report are only potential sources of contamination to your drinking water source. Environmental contamination is not likely to occur if harmful contaminants are managed properly.

### Section 3: What is a Susceptibility Rating?

In North Carolina the susceptibility of any drinking water source is based on two components, a contaminant rating and an inherent vulnerability rating. Your drinking water source(s) was assigned a qualitative susceptibility rating of higher, moderate or lower based on the results of the contaminant rating and inherent vulnerability rating process as described in the following paragraphs.

## Susceptibility Rating

The final susceptibility rating for your drinking water source(s) is determined by combining the contaminant rating and the inherent vulnerability rating. More detailed information on the susceptibility rating process can be found in Section 6 of this report.

### **Contaminant Rating**

The contaminant rating for your drinking water source(s) was determined based on the number and location of PCSs within the delineated area. Each PCS identified within the delineated area was assigned a risk rating of higher, moderate or lower. The number of PCSs that occur within the delineated area was determined and a contaminant rating of higher, moderate, or lower was assigned to your drinking water source(s).

### **Inherent Vulnerability Rating**

The inherent vulnerability rating of your well(s) refers to the geologic characteristics or existing conditions of the well and its delineated assessment area. These characteristics include aquifer rating, unsaturated zone rating and well integrity/well construction rating. The aquifer rating is an assessment of the water transmitting characteristics of the aquifer. The unsaturated zone rating is an assessment of the likelihood that contaminants from surface and shallow sources will follow the path of aquifer recharge and reach the water table. The well integrity/construction rating is an assessment of the quality of the construction of the well. An inherent vulnerability rating of higher, moderate or lower was assigned to your well(s).

**Table 2. SWAP Results Summary**

<b>Source Name</b>	<b>Inherent Vulnerability Rating</b>	<b>Contaminant Rating</b>	<b>Susceptibility Rating</b>
WELL #10 MT HOREB WELL	Lower	Lower	Lower
WELL #11	Lower	Lower	Lower
WELL #13	Lower	Lower	Lower
WELL #4/ABBOTTSBURG	Lower	Lower	Lower
WELL #5/WHITE'S XRD	Moderate	Lower	Moderate
WELL #8	Lower	Lower	Lower
WELL #9 TOBEMORY	Moderate	Lower	Moderate

It is important to understand that a susceptibility rating of higher does not imply poor water quality. Susceptibility is an indication of a water supply's potential to become contaminated by the identified PCSs within the assessment area.

**Table 3. Well Information**

<b>Source Name</b>	<b>Well Yield (Gallons/Min)</b>	<b>Well Depth (Feet)</b>
WELL #10 MT HOREB WELL	300	293
WELL #11	320	283
WELL #13	250	205
WELL #4/ABBOTTSBURG	500	127
WELL #5/WHITE'S XRD	390	144
WELL #8	300	188
WELL #9 TOBEMORY	300	98

#### **Section 4: Reviewing Your SWAP Results**

Please review the information on your drinking water source(s) provided in this report. If you believe any of this information is incorrect please contact the Public Water Supply Section by e-mail at the following address: **SWAP@ncdenr.gov** or you may submit comments to us at:

SWAP  
Public Water Supply Section  
1634 Mail Service Center  
Raleigh, NC 27699-1634

Or you may contact the Source Water Assessment staff by phone at 919-707-9098.

#### **Section 5: Maps, Tables and Figures for Your Drinking Water Source(s)**

Maps, tables and figures specific to your drinking water source(s) are included in this report in the following pages and are listed below.

Map 1. Location Map

Map 2. Delineated Area and PCS Map

Table 4. Potential Contaminant Source Attributes

Table 5. Inherent Vulnerability Rating

Table 6. Unsaturated Zone Rating Calculation or Watershed Characteristics Rating Calculation

Figure 1. Land Use / Land Cover Categories

Figure 2. Unsaturated Zone Rating or Watershed Characteristics Rating

Figure 3. Vertical Hydraulic Conductance Rating or Average Annual Precipitation Rating

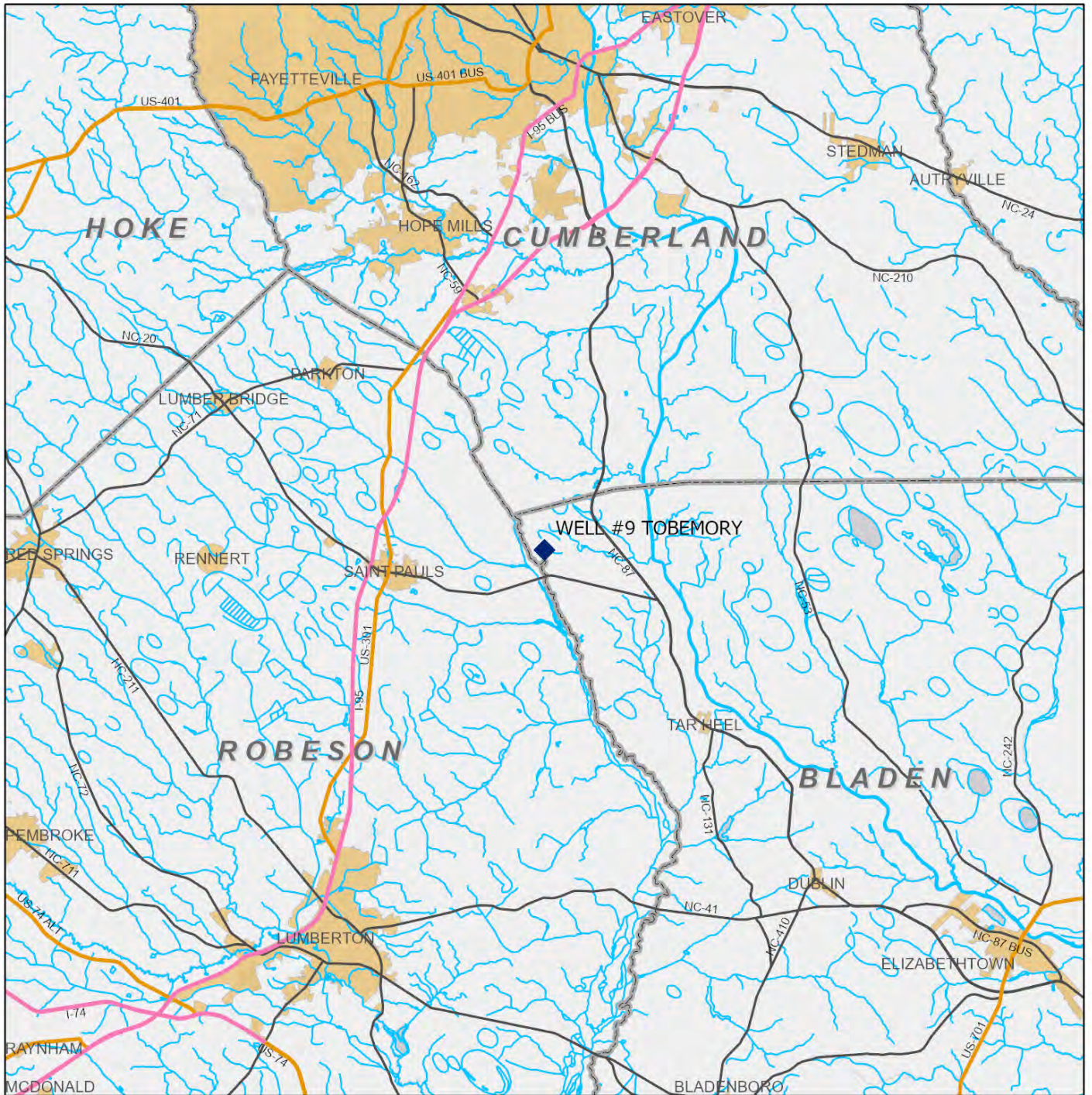
Figure 4. Land Surface Slope Rating

Figure 5. Land Use Rating

Figure 6. Land Cover Rating

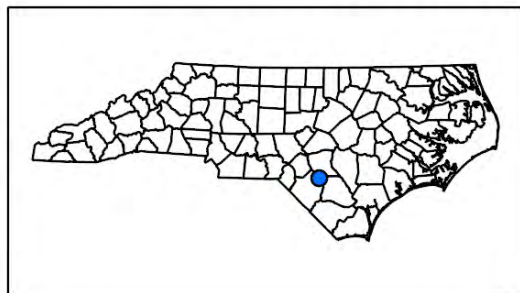
Figure 7. Ground Water Contribution Rating (only applicable to surface water sources)



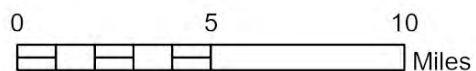


MAP 1. LOCATION MAP

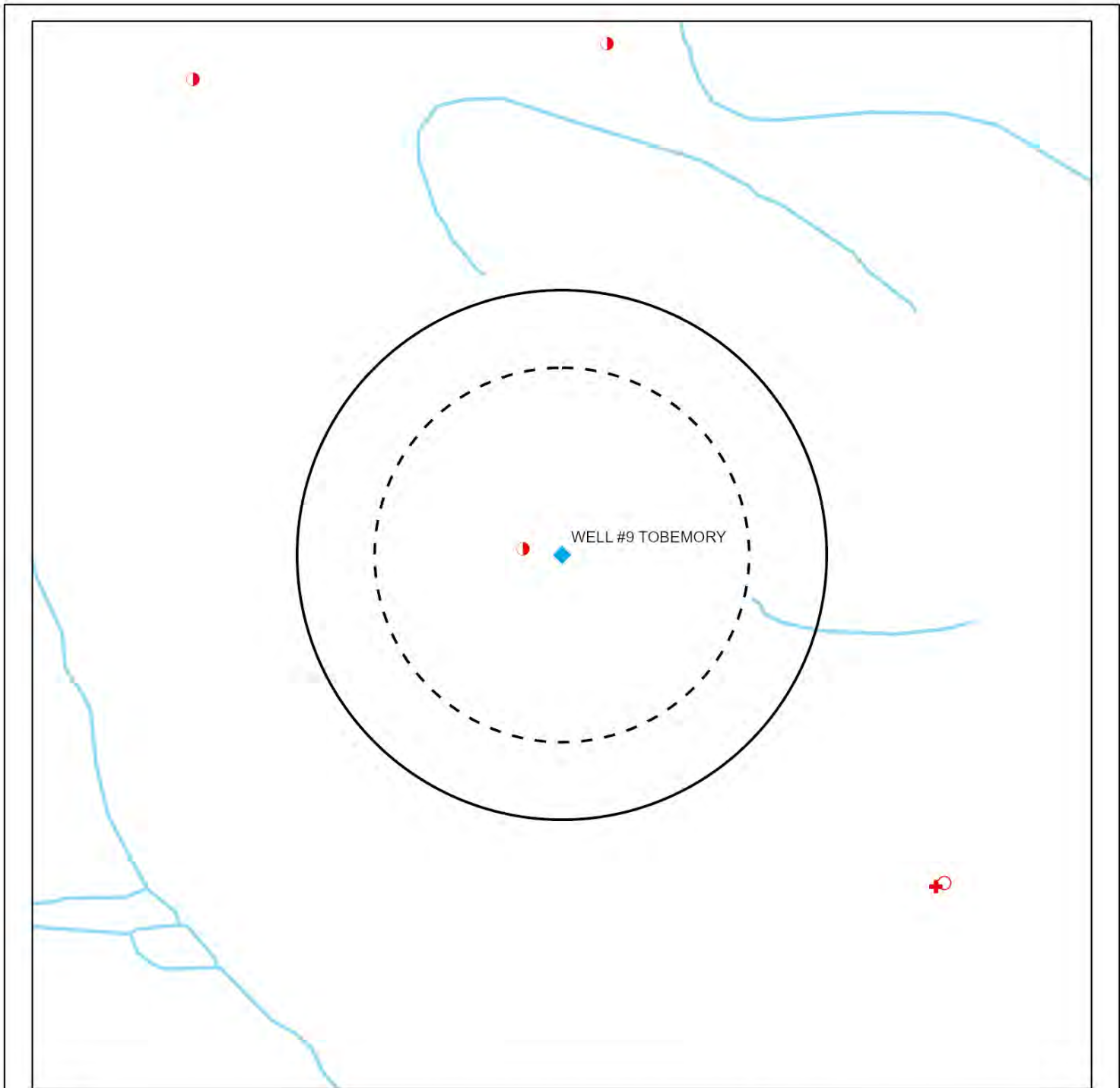
BLADEN CO WTR DIST-WEST BLADEN, PWS ID: 0309055, WELL #9 TOBEMORY



- |             |                      |
|-------------|----------------------|
| Major Roads | Major Hydrology      |
| Interstate  | Municipal Boundaries |
| US Route    | County Boundaries    |
| NC Route    | Rivers and Streams   |







### MAP 2. DELINEATED AREA AND PCS MAP

BLADEN CO WTR DIST-WEST BLADEN, PWS ID: 0309055, WELL #9 TOBEMORY



**PCS Types**

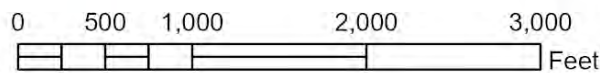
- ▣ Animal Operations
- △ CERCLA-Fed. Remediation
- Hazardous Waste Sites
- ⊕ Inactive Hazardous Waste Sites
- Non Discharge Permits
- ▲ NPDES Permits
- ⊕ PCB Sites
- Pollution Incidents

- ◇ Septage Disposal Sites
- Soil Remediation Sites
- \* Solid Waste Facilities
- \* Tier II Sites
- ⊕ Old Landfill Sites
- ☆ UIC Permits
- ⊕ UST Permits

**Major Roads**

- Interstate
- US Route
- NC Route
- Rivers and Streams
- Major Hydrology
- Municipal Boundaries

- ▭ Ground Water Assessment Area - Delineated Area
- ⋯ Ground Water Assessment Area - Zone A



**Table 4. Potential Contaminant Source Attributes  
BLADEN CO WTR DIST-WEST BLADEN  
PWS ID: NC0309055, WELL #9 TOBEMORY**

PCS Name	PCS ID	PCS Type	PCS Risk Rating	Street Address	City	Zip	County
Tobermory Well	WQ0033325	Non-Discharge Permits	Moderate				Bladen

**Table 5. Inherent Vulnerability Rating  
BLADEN CO WTR DIST-WEST BLADEN  
PWS ID: NC0309055, WELL #9 TOBEMORY**

Ground Water Source Characteristics	Vulnerability
Aquifer Rating	Moderate
Unsaturated Zone Rating	Moderate
Well Integrity/Construction Rating	Higher

**Inherent Vulnerability Rating: Moderate**

**Table 6. Unsaturated Zone Rating Calculation  
BLADEN CO WTR DIST-WEST BLADEN  
PWS ID: NC0309055, WELL #9 TOBEMORY**

<b>Unsaturated Zone Score</b>	<b>59.7</b>
-------------------------------	-------------

**Notes:**

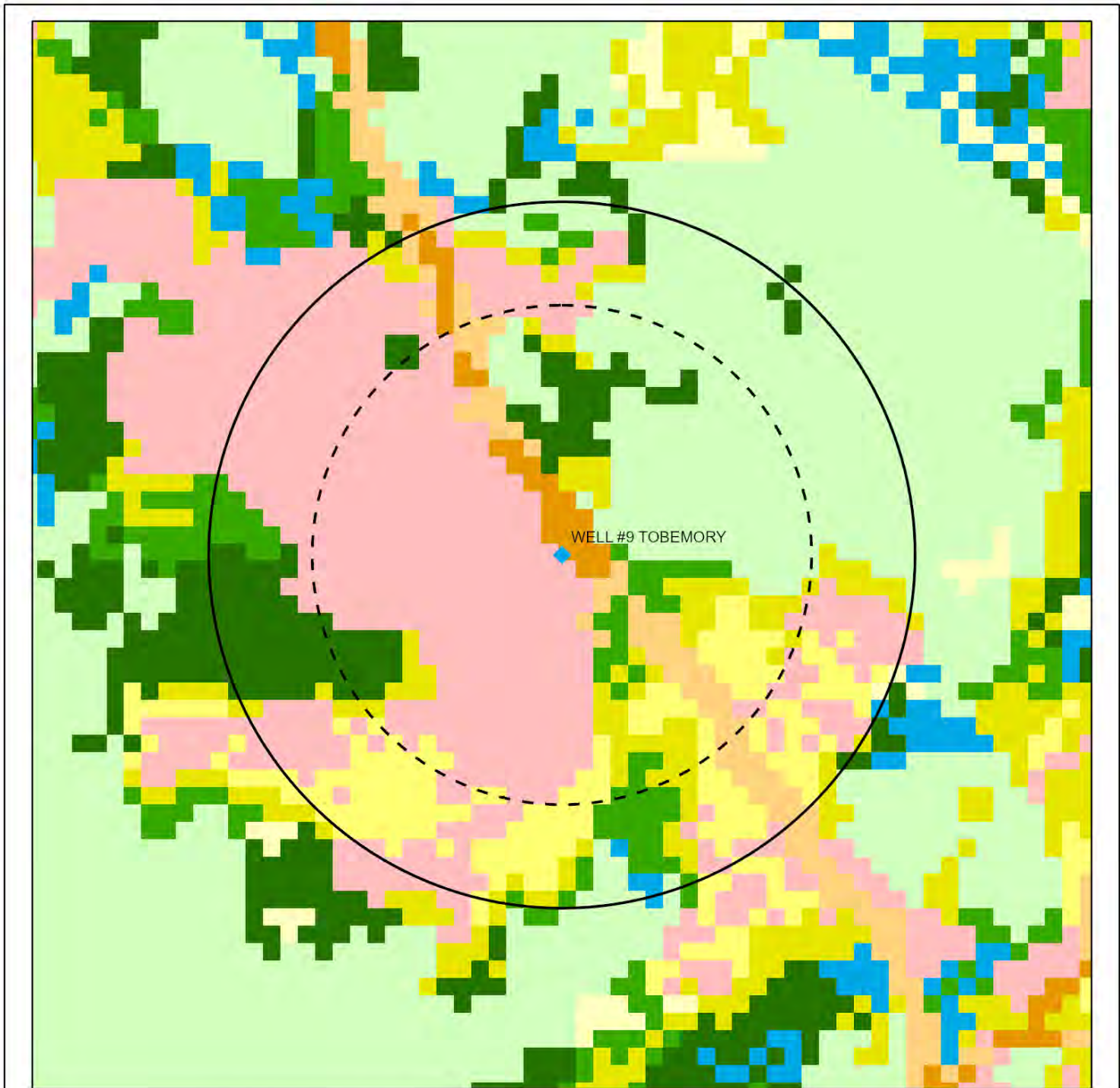
1. Unsaturated Zone Score for each cell (CS):

$$CS = [3 \times (\text{vertical hydraulic conductance score})] + [2 \times (\text{land surface slope score})] + [3 \times (\text{land use score})] + [2 \times (\text{land cover score})]$$

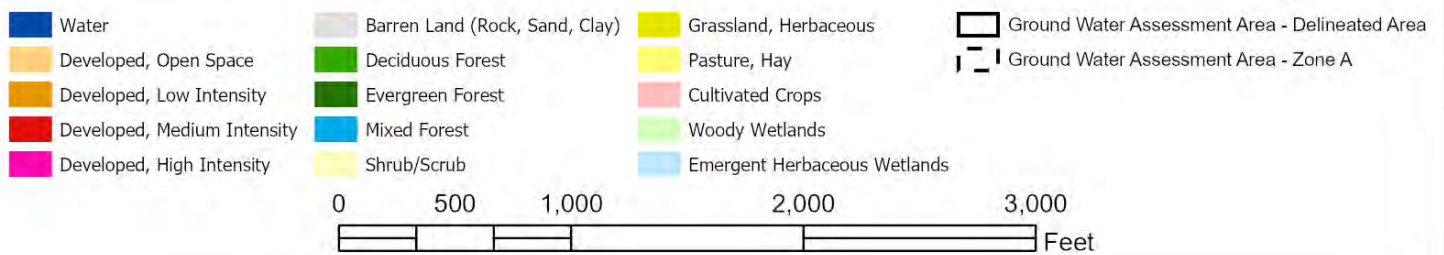
2. Unsaturated Zone Score (S) for the entire assessment area is the mean of the cell scores (CS) calculated as:

The sum of all cell unsaturated zone scores (CS) divided by the number of cells (N) within the assessment area:  $S = (\sum CS) / N$

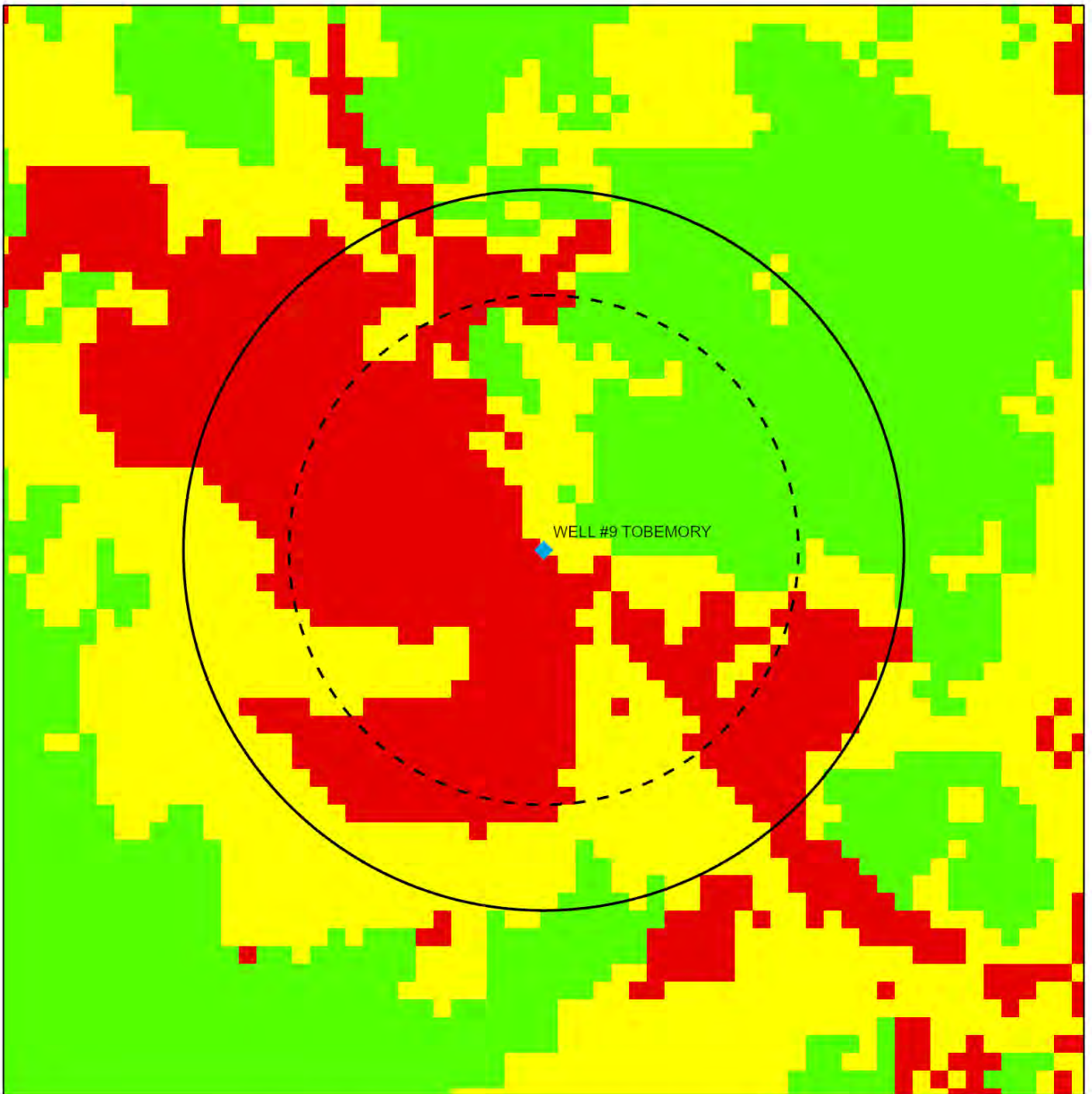
3. The USGS publication "Methods of ranking unsaturated zone and watershed characteristics of public water supplies in North Carolina", by J. L. Eimers, J. C. Weaver, S. Terziotti, and R. W. Midgette, 1999, provides a detailed discussion of the methods used to determine unsaturated zone ratings.



**FIGURE 1. LAND USE/LAND COVER CATEGORIES**  
 BLADEN CO WTR DIST-WEST BLADEN, PWS ID: 0309055, WELL #9 TOBEMORY



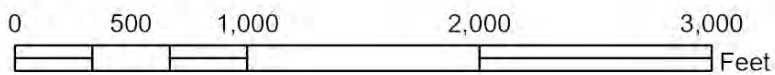




**FIGURE 2. UNSATURATED ZONE RATING**  
 BLADEN CO WTR DIST-WEST BLADEN, PWS ID: 0309055, WELL #9 TOBEMORY



- Lower  $\leq 50$
- Moderate  $> 50$  to  $65$
- Higher  $> 65$
- Ground Water Assessment Area - Delineated Area
- Ground Water Assessment Area - Zone A



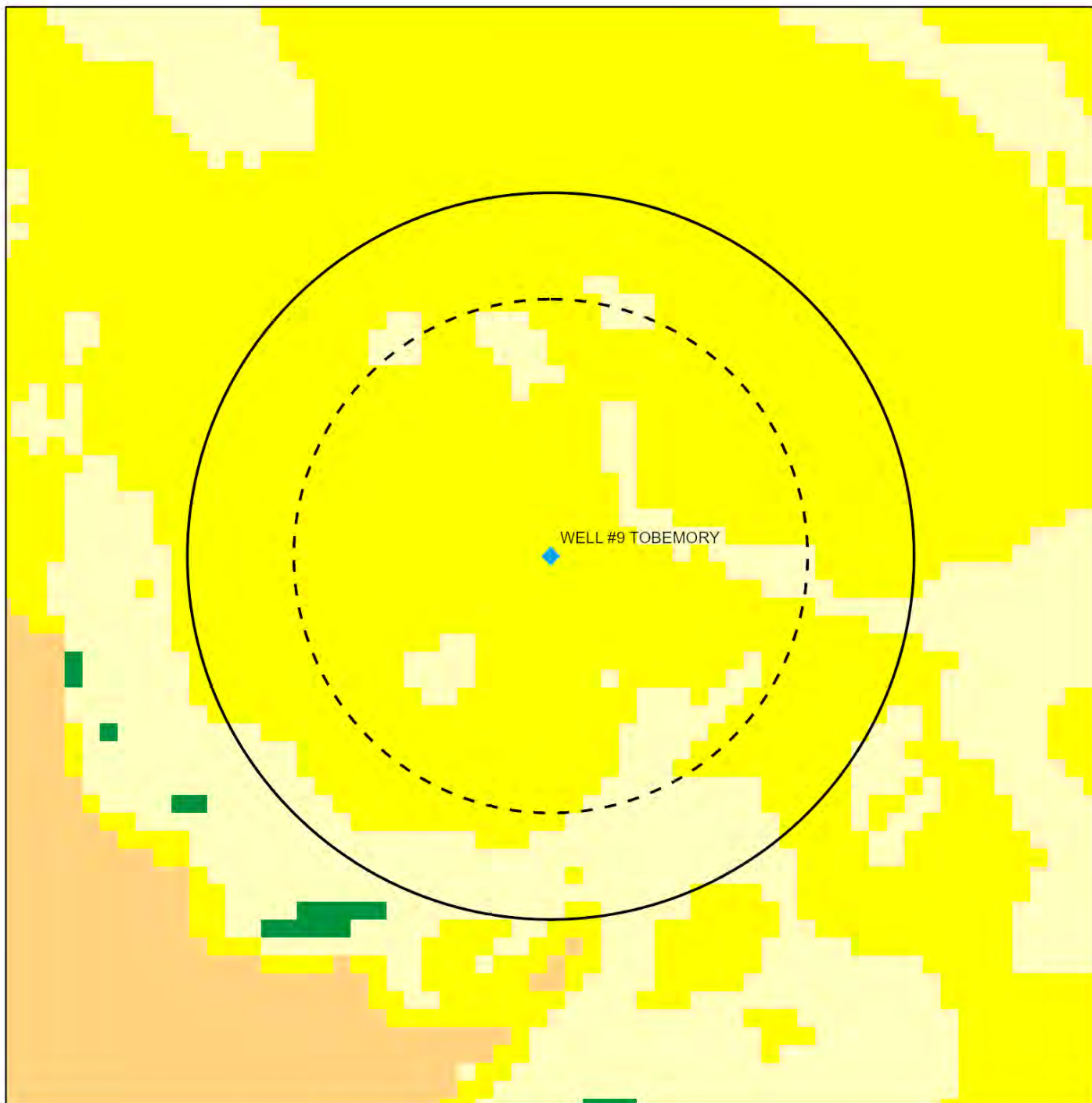
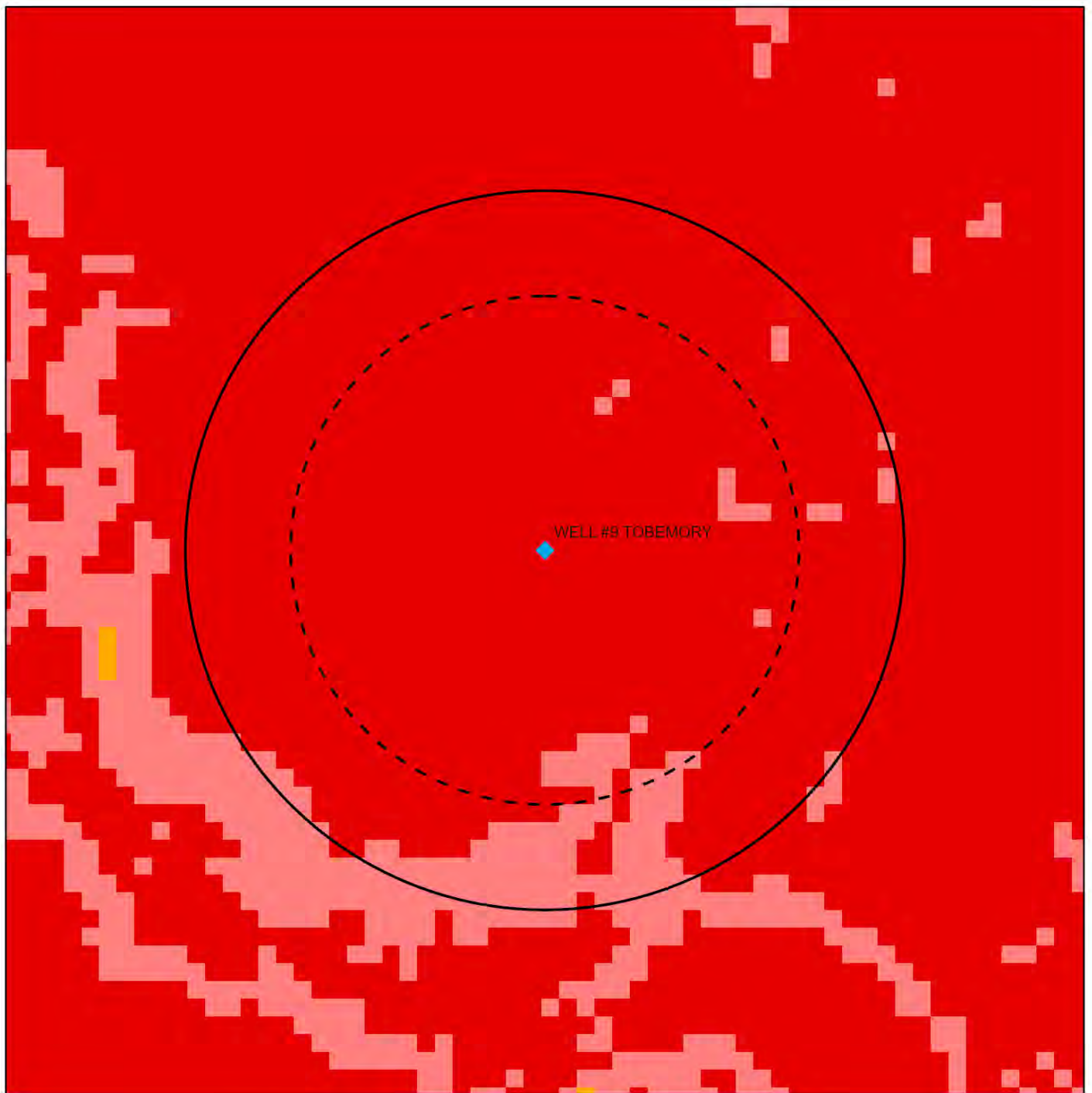


FIGURE 3. VERTICAL HYDRAULIC CONDUCTANCE RATING  
 BLADEN CO WTR DIST-WEST BLADEN, PWS ID: 0309055, WELL #9 TOBEMORY





**FIGURE 4. LAND SURFACE SLOPE RATING**  
 BLADEN CO WTR DIST-WEST BLADEN, PWS ID: 0309055, WELL #9 TOBEMORY



- |                        |                       |  |
|------------------------|-----------------------|--|
| 1 (> 50 percent)       | 7 (> 5 to 10 percent) | Ground Water Assessment Area - Delineated Area |
| 3 (> 20 to 50 percent) | 9 (> 2 to 5 percent)  | Ground Water Assessment Area - Zone A          |
| 5 (> 10 to 20 percent) | 10 (<= 2 percent)     |  |





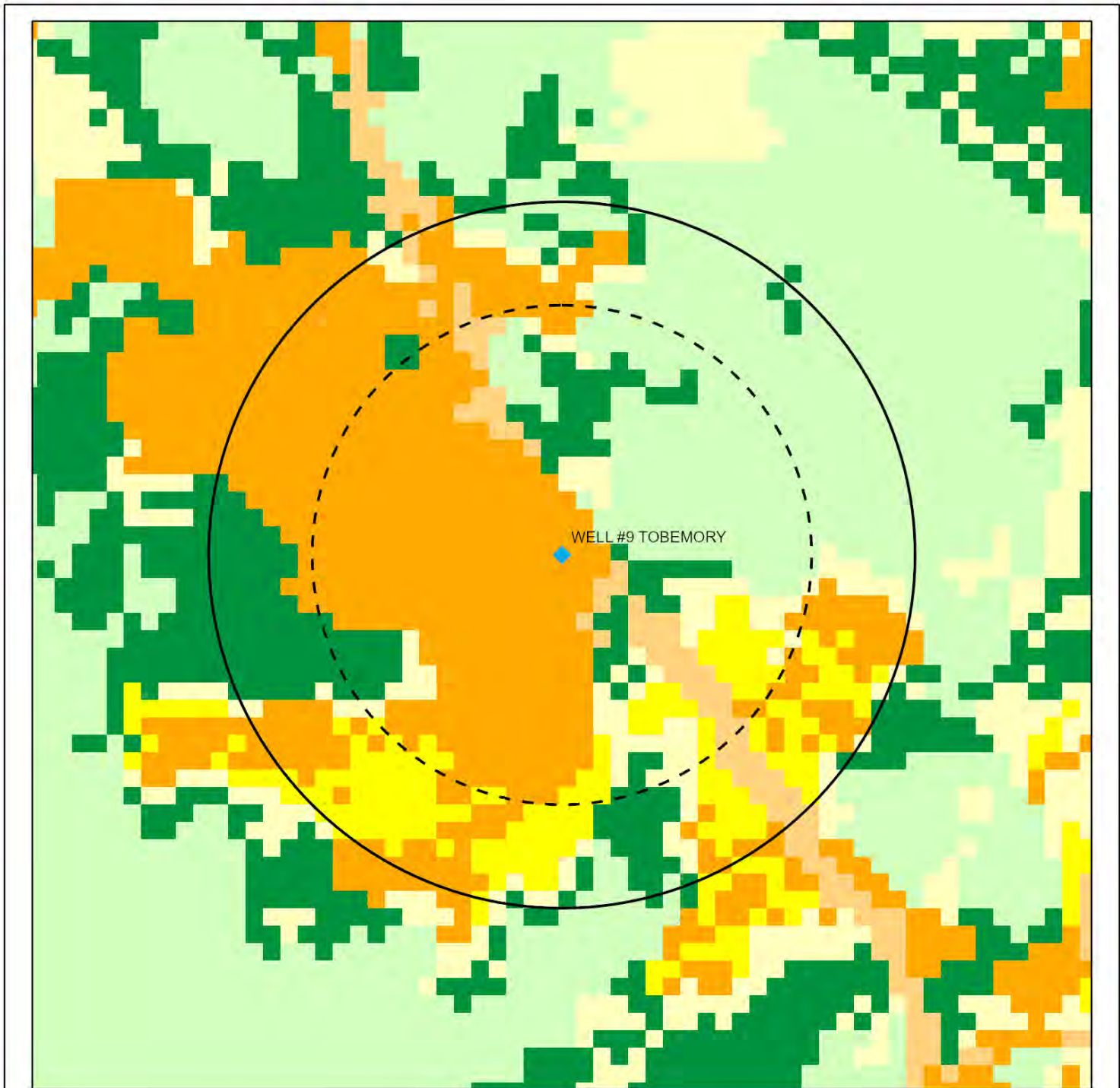


FIGURE 5. LAND USE RATING

BLADEN CO WTR DIST-WEST BLADEN, PWS ID: 0309055, WELL #9 TOBEMORY



- |   |   |   |
|---|---|---|
| <span style="color: #90EE90;">■</span> 1 Water, Wetlands (Woody and Herbaceous) | <span style="color: #FFFF00;">■</span> 5 Pasture/Hay                                | <span style="color: #FF0000;">■</span> 10 Developed, High Intensity   |
| <span style="color: #66CDAA;">■</span> 2 Barren Land (Rock/Sand/Clay)           | <span style="color: #FFDAB9;">■</span> 6 Developed, Open Space                      | <span style="border: 1px solid black; display: inline-block; width: 10px; height: 10px;"></span> Ground Water Assessment Area - Delineated Area |
| <span style="color: #008000;">■</span> 3 Forest (Deciduous, Evergreen, Mixed)   | <span style="color: #FF8C00;">■</span> 7 Developed, Low Intensity; Cultivated Crops | <span style="border: 1px dashed black; display: inline-block; width: 10px; height: 10px;"></span> Ground Water Assessment Area - Zone A         |
| <span style="color: #FFFF00;">■</span> 4 Grassland/Herbaceous; Shrub/Scrub      | <span style="color: #FFB6C1;">■</span> 8 Developed, Medium Intensity                |   |



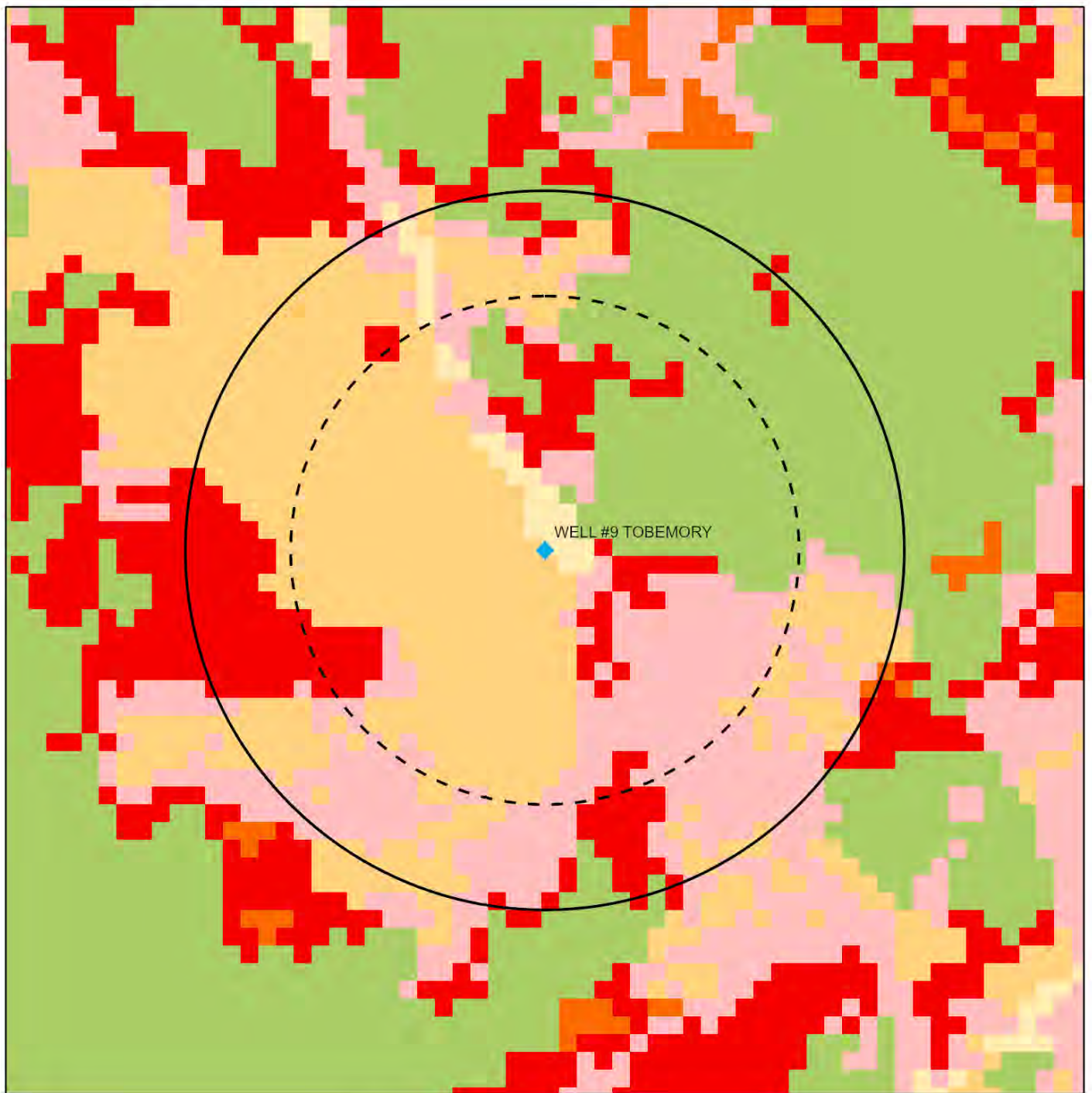


FIGURE 6. LAND COVER RATING

BLADEN CO WTR DIST-WEST BLADEN, PWS ID: 0309055, WELL #9 TOBEMORY



- |   |   |
|---|---|
| <span style="color: #90EE90;">■</span> 1 Developed, High Intensity                                | <span style="color: #FF8C00;">■</span> 9 Shrub/Scrub  |
| <span style="color: #3CB371;">■</span> 2 Water; Wetlands; Developed, Medium Intensity             | <span style="color: #FF0000;">■</span> 10 Deciduous, Evergreen and Mixed Forest   |
| <span style="color: #FFD700;">■</span> 4 Developed, Low Intensity                                 | <span style="border: 1px solid black; display: inline-block; width: 10px; height: 10px;"></span> Ground Water Assessment Area - Delineated Area |
| <span style="color: #FFA500;">■</span> 6 Barren Land (Rock, Sand, Clay); Cultivated Crops         | <span style="border: 1px dashed black; display: inline-block; width: 10px; height: 10px;"></span> Ground Water Assessment Area - Zone A         |
| <span style="color: #FFB6C1;">■</span> 8 Grassland/Herbaceous; Pasture/Hay; Developed, Open Space |   |





## **Appendix B**

### **2013 O&M Plan for Cumberland County Water System**





**OPERATION AND MAINTENANCE PLAN  
CUMBERLAND COUNTY WATER SYSTEM/  
WEST BLADEN PURCHASE SYSTEM**

**PWS I.D. NO.: 50-26-026**

**County Of Cumberland North Carolina  
130 Gillespie Street, Room 215  
Fayetteville, NC 28301**

**Cumberland County**

**Phone: 910-678-7637**

**Email: [ahall@co.cumberland.nc.us](mailto:ahall@co.cumberland.nc.us)**

**PREPARED BY:  
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LUMBERTON, NORTH CAROLINA**

**MARCH, 2013**

**F-0103**



## CUMBERLAND COUNTY WATER SYSTEM

### Operation and Maintenance

Some problems associated with water supply systems can be alleviated if not corrected by observing proper procedures for operating and maintaining the system. Proper maintenance practices should be adhered to according to a pre-established schedule (Walski 1987b, AWWA 1987).

#### A. Frost Prevention

Severe winter conditions may warrant actions to prevent water from freezing and bursting pipes or other structures. The easiest short-term action is to keep water moving in problem pipes either by requesting that consumers run water or by bleeding water from pipes at crucial points in the system. Dead-end sections are most susceptible to freezing. Storage tanks, pump stations and meter vaults are susceptible to freezing and, therefore, are possible candidates for supplemental heating.

#### B. Leak Detection and Repair

Unless specific measures are taken to detect and repair leaks, a considerable amount of water can be lost through poor joints or cracked pipes. Leak detection techniques can uncover previously undetected leaks or pinpoint suspected ones. Most leak detection surveys use sonic equipment that allows operators to listen for the source of the leak. Experienced operators can accurately locate the leak and, in some instances, estimate the leakage rate. Leak detection surveys are often conducted by private firms that contract with the water utility, which often follows up on the survey and repairs the leaks. The cost of leak detection and repair usually is less than the value of water that would have been lost through unrepaired leaks over some reasonably short period of time (Moyer et al. 1983, Moyer 1985). Leak detection surveys can be one-time affairs or can be scheduled periodically. The value of leak detection is not realized unless the identified leaks are repaired. It is possible that extremely high leakage in one pipe segment might warrant replacement of the entire pipe segment instead of repair. Leak detection and repair will also help determine which geographic areas and types of pipe are more likely to leak. The degree to which this approach will alleviate water loss depends on the condition of the system. Leak repair might also contribute to a longer-lasting system. First, leaking water tends to erode soil surrounding and supporting a pipe. Continued leaking, therefore, might lead to a more costly break. Second, the increased soil moisture resulting from the leak can promote corrosion if stray direct current is present (because of its higher electric conductivity in wet soil). Repair may not eliminate the cause of leaks and future leakage may result. Poor joint material and corrosion (caused by direct current, bimetallic connections, poor soil, or corrosive water in unlined pipe) are possible causes

that need to be addressed to prevent recurrence of the leaks. Some leaks do not require repair but merely tightening or replacing fittings (Male, Noss and Moore 1985; Moyer et al. 1983; Brown and Caldwell 1984; Walski 1984b).

C. Meter Calibration

Master meters (connection to Bladen County) can over-register, thereby creating the appearance that more water is being used in the system than actually is. Calibration of the meter(s) will not save any water, but will contribute to better accounting practices, which in turn will lead to better operation of the existing system and better design of improvements. Master meter calibration should be a routine part of preventive maintenance. Consumer meters should also be tested and calibrated on a periodic basis. Consumer meters often tend to under-register as they age. This under-registration results in lost revenue (in cases where consumers are being billed) and an elevated assessment of unaccounted-for water. Meters can be checked on a periodic basis, and, in addition, failed meters can be identified by surveillance of billing records (Male, Noss and Moore 1985; AWWA 1986d).

D. Flushing

In some systems with turbidity problems, periodic flushing of the system will improve water quality by removing any settled material. This sediment can occasionally be resuspended and cause dirty water. Flushing assures that when the material is resuspended, it is removed from the lines. Periodic flushing is particularly useful where velocities are slow, such as in dead ends. Flushing eliminates symptoms but does not eliminate the underlying problem. When flushing in a complex grid, it is helpful to isolate individual lines to maximize velocities and hence the effectiveness of the flushing (California-Nevada AWWA 1981).

E. Valve Exercise

Regular exercising of valves is important for several reasons. First, it helps to ensure that the valves can be found and that they will operate when necessary. Second, valves may have been incorrectly left closed or partially closed, and periodic exercise will allow correct positioning. Third, valve exercise also serves as training, allowing personnel to find valves more quickly in an emergency. Records of valve exercising should be kept to determine the effectiveness of the program (e.g., number of valves found stuck), and to ensure that each valve is exercised within a reasonable time period. Valves do not need to be exercised every week but do need to be exercised every few years.

F. Control of Unauthorized Use

Utility personnel need to be on the alert for apparent theft of water. Meter readers, valve crews and construction inspectors all need to be on the alert for water theft.



## **Appendix C**

### **NC0309055 Well Treatment Process Summary**





<a href="#">County Map of NC</a>	<a href="#">Water System Search</a>	<a href="#">Public Water Supply Section Home Page</a>	
<b><a href="#">Water System Detail Information</a></b>			
Water System No.:	NC0309055	Federal Type:	C
Water System Name:	BLADEN CO WTR DIST-WEST BLADEN	Federal Source:	GW
Principal County Served:	BLADEN	System Status:	A
Principal City Served:	ELIZABETHTOWN	Activity Date:	11-01-1989

<b>Water System Facility</b>			
Facility ID No.	P09	Type:	TP - Treatment Plant
Facility Name	TREATMENT_PLT_WELL #9	Status/Reason	A
Water Type	GW	ACTIVITY_DATE	07-01-2007

<b>Sample Points</b>		
<b>Sample Point ID</b>	<b>Location Description</b>	<b>Type</b>
E09	WELL #9	EP

<b>Water System Facility Contacts</b>		
<b>Type</b>	<b>Contact</b>	<b>Communication</b>

<b>Facility Annual Operating Period(s)</b>			
<b>Effective Begin Date</b>	<b>Effective End Date</b>	<b>Start Month/Day</b>	<b>End Month/Day</b>

<b>Treatment Plant</b>	
<b>Treatment Plant Filter Type</b>	

<b>Treatment Plant Contact Time</b>				
<b>Status</b>	<b>Status Date</b>	<b>Contact Time (Minutes)</b>	<b>Disinfection Concentration (mg/L)</b>	<b>CT Value (mg.min/L)</b>

<b>Treatment Plant Disinfection Profiling Benchmark</b>							
<b>Giardia Status</b>	<b>Giardia Inact. Log</b>	<b>Giardia Inact.</b>	<b>Giardia Status Date</b>	<b>Virus Status</b>	<b>Virus Inact Log</b>	<b>Virus Inact</b>	<b>Virus Status Date</b>

Treatment Plant Analyte Removal					
Code	Analyte Name	Removal Credited	Removal Achieved	Removal/Inact. Required	Inactivation Needed

Treatment Plant BIN Determination		
Status	BIN	Status Date

Treatment Plant Filter Backwash Recycling Rule						
Schem Stat	Schem Rec	Schem Rev	Alt Ret Loc Req Stat	Alt Ret Loc Req Stat Dt	Corr Act Req Stat	Corr Act Req Stat Dt

Treatment Units								
Type	Name	Subtype	Cont. Dis.	Aerator Type	Sludge Rem. Type	Filter Media Type	Basin Count	Subunit Count
<u>GU - Generic Unit</u>	GENERIC UNIT						0	0
<b>Treatment Objective Process Associations</b>								
	<b>Primary</b>	<b>Obj. Code</b>	<b>Objective Name</b>		<b>Proc. Code</b>	<b>Process Name</b>		
		C	CORROSION CONTROL		741	PH ADJUSTMENT, POST		
		C	CORROSION CONTROL		445	INHIBITOR, ORTHOPHOSPHATE		
		D	DISINFECTION		423	HYPOCHLORINATION, PRE		
		D	DISINFECTION		421	HYPOCHLORINATION, POST		
		F	IRON REMOVAL		742	PH ADJUSTMENT, PRE		
		F	IRON REMOVAL		344	FILTRATION, PRESSURE SAND		
		O	ORGANICS REMOVAL		121	ACTIVATED CARBON, GRANULAR		

Treatment Plant Unit Process Flows				
Train ID	Sequence ID	Supply	Receive	Connection Type

WSF Indicators		
Type	Value	Date

## **Appendix D**

### **Hydrant Flow Test Reports**







PROJECT: Cumberland County Public Utilities  
Asset Management Plan

McGill Associates, P.A.  
5 Regional Circle, Suite A  
Pinehurst, North Carolina 28374  
Phone (910-295-3159) / Fax (910-295-3647)

## Hydrant Flow Test Report

Location Southpoint Neighborhood, Cumberland County, NC Date 4/10/2024  
Test made by Demi Watkins, Dean Byrd, Amy Hall Time 3:40 PM

Conditions	Sunny, 85 degrees		
Flow Hydrant		Residual Hydrant	
No.	<u>8634 Brightleaf</u>	No.	<u>8480 Brightleaf</u>
Location	<u>Place</u>	Location	<u>Place</u>
Size nozzle	<u>2 1/2 Steamer</u>	Static	<u>54</u> psi
Inlet type	<u></u>	Residual	<u>1</u> psi
Discharge coefficient	<u></u>	Elev. (Autocad)	<u>161</u>
Pitot Pressure	<u>1</u> psi	Residual Hydrant 2 (if applicable)	
GPM	<u>168</u>	No.	<u></u>
		Location	<u></u>
		Static	<u></u> psi
		Residual	<u></u> psi

Remarks Amy was at the Residual hydrant, Dean and Demi were at the Flow hydrant.

*Disclaimer: Hydrant test results indicated are for the single point in time that the test was conducted, and are subject to variation. A number of factors may affect test results which are specific to conditions during testing. These conditions include water system demand, water tank levels, booster pump station status, valve positions, etc.*



# Cumberland County Water and Sewer Asset Inventory and Assessment





# Asset Inventory & Assessment

## History:

- In 2021, Cumberland County was designated as “distressed” by the Local Government Commission and the State Water Infrastructure Authority.
- County staff began working to address required steps to be removed from distressed list
- In 2023, Cumberland County contracted with McGill to develop Asset Management Plans (AMP) for each of the existing utility districts.
- Cumberland County intended to adopt CIP’s for each of the utility districts in order to perform and adopt a System Development Fee study.
- McGill utilized NCDEQ AIA guidance and industry standards to **inventory** and **assess** the County’s one water distribution system and three wastewater collection systems.



# What is an Asset Management Plan?

It is a **WORKING** plan and includes 4 key components:

- An **Inventory** of system assets:  
WATER: water main, water valves, fire hydrants, interconnections  
SEWER: sewer line, manholes, lift stations
- A summary of **Asset Conditions**
- A **Capital Improvements Plan**
- An **Operations and Maintenance and Staffing Recommendations Plan**





# Summary of NORCRESS System Assets

- Year put into service: 2005
- Active Service Connections : 452 (394 residential, 87%)
- Performed smoke testing, manhole inspections, flow monitoring

## Sewer Mains – 138,200 feet (26.2 mi)

- PVC (97%) and Ductile Iron Pipe

## Sewer Manholes – 424

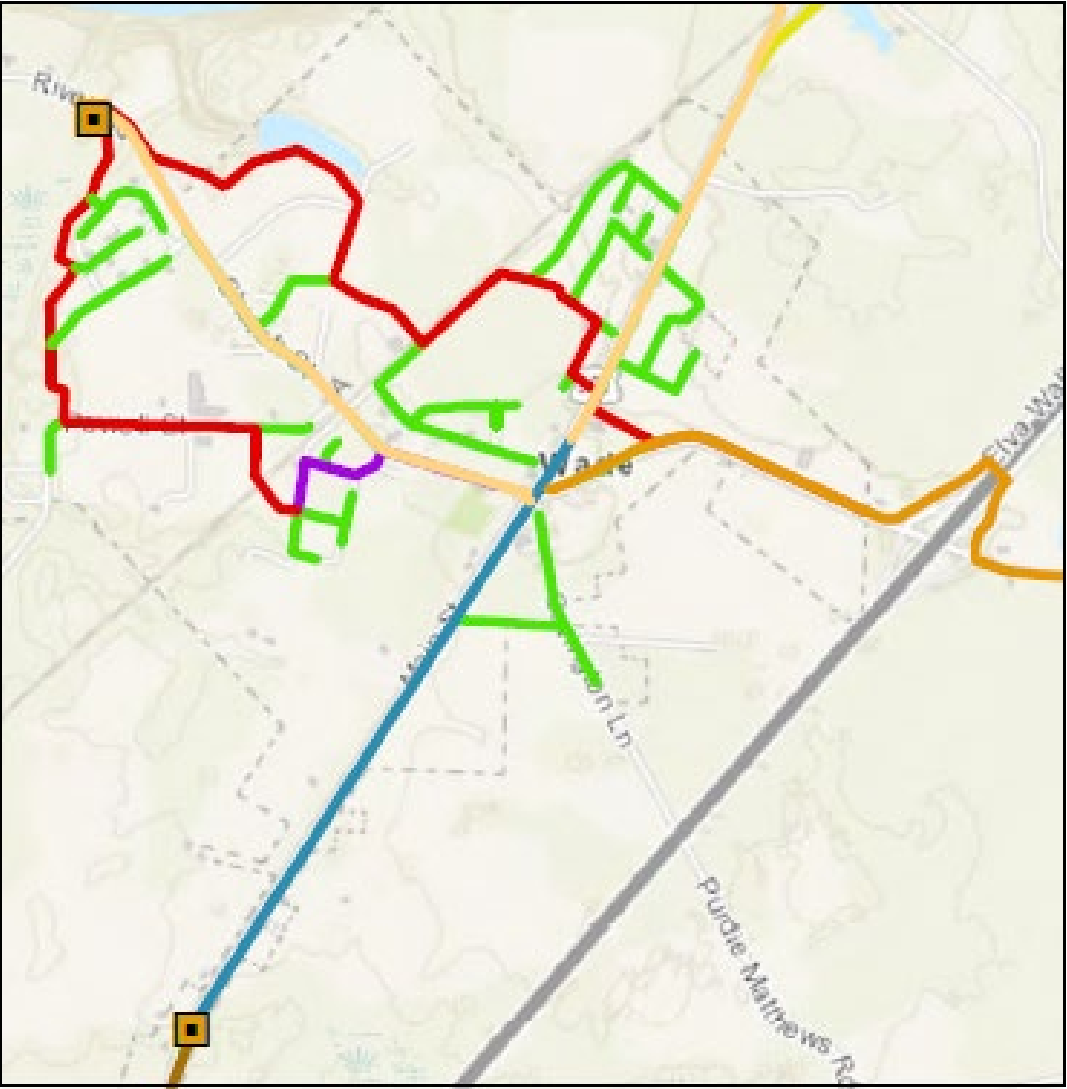
- All Precast Concrete Material
- Beginning to show some corrosion
- Generally good condition

## Lift Stations - 4

- Godwin LS, Falcon LS, Wade #1 LS, Wade #2 LS



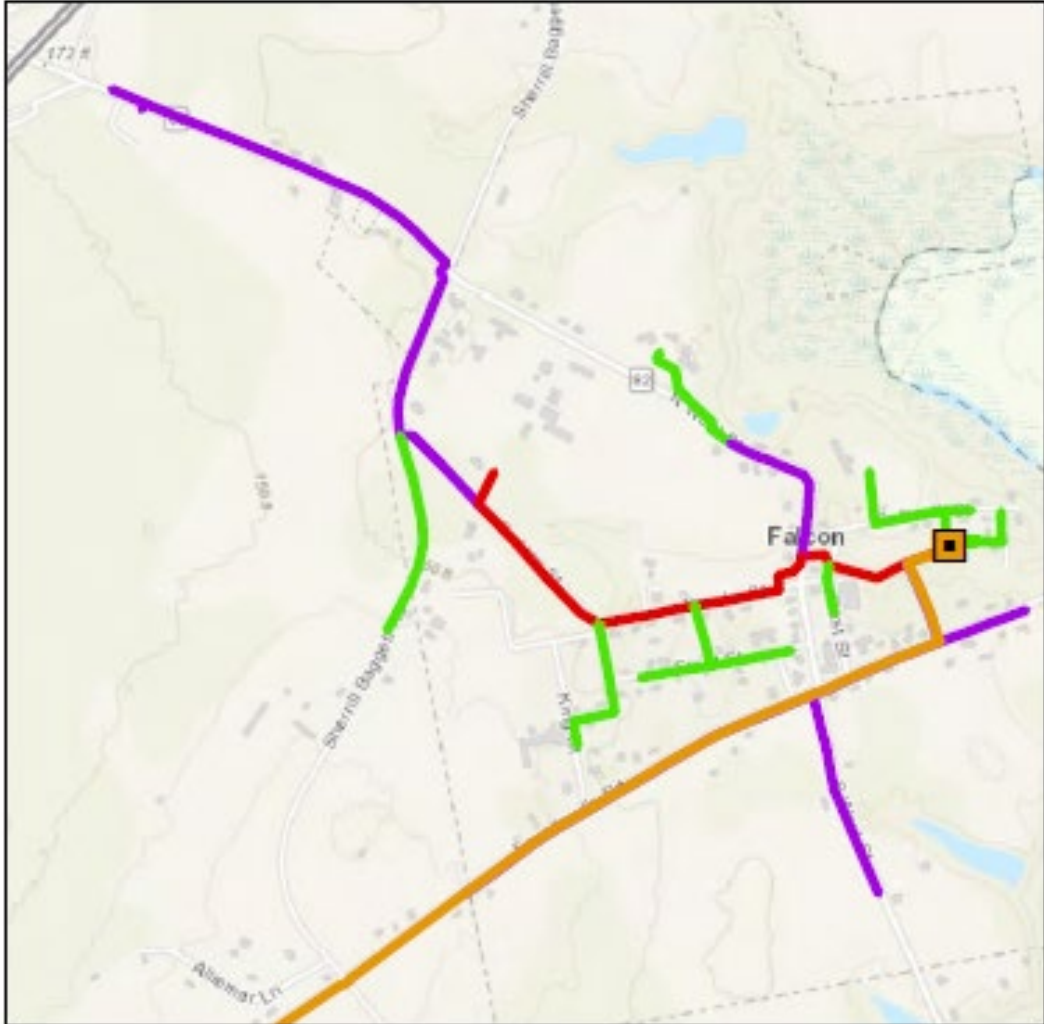
# Wade



# Godwin



# Falcon



**Legend**

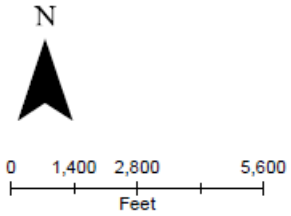
GRAVITY SEWER DIAMETER

- 8" (Green line)
- 10" (Purple line)
- 12" (Red line)
- 15" (Blue line)

FORCE MAIN DIAMETER

- 3" (Yellow line)
- 6" (Orange line)
- 8" (Dark Orange line)
- 10" (Brown line)

☐ Lift Station





# NORCRESS Sewer Capital Improvement Projects

No.	Project Name	Cost
1	New Generators – All Lift Stations	\$640,000.00
2	Upgrade SCADA	\$240,000
3	Flow Meter Project	\$203,900.00
4	Flow Monitoring Study	\$25,440.00
5	Falcon Force Main and ARV Project	\$80,000.00
6	Manhole Rehabilitation Project 1	\$118,600.00
7	Manhole Rehabilitation Project 2	\$118,600.00
8	Manhole Rehabilitation Project 3	\$118,600.00
9	Manhole Rehabilitation Project 4	\$118,600.00
	<b>10-Year CIP Total Project Cost</b>	<b>\$1,714,620.00</b>



# Summary of Kelly Hills System Assets

- Year put into service: 2005
- Active Service Connections: 102 (all residential)
- Performed Smoke testing, manhole inspections

## Sewer Mains – 23,540 feet (4.4 mi)

- PVC (84%) and Ductile Iron Pipe

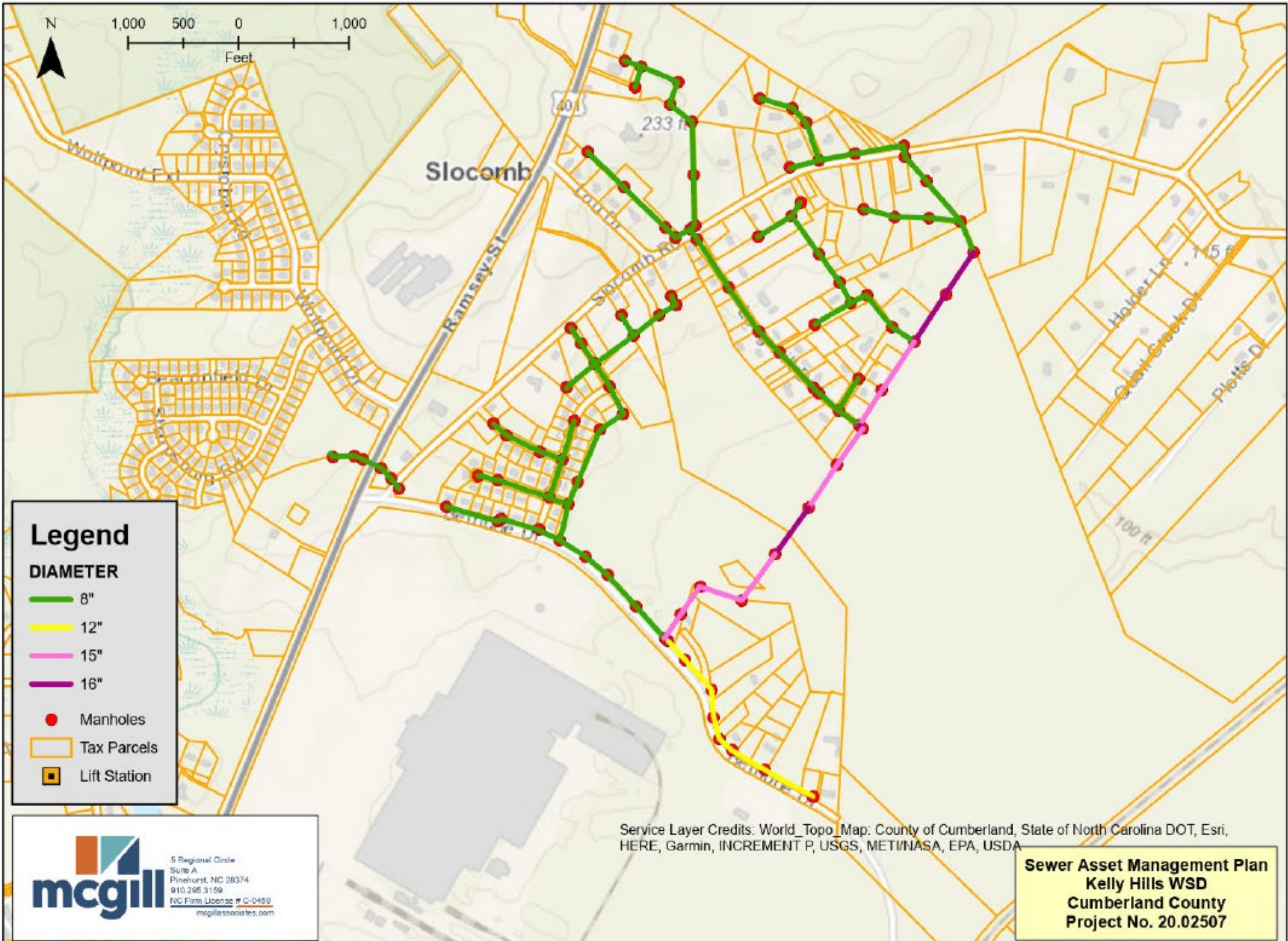
## Sewer Manholes – 100

- All Precast Concrete Material
- Beginning to show some corrosion
- Generally good condition

## Lift Station - 1

- Unobligated Capacity: 53,580 GPD (~230 res. conn.)





**Legend**

**DIAMETER**

- 8"
- 12"
- 15"
- 16"

- Manholes
- Tax Parcels
- Lift Station

5 Regional Circle  
Suite A  
Pinehurst, NC 28374  
910.295.3159  
I/C Firm License # G-0489  
mcgillassociates.com





# Kelly Hills Sewer Capital Improvement Projects

No.	Project Name	Cost
1	Manhole Rehabilitation Project 1	\$81,000.00
2	Flow Monitoring Improvements	\$103,900.00
3	Manhole Rehabilitation Project 2	\$81,000.00
4	Manhole Rehabilitation Project 3	\$81,000.00
5	Manhole Rehabilitation Project 4	\$81,000.00
	<b>10-Year CIP Total Project Cost</b>	<b>\$427,900.00</b>



# Summary of Overhills System Assets

- Year put into service: 2019
- Active Service Connections: 107 (all residential)
- Performed Smoke testing, manhole inspections

## Sewer Mains – 17,420 feet

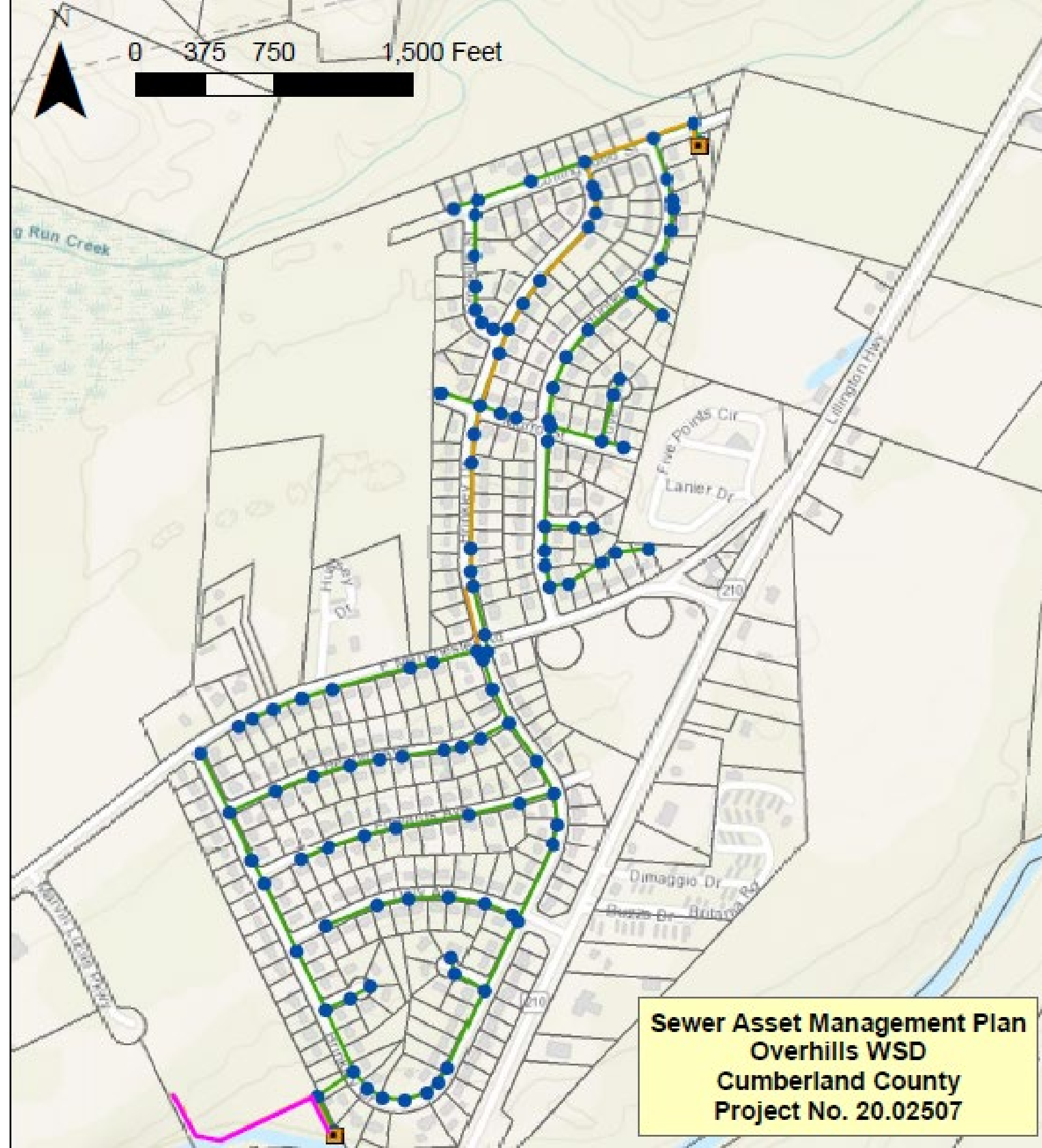
- All 8" PVC Pipe

## Sewer Manholes – 119

- All Precast Concrete Material

## Lift Stations - 2

- Collinswood LS, Brinkley LS
- FY 2025 Daily Flow Per Connection: 84 – 276 GPD



**Legend**

- Lift Station
- 6" PVC Forcemain
- Manhole
- 4" PVC Forcemain
- 8" PVC Gravity Sewer

**Sewer Asset Management Plan  
Overhills WSD  
Cumberland County  
Project No. 20.02507**



# Overhills Sewer Capital Improvement Projects

No.	Project Name	Cost
1	Brinkley Lift Station Improvements	\$33,100.00
2	Manhole Rehabilitation Project 1	\$84,100.00
3	Manhole Rehabilitation Project 2	\$84,100.00
4	Manhole Rehabilitation Project 3	\$84,100.00
	<b>10-Year CIP Total Project Cost</b>	<b>\$285,400.00</b>



# Summary of Southpoint Water Assets

- Year Put into service: 2013
- Active Service Connections: 84 (all residential)
- Flow testing performed, 55 psi average pressure

## Water Main – 16,900 feet

- Diameters: 12-inch, 8-inch, 6-inch, 2-inch

## Valves – 6

- Condition generally good

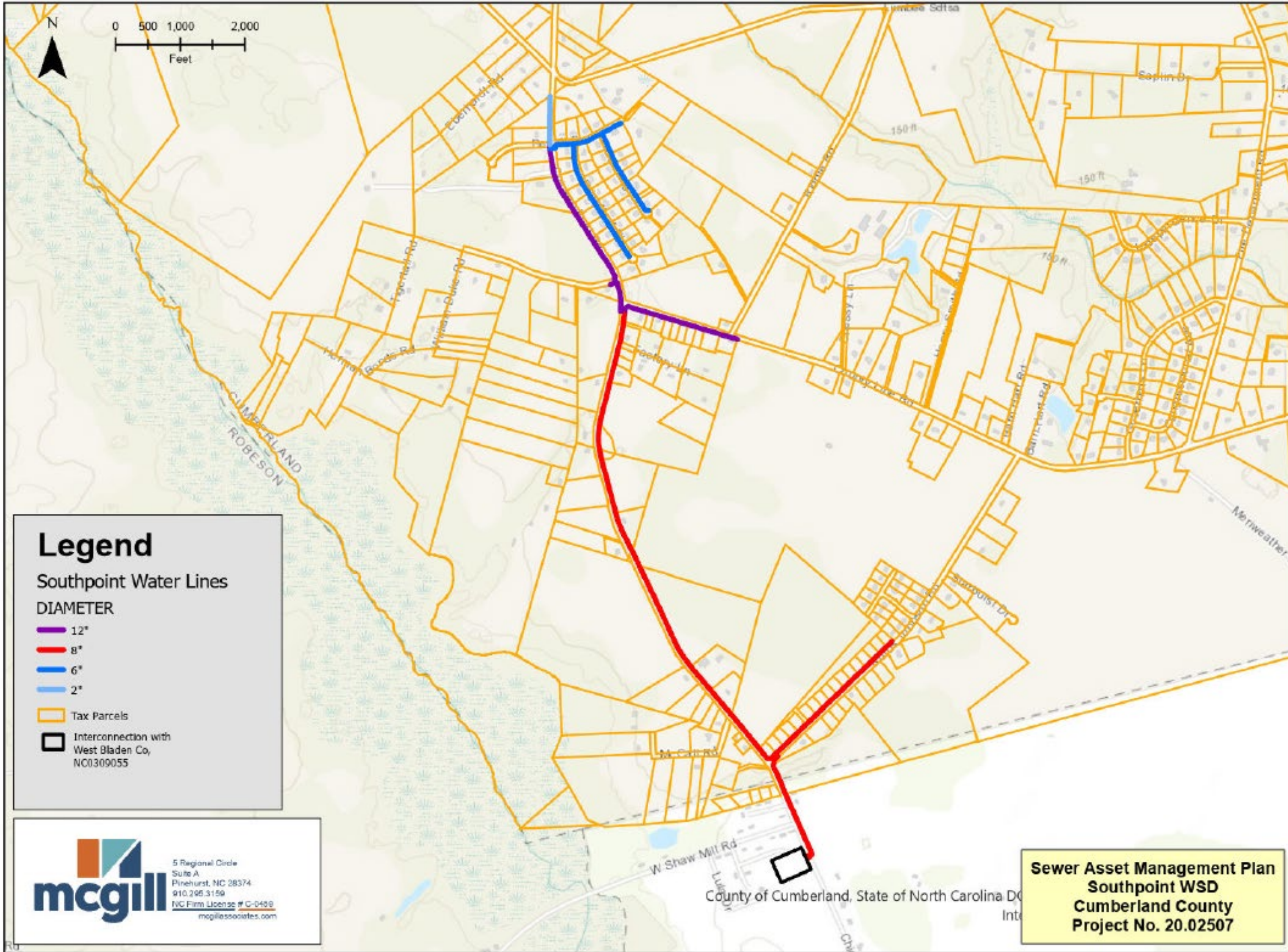
## Fire Hydrants– 12

- Condition generally good

## System Interconnection – Bladen County Water

- 45,000 GPD capacity
- 10,500 GPD average usage





**Legend**  
 Southpoint Water Lines  
 DIAMETER

- 12"
- 8"
- 6"
- 2"
- Tax Parcels
- Interconnection with West Bladen Co, NC0309055

 5 Regional Circle  
 Suite A  
 Pinehurst, NC 28374  
 910.296.3159  
 IVC Firm License # C-0428  
 mcgillassociates.com

**Sewer Asset Management Plan**  
**Southpoint WSD**  
**Cumberland County**  
**Project No. 20.02507**

County of Cumberland, State of North Carolina





# Southpoint Water Capital Improvement Projects

No.	Project Name	Cost
1	Water Meter Replacement	\$71,300.00
2	Construction New Wells and Water Main	\$19,614,136.00
3	Ground Storage Tank and Filter	\$303,500.00
	<b>10-Year CIP Total Project Cost</b>	<b>\$19,988,936.00</b>





# Staffing Recommendations

- County is responsible for management of 3 Sewer Systems and 1 Water System
- Staffing analysis was performed based on typical staffing from EPA study
- EPA study utilizes population and pipe length to estimate staffing
- Table 19 shows calculated Full Time Equivalent (FTE) based on position type

**Table 19: Average Community System Statistics**

Employee Category	System Size (miles of Main)		Mean	Cumberland County
	Pop. 500-3300	Pop. 3300-10000		
	21	62	41.5	51.7
Manager FTE	0.6	1.1	0.85	1.06
per mile	0.029	0.018	0.020	0.020
Plant Operator FTE	0.6	1.3	0.95	1.03
per mile	0.029	0.021	0.023	0.023
Distribution FTE	0.8	2.5	1.65	2.06
per mile	0.038	0.040	0.040	0.040
Administrative FTE	0.6	1.5	1.05	1.31
per mile	0.029	0.024	0.025	0.025



# Staffing Recommendations

- Calculated FTE's were applied based on employee categories
- Wage information based on Zip Recruiter statistics and Benefits Multiplier from U.S. Bureau of Labor Statistics
- Provided for preliminary planning purposes only

**Table 20: Overall Salary Estimates**

Employee Category	Hourly Rate	Annual Salary	Ben. Mult.	Total	Applied FTE	Applied Budget Cost
Manager	\$38.50	\$80,080.00	1.38	\$110,510.40	1.06	\$117,000
Operator	\$24.52	\$51,001.60	1.38	\$70,382.21	1.03	\$72,700
Distribution	\$23.57	\$49,025.60	1.38	\$67,655.33	2.06	\$139,100
Administrative	\$21.33	\$44,366.40	1.38	\$61,225.63	1.31	\$80,100
<b>Total Applied Budget Cost Based FTEs</b>						<b>\$408,900</b>

Any questions?

Thank you!





# Additional Information as needed



# System Development Fees

- Enacted in the North Carolina Public Water and Sewer System Development Fee Act approved in 2017 (House Bill 436)
- Enables public water and sewer utilities in North Carolina to assess system development fees for utility service to new development
- The SDF Act defines new development as:
  1. Subdivision of land
  2. Construction or structural change that increases service needs, or
  3. Any use of land which increases service needs
- SDFs serve as the mechanism by which “growth pays for growth”



# System Development Fees

- Fee calculation in a written analysis prepared by a financial professional or licensed engineer employing generally accepted accounting, engineering and planning methodologies
- The analysis must be posted on the County's website and provide a means by which public comments are received for 45 days
- Comments received must be considered by the preparer of the analysis for possible adjustments to the analysis
- A public hearing must be held prior to considering adoption



## **SOLID WASTE MANAGEMENT**

### **MEMORANDUM FOR BOARD OF COMMISSIONERS AGENDA OF SEPTEMBER 15, 2025**

**TO: BOARD OF COUNTY COMMISSIONERS**

**FROM: AMANDA LEE, PE, GENERAL MANAGER FOR NATURAL RESOURCES**

**DATE: 9/10/2025**

**SUBJECT: APPROVAL OF UTILITY SERVICE AGREEMENT FOR THE KELLY HILLS/SLOCOMB ROAD WATER AND SEWER DISTRICT**

#### **BACKGROUND**

The Public Utilities Department has received a request from Slocomb at Bethune, LLC to connect phased retail space to the existing Kelly Hills/Slocomb Road Water and Sewer District. The project will consist of installation of approximately 349 feet of an 8-inch sewer line with 4 individual 4-inch commercial sewer services, with all costs being paid by Slocomb at Bethune, LLC. The Utility Service Agreement is needed to set the guidelines between Slocomb at Bethune, LLC and Kelly Hills/Slocomb Road Water and Sewer District, to ensure proper installation and connection to the sewer system. Upon completion of construction of the sewer lines and written acceptance of the as-builts and certifications the said utility mains shall be the property of Kelly Hills Water and Sewer District and will be operated and maintained as part of the existing Kelly Hills sewer system.

Further information regarding the capacity available in the Kelly Hills sewer system has been requested from Fayetteville Public Works Commission due to the future connection of the Titanium plant and will be provided at the infrastructure meeting.

The County Attorney has reviewed the attached Utility Service Agreement.

At their September 8, 2025, meeting, the Infrastructure Committee approved moving this item to the Consent Agenda of the September 15, 2025, Board of Commissioners' meeting and the Kelly Hills Water and Sewer District Governing Board Consent Agenda.

#### **RECOMMENDATION / PROPOSED ACTION**



The Public Utilities Project Manager, General Manager for Natural Resources and Management recommend the approval of the Utility Service Agreement for the Kelly Hills/Slocomb Road Water and Sewer District.

**ATTACHMENTS:**

Description	Type
Meyers Engineering, PLLC Memo	Backup Material
Utility Service Agreement	Backup Material



August 27, 2025

Amy Hall  
Public Utilities Project Manager  
Cumberland County, NC

Subject: Kelly Hills Collection System

Mrs. Hall:

We have not received information about process water use and sewer discharge, so anticipated sewage discharge is based on 15A NCAC 02T .0114 Wastewater Design Flow Rates  
Factories, excluding industrial waste - **25 gpd/employee/shift x 300 employees = 7500 gpd.**

The site would discharge to an existing 15-inch gravity sewer that is tributary to the Kelly Hills Pump Station. That 15-inch gravity sewer is owned by Cumberland County and the Kelly Hills Pump Station is owned by the Fayetteville Public Work Commission (PWC).

From previous study by McGill dated October 2024:

*"The Kelly Hills Lift Station is owned and operated by Fayetteville PWC. The station includes a flow meter that is used for recording flow generated by the Kelly Hills Sewer Collection System. The monthly records from that station were provided by the County, and have used to develop an average use per user for the District. The results of the analysis are below.*

<i>Lift Station Design Capacity</i>	<i>100,000 GPD</i>
<i>Metered Average Daily Use</i>	<i>16,900 GPD</i>
<i>Permitted, Not Yet Tributary Flow</i>	<i>29,520 GPD</i>
<i>Pending Development Usage</i>	<i>41,400 GPD</i>
<b><i>Lift Station Available Capacity*</i></b>	<b><i>53,580 GPD</i></b>

*\*Does not include pending development usage. Available capacity including pending amount is 12,150 GPD."*


Based on the McGill Study information, the available capacity of the Kelly Hills Pump Station is 12,150 gpd when pending development is considered. Therefore, there is sufficient capacity in the pump station for the proposed industrial use based on 25 gallons per day per employee. Any industrial process water should be submitted for further evaluation.

The Kelly Hills collection system owned by Cumberland County, specifically the 15-inch gravity sewer line adjacent to the proposed economic development site, has more than adequate capacity to provide service for the proposed 300 employees, based on 15A NCAC02T .0114 Wastewater Design Flow Rates. The capacity of a 15-inch sewer at minimum grade flowing half full **810,765 gallons per day**.

The site may require a pump station based on topography. A proposed layout could determine if the site can be served by gravity versus a pump station.

If you need any other information, please do not hesitate to contact Meyers Engineering.

Sincerely,

  
Jay Meyers, PE  
President

**NORTH CAROLINA  
CUMBERLAND COUNTY**

**AGREEMENT FOR UTILITY SERVICE(S)**

THIS AGREEMENT, made this \_\_\_\_\_ day of \_\_\_\_\_, 2025 by and between the NORCRESS Water and Sewer District (hereinafter called "DISTRICT") and Slocomb at Bethune, LLC. (hereinafter called "APPLICANT")

**WITNESSETH**

WHEREAS, APPLICANT desires public utility services from DISTRICT as selected below. (check all that apply)

- Water and/or Sewer Utility Extension
- Water Service
- Sewer Service

NOW THEREFORE, in consideration of the premises and of the mutual agreements hereinafter set forth, the parties hereby agree and contract as follows:

**DEFINITION OF DISTRICT'S AGENTS.** Throughout this Agreement, any reference to "Agent" or "DISTRICT'S Agent" shall mean any worker, employee, official, contractor, consultant or operator of DISTRICT'S water and sewer services or systems whether employed, hired, or contracted by DISTRICT or Cumberland County on behalf of DISTRICT.

**Article 1: Water and/or Sewer Utility Extension**

As selected above, APPLICANT hereby requests installation of water and/or sanitary sewer utility services as described in Exhibit "T", Project Summary, and is subject to the following terms and conditions:

- A. APPLICANT shall perform all work necessary to accomplish the proposed utility extension including, but not limited to, design, specifications, permitting and construction. Applicant will furnish all material, perform all labor, and pay all costs to construct, by a contractor licensed to perform utilities construction in North Carolina, to DISTRICT'S rules currently in effect and approved by the DISTRICT'S governing board, all applicable local codes and ordinances, the current service provider, and State regulations and laws for those utilities. The work shall be completed in accordance with this Agreement. The DISTRICT or its Agent will review and inspect work performed by APPLICANT to assure that the work meets the purpose for which it is intended and is in compliance with all requirements and conditions contained herein. Such review and approval will not relieve APPLICANT from complying with all said conditions and requirements.
- B. Such construction shall be undertaken and completed as soon as practicable, and not later than one year from date of this agreement, unless delayed or prevented by acts of God, or other things beyond APPLICANT's control. In the event that construction is not completed one year from date of this agreement, then DISTRICT, through the Director of the Cumberland County Public Utilities Department may extend the agreement upon such terms and conditions as the Director deems necessary.
- C. Fees shall be paid by APPLICANT for services provided by DISTRICT, the service provider, or its Agent for the following:
  - (1) review and approval of plans, specifications, and necessary documents, to include final review of the required documents to assure that DISTRICT has legal title to necessary rights-of-way and easements;
  - (2) review and approval of the Bill of Sale provided by APPLICANT, and acceptance of the utility extensions by DISTRICT;

- (3) and daily inspection of the construction in progress, as needed to ensure that construction of the utility extensions are in accordance with this Agreement, the Plans and Specifications, and any other DISTRICT requirements;
  - (4) conduction of pre-flush required pressure tests, any retesting which may be necessary, and sampling of the completed extension after flushing for submittal to the State, or a certified testing laboratory, for bacteriological examination;
  - (5) conduction of required pressure tests, after flushing, and any retesting of sewer system improvement which may be necessary;
  - (6) approval of the sewer video taping schedule, supervision of video taping and revisions/approval of the completed tape and log sheets;
  - (7) final inspection of the completed extension and preparation of the inspection report, which shall set forth any deficiencies that may exist;
  - (8) reinspection of any deficient work;
  - (9) review of the water and/or sewer as-built construction drawings; and
  - (10) reinspection at the end of the one-year warranty period.
- D. Materials and equipment shall be new and shall be as specified in this Agreement, the plans and specifications, the service providers standards, or if not specified, of a quality approved by DISTRICT. All materials and equipment furnished are warranted by APPLICANT as new and in accordance with this Agreement and the approved plans and specifications, and suitable for the intended purpose. In addition, APPLICANT, shall furnish DISTRICT copies of the supplier's warranty and shall adopt the same as the warranty of APPLICANT, and shall also be liable thereon to DISTRICT.
- E. Connection to DISTRICT's water and/or sanitary sewer system of buildings constructed after the date of this agreement on parcels of land that are subject to the Cumberland County's Subdivision Ordinance shall be governed by the requirements of Cumberland County's Subdivision Ordinance.
- F. Upon satisfactory completion of construction of said water and/or sanitary sewer mains and written acceptance of such construction by DISTRICT, said utility mains shall be the property solely of DISTRICT and DISTRICT will maintain same after the one (1) year warranty set forth below has expired. To accurately value the assets being transferred, APPLICANT shall complete and submit a preliminary Statement of Project Cost Form attached as Exhibit "II" to DISTRICT at time of submittal and a final certified form at project completion.
- G. Warranty: APPLICANT shall warrant that the water and/or sanitary sewer utilities to be owned by DISTRICT shall be free from any defects in materials and workmanship. APPLICANT also warrants that it shall be solely responsible for the repair of any damage caused by its agents or employees. Said warranties shall remain in full force and effect for a period of one (1) year from the date of final acceptance of the facilities by DISTRICT. In the event it becomes necessary to repair and/or replace any of the facilities during the initial one (1) year period, such repair and/or replacement shall be at APPLICANT's sole expense and the warranty as to those items repaired and/or replaced shall continue to remain in effect for an additional period of one (1) year from the date of final acceptance by DISTRICT of those repairs and/or replacements. If DISTRICT must repair and/or replace said utilities during the warranty period due to response time requirements, DISTRICT shall bill APPLICANT for work completed and APPLICANT shall remit payment therefore within thirty (30) days of the date of the invoice.
- H. Water and/or sanitary sewer connections to structures along said utility mains from service laterals installed by APPLICANT will not be made nor will such service be activated until all work to be performed by APPLICANT has been satisfactorily completed and written acceptance of such work is given by DISTRICT. Also, if a water main is extended pursuant to this agreement, it must be tested and sterilized by APPLICANT'S contractor before activation of any water service from said water main.

- I. Water and/or sanitary sewer service will be supplied to structures now or hereafter located along said utility mains in accordance with DISTRICT's rules, regulations, and rate schedules applicable to such structures and currently in effect at the time of application for service. If all normal DISTRICT fees and charges for installation and activation of such services have been paid by applicants for said services, DISTRICT will thereafter use its best efforts to supply water to said structures at good operating pressure, but in no event shall DISTRICT be liable for failure to do so, it being understood that all such original operating fees, charges, rates, etc., are, solely at DISTRICT's discretion, subject to change by DISTRICT.
- I. Any replacements or adjustments in elevations and grades of those water and/or sanitary sewer service laterals, including water meters and boxes and sanitary sewer cleanout stacks, which were originally installed by APPLICANT'S contractor in accordance with approved plans by APPLICANT's engineer, shall be at APPLICANT's expense; and the determination of DISTRICT that such replacements or adjustments are required shall be final and binding on APPLICANT.
- J. During construction of project, APPLICANT will be responsible and pay DISTRICT as invoiced for any and all damages to DISTRICT utilities and materials except when such damages are caused by DISTRICTS forces. APPLICANT shall remit payment therefore within thirty (30) days of the date of the invoice.
- K. APPLICANT'S contractor shall be responsible for complying with any and all statutes, rules, regulations or ordinances, which may be imposed by other governmental agencies (local, state and federal), which have jurisdiction. APPLICANT shall hold harmless DISTRICT against any claims, fines or civil penalties resulting from APPLICANT'S contractor's failure to comply with said regulations.
- L. The Water and Sewer Utility Extension is further illustrated in Exhibit "IIP", Water and Sewer Utility Extension Map. APPLICANT shall be responsible for costs (engineering, materials, design, etc.) associated with major design changes that deviate from Exhibit "II" and the attached map as identified in Exhibit "IIP".

## **Article 2: General Terms and Conditions**

### **AUTHORITY:**

DISTRICT shall have general authority over the work to be accomplished under this Agreement, provided nothing contained in this Agreement shall be construed to require DISTRICT to direct the method or manner of performing any work by APPLICANT. Incident to this general authority, DISTRICT may engage engineers and contractors to observe construction, inspect, test, and evaluate any construction performed by APPLICANT's contractors and assist APPLICANT'S contractors with correcting or completing any construction if DISTRICT determines the construction by APPLICANT'S contractors creates a risk of harm to DISTRICT'S water or sewer system for which APPLICANT'S extension is permitted. APPLICANT shall be responsible for the costs incurred by DISTRICT for this purpose.

DISTRICT shall decide all questions pertaining to the interpretation of this Agreement and the approved plans and specifications prepared thereto, the quality or acceptability of materials furnished, and work performed under this Agreement on the part of APPLICANT. The decision of DISTRICT on such matters shall be final.

All work under this Agreement shall be performed to the satisfaction of DISTRICT, and the decision by DISTRICT as to whether the work has been performed in a satisfactory manner shall be final.

DISTRICT may stop work under this Agreement whenever, in its opinion, such stoppage is necessary to ensure proper performance of this Agreement. DISTRICT may also reject all work and materials which, in its opinion, do not conform to this Agreement.

### **DETERMINATION OF "OR EQUAL"**

DISTRICT or its Agent shall be the sole judge of the questions of "or equal" of any supplies, materials or equipment proposed by APPLICANT. APPLICANT shall pay to DISTRICT the costs of test and evaluations needed to determine the acceptability of alternates proposed by APPLICANT.

## **STOPPAGE OF WORK**

If APPLICANT performs any work contrary to this Agreement, laws, ordinances, rules, or regulations; or, prior to obtaining any necessary permits or other required permission, DISTRICT may order the work stopped.

## **INSPECTIONS AND TESTS**

Inspection by DISTRICT or its Agent is required for various aspects of the utility system. Such aspects include, but are not limited to: water and/or sewer main pipe laying operations, installation of sleeves, couplers and adapters on pipe, pipe bedding and backfilling, casings, concrete encasement or other special installations, repairs to water and/or sewer utilities, all water main fittings with concrete blocking, pressure testing water mains, water main purity samples after flushing, main wet taps, any cut-in's on existing water mains, hydrant installations, water service installations, vault installations and appurtenances, hole cuts on sanitary sewer pipe, manhole installations and pipe connections, manhole vacuum testing, manhole core drilling, air testing sewer main and side sewer stubs, flushing/cleaning sewer mains and CCTV inspection, grease/oil-water separators, vehicle wash and dumpster area drains, tee locations and stub markers, sewer depth at right-of-way/easement line, sewer slope, fittings and clean-outs.

Inspection of the work by DISTRICT or its Agent shall be strictly for the benefit of DISTRICT or its Agent and no other person or agency.

DISTRICT staff or its Agent, at all times, will have access to the work area for the purpose of inspecting and testing. APPLICANT shall provide facilities for safe access, inspection, and testing.

If any work is covered without the approval or consent of DISTRICT or its Agent it shall be uncovered for inspection at APPLICANT'S expense, if required by DISTRICT or its Agent.

APPLICANT shall make reasonable tests of the work at APPLICANT'S expense upon DISTRICT'S or its Agent's request and shall maintain a record of such tests.

Before a performance test is to be observed by DISTRICT or its Agent, APPLICANT shall make such preliminary tests as are necessary to assure that the material and/or equipment are in accordance with the approved plans and specifications provided. If, for any reason, the test observed is unsatisfactory, APPLICANT shall pay all costs incurred for the inspection of further testing.

Should APPLICANT elect to work more than eight hours per weekday, all costs of inspection thus entailed may be charged to APPLICANT at the overtime billing rate.

Approval is required from DISTRICT or its Agent to work nights, weekends, and holidays. After-hours inspections may not be possible due to the lack of staff availability. APPLICANT shall submit its proposed schedule to work nights, weekends, or holidays at least five days in advance (not including weekends and holidays) for review. If APPLICANT elects to work on weekends, nights or holidays, and such work schedule is approved by DISTRICT or its Agent, all costs of inspection may be charged to the APPLICANT at the overtime billing rate.

Where this Agreement, approved plans and specifications, or laws, ordinances, rules, or regulations of any governmental authority require that any work be specially tested or inspected, APPLICANT shall give DISTRICT notice that such tests or completed work is ready for inspection. APPLICANT shall notify DISTRICT of the date, time, and location of the inspection. Required certificates of inspection shall be secured by APPLICANT.

Notice of deficiencies shall be given to APPLICANT upon completion of each inspection. APPLICANT shall correct such deficiencies within seven days of the notice and before final inspection is made by DISTRICT.

A representative of APPLICANT'S contractor shall arrange a time to accompany DISTRICT or its Agent on the final inspection and subsequent reinspection, if required. DISTRICT or its Agent will not make the final inspection until the physical work, including final clean-up and all extra work ordered by the Inspector has been completed.



Deficiencies discovered during the final inspection shall be corrected within seven days of notice thereof and, in no instance, shall service be provided until the deficiencies are corrected and the utility extensions pass reinspection.

### **AVAILABILITY OF PROJECT DOCUMENTS**

APPLICANT shall keep at least one copy of the following project documents constantly available at the construction site: (1) approved construction plans and shop drawings, and (2) construction specifications.

### **MATERIALS AND EQUIPMENT LIST**

APPLICANT shall file three copies of a materials and equipment list with DISTRICT prior to commencing construction. This list shall designate the quantity, manufacturer and model number of materials and equipment to be installed under this Agreement.

The materials and equipment list will be checked by DISTRICT or its Agent for conformity with this Agreement and the approved plans and specifications provided. DISTRICT will determine the conformity of the list with reasonable promptness. APPLICANT shall make any required corrections and file two correct copies with DISTRICT within one week after receipt of the required corrections. DISTRICT'S review of the list shall not relieve APPLICANT from the responsibility of providing materials and equipment suitable for their intended purpose nor for deviations from this Agreement or the plans and specifications without written approval from DISTRICT.

### **WATER METERS**

It shall be the responsibility of APPLICANT to make application and pay any necessary fees to DISTRICT for the installation of water meters. APPLICANT shall not purchase and install water meters from a private supplier.

Single family meter applications shall not be submitted until after acceptance of the utility extensions.

### **SEWER TAPS**

It shall be the responsibility of APPLICANT to make application and pay any necessary fees to DISTRICT for the connection of sewer taps to the mains. Elder valve installations may be required in addition to sewer taps.

Single family sewer connections shall not be submitted until after acceptance of the utility extensions.

### **SAFETY:**

Safety in, on, or about the construction site is the sole and exclusive responsibility of APPLICANT. APPLICANT'S means and method of work performance, superintendent of APPLICANT'S employees and sequencing of construction are also sole and exclusive responsibilities of APPLICANT.

APPLICANT shall be responsible for the safety of any person, including but not limited to, any worker, DISTRICT'S Agent, Owner and/or Owner's representative, visitor or invitee on the site of the work at all times during the prosecution of the work, regardless of whether the individual is an employee of APPLICANT or APPLICANT'S Contractor or Sub-Contractor. APPLICANT is responsible for compliance with the rules, regulations and interpretations of the North Carolina Department of Labor relating to "North Carolina Occupational Safety and Health Standards (OSHA) for the Construction Industry" (Title 29 CFR Part 1926 and 29 CFR Part 1919 as adopted by 13 NCAC 7C.0101) and revisions as adopted by N.C.G.S. § 95-126 through 155 and additionally with normal industry safety practices or standards.

DISTRICT shall have the right to inspect the work for pay application compliance and compliance with DISTRICT'S standards and specifications but is not required to do so. DISTRICT shall further have the right to monitor the progress of the work, but no such inspection shall relieve APPLICANT of any duty or obligation it might have under the terms of this Agreement. Nothing in this Agreement shall relieve APPLICANT of any duty or obligation to direct the means and methods of the work.

**INDEMNIFICATION:**

APPLICANT shall indemnify and hold DISTRICT and DISTRICT'S Agents harmless from and against all liabilities, claims, demands, suits, losses, damages, costs, and expenses (including attorney's fees) for bodily injury to or death of any person, or damage to or destruction of any property proximately caused by the negligence of APPLICANT or any person for whom APPLICANT is legally responsible during the performance of services relative to this Agreement.

**INDEPENDENT CONTRACTOR:**

APPLICANT is an independent contractor and shall undertake performance of the services relative to this Agreement as an independent contractor. APPLICANT shall be wholly responsible for the methods, means, and techniques of performance. DISTRICT shall have no rights to supervise methods and techniques of performance employed by APPLICANT, but DISTRICT shall have the right to observe such performance.

**COMPLIANCE WITH LAWS:**

In performing services relative to this Agreement, APPLICANT shall comply with all applicable regulatory requirements including federal, state, and local laws, rules, regulations, orders, codes, criteria, and standards. APPLICANT shall be responsible for procuring all permits, certificates, and licenses necessary to allow APPLICANT to undertake activities and construction relative to this Agreement.

**FINAL SEQUENCE FOR ACCEPTANCE OF PROJECTS**

In order for DISTRICT to accept the utility extension as part of DISTRICT'S assets, APPLICANT must complete the following:

- (1) APPLICANT'S Contractor completes all utility work and makes an appointment for final inspection.
- (2) DISTRICT'S Inspector inspects, re-inspects "punch list" items, and signs off as "complete", provided there are no deficiencies.
- (3) All applicable requirements of this Agreement have been satisfied, including but not limited to, the Operation and Maintenance Manual approved and recordable, outstanding fees paid, easements verified & recordable, Bills of Sale for transfer of facilities to be owned by DISTRICT, Maintenance Bonds, if greater than original Performance Bonds, Certification of Construction Cost, and final as-builts hard copies, CAD and shapefiles received.

**NOTICE:**

Any formal notice, demand, or request required by or made in connection with this Agreement shall be deemed properly made if delivered in writing or deposited in the United States mail, postage prepaid, to the address specified below.

APPLICANT:           Name: Slocomb at Bethune, LLC  
                              Attention: Deno Hondros, Managing Member  
                              Address: 304 Courtyard Lan  
                              City, State, Zip: Fayetteville, NC 28303

DISTRICT:            Name: County of Cumberland  
                              Attention: Kelly Hills/Slocomb Road Water and Sewer District  
                              Address: P.O. Box 1829  
                              Fayetteville, NC 28302

Nothing contained in this Article shall be construed to restrict the transmission of routine communication between representatives of APPLICANT and DISTRICT.

**GOVERNING LAW:**

This Agreement shall be governed by the laws of the State of North Carolina.

**BREACH:**

APPLICANT'S failure to observe or perform any of the terms, warranties, conditions, requirements, or provisions of this Agreement shall constitute a breach of this Agreement by APPLICANT. In the event of a breach of this Agreement by APPLICANT, DISTRICT, due to such breach, shall have the right to terminate this Agreement upon which DISTRICT shall have no further obligation to perform under this Agreement and APPLICANT shall have no right to perform any further work under this Agreement.

In the event of breach of this Agreement by APPLICANT and termination of this Agreement by DISTRICT, APPLICANT hereby shall reimburse DISTRICT for all expenditures made in relation to, and in furtherance of, this Agreement.

**NONWAIVER OF BREACH:**

No breach or non-performance of any term of this Agreement shall be deemed to be waived by either party unless said breach or non-performance is waived in writing and signed by the parties. No waiver of any breach or non-performance under this Agreement shall be deemed to constitute a waiver of any subsequent breach or non-performance and, for any such breach or non-performance, each party shall be relegated to such remedies as provided by law.

**SEVERABILITY:**

The invalidity, illegality, or unenforceability of any portion or provision of this Agreement shall in no way affect the validity, legality, and/or enforceability of any other portion or provision of this Agreement. If any provision of this Agreement is held invalid, illegal, or unenforceable by a court of law with jurisdiction, then such provision shall be modified to the mutual satisfaction and agreement of the parties to reflect the parties' intent. In the event the parties cannot reach an agreement as to a modification of said provision, any invalid, illegal, or unenforceable provision of this Agreement shall be deemed severed from this Agreement, and the balance of this Agreement shall be construed and enforced the same as if the Agreement had not contained any portion or provision which was invalid, illegal, or unenforceable.

**ASSIGNMENT:**

APPLICANT shall not assign, sublet, subcontract or transfer any rights under or interest in this Agreement without the written consent of DISTRICT.

**BENEFITS LIMITED TO PARTIES:**


Nothing herein shall be construed to give any right or benefits hereunder to any third parties other than DISTRICT and APPLICANT.

IN WITNESS WHEREOF, the parties hereto through their duly authorized officers has executed this instrument as to the date and year first above written.

Slocomb at Bethune, LLC

BY:   
Deno Hondros, Managing Member

WITNESS:

  
Name, Title WITNESS

Kelly Hills/Slocomb Road Water & Sewer District

BY: \_\_\_\_\_  
Kirk deViere, Chairman

WITNESS:

\_\_\_\_\_  
Andrea Tebbe, Clerk to the Board

Approved for Legal Sufficiency  
Kelly Hills/Slocomb Road Water & Sewer District

\_\_\_\_\_  
Rickey L. Moorefield, County Attorney  
Attorney for Kelly Hills/Slocomb Road Water and Sewer District

EXHIBIT "I"

PROJECT SUMMARY

PHASE ONE - NEW RETAIL AND FLEX SPACE

Project Name: SLOCOMB AT BETHUNE

Engineer: GEORGE M. ROSE

Project Location: 133 BETHUNE DRIVE  
FAYETTEVILLE, NC 28311

Developer: SLOCOMB @ BETHUNE, LLC

Parcel Number: \_\_\_\_\_

Asset Summary

APPROXIMATELY 349 LINEAR FEET OF 8"  
SOR-26 PVC SANITARY SEWER; 4 EACH 4'  
DIAMETER MANHOLES

Project Highlights

Project description/location goes here.

PHASE ONE CONSISTS OF A 5,144 SQUARE FOOT  
RETAIL BUILDING WITH ASSOCIATED PARKING AND  
UTILITIES. FUTURE PHASE TWO IS A 14,400 FLEX  
SPACE COMMERCIAL BUILDING WITH ASSOCIATED PARKING.  
PHASE TWO WILL INVOLVE A FURTHER EXTENSION OF  
SEWER FACILITIES.

**EXHIBIT "II"**

**STATEMENT OF TOTAL PROJECT COST**

Developer/Applicant SLOCOMB@ BETHUNE, LLC Contractor \_\_\_\_\_  
 Project Name/Loc PHASE ONE - NEW RETAIL AND FLEX  
SPACE SLOCOMB@ BETHUNE Pipe Supplier \_\_\_\_\_  
133 BETHUNE DRIVE Engineer GEORGE M. ROSE, P.E.  
 Completion Date \_\_\_\_\_

**WATER**

_____	feet of _____	inch water main	
_____	feet of _____	inch water main	
_____	feet of _____	inch water main	
_____	- _____	inch domestic water lateral(s)	
		<b>Total water distribution*</b>	\$ _____
Mains greater than 12"			
_____	feet of _____	inch water main	
_____	feet of _____	inch water main	
		<b>Total water transmission *</b>	\$ _____

**SEWER**

<u>349</u>	feet of <u>8"</u>	inch sewer mains	
_____	feet of _____	inch sewer mains	
<u>42</u>	- <u>4</u>	inch sewer laterals	
		<b>Total sanitary sewer collection*</b>	\$ <u>31,500</u>
Mains greater than 12"			
_____	feet of _____	inch sewer main	
_____	feet of _____	inch sewer main	
		<b>Total sanitary sewer outfalls &amp; interceptors*</b>	\$ _____
_____	feet of _____	inch sewer force mains	\$ _____
_____	- _____	lift station (s)	\$ _____

**OFF-Site**

_____	feet of _____	inch water mains*	\$ _____
_____	feet of _____	inch sewer mains*	\$ _____

\*Value to include equipment, labor & materials (valves, fittings, fire mains & hydrants, manholes, etc.)

Other Project Costs:

Engineering	_____
<span style="border: 1px solid black; padding: 2px;">10</span> * Percentage of Project Cost	_____
Other (list detail)	<u>3,150</u>
<b>Total project cost</b>	<b>\$ <u>34,650</u></b>

Comments: \_\_\_\_\_

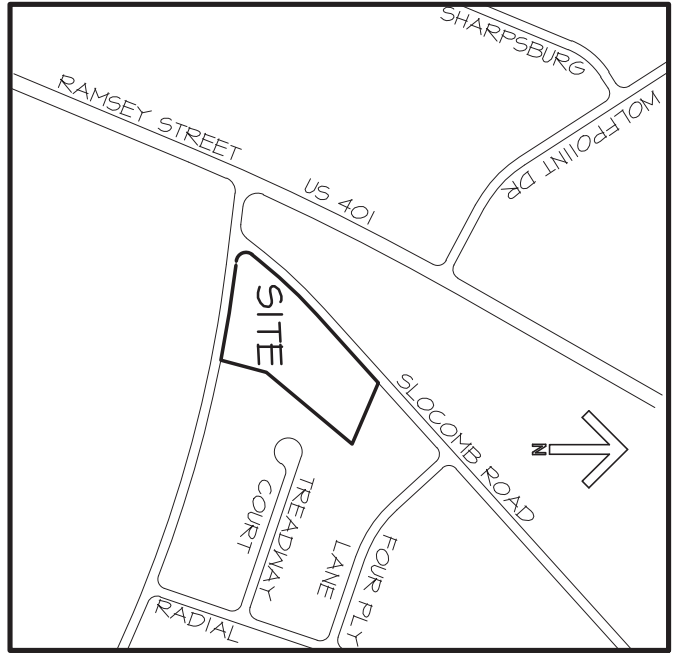
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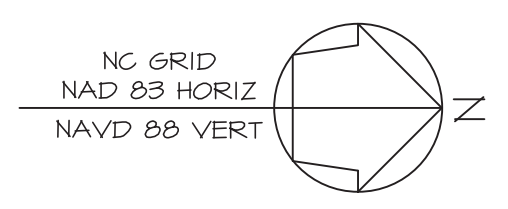
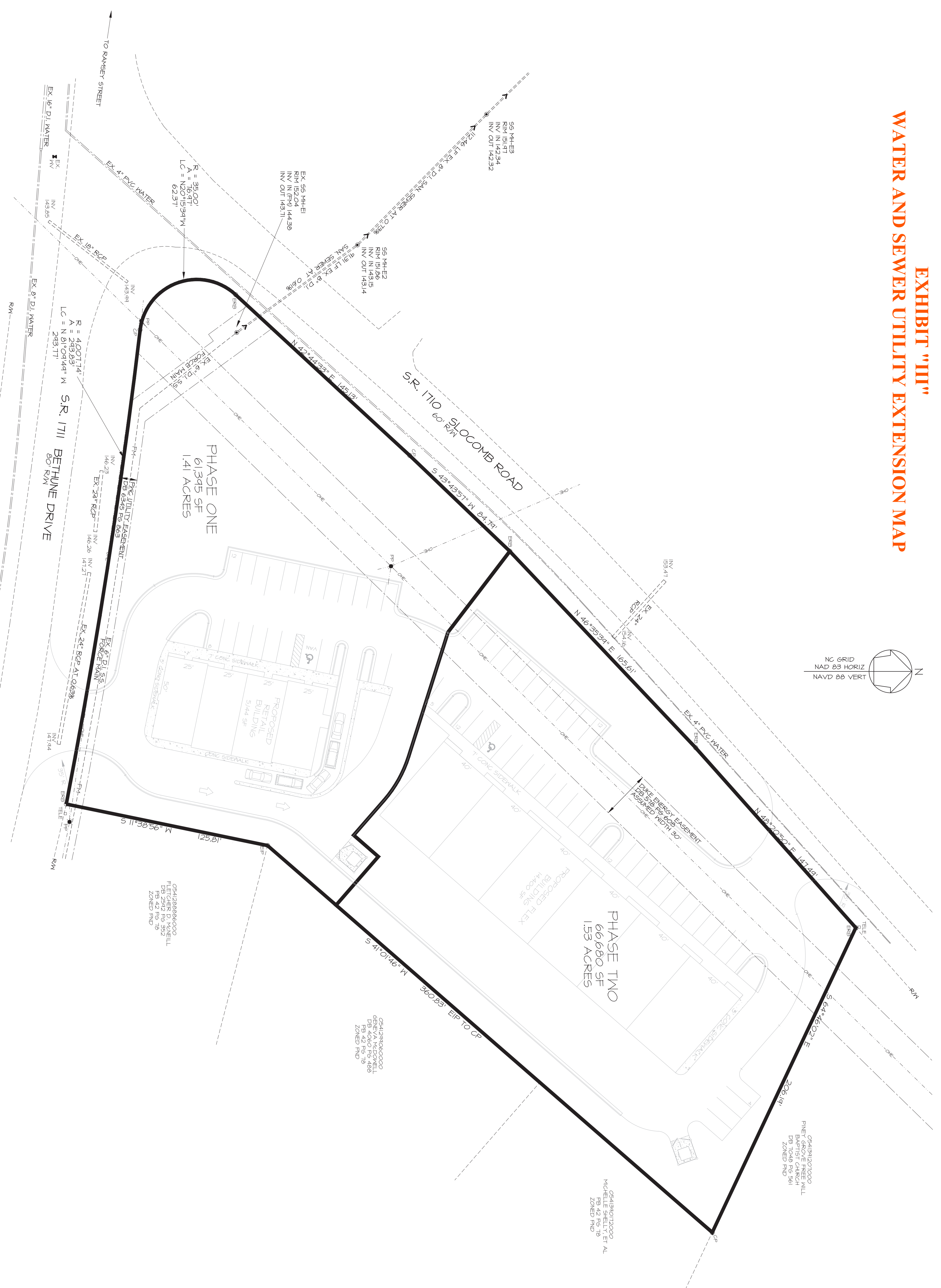


# EXHIBIT "III" WATER AND SEWER UTILITY EXTENSION MAP



- LEGEND**
- ECM EXISTING CONCRETE MONUMENT (PROPERTY CORNER)
  - EBB EXIST REBAR (PROPERTY CORNER)
  - CP COMPUTED POINT (PROPERTY CORNER)
  - EIP EXIST IRON PIPE (PROPERTY CORNER)
  - LF EXIST LIGHT POLE
  - PE EXISTING POWER POLE
  - SUT--- EXISTING SIX WIRE
  - OHE--- EXISTING OVERHEAD ELECTRICAL

- NOTES**
1. TOTAL AREA IN TRACT = 182,075 SF = 244 ACRES
  2. OWNER/DEVELOPER: SLOCOMB & BETHUNE, LLC
  3. REFERENCE: DB 11768 PG 563, FB 130 PG 21
  4. REID NO. 054127074000
  5. SITE ADDRESS: 105-111 BETHUNE STREET
  6. PROPERTY IS ZONED CC, CITY.
  7. TOTAL AREA IN BUILDINGS = 3144 + 14400 = 14944 SF
  8. PARKING REQUIRED = 14944/300 = 49 SPACES
  9. THERE ARE NO EXISTING IMPROVEMENT SURFACES ON THIS SITE.
  10. ALL CONSTRUCTION TO BE IN ACCORDANCE WITH ALL CITY OF FAYETTEVILLE STANDARDS AND SPECIFICATIONS.
  11. THE CONTRACTOR MUST CONTACT THE NORTH CAROLINA CALL CENTER FOR INFORMATION REGARDING THE LOCATION OF ALL EXISTING UTILITIES.



**PHASING PLAN**  
SCALE 1" = 30'



DATE: JAN 2025  
DRAWN BY: GMR  
CHECKED: GMR  
SCALE: NOTED  
SHEET NO. **SP2**

PHASE ONE – NEW RETAIL AND FLEX SPACE  
**SLOCOMB AT BETHUNE**  
105-111 SLOCOMB ROAD  
FAYETTEVILLE, NC

**PHASING PLAN**

**GEORGE M. ROSE, P.E.**  
P.O. BOX 53441  
FAYETTEVILLE, NC 28305  
O 910-485-5822 M 910-977-5822 EMAIL george@gmrpe.com

REVISIONS





## **SOLID WASTE MANAGEMENT**

### **MEMORANDUM FOR BOARD OF COMMISSIONERS AGENDA OF SEPTEMBER 15, 2025**

**TO: BOARD OF COUNTY COMMISSIONERS**

**FROM: AMANDA LEE, PE, GENERAL MANAGER FOR NATURAL RESOURCES**

**DATE: 9/10/2025**

**SUBJECT: APPROVAL OF ASSET MANAGEMENT PLANS FOR THE WATER AND SEWER DISTRICTS**

#### **BACKGROUND**

The Public Utilities Department has been working with McGill Associates, PA, on Asset Management Plans (AMP) for the water and sewer districts owned by Cumberland County. These plans are needed to effectively manage the systems and budget for projects that support the utility needs of customers within each district. As part of the AMP studies a 10-year Capital Improvements Plan (CIP) is being included for each district in accordance with NC Department of Environmental Quality Division of Water Infrastructure Guidance. Projects will include focusing on operational and maintenance challenges and consideration to potential growth.

The suggested CIP was incorporated into the FY26 budget. The CIP for the Water and Sewer Enterprise funds can be found on page 77 of the Recommended Annual Budget for FY26. It should be noted that in the CIP Cost Summary for each AMP has a year one of FY26, and continues for ten years, whereas FY30+ is combined in the CIP Recommended Budget document. All amounts remain the same.

Matthew Jones, PE, with McGill Associates, presented an overview of the studies to the Infrastructure Committee on September 8, 2025. The Infrastructure Committee approved moving this item to the Consent Agenda of the September 15, 2025, Board of Commissioners' meeting, as well as to the Consent Agendas of the Kelly Hills Water and Sewer District Governing Board, the NORCRESS Water and Sewer District Governing Board, the Overhills Park Water and Sewer District Governing Board, and the Gray's Creek Water and Sewer District Governing Board.

#### **RECOMMENDATION / PROPOSED ACTION**

The Public Utilities Project Manager, General Manager for Natural Resources and Management recommend

the following proposed actions for the Board of Commissioners and the Kelly Hills Water and Sewer District Governing Board, the NORCRESS Water and Sewer District Governing Board, the Overhills Park Water and Sewer District Governing Board, and the Gray's Creek Water and Sewer District Governing Board:

Approve the Asset Management Plans (AMP), including the 10-year Capital Improvements Plans (CIP), for the Kelly Hills, NORCRESS, Overhills Park, and Gray's Creek Water and Sewer Districts.

**ATTACHMENTS:**

Description	Type
Kelly Hills Asset Management Plan	Backup Material
NORCRESS Asset Management Plan	Backup Material
Overhills Asset Management Plan	Backup Material
Southpoint Asset Management Plan	Backup Material
McGill Associates AMP Presentation	Backup Material

**SEWER ASSET MANAGEMENT PLAN**

**KELLY HILLS / SLOCOMB ROAD  
WATER AND SEWER DISTRICT**

**CUMBERLAND COUNTY, NC**



PINEHURST, NORTH CAROLINA

**SEWER ASSET MANAGEMENT PLAN**

**KELLY HILLS / SLOCOMB ROAD  
WATER AND SEWER DISTRICT**

**CUMBERLAND COUNTY, NC**

**MATTHEW JONES, PE**  
matthew.jones@mcgillassociates.com



5 Regional Circle, Suite A  
Pinehurst, NC 28374  
910.295.3159

**AUGUST 2025**

**PROJECT NO. 20.02507**

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- Appendix A – Manhole Inspection List**
- Appendix B – Smoke Testing Results List**
- Appendix C – Wastewater Collection System Permit**
- Appendix D – PWC Agreement**

## EXECUTIVE SUMMARY

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The purpose of this Asset Management Plan (AMP) is to document the condition of the Kelly Hills/Slocomb Road (Kelly Hills) Sewer District's infrastructure to assist the County with becoming more proactive in the management, operation and financing of its sewer collection system. The Kelly Hills Sewer District serves approximately 102 residential connections in the northern area of Cumberland County. There are 166 properties within the Kelly Hills District are not currently connected and are paying the sewer availability fee. The District's sewer collection system consists of approximately four and a half miles of gravity sewer and approximately 100 manholes. Collected wastewater is pumped from the Kelly Hills Lift Station, which is owned and operated by Fayetteville PWC, to the PWC collection system. Wastewater generated from the district is ultimately treated at the Cross Creek Water Reclamation Facility (NC0023957), which is also owned and operated by Fayetteville PWC.

This asset inventory and assessment consisted of assembling data on sewer pipe, manholes, and other appurtenances in the collection system. This assessment included performing inspections of selected manholes, performing smoke testing throughout the system, and reviewing existing data with County Staff. This information was evaluated and is summarized in this document which includes the asset management plan and capital improvements plan. This process resulted in the development of a 10-year Capital Improvements Plan (CIP) to guide the County with scheduling and financing the capital projects and equipment purchases necessary to maintain and improve its wastewater collection system. Through the AMP process, approximately 20% of the manholes and 25% of the cleanouts in the sewer collection system are in need of rehabilitation due to deterioration and fair condition.

The CIP includes a focused improvement to components within the sewer system that need rehabilitation or replacement based on existing condition, and on improvements that could improve management of the sewer system for staff. These planned projects will bring the County into a better position to serve its customers by improving the reliability



of the collection system. The County should look to its CIP to guide its next projects, and the CIP should be updated regularly as priorities change and as projects are completed. It is noted that many factors may impact the priorities including failures, and funding availability both local and through grant and loan programs. This assessment project provides evidence for the prioritization of manhole rehabilitation and improvement projects in the CIP.

### ***System Evaluation***

All of the pipe material in the Kelly Hills sewer system is PVC pipe. The collection system was first put into service in 2005, therefore the relative age of the system is low. PVC pipe is the most common material used for sewer systems today. The typical useful life for PVC pipe is anywhere from 40 to 60 years.

As part of the AMP, McGill Associates, PA (McGill) assisted the County with evaluating the condition of its sewer infrastructure to identify projects in line with these goals. The following items were included in the AMP scope:

- Identify areas to conduct smoke testing to identify potential sources of I/I into the sewer system;
- Analyze the Kelly Hills lift station, based on County-provided data
- Inspect selected sewer manholes within the system to establish overall system condition;
- Identify and evaluate potential sewer system improvements;
- Prioritize sewer system improvements;
- Prepare opinions of probable costs for sewer system improvements; and
- Create a Capital Improvements Plan.

### **Manhole Inspections**

All manholes in the Kelly Hills sewer system are precast concrete based on information provided by County staff. The results of the selected manhole inspections performed as a part of this inventory were used to develop an assessment of manhole conditions in the

system. Based on the inspections performed, manholes that were inspected were assigned a condition rating – excellent, good, fair, or poor. Of the ten manholes they were all in good to fair condition. The remaining 90 are noted as unknown condition, but the manholes inspected are believed to be representative of the system based on input from County staff. These results are recorded in Figure 5 and included in Appendix A.

### Lift Station Inspection

The Lift Station serving the Kelly Hills District is owned and operated by Fayetteville PWC, therefore inspection of the station was not included as a part of this assessment. The Lift Station is located at 355 Bethune Drive. Analysis of flow data and customer usage was performed and is included in this report.

### Findings and Recommendations

The system evaluation allowed McGill to assemble a list of general recommendations and high priority projects to guide the County in the next 10 years. General recommendations to the District included establishing its own flow monitoring and smoke testing programs in high priority areas to determine sewer rehabilitation needs and inspecting sewer lines and manholes with CCTV equipment during routine cleanings to track the condition of these items. McGill also recommended the County begin rehabilitation and/or replacement of existing manholes within the collection system in order to reduce the risk of I/I.

Data and field investigation reporting were utilized to identify the priority projects within the collection system, focusing on manhole rehabilitation.

Table 1 summarizes projects identified during this assessment, centering around manhole rehabilitation projects. A project to install flow monitors is included to give greater control and understanding of flows from the collection system.

**Table 1: Summary of Capital Improvements Projects**

No.	Project Name	Cost
1	Manhole Rehabilitation Project 1	\$81,000.00
2	Flow Monitoring Improvements	\$103,900.00
3	Manhole Rehabilitation Project 2	\$81,000.00
4	Manhole Rehabilitation Project 3	\$81,000.00
5	Manhole Rehabilitation Project 4	\$81,000.00
<b>10-Year CIP Total Project Cost</b>		<b>\$427,900.00</b>

***Capital Improvements Plan***

The purpose of this asset inventory and assessment was to document the condition of the District’s inventoried infrastructure to assist the County with becoming proactive in the management of its wastewater system, to include capital project planning. The County does not currently have a Capital Improvements Plan (CIP) for its wastewater system. The CIP being developed from this current assessment will guide the County through its planning for projects within the 10-year window. The CIP will remain a living document and be updated in the future so that it remains current to the Districts’ highest priorities and provides accurate cost estimates. The CIP included in this assessment includes projects focused on rehabilitation of existing manholes, which have been identified to be potential sources for I/I into the system. Through discussion with County staff, field investigation and review of existing system data, the specific defects and general problematic areas within the wastewater system have been summarized. These results were used to develop the CIP and formulate a 10-year plan.

The complete asset inventory and assessment task consisted of multiple field work and analysis components, culminating in the development of the Kelly Hills/Slocomb Road Water and Sewer District’s CIP. McGill developed cost estimates for all projects based on current 2024 materials and construction costs. The updated CIP is intended to be adopted by the County to guide its selection of sewer system improvement projects over the next decade. This plan also includes a budget-level recommendation for staffing associated with system operations and maintenance for all County utility districts.

## 1.1 BACKGROUND

The Kelly Hills/Slocomb Road Water and Sewer District is located in Cumberland County, North Carolina, and is owned and operated by Cumberland County. The District includes a wastewater collection system that currently serves 102 residential customers as of August 2025. The collection system consists of approximately four and a half miles of gravity sewer mains that are 8-inch, 12-inch, 15-inch, and 16-inch in diameter. These gravity sewer mains are constructed of PVC and Ductile Iron pipe. The system was put into service in 2005. Figure 1 shows the existing sewer collection system.

Developing a Capital Improvements Plan (CIP) will allow the District to update its current rate setting model to better estimate future revenue and expenses, capital outlay, indebtedness, and overall health of the sewer system enterprise fund reserves. A model of this nature would continue to balance revenues and expenditures with a longer-term approach to rate setting and establish a financially sound framework for the District to follow.

The District has experienced the degradation of manholes within its sewer collection system due to the age of the system and resulting from wear over time.

Even with the relatively young age of the Kelly Hills system, County staff remains cognizant that infiltration and inflow (I/I) is always a concern, particularly in a scenario where the County's operation costs are based on the gallons of flow that enter into the existing lift station. Therefore, the top challenges for the Kelly Hills sewer system are mitigating I/I that results from deteriorated infrastructure and collecting reliable data on existing sewer flows for operations and maintenance planning. The information collected through this assessment project will help identify system deficiencies and develop improvement projects to reach these goals.

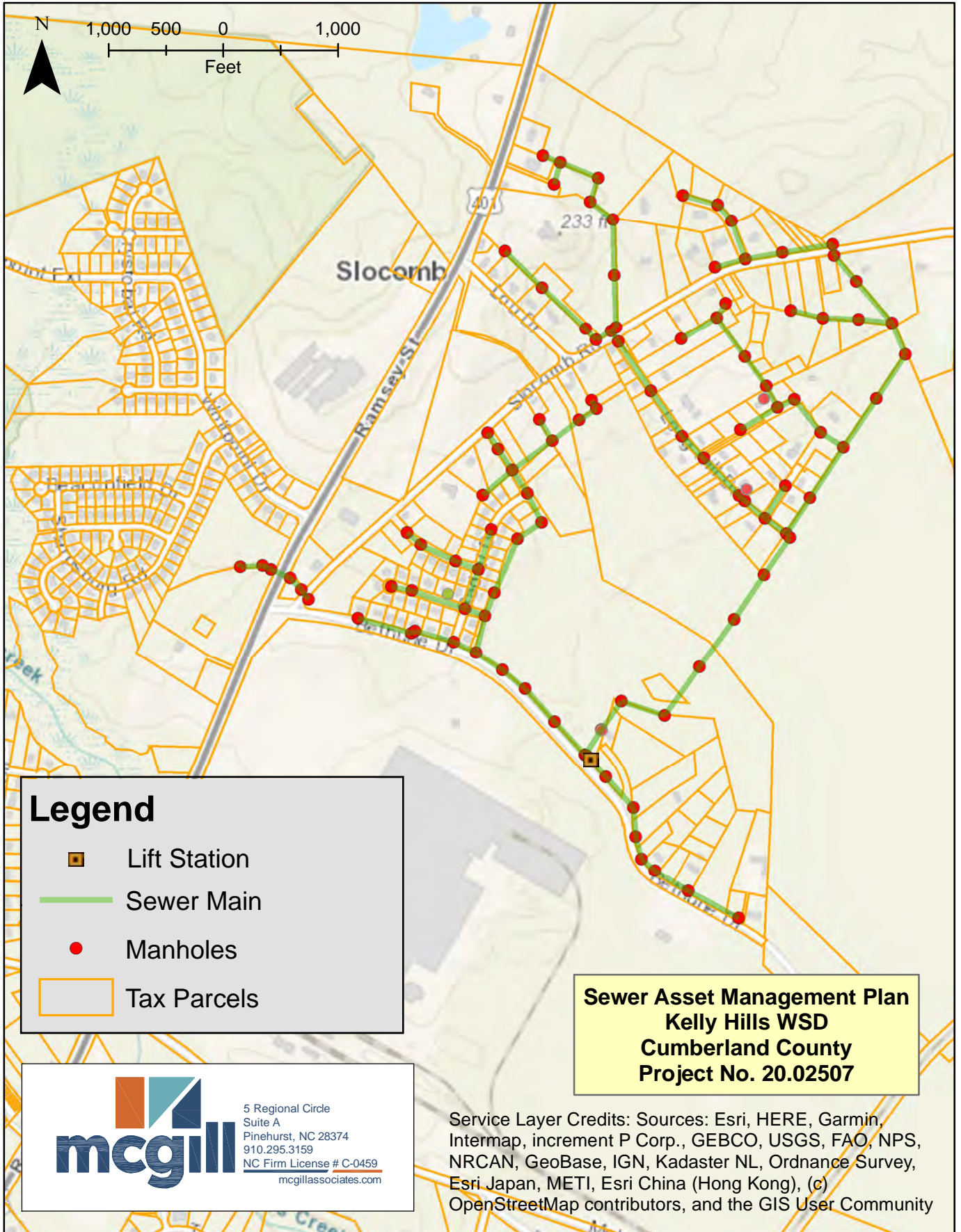
This process resulted in the development of a 10-year Capital Improvements Plan (CIP) to guide the District with scheduling and financing the capital projects and equipment purchases necessary to restore its wastewater collection system. Through the AMP process, the McGill and County staff have identified approximately multiple that require rehabilitation or replacement due to their poor condition.

The purpose of this Asset Management Plan (AMP) is to document the condition of the Districts' inventoried infrastructure to assist the District with becoming more viable and proactive in the management and financing of its wastewater system. The District continues to look to its CIP to guide its next projects; therefore, it is vital that the CIP remains current to the Districts' highest priorities and provides accurate cost estimates. This assessment project was utilized for the prioritization of replacement of lines and improvement projects in the CIP.



# Kelly Hills Overall System Map

## Figure 1



**2.1 SMOKE TESTING****2.1.1 Overview**

Smoke testing is one of the most cost-effective ways to locate defects in sewer mains and laterals. In this process, artificially produced non-harmful smoke is injected into the sewer line via a blower placed over a selected manhole. The pressurized smoke travels up and down the sewer line and connections and emerges at openings in the system. This visual aide allows test crews to easily identify, record, and mark locations where defects are present. If the sewer is in good condition, one should only see smoke rising from manhole lids and house roof vents. If the line has defects, such as breaks or illegal connections, the smoke will emerge at these points.

**2.1.2 Investigation**

McGill met with County staff to identify areas that would benefit most from smoke testing. Based on the size of the Kelly Hills District, it was determined that the entire system could be smoke tested. McGill prepared a detailed map of the area based on the County's GIS database. The Fire Department and customers along the route were alerted to the upcoming testing.



### **2.1.3 Methodology**

McGill and County staff smoke tested all four and a half miles of gravity sewer lines over a period of two days to determine locations where I/I enter the wastewater collection system. For each line to be tested, County staff recommended a centrally located manhole on which to place the blower based on the manhole's accessibility and avoidance of traffic. The manhole nomenclature used by the County was utilized and the location, configuration and condition of each one was recorded.

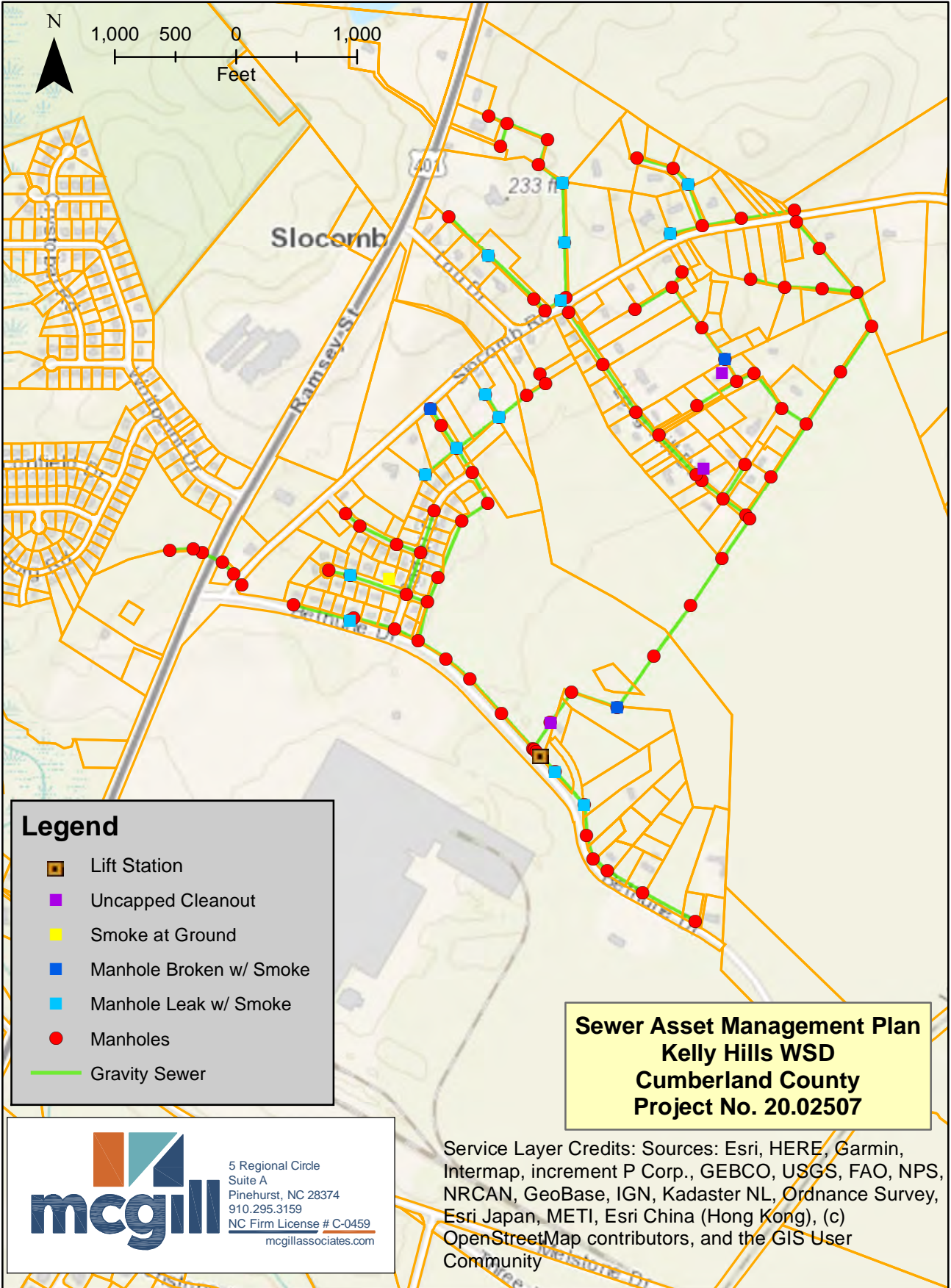
At each location, the following procedure was executed.

1. Place the blower on the manhole (with the rubber seal, if necessary).
2. Fill smoke pump up to  $\frac{3}{4}$  with liquid smoke.
3. Close all smoke pump valves.
4. Start blower and allow to warm up.
5. Open smoke pump valves.
6. Pressurize smoke pump by pumping the canister manually.
7. Once smoke begins emerging from roof vents, begin surveying for smoke emergencies indicating defects or problem areas in the pipeline.
8. For each defect, record the opening type, address, manhole identifier, and notes.
9. Additionally, mark each defect with paint.

This process continued until all visible defects were marked and recorded. Figure 2 shows some problematic system openings.

# Kelly Hills Smoke Testing Map

## Figure 2



**Legend**

-  Lift Station
-  Uncapped Cleanout
-  Smoke at Ground
-  Manhole Broken w/ Smoke
-  Manhole Leak w/ Smoke
-  Manholes
-  Gravity Sewer

**Sewer Asset Management Plan  
Kelly Hills WSD  
Cumberland County  
Project No. 20.02507**



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## **2.2.4 Results**

The crew recorded 54 abnormal smoke outlets, which divided generally into four categories.

1. **Uncapped cleanouts:** Several cleanout caps were missing or broken. The cumulative number of broken cleanouts in the District can contribute significant I/I. County staff had repair caps on hand during the testing and were able to install new caps where needed.
2. **Broken Cleanouts:** Ground smoke was detected adjacent to the cleanout, which appeared to be damaged or below grade. Replacement of the cleanout assembly will be needed.
3. **Ground Smoke:** Ground smoke can be the result of broken lines, joint separation, etc. Any of these problems can cause significant I/I.
4. **Unsealed manholes:** Some manholes emitted excess smoke indicating cracked concrete or offset rings. Manholes located in ditches are most likely to contribute I/I.

A spreadsheet describing all smoke occurrences can be found in Appendix A and all locations were documented in the mapping information in ArcGIS for the County staff's use.

## **2.2 SEWER MAINS**

### **2.2.1 Overview**

Kelly Hills/Slocomb road sewer mains consist of polyvinyl chloride (PVC) pipe. The District's existing sewer lines range from 8-16-inches in diameter. The age of the system and system materials were confirmed by the County based records from construction of the system in 2005. Condition was determined based on visual inspection of select manholes and smoke testing of the system.

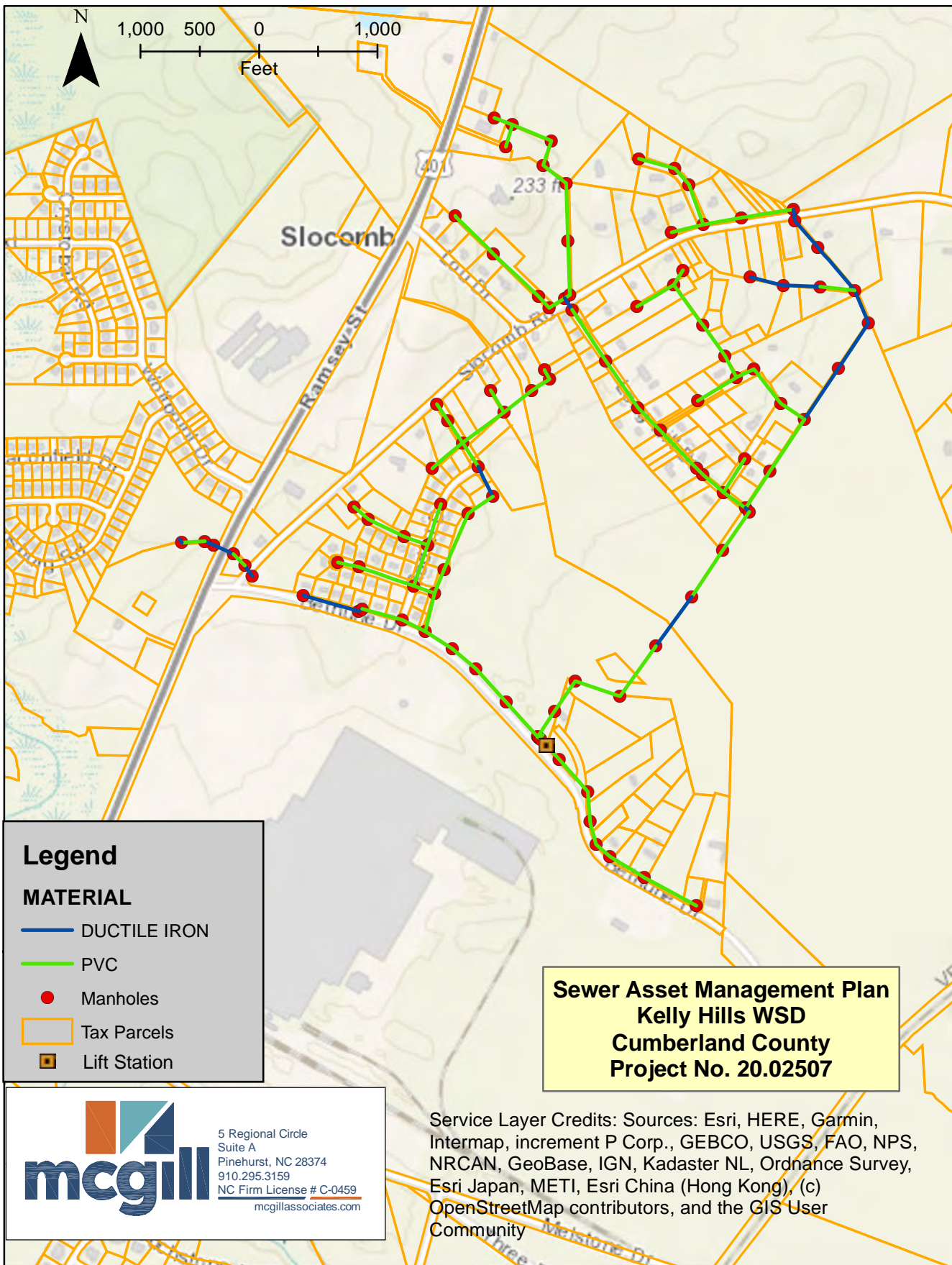
### **2.2.2 Investigation**

With District input from County staff, McGill has reviewed the district's data on the sewer mains throughout the District's collection system. The sewer main material and diameters were verified by the County and updated according to GIS records. Figure 3 shows the sewer line materials in the system, and Figure 4 shows the sewer line diameter throughout the system.

The purpose of this portion of the assessment was to create a working system inventory and then review which areas of Kelly Hills District have system components in need of replacement or rehabilitation.

# Kelly Hills Sewer Line Material Map

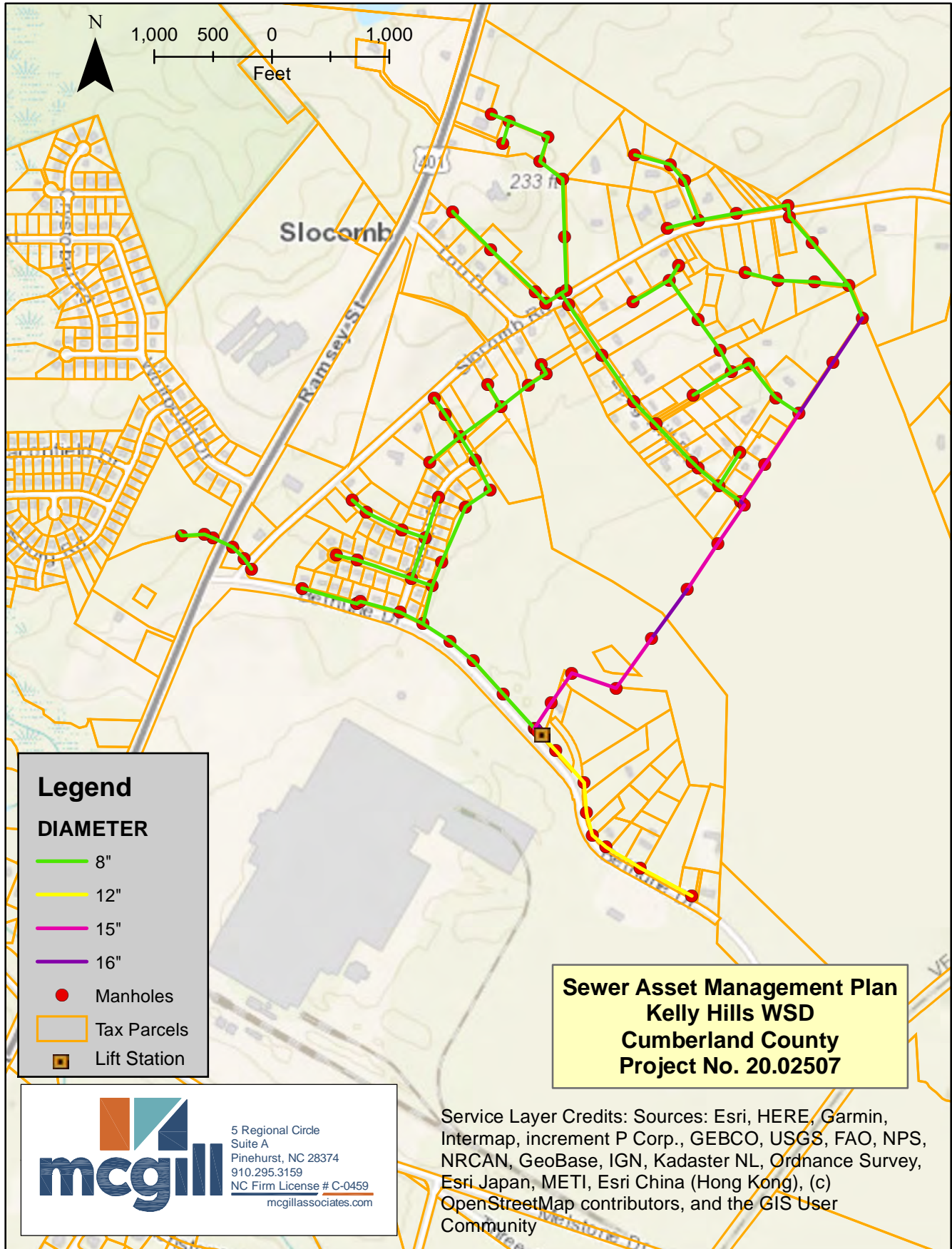
## Figure 3





# Kelly Hills Sewer Line Diameter Map

## Figure 4



### 2.2.3 Methodology

McGill reviewed the District's GIS data for the sewer collection system. County staff provided information on manholes where deterioration was suspected. Smoke testing was performed throughout the system. The County's GIS mapping was utilized to create maps that document the collection system by material and by diameter.

### 2.2.4 Results

The existing gravity sewer pipe in the sewer system ranges from 8-inch to 16-inch in diameter based on County records. All pipe diameters therefore do meet current NCDEQ minimum design standards. Based on the age of the system, the PVC and ductile iron pipe installed in 2005 has not exceeded its useful life, and therefore replacement is not recommended outright. Recommendations will include planned CCTV inspections by the County of the existing piping in order to verify existing condition and provide future updates to this AMP/CIP. Based on the age of the pipes and no documented issues from County staff, pipe in the system has been noted to be in good/excellent condition. Tables 2 and 3 show the assessment based on material and then broken out by diameter.

**Table 2: Summary of Gravity Sewer Main by Material**

<b>Material</b>	<b>Diameters (in)</b>	<b>Total LF</b>	<b>% of System</b>
<b>Polyvinyl Chloride</b>	<i>8, 12, 15</i>	<b>19,750</b>	<b>83.9%</b>
<b>Ductile Iron</b>	<i>8, 16</i>	<b>3,790</b>	<b>16.1%</b>
<b>Total LF</b>		<b>23,540</b>	<b>100%</b>



**Table 3: Summary of Gravity Sewer Main by Diameter**

<b>Diameter</b>	<b>Total LF</b>	<b>% of System</b>
<b>8"</b>	<b>17,900</b>	<b>76.0%</b>
<b>12"</b>	<b>1,670</b>	<b>7.1%</b>
<b>15"</b>	<b>2,690</b>	<b>11.4%</b>
<b>16"</b>	<b>1,280</b>	<b>5.5%</b>
<b>Total LF</b>	<b>23,540</b>	<b>100%</b>

**Table 4: Summary of Gravity Sewer Main Conditions by Age**

<b>Year Put Into Service</b>	<b>Total LF</b>	<b>% of System</b>
<b>2005</b>	<b>23,544</b>	<b>100%</b>
<b>Total LF</b>	<b>23,544</b>	<b>100%</b>

## **2.3 MANHOLE INSPECTIONS**

### **2.3.1 Overview**

Manholes are the primary access points to the sanitary sewer system and are essential for its operation and maintenance. As they allow personnel access to the sewer system, manholes are also likely culprits for allowing I/I to enter the sewer system. Manholes in low-lying areas with improperly sealed lids, manhole joints, and poor connection practices can all be sources of I/I. Storm drains or the presence of manholes in ditches and low-lying areas in Kelly Hills/Slocomb road frequently allow standing water to remain for hours or days after a storm event which can exacerbate inflow through manhole lids.

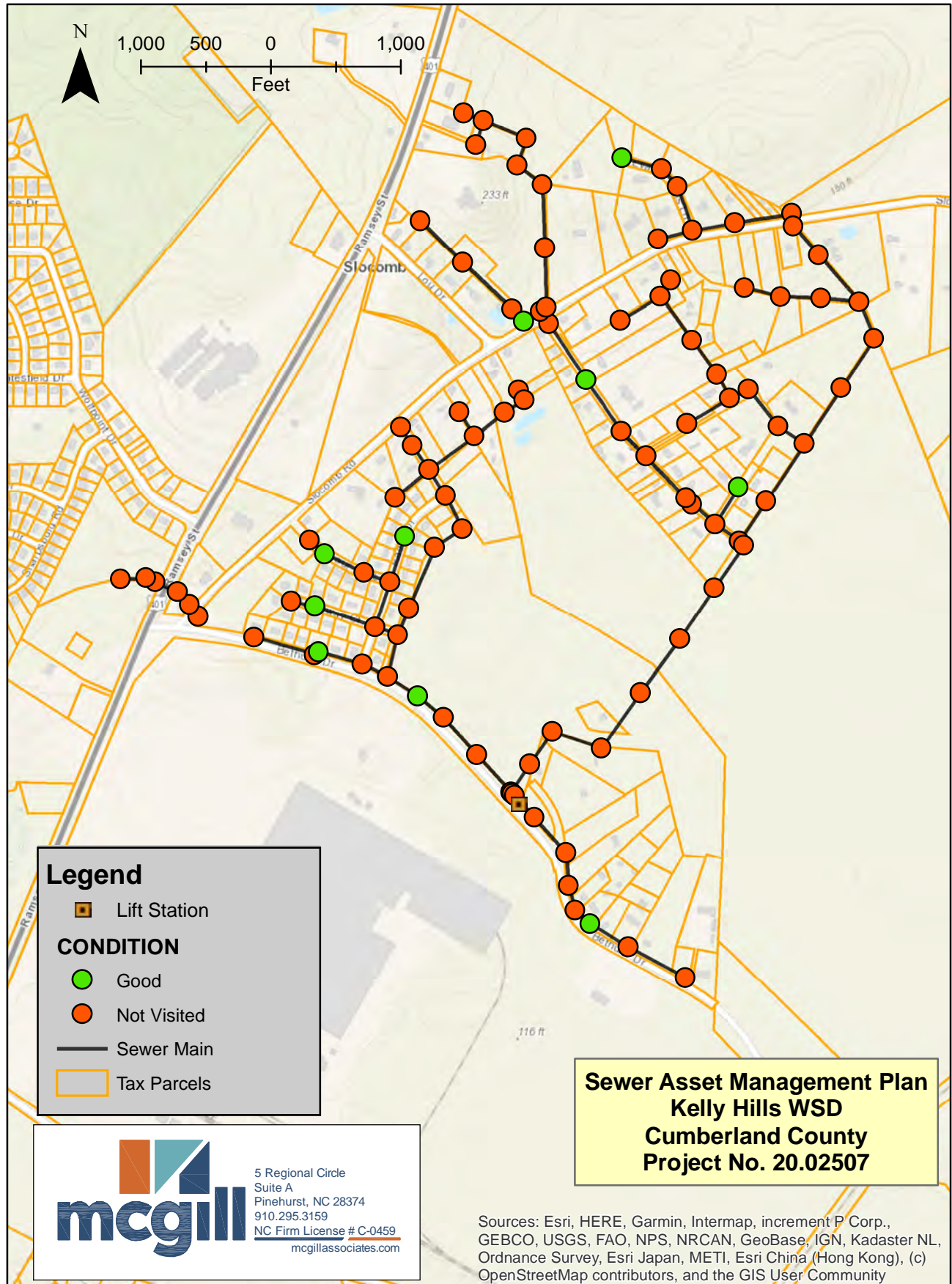
One of the most cost-effective practices for managing this intrusion is visual manhole inspections, where the various components of the manhole are rated according to their condition. Some examples of noticeable deficiencies are benches which have deteriorated from abrasion and corrosion and rings which can be moved by traffic, soil, and the freeze/thaw cycle. Defects in any aspect of the manhole can lead to I/I, structural instability, and manhole failure.

### **2.3.2 Investigation**

After the Kelly Hills system was put into service, the GIS record was created in 2006. The purpose of this portion of the assessment was to perform selected field inspections to determine an overall system assessment. A total of 100 manholes are currently inventoried by the District. Approximately ten manholes were inspected as a part of this inventory and assessment. The map of the diameter of all manholes that were accessible (not paved over or otherwise not located) are shown in Figure 3.

# Kelly Hills Manhole Condition Map

## Figure 5



### **2.3.3 Methodology**

The District of Kelly Hills/Slocomb Road sewer collection system contains 100 sewer manholes. Working with County staff, McGill inspected selected manholes within the sewer system to obtain a representative condition sampling. County staff determined which manholes to inspect in each area based on manhole location and orientation. Manholes prioritized for inspection include those located in existing ditches or low-lying areas where the manhole would be susceptible to degradation and inflow from surface water. At each manhole, the inspector recorded the manhole's location, dimensions, material, and condition of its various components. All information including photographs of the interior of the manhole and top area were uploaded into the GIS mapping.

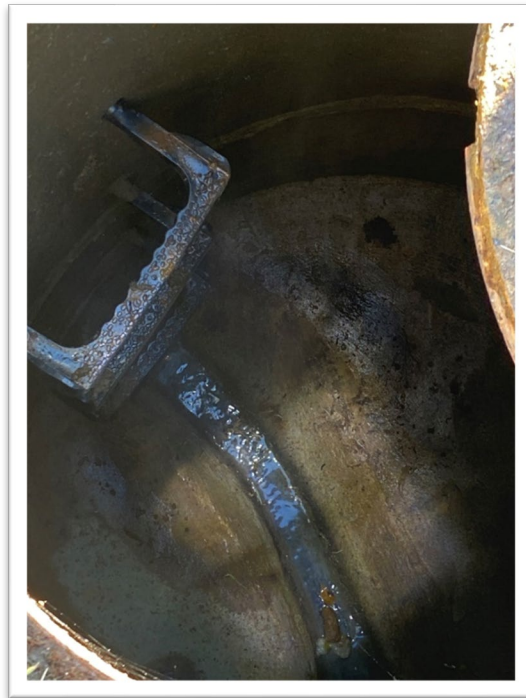
Some typical distresses include:

- Wear and asphalt paving on the cover;
- Corrosion and mud seepage on the ring and frame;
- Gas residue, corrosion, seepage, and deteriorating concrete on the cone and riser;
- Wetness, silt, root intrusion, and deteriorating concrete on the barrel;
- Dirt and corrosion on the rungs;
- Silt accumulation on the bench; and
- Misaligned pipes, obstructions, trough deteriorating, standing water, and no flow in the channel.

Based on the recorded comments, each component was assigned a condition score, and these scores were combined into an overall condition rating for each manhole- excellent, good, fair, or poor. The images below depict the interiors of various condition manholes.



*SMH-027203, Treadway Court. Precast manhole shows signs of corrosion and wear over time. Invert is well-formed.*



*SMH-027197, Bethune Drive. Precast manhole in good condition, invert well formed.*

### 2.3.4 Results

All of the ten inspected manholes are precast manholes. Due to the relative low age of the system, County staff confirmed that all of the existing manholes in Kelly Hills are precast sewer manholes. Of the manholes observed, all were noted as good to fair condition. Still, the presence of I/I and deterioration was observed in several instances. Based on the condition of those observed, it is suspected that the remaining manholes not inspected would have similar condition to those observed. Tables 5 and 6 summarize the manhole materials and condition.

**Table 5: Summary of Manholes by Material**

<b>Material</b>	<b>Total</b>
<b>Precast Concrete</b>	<b>100</b>
	<b>100</b>

**Table 6: Summary of Manholes by Condition**

<b>Condition</b>	<b>Total</b>
<b>Good-Fair</b>	<b>10</b>
<b>Unknown</b>	<b>90</b>
	<b>100</b>

The County maintains its collection system using the ESRI platform and includes the attribute data for each manhole. A spreadsheet including condition comments for each manhole can be found in Appendix A.



## 2.4 LIFT STATION

### 2.4.1 Overview

The Kelly Hills Lift Station is owned and operated by Fayetteville PWC. The station includes a flow meter that is used for recording flow generated by the Kelly Hills Sewer Collection System. The monthly records from that station were provided by the County and have used to develop an average use per user for the District. The results of the analysis are below.

Lift Station Design Capacity	100,000 GPD
Metered Average Daily Use	16,900 GPD
Permitted, Not Yet Tributary Flow	29,520 GPD
<i>Pending Development Usage</i>	<i>41,400 GPD</i>
Lift Station Available Capacity*	<b>53,580 GPD</b>

\*Does not include pending development usage. Available capacity including pending amount is 12,150 GPD.



Recommendations for various sewer system improvements to include the gravity sewer pipe and manholes in the collection system include general recommendations, high priority projects (within 10-years) and future projects (past the 10-year planning window). General recommendations are typically less costly and can be implemented more quickly, whereas high priority projects may require financial assistance and be undertaken in phases.

### **3.1 GENERAL RECOMMENDATIONS**

#### **3.1.1 *Smoke Testing***

Smoke testing is a valuable tool that can be used to locate broken pipe, cleanouts, or manholes that need repair. Any of these issues can be a source for the inflow and infiltration (I&I) of surface water into the sewer collection system. It is recommended that the District utilize smoke testing on an “as needed” basis to troubleshoot possible problem areas. The most common repairs that would result from smoke testing include replacing missing or broken cleanout caps and removing buildup from manholes. Other repairs that can be performed at this time are patching the exterior concrete or replacing the rings/lids of manholes identified to be leaking during smoke testing. These may be contributing to significant I/I into the wastewater collection system. Similarly, line breaks in flooded areas should also be addressed promptly. It is also recommended that the District continue to conduct regular smoke testing to monitor the system’s ongoing wear and identify specific areas for improvement.

#### **3.1.2 *Video Evaluations***

Based on information provided by the County, video evaluations were not performed as part of the system inventory. County staff reports that no video evaluations have been performed on the collection system to date. It is recommended that the County plan to perform video evaluation of the system as a part of O&M in order to stay vigilant concerning potential issues within the collection system.

### **3.1.3 Manhole Inspections**

Manhole inspections uncovered some infrastructure deficiencies which can be repaired immediately to improve the condition and function of the wastewater collection system. The full list of manholes and their field assessment is included in Appendix A. Manhole rehabilitation and replacement is the priority work that is targeted by the CIP. The proposed projects are divided out on an annual basis in order to include the improvements as a reasonable component of annual budgeting.

### **3.1.4 Flow Monitoring**

The District and McGill have discussed that flow monitoring is not needed at this time. Should the County begin to suspect the presence of I&I, they will engage in flow monitoring to verify as needed. The PWC Lift Station does provide for metering of flow received within the district. It is recommended within the CIP that the County install an in-line flow meter within the collection system just upstream of the lift station, in order to assist with recording of data and calibration with the PWC maintained lift station.

## 3.2 PRIORITY PROJECTS

### 3.2.1 *Manhole Rehabilitation Projects*

In these projects, manholes will be repaired and lined. The projects are scoped to be undertaken every 3 years. Each project is priority targeting any manhole deficiencies or evidence of I/I observed during manhole inspections or leaks based on the results of the smoke testing. There are a range of issues from broken risers to cracks in the frame of the manhole that warrant various repairs. To reduce the amount of I/I that enters the system it is imperative to repair these manholes. The project will be ongoing to spread out the cost for the County over a 10-year period. There are 100 manholes in the system, and for planning purposes it is assumed that 50% of the manholes would benefit from rehabilitation and lining. In order to fit a reasonable budgeting target, the rehabilitation of those 50 manholes is broken into four projects, which are included in the CIP separately, but can be combined or modified as needed given annual budgetary considerations. The projects also include replacement of existing cleanout assemblies for select residences. The results of the smoke testing identified that some cleanouts were damaged below grade, therefore replacement of the assembly would be necessary.

This project is recommended to be pursued with a manhole rehabilitation specialty company with scopes large enough to get competitive pricing for each mobilization. The manholes proposed for rehabilitation or replacement range in depth; therefore an average depth of seven vertical feet (VF) was used per manhole for estimating purposes. The capital improvements plan breaks this project into four phases with a budget of approximately \$81,000 every three years over a 10-year span with the exception of year four, if the County elects to perform the flow monitoring improvement project, as outlined in Table 7. The total cost of the manhole rehabilitation projects is estimated to be \$324,000.

**Table 7: Preliminary Opinion of Probable Cost for Manhole Rehabilitation Projects**

Item	Description	Units	Quantity	Unit Price	Total Cost
1	Mobilization	LS	3%	N/A	\$ 1,900
2	Rehabilitate Existing Manhole	VF	84	\$ 500	\$ 42,000
3	Additional Manhole Repairs	LS	1	\$ 10,000	\$ 10,000
4	Asphalt Surface Restoration	LS	1	\$ 8,500	\$ 8,500
5	Replace Cleanout Assembly on Existing Service	EA	3	\$ 1,100	\$ 3,300
<b>Construction Subtotal</b>					<b>\$ 65,700</b>
Contingency (15%)					\$ 9,800
Engineering Coordination					\$ 5,500
<b>Total Base Project Cost</b>					<b>\$ 81,000</b>

*\*Cost estimates are based on the knowledge of a professional engineer based on 2024 construction costs and are subject to change due to bidding environment and other factors.*

**3.2.2 Flow Monitoring Improvement Project**

This project includes installing two in-line flow monitoring devices on the two downstream collection lines within the sewer system. These devices will allow the County to monitor its own sewer flow. This data can be utilized by staff for planning and budgeting purposes.

The project includes two 8-inch electromagnetic flow meters in a precast underground bypass vault with associated piping and appurtenances. The meters will be installed on the County’s 12-inch and 15-inch lines outside of the existing lift station. The preliminary cost estimate for this project is \$103,900 as outlined in Table 8 below.

**Table 8: Preliminary Opinion of Probable Cost for Flow Monitoring Improvements Project**

Item	Description	Units	Quantity	Unit Price	Total Cost
1	Mobilization	LS	3%	N/A	\$ 2,400
2	8-inch Mag Meter	EA	2	\$ 25,000	\$ 50,000
3	Precast Concrete Valve Vault	EA	2	\$ 8,000	\$ 16,000
4	Piping, Valves, Fittings	LS	1	\$ 15,000	\$ 15,000
<b>Construction Subtotal</b>					<b>\$ 83,400</b>
Construction Contingency (15%)					\$ 12,500
Engineering Coordination					\$ 8,000
<b>Total Base Project Cost</b>					<b>\$ 103,900</b>

*\*Cost estimates are based on the knowledge of a professional engineer based on 2024 construction costs and are subject to change due to bidding environment and other factors.*

### **3.3 CIP PROJECTS SUMMARY**

The purpose of this asset management plan was to document the condition of the Kelly Hills sewer infrastructure to assist the County with becoming more viable and proactive in the management and financing of its wastewater system. The County intends to look to its CIP to guide its next project; therefore, it is vital that the CIP be established as an accurate depiction of current conditions and reflect the Districts' highest priorities with accurate cost estimates. The development of this AMP will serve as a positive step towards ensuring that the District can maintain its level of service agreement.

Sewer manhole rehabilitation and cleanout replacement was evaluated based on current staff input and the results of the field inspections. The existing manholes and cleanouts were divided into projects recommended for the next 10-years.

McGill prepared cost estimates for all projects based on current materials and construction costs. The 10-year CIP is intended to be adopted by the District to guide its selection of sewer system improvement projects over the next two decades. The cost summary for the 10-year CIP is shown below in Table 9.

**Table 7: CIP Cost Summary**

Year <sup>1</sup>	Manhole Rehabilitation Project 1	Flow Monitoring Improvements	Manhole Rehabilitation Project 2	Manhole Rehabilitation Project 3	Manhole Rehabilitation Project 4	TOTAL COST
1	\$ 81,000.00	\$ -	\$ -	\$ -	\$ -	\$ 81,000.00
2	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3	\$ -	\$ 103,900.00	\$ -	\$ -	\$ -	\$ 103,900.00
4	\$ -	\$ -	\$ 81,000.00	\$ -	\$ -	\$ 81,000.00
5	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
7	\$ -	\$ -	\$ -	\$ 81,000.00	\$ -	\$ 81,000.00
8	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
9	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
10	\$ -	\$ -	\$ -	\$ -	\$ 81,000.00	\$ 81,000.00
<b>TOTAL ESTIMATED CIP COST</b>						<b>\$ 427,900.00</b>

Notes:

1: Considering timeline for adoption of this plan and County budget planning cycle, Year 1 is anticipated to be FY 2026



## 4.0

## OPERATIONS AND MAINTENANCE PLAN

### 4.1 GENERAL RECOMMENDATIONS

The purpose of an Operations and Maintenance (O&M) Program is to provide an organized and cost-effective approach to ongoing maintenance, repair and replacement activities that will maintain the sewer collection system, so it performs as intended and meets the requirements of the sewer utility's System-Wide Collection System Permit, issued under North Carolina General Statutes Article 21 of Chapter 143.

This section provides a general description of proactive O&M, which can be defined as scheduled maintenance activities (preventive maintenance), performed on a regular basis in order to achieve the highest level of system performance using available resources and minimizing failures that can result in Sewer System Overflows (SSOs)

Developing an O&M Program begins with accurate records of infrastructure inventory, asset locations and physical condition. Coupled with work records and system performance history, preventive maintenance schedules can be developed to efficiently address general system needs, from cleaning and debris removal to site-specific maintenance work such as cutting and repair work.

The following elements provide the foundation for an effective O&M program:

- Maintain up-to-date wastewater treatment plant equipment documentation, sewer collection system maps and related work history and operational data.
- Develop a routine preventive O&M program and activities for staff and contractors maintaining the sewer collection system and a system to document scheduled activities.
- Develop a rehabilitation and replacement plan identifying and prioritizing system deficiencies and implement short- and long-term actions to address the deficiencies.
- Develop and implement training programs to build technical competence and emergency preparedness.
- Develop and provide equipment and replacement part inventories, including critical replacement parts.

## **Sewer System Mapping**

Sewer system maps and related databases are typically managed using a Geographic Information System (GIS). The District of Kelly Hills/ Slocomb Road currently utilizes ESRI as the GIS platform from which to manage the utility systems. This GIS mapping is supported by a database that records sewer main size, material types, and locations of manholes and clean-out connections. The platform has the ability to store more information that is currently being utilized by the County, including invert and rim elevations and other attributes of system appurtenances. If County intends to utilize the GIS platform for managing and recording maintenance performed and planned, it is recommended that the County investigate alternative software to ensure that they are utilizing a software that meets their needs with respect to budget.

The GIS database should be updated on a regular basis. Software applications such as work order systems are available to allow field staff to update GIS data as inspection and maintenance activities are completed. Other applications can also allow staff to update and edit maps. Field information that was gathered by McGill and County staff as a part of this assessment is now included in the County's GIS system database for future reference.

GIS can organize work history along with operational data, inspection records and images to provide managers, operations staff and engineers with powerful data sets to track current resource allocations and forecast short and long-term operational and capital needs. Outcomes of detailed analysis such as recommended sewer main rehabilitation work versus sewer overflows can be mapped to present the relationship visually for ease of understanding.

## **Preventive Operation and Maintenance (O&M)**

Preventive maintenance is performing routine and scheduled maintenance activities before wastewater treatment plant and lift station equipment or buried infrastructure fails, for the purpose of extending useful life, reducing overall operating costs, and increasing system reliability. This proactive approach to maintenance work is more efficient and cost effective than reactive and curative operations. Preventive maintenance activities will also help operations staff to better understand the wastewater treatment plant equipment, lift station equipment, and collection system components and how they work under various conditions. This knowledge is essential to setting maintenance priorities and developing the scope and timing of long-term rehabilitation and replacement projects.

## **Scheduled Cleaning of Sewers**

EPA recommends, at a minimum, that 100% of sewer mains should be cleaned every five (5) years, or 20% of the system annually. The sewer utility's Collection System Operating Permit requires 10% of the gravity sewers to be cleaned annually. High pressure jetting is the most common approach using various spray nozzles for general cleaning and debris removal. Mechanical cutters are used to address root intrusion and cleaning agents can be added to help remove fats, oils, and grease (FOG).

More frequent cleaning is scheduled for areas with a history of heavy debris, grease buildup and roots. CCTV inspections are also used to identify areas to clean more often, such as sections with minor defects such as offset joints and service taps protruding into the main line. Sewer sections near siphons are cleaned more frequently to ensure continuous and uninterrupted operation.

As part of the O&M Program, a master list of cleaning operations, priority locations and scheduling can be incorporated into GIS. Maps can be produced to define work areas, schedule resources, including contracted services, track progress and task completion. Updating GIS maintenance operations data (partial blockages found, debris quantity, etc.)

will help managers adjust cleaning frequency and area boundaries as needed to increase program efficiency, reduce sewer blockages, and avoid SSOs.

## **Routine Visual Inspections**

Routine inspections are used to assess the condition of lift stations, manholes and surface facilities, recording general conditions and evidence of possible structural problems or failures (offset structures, etc.), corrosion, surcharging, overflows and excessive Inflow and Infiltration (I&I). Work orders are generated based on inspection records to effect operational adjustments, scheduling more detailed inspections and/or making necessary repairs.

## **Manhole Inspection Program**

Manhole inspections keep the asset inventory up-to-date and are used not only to update collection system maps, but to determine structural condition. During manhole inspections, a complete inventory is taken of each manhole including construction materials, ring size, depth to invert, flow conditions and evidence of problems. The National Association of Sewer Service Companies (NASSCO) Manhole Assessment and Certification Program (MACP) may be adopted or used as a guide to ensure consistency and reliability of evaluation and ranking methodology.

The results from routine manhole inspections and monitoring are used to prioritize areas needing CCTV inspections to assess pipe condition such as manholes with evidence of slow flow or surcharging. Information is recorded and used to schedule maintenance and repairs.

## **CCTV Inspection Program**

While routine cleaning and visual inspection are used to assess the condition of surface facilities and manholes, CCTV video inspections are the primary method used to assess the condition of the sewer pipes. Using conventional defect criteria is highly recommended to provide standardization and consistency in sewer pipe condition

assessment and ranking. The NASSCO Pipeline Assessment and Certification Program (PACP) may be adopted or used as a guide to ensure consistency and reliability of evaluation and ranking methodology.

## **Maintenance Activity Records**

Detailed records and daily logs of O&M work provide valuable information to help managers evaluate the effectiveness of maintenance activities and make adjustments to optimize the use of limited resources. Equipment, manpower and other resources are tracked along with detailed descriptions of defects and/or obstructions encountered including debris, FOG, structural failures, etc. Maintenance work resulting in system modifications or extensions is required to be incorporated into record drawings and system maps. Scheduled testing of emergency and standby equipment is also a requirement of the collection system permit.

These records are required to be reviewed periodically to identify problems that cannot be resolved in a short period of time in order to develop a plan to address the problem(s). Maintaining these records for an extended period of time (5-years or more) will also provide accurate reference points of maintenance investments made over time that will track the effectiveness of operation and maintenance activities.

In the event of a sewer spill or system overflow, maintenance records will need to provide sufficient detail to satisfy reporting requirements for the event, including location(s), volume of wastewater, corrective actions, etc. This data may also be integrated into GIS to allow mapping of these events over time in order to identify patterns and/or trends that will assist with scheduling maintenance and planning rehabilitation and other capital improvements.

## **Resolution of Customer Complaints**

Customer complaints are primarily for sewer backups and odors. Sewer backups require an immediate response to diagnose and resolve the problem. These complaints can occur outside normal business hours, significantly escalating costs. Detailed records of the problems found, and the resources needed to address the failed condition, provide valuable feedback for making adjustments to the preventive maintenance program that can reduce these types of calls and help lower overall maintenance costs.

These records can also identify areas where private service laterals frequently fail. Notifying customers in these areas will allow them the opportunity to address deficiencies proactively, which will also help reduce customer “emergency” calls.

## **Capital Improvements Plan**

A Capital Improvements Plan (CIP) is required by the collection system permit to identify rehabilitation, replacement and expansion needs of the system. The CIP is required to address the short and long-term needs of the system, covering at least a 3 to 5-year planning period, and must include the estimated cost of each capital project.

CIP development incorporates maintenance activity, cleaning and inspection records, and system performance data that may include flow monitoring and hydraulic modeling to evaluate the existing system and to recommend improvements needed to correct existing deficiencies, and ensure adequate capacity is maintained throughout the system.

Capital planning includes consideration of on-going funding for rehabilitation and replacement of the collection system as it wears out, and potential upgrades for expansion as needed.

## **Training Program**

Training programs provide a mechanism for educating employees and establishing their technical competence to perform operations, maintenance, and emergency responses safely and effectively. A combination of in-house skill training and specialized training purchased or provided through state and national associations, conferences and vendor training programs are typically used to build and enhance skills for performing daily work duties. Periodic training reinforces previous efforts, as people often overlook things that are used infrequently. It also provides an opportunity to train new staff and learn about new problems, new techniques, and changes in equipment.

Emergency training educates system personnel about emergency situations and resulting effects on the wastewater system, public health, and environmental impacts. It also provides an opportunity to practice responses. Good record keeping ensures personnel are properly trained and prepared to effectively operate and maintain the collection system under any given circumstance. Regular review of training records is essential for keeping content up-to-date and maintaining proper employee awareness.

## **Equipment and Replacement Parts**

A reasonable supply of equipment and replacement parts should be maintained to fully support all operations and maintenance activities. A detailed inventory is essential to ensure availability under normal operations and emergency conditions. Specialized equipment or parts may be too costly to keep in stock, so arrangements with vendors and/or contractors may be necessary to ensure availability during non-business hours or during emergencies.



## 4.2 STAFFING RECOMMENDATIONS

Cumberland County is responsible for three wastewater collection systems and one water system: NORCRESS, Overhills, Kelly Hills, and Southpoint Water System. While each of these districts maintains its own operating budget, the Board leadership and operational management is performed solely by Cumberland County. Therefore, in consideration of the typical utility system management and operations and maintenance that is necessary for maintaining each of the systems, McGill has considered all of the four utility systems cumulatively. While each system could be analyzed separately, considering the systems together is more consistent with actual management of the systems.

Typical metrics for analyzing full-time equivalent (FTE, representing quantity full-time workers) are based on either the population served by the system or by miles of utility piping (water main or sewer line) within each system. For reference, Table 8 below summarizes the customers and piping in each of the County’s utility systems.

**Table 8: Utility System Comparison**

DISTRICT	Number of Connections		Paying Avail. Fee	Pipe in System (mi.)
	Water	Sewer		
<b>Southpoint</b>	84		129	2.8
<b>Kelly Hills</b>		102	166	4.5
<b>Overhills</b>		107	318	4.0
<b>NORCRESS</b>		452	666	41.1
<b>TOTALS</b>	<b>84</b>	<b>661</b>	<b>1279</b>	<b>52.4</b>

**Table 9: Typical Population vs. Pipe Length**

<b>Population</b>	<b>Pipe in System (mi.)</b>
0-100	5
101-500	5
501-3300	21
3301-10000	62

The typical sizes of utility systems from a community system EPA study<sup>1</sup> are shown in Table 9, and are generally consistent when compared to the County’s systems. This study was selected as a basis for comparison due to its comprehensive nature, having included water systems nationwide in its breadth. NORCRESS is the exception when compared to Table 9. This is mostly likely indicative of the system serving a more rural population where the connection density is less, and resulting from the length of force main piping in the system that increases the overall length but does not contribute to population density. Overall, these metrics were found to be reasonably consistent with the County’s systems. Similarly, the data is consistent regardless of whether the utility system is a water systems or wastewater collection system.

The objective is to make budget-level staffing recommendations for the County’s utility systems based on what is typical across the industry and other utility systems of comparable size. The EPA study utilized provides typical FTE for the roles of manager, plant operator, distribution (and collection, for our purposes), and administrative functions. All of these were considered applicable to management and operation of the County’s utility systems. Note: while the County is not responsible for plant operation in any system, the lift stations in the NORCRESS and Overhills systems are the County’s responsibility, therefore this metric was used, albeit in a smaller percentage, to account for the management of those resources.

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<sup>1</sup> Analysis conducted using excerpts from US EPA document, “National Characteristics of Drinking Water Systems Serving 10,000 or Fewer People,” published July 2011.

Table 10 shows Further utilizing the EPA statistics as base for typical FTE for each of the positions, based on the system size in terms of miles of pipe main.

**Table 10: Average Community System Statistics**

Employee Category	System Size (miles of Main)		Mean	Cumberland County
	Pop. 500-3300	Pop. 3300-10000		
	21	62	41.5	51.7
<b>Manager FTE</b> per mile	0.6	1.1	0.85	1.06
	0.029	0.018	0.020	0.020
<b>Plant Operator FTE</b> per mile	0.6	1.3	0.95	1.03
	0.029	0.021	0.023	0.023
<b>Distribution FTE</b> per mile	0.8	2.5	1.65	2.06
	0.038	0.040	0.040	0.040
<b>Administrative FTE</b> per mile	0.6	1.5	1.05	1.31
	0.029	0.024	0.025	0.025

The green highlighted cells are the calculated FTEs that were applied to estimate staffing size based on the quantity of pipe across the County’s four utility systems. Those calculated FTEs are based on the size of systems managed by the County and reasonable estimate of staffing needed for these systems.

Each of the FTEs is applied to each respective employee category. McGill utilized wage information from Zip Recruiter and a benefits multiplier of 1.38 from the U.S. Bureau of Labor Statistics to develop the summary shown in Table 11.

**Table 11: Overall Salary Estimates**

Employee Category	Hourly Rate	Annual Salary	Ben. Mult.	Total	Applied FTE	Applied Budget Cost
Manager	\$38.50	\$80,080.00	1.38	\$110,510.40	1.06	\$117,000
Operator	\$24.52	\$51,001.60	1.38	\$70,382.21	1.03	\$72,700
Distribution	\$23.57	\$49,025.60	1.38	\$67,655.33	2.06	\$139,100
Administrative	\$21.33	\$44,366.40	1.38	\$61,225.63	1.31	\$80,100
<b>Total Applied Budget Cost Based FTEs</b>						<b>\$408,900</b>

Utilizing industry metrics and comparing to systems of comparable size, McGill offers the proceeding section as a general staffing recommendation. This section and these budget values are provided for preliminary planning purposes only.

Staffing levels appear to be reasonable based on the District's ability to operate and maintain the system while providing a reliable level service to its customers.

While this budget number is higher than the current budget staffing, consideration should also be given to the cumulative effect cost to the County for contracted operation and distribution support in the NORCRESS and Kelly Hills district.

# **APPENDICES**



## **Appendix A**

### **Manhole Inspection List**



# Kelly Hills Manhole Inspection

**DATE:** January 17th, 2024

<b>FACILITYID</b>	<b>MH ID NO.</b>	<b>CONDITION</b>
115136	SMH027236	Good
115167	SMH027267	Good
115168	SMH027268	Good
115098	SMH027198	Good
115101	SMH027201	Good
115103	SMH027203	Good
115109	SMH027209	Good
115113	SMH027213	Good
115125	SMH027225	Good
115188	SMH027287	Good

## **Appendix B**

### **Smoke Testing Results List**

## Kelly Hills Smoke Testing Manholes

Date: September 21, 28, 2023		
Manhole ID	Status	Notes
SMH027233	Leak	Smoke around lid
SMH027234	Leak	Smoke around lid
SMH027246	Broken	
SMH027248	Seal	Smoke from lid
SMH027258	Seal	Smoke from collar
SMH027259	Seal	Smoke around lid
SMH027264	Leak	From around bottom of mh
SMH027265	Leak	
SMH027197	Leak	Leak around the lid
SMH027198	Seal	Smoke around lid
SMH027203	Leak	Smoke around rim
SMH027209	Seal	Smoke around lid
SMH027214	Leak	Smoking from top
SMH027215	Leak	
SMH027218	Broken	Cracked ring
SMH027219	Leak	
SMH027220	Leak	
SMH027223	Leak	
SMH027226	Leak	
SMH027277	Broken	
SMH027279	Seal	Smoke around concrete collar
SMH027283	Leak	
SMH027284	Leak	
SMH027288	Seal	Smoke around lid

<b>Kelly Hills Smoke Testing Cleanouts</b>		
<b>Date: September 21, 28, 2023</b>		
<b>Facility ID</b>	<b>Status</b>	<b>Notes</b>
33904	Broken	Broken cap
33991	Broken	Broken no cap
34012	Broken	Needs cap 9/28/2023 no cap
33889	Broken	
33908	Broken	
33961	Broken	Both valves broken
33895	Broken	
33990	Broken	cleanout cap repaired
33927	Broken	smoking from sides,burnt
33945	Broken	
34014	Broken	
33972	Broken	Missing lid covers
34029	Broken	
33913	Broken	
33916	Broken	
33985	Broken	broken cap
34033	Broken	Replace whole top
33926	Broken	Broken cap unable to open
33937	Broken	CO broken from bush hogging
34031	Broken	Around lid cracked
33966	Broken	
33976	Broken	CO in yard house
33906	Broken	Repaired
33964	Broken	Vacant lot
33955	Broken	Possible I&I issue.
33901	Broken	No cap repaired
33910	Broken	Broken cap in yard, cap replaced



## **Appendix C**

### **Wastewater Collection System Permit**



Michael F. Easley, Governor  
William G. Ross Jr., Secretary  
North Carolina Department of Environment and Natural Resources  
Alan W. Klimek, P.E. Director  
Division of Water Quality

October 27, 2003

Mr. Joseph Glass  
City of Fayetteville,  
Public Works Commission  
PO Drawer 1089  
Fayetteville, NC 28302

**SUBJECT: Permit No. WQ0023202  
Kelly Hills/Slocomb Road Water & Sewer District  
Wastewater Collection System Extension  
Cumberland County**

Dear Mr. Glass:

In accordance with your application received October 23, 2003, we are forwarding herewith Permit No. WQ0023202, dated October 27, 2003, to the City of Fayetteville, Public Works Commission for the construction and operation of the subject wastewater collection system extension. This permit shall be effective from the date of issuance until rescinded and shall be subject to the conditions and limitations as specified therein. This cover letter shall be considered a part of this permit and is therefore incorporated therein by reference.

Please pay particular attention to Permit Condition 3 which requires that the wastewater collection facilities be properly operated and maintained in accordance with 15A NCAC 2H .0227 or any individual system-wide collection system permit issued to the Permittee.

Permitting of this project does not constitute an acceptance of any part of the project that does not meet 15A NCAC 2H .0200; the Division of Water Quality's (Division) Gravity Sewer Minimum Design Criteria adopted February 12, 1996 as applicable; and the Division's Minimum Design Criteria for the Fast-Track Permitting of Pump Stations and Force Mains adopted June 1, 2000 as applicable, unless specifically mentioned therein. Division approval is based on acceptance of the certification provided by the North Carolina-licensed Professional Engineer named in the application. It shall be the Permittee's responsibility to ensure that the as-constructed project meets the appropriate design criteria and rules. Failure to comply may result in penalties in accordance with North Carolina General Statute § 143-215.6A through § 143-215.6C, construction of additional or replacement wastewater collection facilities, and/or referral of the North Carolina-licensed Professional Engineer to the licensing board.

In accordance with provisions of Article 21 of Chapter 143, General Statutes of North Carolina as amended, and other applicable Laws, Rules, and Regulations, permission is hereby granted to the City of Fayetteville, Public Works Commission for the construction and operation of





Mr. Joseph Glass  
Page 2  
October 27, 2003

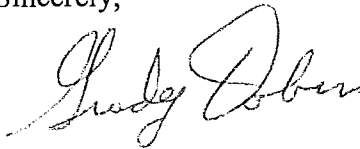
approximately 18,811 linear feet of 8-inch gravity sewer; as well as approximately 1,699 linear feet of 12-inch gravity sewer; as well as approximately 2,664 linear feet of 15-inch gravity sewer; as well as approximately 1,258 linear feet gravity sewer; a 0.1416 mgd, 225 gpm @ 74' TDH pump station with permanent generator; as well as approximately 2,388 linear feet of 6-inch force main to serve 144 three-bedroom residences, 10 three-bedroom mobile homes and 2 two-hundred seat churches as part of the Kelly Hills/Slocumb Road Water & Sewer District project, and the discharge of 56,640 gallons per day of collected domestic wastewater into the City of Fayetteville, Public Works Commission Cross Creek Wastewater Treatment Facility's existing sewerage system, pursuant to the application received October 23, 2003 and in conformity with 15A NCAC 2H .0200; the Division's Gravity Sewer Minimum Design Criteria adopted February 12, 1996 as applicable; the Division's Minimum Design Criteria for the Fast-Track Permitting of Pump Stations and Force Mains adopted June 1, 2000 as applicable; and other supporting data subsequently filed and approved by the Department of Environment and Natural Resources and considered as part of this permit.

The sewage and wastewater collected by this system shall be treated in the City of Fayetteville, Public Works Commission Cross Creek Wastewater Treatment Facility (Permit No. NC0023957) prior to being discharged into the receiving stream.

If any parts, requirements, or limitations contained in this permit are unacceptable, you have the right to request an adjudicatory hearing upon written request within 30 days following receipt of this permit. This request must be in the form of a written petition, conforming to Chapter 150B of North Carolina General Statutes, and filed with the Office of Administrative Hearings, 6714 Mail Service Center, Raleigh, NC 27699-6714. Unless such demands are made, this permit shall be final and binding.

If you need additional information concerning this matter, please contact Grady Dobson at (910) 486-1541 extension 729.

Sincerely,



for Alan W. Klimek, P.E.

cc: Cumberland County Health Department  
Fayetteville Regional Office, Water Quality Section (WWTF Permit No. NC0023957)  
Mr. James M. Kizer, Jr., Moorman, Kizer & Reitzel, Inc.  
Water Quality Central Files  
NDPU

**NORTH CAROLINA**  
**ENVIRONMENTAL MANAGEMENT COMMISSION**  
**DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES**  
**RALEIGH**  
**WASTEWATER COLLECTION SYSTEM EXTENSION PERMIT**

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This permit shall be effective from the date of issuance until rescinded and shall be subject to the following specified conditions and limitations:

1. This permit shall become voidable unless the wastewater collection facilities are constructed in accordance with the conditions of this permit; 15A NCAC 2H .0200; the Division of Water Quality's (Division) Gravity Sewer Minimum Design Criteria adopted February 12, 1996 as applicable; the Division's Minimum Design Criteria for the Fast-Track Permitting of Pump Stations and Force Mains adopted June 1, 2000 as applicable; and other supporting materials unless specifically mentioned herein.
2. This permit shall be effective only with respect to the nature and volume of wastes described in the application and other supporting data.
3. The wastewater collection facilities shall be properly maintained and operated at all times. The Permittee shall maintain compliance with an individual system-wide collection system permit for the operation and maintenance of these facilities as required by 15A NCAC 2H .0227. If an individual permit is not required, the following performance criteria shall be met as provided in 15A NCAC 2H .0227:
  - a. The sewer system shall be effectively maintained and operated at all times to prevent discharge to land or surface waters, and any contravention of the groundwater standards in 15A NCAC 2L .0200 or the surface water standards in 15A NCAC 2B .0200.
  - b. A map of the sewer system shall be developed prior to January 1, 2004 and shall be actively maintained.
  - c. An operation and maintenance plan shall be developed and implemented.
  - d. Pump stations that are not connected to a telemetry system shall be inspected every day (i.e. 365 days per year). Pump stations that are connected to a telemetry system shall be inspected at least once per week.
  - e. High-priority sewer lines shall be inspected at least once per every six-month period of time.
  - f. A general observation of the entire sewer system shall be conducted at least once per year.
  - g. Inspection and maintenance records shall be maintained for a period of at least three years.
  - h. Overflows and bypasses shall be reported to the appropriate Division regional office in accordance with 15A NCAC 2B .0506(a), and public notice shall be provided as required by North Carolina General Statute §143-215.1C.

4. **This permit shall not be transferable.** In the event there is a desire for the wastewater collection facilities to change ownership, or there is a name change of the Permittee, a formal permit request shall be submitted to the Division accompanied by documentation from the parties involved, and other supporting materials as may be appropriate. The approval of this request shall be considered on its merits and may or may not be approved.
5. Construction of the gravity sewers, pump stations, and force mains shall be scheduled so as not to interrupt service by the existing utilities nor result in an overflow or bypass discharge of wastewater to the surface waters of the State.
6. Upon completion of construction and prior to operation of these permitted facilities, a certification, a copy of the construction record drawings, as well as supporting design calculations for any pump stations permitted as part of this project shall be received from a North Carolina-licensed Professional Engineer certifying that the facilities have been installed in accordance with this permit; 15A NCAC 2H .0200; the Division's Gravity Sewer Design Criteria adopted February 12, 1996 as applicable; the Division's Minimum Design Criteria for the Fast-Track Permitting of Pump Station and Force Main adopted June 1, 2000 as applicable; and other supporting materials. If this project is to be completed in phases and partially certified, you shall retain the responsibility to track further construction approved under the same permit, and shall provide a final certificate of completion once the entire project has been completed. A copy of the construction record drawings, indicating the facilities constructed in the phase being certified, shall be submitted with each partial certification. Mail the Engineer's Certification, one copy of the "Construction Record Drawings," and one copy of the supporting design calculations to the Non-Discharge Permitting Unit, 1617 Mail Service Center, Raleigh, NC 27699-1617.
7. A copy of the construction record drawings shall be maintained on file by the Permittee for the life of the wastewater collection facilities.
8. Failure to abide by the conditions and limitations contained in this permit; 15A NCAC 2H .0200; the Division's Gravity Sewer Design Criteria adopted February 12, 1996 as applicable; the Division's Minimum Design Criteria for the Fast-Track Permitting of Pump Station and Force Mains adopted June 1, 2000 as applicable; and other supporting materials may subject the Permittee to an enforcement action by the Division, in accordance with North Carolina General Statutes §143-215.6A through §143-215.6C.
9. In the event that the wastewater collection facilities fail to perform satisfactorily, including the creation of nuisance conditions, the Permittee shall take immediate corrective action, including those as may be required by this Division, such as the construction of additional or replacement facilities.
10. The issuance of this permit shall not exempt the Permittee from complying with any and all statutes, rules, regulations, or ordinances that may be imposed by other government agencies (local, state and federal) which have jurisdiction, including but not limited to applicable river buffer rules in 15A NCAC 2B .0200, erosion and sedimentation control requirements in 15A NCAC Ch. 4 and under the Division's General Permit NCG010000, and any requirements pertaining to wetlands under 15A NCAC 2B .0200 and 15A NCAC 2H .0500.

**11. Noncompliance Notification:**

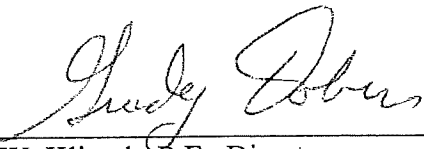
The Permittee shall report by telephone to the Fayetteville Regional Office, telephone number (910) 486-1541, as soon as possible, but in no case more than 24 hours or on the next working day, following the occurrence or first knowledge of the occurrence of either of the following:

- a. Any process unit failure, due to known or unknown reasons, that renders the facility incapable of adequate wastewater transport, such as mechanical or electrical failures of pumps, line blockage or breakage, etc.; or
- b. Any failure of a pumping station or sewer line resulting in a by-pass directly to receiving waters without treatment of all or any portion of the influent to such station or facility.

Persons reporting such occurrences by telephone shall also file a written report in letter form within five days following first knowledge of the occurrence. This report must outline the actions taken or proposed to be taken to ensure that the problem does not recur.

Permit issued this the twenty-seventh day of October 2003

NORTH CAROLINA ENVIRONMENTAL MANAGEMENT COMMISSION



for Alan W. Klimek, P.E., Director  
Division of Water Quality

By Authority of the Environmental Management Commission

**Permit Number WQ0023202**

**Fast Track Engineering Certification**

Permit No. WQ0023202  
October 27, 2003

Complete and submit this form to the permit issuing regional office with the following:

- One copy of the project record drawings (plan & profile views of sewer lines) of the wastewater collection system extension
- supporting design calculations (selected pumps, system curve, operating point, available storage if portable generator(s) or storage greater than longest past three year outage reliability option selected) for any pump stations permitted as part of this project
- Changes to the project should be clearly identified on the record drawings or in written summary form. Permit modifications are required for any changes resulting in non-compliance with this permit, regulations or minimum design criteria.

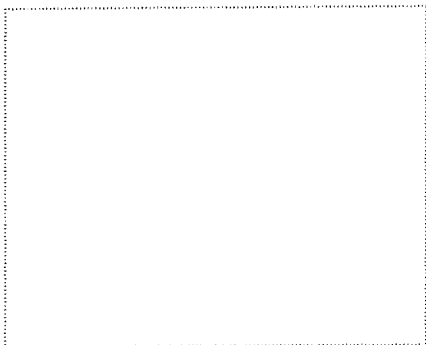
This project shall not be considered complete nor allowed to operate until this Engineer's Certification and all required supporting documentation have been received by the Division. **Therefore, it is highly recommended that this certification be sent in a manner that provides proof of receipt by the Division.**

**ENGINEER'S CERTIFICATION**

Partial                       Final

I, \_\_\_\_\_, as a duly registered Professional Engineer in the State of North Carolina, having been authorized to observe ( periodically,  weekly,  full time) the construction of the Kelly Hills/Slocomb Road Water & Sewer District, Cumberland County project for the Permittee hereby state that, to the best of my abilities, due care and diligence was used in the observation of the construction such that the construction was observed to be built within substantial compliance of this permit; 15A NCAC 2H .0200; the Division of Water Quality's (Division) Gravity Sewer Minimum Design Criteria adopted February 12, 1996 as applicable; the Division's Minimum Design Criteria for the Fast-Track Permitting of Pump Stations and Force Mains adopted June 1, 2000 as applicable; and other supporting materials.

North Carolina Professional Engineer's seal, signature, and date:



**SEND THIS FORM & SUPPORTING DOCUMENTATION WITH REQUIRED ATTACHMENTS TO THE FOLLOWING ADDRESS**

**FAYETTEVILLE REGIONAL OFFICE  
225 GREEN STREET, SUITE 714  
FAYETTEVILLE NC 28301**

The Permittee is responsible for tracking all partial certifications up until a final certification is received. Any wastewater flow made tributary to the wastewater collection system extension prior to completion of this Engineer's Certification shall be considered a violation of the permit and shall subject the Permittee to appropriate enforcement actions.



## **Appendix D**

### **PWC Agreement**



**STATE OF NORTH CAROLINA  
COUNTY OF CUMBERLAND  
SANITARY SEWER WHOLESALE AGREEMENT**

**THIS AGREEMENT** made and entered into this 24<sup>th</sup> day of September 2014 by and between the City of Fayetteville acting by and through its Public Works Commission of the City of Fayetteville (hereinafter referred to as "Commission" or "PWC") and the County of Cumberland, a North Carolina body politic acting by and through its Kelly Hills/Slocomb Road Water & Sewer District, (hereinafter referred to as "Kelly Hills").

**WITNESSETH**

**THAT, WHEREAS,** Kelly Hills owns and operates a wastewater collection system, as described in Exhibit B, that currently serves approximately 115 customers in the Kelly Hills/Slocomb Road area; and,

**WHEREAS,** Commission owns and operates wastewater treatment facilities (the "Municipal Wastewater System") and provides wholesale wastewater treatment services; and,

**WHEREAS,** Kelly Hills wishes to contract with Commission for PWC to furnish wholesale wastewater treatment service to Kelly Hills for the treatment of Kelly Hills wastewater; and ,

**WHEREAS,** Commission agrees to furnish wastewater treatment service pursuant to the terms of this agreement; and,

**WHEREAS,** Kelly Hills wishes to contract with Commission for PWC to provide operation and maintenance services to Kelly Hills for the Kelly Hills Sanitary Sewer system; and,

**WHEREAS,** Commission agrees to furnish operation and maintenance services to Kelly Hills for the Kelly Hills Sanitary Sewer system pursuant to the terms of this agreement; and,

**WHEREAS,** both parties recognize the Commission must implement and enforce a pretreatment program to control wastewater discharges from Significant Industrial Users ("SIUs") under 40 CFR Part 403 or other dischargers who require issuance of SIU or local permits.

**NOW THEREFORE,** Commission and Kelly Hills agree to the following terms and conditions:

1. Discharge Points:  
As of the Effective Date, wastewater from Kelly Hills existing sanitary sewer collection system will be discharged into the Commission's Municipal Wastewater System at the

existing entry point listed in this Section 1 and thence treated at Commission's plants as deemed appropriate. Existing entry point is PWC Lift station at 355 Bethune Drive. Kelly Hills shall not discharge into Commission's Municipal Wastewater System at any other entry point without prior written approval from the Commission. Exhibit A shows the approved discharge points.

2. Flow Measurement:

Within one hundred and twenty (120) business days from the Effective Date of this agreement, Commission shall install at Kelly Hills' expense a flow measurement device at the Kelly Hills approach main where Kelly Hills discharges wastewater into the Commission's Municipal Wastewater System. Commission at its expense, shall be responsible for maintenance and calibration of the flow measurement device and calibration shall be done annually and shall operate within the accuracy tolerances as specified by the manufacturer. Commission shall provide Kelly Hills a copy of the calibration records of the flow measurement device.

3. Basic Operations and Maintenance

A. The cost of basic operation and maintenance of the sanitary sewer collection system is built into the sanitary sewer rate being charged to Kelly Hills. Basic operation and maintenance includes:

1. Rights-of-way and/or easement maintenance to allow for accessibility to the sanitary sewer collection system.
2. Cleaning of at least 10% of the sanitary sewer collection system each year.
3. A general observation of the entire sanitary sewer collection system throughout the course of every year.
4. Semiannual inspections of all high priority lines (i.e. aerial, sub-waterway crossing, line contacting surface waters, siphon, line positioned parallel to stream banks subject to eroding, or line designated as high priority in a permit if applicable).
5. Point repair to a damaged or broken sanitary sewer main pipe, not to include replacement of multiple pipe joints.
6. Point repair to a damaged or broken sanitary sewer lateral or cleanout, not to include outright renewal of entire lateral.
7. Cleaning and rodding of clogged sanitary sewer mains and laterals.
8. Repair of manholes to include resetting of manhole ring and cover, not to include adjustments to or replacement of manhole or ring and cover; not to include repairs warranted to address I&I or corrosion issues.

- B. Other extraordinary work required or requested by Kelly Hills will be NU billed at the appropriate rate to include applicable overtime and overhead for labor, equipment and materials ( to include an amount for all direct and indirect charges) plus 10%. Examples of extraordinary work are: SSO remediation and post cleaning and inspection, work consider as a capital improvement under Financial Accounting Standards Board (FASB) standards, replacement of multiple joints of sanitary sewer pipe, renewal of a sanitary sewer lateral, installation of a new sanitary sewer lateral, elder valve installation, smokedye testing and CCTV inspection. Kelly Hills shall have the right to install themselves or to hire a contractor(s) to perform this work to PWC standards.
- C. The Commission shall at its discretion exercise the right to decline or subcontract any work required or requested by Kelly Hills that would conflict with the Commission's responsibilities and requirements for the operation and maintenance of the Commissions' sanitary sewer collection system.
- D. Commission will provide other services, upon request, but which will be billed separately and not included in the Wholesale Sewer Rate. A partial list of the other services that may be available to Kelly Hills include the following:
1. Promote participation agreements with other benefitted parties;
  2. Participation and administration of utility extension contracts;
  3. Right-of-way acquisition for land and easement requirements to be secured in the name of Kelly Hills within the limits permitted by law but not to include actions in eminent domain;
  4. Inspection services during construction;
  5. Miscellaneous services such as GIS mapping as requested.
- E. Other services requested by Kelly Hills will be NU billed at the appropriate rate to include applicable overtime and overhead for labor, equipment and materials ( to include an amount for all direct and indirect charges) plus 10%.

4. Upsizing Mains

Commission will be responsible for the cost associated with upsizing mains within the delineated Kelly Hills service as may be deemed necessary in order to meet

Commission's existing and future sanitary sewer needs which would not be otherwise required for the sanitary sewer collection system being installed by Kelly Hills pursuant to this Agreement.

5. Ownership of Sewer Lines

A. All sanitary sewer lines installed within the boundaries of the Kelly Hills Sanitary Sewer District shall be owned and operated by Kelly Hills subject to Commission's right to upsize such mains at its expense and to transmit sanitary sewer through such mains to areas beyond the Kelly Hills area.

B. Commission shall own and operate the lift station located at 355 Bethune Drive, Fayetteville, NC and the associated force main.

6. Rights-of-way and encroachments

Kelly Hills will acquire all rights-of-way and/or encroachments as may be needed for construction and maintenance of the sanitary sewer collection system as referenced herein.

7. Extension of Mains Outside Kelly Hills Service Area

Commission reserves the right to extend or continue sanitary sewer mains from such mains as initially constructed by Kelly Hills to points outside of the delineated Kelly Hills service area. Future connections or main extensions that occur outside of the delineated Kelly Hills area are not subject to this Agreement and shall be the property of Commission unless the Kelly Hills boundary is expanded by law to serve development of contiguous properties. If such extensions occur, then the Commission shall install a flow measurement device at its expense to measure all flow being generated by customers outside of the Kelly Hills Service Area. A map of showing the boundaries of the Kelly Hills service is show as Exhibit B.

8. Extension of Mains Within Kelly Hills Service Area

The further extension of or connection to mains within the delineated Kelly Hills service area will be pursuant to applicable extension and connection policies and procedures of Kelly Hills in effect at the time a request for service is made.

9. Compliance with Commission Policies and Procedures

Kelly Hills may by resolution adopt a policy whereby future customers and/or extenders of sanitary sewer infrastructure in the Kelly Hills service area will be subject to the then current applicable Commission Policies and Procedures to simplify the application process for customers with the understanding that such customers remain responsible to Kelly Hills for compliance with such policies and procedures.



10. Notification of Excessive Inflow/Infiltration

Upon notification by Commission that volumes of Kelly Hills wastewater entering Commission's lines, based on flow measuring data, exceed one hundred twenty-five percent (125%) of the average volume of sewer measured at the Discharge Point during any consecutive three-month billing period, Kelly Hills shall initiate an infiltration/inflow study to be conducted or supervised by a professional consulting engineer. Such study will provide Kelly Hills with recommendations designed to reduce infiltration/inflow to acceptable levels as delineated by the United States Environmental Protection Agency. Said study shall be made during the fiscal year immediately following notification. Corrective measures shall be taken by Kelly Hills upon receipt of and based on said infiltration/inflow study. Kelly Hills shall be responsible for all costs associated with any required infiltration/inflow study and corrective measures. Results of any infiltration/inflow study and proposed corrective measures shall be sent to Commission for review and approval.

11. New Laterals

- A. At Kelly Hills request, Commission will install new laterals in the Kelly Hills Sanitary Sewer District at Kelly Hills expense. Commission will NU bill Kelly Hills for such laterals at the appropriate rate to include applicable overtime and overhead for labor, equipment and materials (to include an amount for all direct and indirect charges) plus 10%.
- B. Kelly Hills, at its sole discretion, may install or contract for the installation of new laterals in the Kelly Hills Sanitary Sewer District.
- C. All new laterals will be designed and built to the PWC standards in effect at the time of the design and construction.

12. Monthly Billing:

- A. As of the Effective Date, the flow measuring device at the Kelly Hills connective main will be read, as nearly as practical, at regular monthly intervals. The period of time between device readings shall not be less than twenty-seven (27) days and not more than thirty-three (33) days. If Commission is unable to read the flow measuring device, for any reason, the wastewater flow shall be estimated by Commission on the basis of Kelly Hills wastewater flow for the preceding three billing periods for which readings were obtained. Bills rendered on the basis of such estimates shall be as valid as if made from actual device readings and appropriate adjustment of Kelly Hills bill shall be made at first actual reading of the flow measuring device subsequent to such estimate.
- B. The term "month" or "monthly" refers to the interval(s) transpiring between the previous meter reading date and the current meter reading date, and bills shall be rendered accordingly.

- C. The Commission will submit bills to Kelly Hills on a monthly basis for the prior month's sewer treatment service.
- D. If at the time of this Agreement's Effective Date, the flow measurement device at Kelly Hills approach main is not installed, the parties agree that billing shall continue under the existing arrangement, as specified in the Kelly Hills/Slocomb Road Water & Sewer District Sanitary Sewer Service Agreement as amended October 24, 2005 until such time that the flow measurement device is installed and calibrated.
- E. The Commission will, annually, or such time as shall be determined by Commission, perform a rate analysis to determine the rates which are applicable to serving Commission's various classes of water and sanitary sewer service. Among those classes of service will be wholesale sanitary sewer service classes, a class which includes Kelly Hills.
- F. Commission will use audited balance sheets, income statements, comparable wholesale market rate data, and return on investment financial information as the basis for determining the rates applicable to this Agreement. Commission may at its option, adjust audited financial data for changes to such financial data known or reasonably expected to occur during the period in which the billing rate will be in effect.
- G. Commission will provide at least 30 days' notice to Kelly Hills of any rate changes.
- H. The initial Wholesale Sewer Rate to be charged to Kelly Hills, including the cost of O&M, is \$ 4.1267 per 1,000 gallons, or \$ .0041267 per gallon, the rate effective January 1, 2014. This cost includes the cost of basic operation and maintenance of the sanitary sewer collection system as described in paragraph 3.

13. Capacity Charges

- A. Commission shall receive and treat up to 100,000 gallons per day of Kelly Hills wastewater, representing the projected average daily usage generated from sources within the Kelly Hills Sanitary Sewer District. Kelly Hills has purchased 32,430 gallons per day sanitary sewer treatment capacity using \$ 92,640 of FIF credits. Upon execution of this agreement Kelly Hills will purchase an additional 67,570 gallons per day of sanitary sewer treatment capacity using \$ 201,358.60 of their existing FIF credits that expire in October 2015.

Kelly Hills has the option, in the future, to purchase any or all of the remaining 50,000 gallons per day force main capacity at the then current FIF charge. Such purchases will be made in increments of at least 5% of the then current contract capacity.

- B. Kelly Hills shall, advise Commission of any anticipated growth in number of connections to its sanitary sewer system, population served and anticipated volume of wastewater as Kelly Hills becomes aware of such growth.. Commission does not anticipate any restriction on annual increase in flow from Kelly Hills, if within limits of the contract demand of 100,000 gallons per day. However, flow limits may be imposed if a regulatory agency having jurisdiction over Commission's treatment facilities requires restriction on flow increases on Commission's system.
  - C. Commission shall notify Kelly Hills if the measured average daily usage in gallons per day of wastewater reaches 80% of the contract demand.
  - D. If the measured average daily usage in gallons per day of wastewater from Kelly Hills exceeds 90% of the contract demand, Kelly Hills shall purchase additional contract demand at the current Commission capacity rate in increments of at least 5% of the existing contract demand.
14. Surcharges for Carbonaceous Biochemical Oxygen Demand (CBOD) and Suspended Solids (SS) and Total Kjeldhal Nitrogen (TKN):
- A. A surcharge for CBOD, Suspended Solids or NH<sub>3</sub> will be applied to those customers of Kelly Hills who are issued SIU or local permits ("Industrial Users"). These surcharges will be determined in accordance with the Commission Rate Schedule "Sanitary Sewer Surcharges" currently indexed as 620.05. Such surcharge billing will be determined by testing samples of wastewater from each Industrial Users' discharge at Commission's laboratories pursuant to standard test requirements and procedures of the State and Federal governments. Commission shall bill surcharges directly to the Industrial Users. The additional costs to treat wastewater in excess of limits stated above are determined by the Commission and published annually. The Commission will, from time-to-time, review and revise the surcharge applicable to Industrial Users based on testing.
  - B. Kelly Hills shall terminate sewer service to any Industrial User upon notice from the Commission that said Industrial User has failed to pay surcharges pursuant to Sections 5 or 7 or any additional fees or penalties under the City of Fayetteville's Sewer Use Ordinance.
15. Sewer Use Ordinance Requirement:
- A. The Sanitary Sewer Ordinance of the City of Fayetteville, as amended from time-to-time, shall be applicable to all Kelly Hills customers whose wastewater is discharged to Commission's Municipal Wastewater System.



- B. Kelly Hills shall be responsible for regulation of all customers who discharge wastewater through Kelly Hills system to the Commission's Municipal Wastewater System. Kelly Hills shall be responsible for enforcement of the requirements of the City of Fayetteville's Sanitary Sewer Ordinance.

16. Sewer Use Ordinance, and Pretreatment Requirements and Costs:

- A. The Sanitary Sewer Use Ordinance of the City of Fayetteville and subsequent revisions of such Ordinance to include pretreatment requirements and cost, both incorporated herein by reference, shall be applicable to the effluent of Kelly Hills' sanitary sewer being discharged into the Commission's sanitary sewer system.
- B. Kelly Hills hereby designates Commission as the agent of Kelly Hills for the purposes of implementation and enforcement of the pretreatment requirements of Kelly Hills for industrial users located in Kelly Hills' jurisdiction. Commission hereby accepts the designation of agent of Kelly Hills' jurisdiction for purposes of implementation and enforcement of the pretreatment requirements. If Commission determines the pretreatment requirements are not enforceable by Commission, then Kelly Hills shall provide timely enforcement. Kelly Hills shall continue to enforce all other provisions of the City's Sanitary Sewer Use Ordinance.
- C. Commission, on behalf of and as an agent for Kelly Hills', agrees to perform technical and administrative duties necessary to implement and enforce the pretreatment requirements, including but not limited to the following:
  - 1. Updating industrial waste survey no less than once every five (5) years;
  - 2. Providing technical services such as sampling and analysis;
  - 3. Permitting of Significant Industrial Users (SIU's);
  - 4. Conducting inspection and compliance monitoring at permitted SIU's and certain commercial users; and
  - 5. Performing enforcement activities.

In addition, Kelly Hills authorizes the Commission, as its agent, to take emergency action to stop or prevent any discharge which presents or may present an imminent danger to the health or welfare of humans, reasonably appears to threaten the environment, threatens to interfere with the operation of Commission's sanitary sewer treatment system (including the collection system and its workers' safety), or which could pass through the treatment plant and threaten the integrity of the publicly owned treatment works receiving stream.

- D. Kelly Hills, as with other Commission customers, shall be responsible for additional cost associated with treatment of sanitary sewer in excess of published limits as determined by Commission. Such pretreatment surcharge billing will be determined by testing of samples of sanitary sewer from the Kelly Hills sanitary sewer collection system at Commission's laboratories pursuant to standard test requirements and procedures of the State and Federal governments. The pretreatment surcharge procedure as it applies to commercial industrial customers is described in Commission's Rates and Policies Manual and is incorporated herein by reference.
- E. Kelly Hills shall pay Commission for actual costs incurred by Commission, including all reasonably allocated overhead costs, implementing and enforcing pretreatment requirements on behalf of Kelly Hills'. Commission shall bill Kelly Hills monthly for pretreatment costs incurred by Commission in implementing and enforcing Kelly Hills' pretreatment requirements, which shall be payable within 30 days of date of invoice.

17. Corrosion Control:

Kelly Hills shall be responsible for ensuring compliance with hydrogen sulfide discharge limits at the point(s) of discharge to the Commission's Municipal Wastewater System. The discharge of dissolved sulfide by Kelly Hills to Commission's Municipal Wastewater System at the discharge point(s) identified in Section 1 of this Agreement, are limited to the following: a daily average of 5mg/l in solution and/or 10 ppm in atmosphere and a maximum of 10 mg/l in solution and/or 30 ppm in atmosphere per day. PWC, at its own expense, shall perform all testing and as needed shall coordinate with Kelly Hills. Kelly Hills, at its own expense, shall be responsible for the addition of any chemicals or additional treatment necessary to comply with the hydrogen sulfide limit. Any addition of chemicals to control hydrogen sulfide shall be coordinated with Commission prior to introduction into the system.

18. Indemnity and Responsibilities:

Kelly Hills assumes responsibility for and shall indemnify (or defend at Commission's sole option) Commission, its successors and assigns, and hold it harmless against all injuries, liabilities, claims, damages, losses, costs and expenses, including reasonable attorney's fees and costs, personal injury or property damage, arising out of or related to 1) the construction, maintenance and operation of Kelly Hills sanitary sewer system, 2) Kelly Hill's discharge into the Commission's Municipal Wastewater System, 3) this Agreement, or 4) fines or penalties by any Federal, State or local agency or body.. Kelly Hills will not indemnify PWC for intentional or negligent acts solely attributable to PWC, its employees, agents, or contractors.

19. Suspension or Termination of Sanitary Wastewater Treatment Service:

Commission, in addition to all other legal remedies, may either terminate this Agreement or suspend sanitary sewer treatment service to Kelly Hills for:

- a) Any material default or breach of this Agreement by Kelly Hills; Fraudulent or unauthorized use of the sanitary sewer treatment service or discharge of sanitary sewer in such manner as to circumvent Commission's meter(s) serving Kelly Hills; or,
- b) Failure to pay monthly sanitary sewer bills when due and payable.
- c) No such termination or suspension, however, will be made by Commission without thirty (30) days written notice delivered to Kelly Hills personally or by mail, within which time Kelly Hills may cure any such alleged default or breach or commence in good faith to cure any such default or breach which cannot reasonably be cured within thirty (30) days, except that only seven (7) days' notice need be given under subsection (b) above.
- d) Commission's suspension of sanitary sewer service or termination of this Agreement upon any authorized grounds shall not relieve Kelly Hills of:
  - 1) Liability for the payment of sanitary sewer treatment service to the date of suspension or termination of this Agreement; nor
  - 2) Liability for any actual damages sustained by Commission.

20. Payment:

Monthly bills are payable within thirty (30) days from date thereof at P.O. Box 1089, Fayetteville, North Carolina, 28302, or its successors. A late payment charge in accordance with PWC's Schedule of Deposits, Fees, and Charges shall be applicable to all bills rendered pursuant to this Agreement except when notified within fifteen (15) days by Kelly Hills in writing of an invoice dispute, but Kelly Hills shall pay the undisputed amount pursuant to this contract.

21. Term of Agreement:

The term of this Agreement is for twenty (20) years from September 24, 2014 until September 24, 2034 (the "Initial Term"). This Agreement shall automatically renew at the end of the Initial Term for a period of one (1) year, and shall automatically renew each year thereafter for a period of one year, unless terminated pursuant to the terms of Paragraph 10, or by either party by giving not less than one (1) year written notice to the other party, or upon mutual consent of both parties. Either party may terminate this Agreement during the Initial Term by giving the other party one (1) year written notice.

22. Prior Agreements: This Sanitary Sewer Wholesale Agreement shall replace the Sanitary Sewer Service Agreement by and between the City of Fayetteville acting by and through its Public Works Commission of the City of Fayetteville and the Kelly Hills /Slocomb Road Sanitary Sewer District dated April 19, 2004 and amended October 24, 2005.

23. Continuity of Service:

Commission does not guarantee continuous utility service, but shall use reasonable diligence in providing uninterrupted services. Having used such reasonable diligence, Commission shall not be liable to Kelly Hills or its customers for failure to provide continuous services. The performance of Commission's obligations under this Agreement shall be excused during such times and to the extent such performance is prevented by reason of any event beyond the control of Commission, including without limitation, flood, earthquake, storm, lightning, fire, explosion, war, riot, civil disturbances, terrorist act, strikes, sabotage, or act of God.

24. Dispute Resolution:

Commission and Kelly Hills will attempt in good faith to resolve any dispute or claim arising out of or in relation to this Agreement through direct negotiations between Commission and Kelly Hills' staff. If the dispute is not settled through such negotiations, then Commission and Kelly Hills agree to attend voluntary mediation prior to initiating formal legal proceedings. Said voluntary mediation shall be initiated by either party giving notice of the same, and shall be concluded within 30 days of such notice. Said voluntary mediation shall be conducted pursuant to the North Carolina Rules Implementing Statewide Mediated Settlement Conferences in Superior Court Civil Actions in effect at the time said notice is given. The requirements of this Section 25 shall not apply to emergency situations where the dispute involves potential harm to the Commission's Municipal Wastewater System.

25. Amendment Proceedings:

This Agreement may be amended, changed, modified, altered, or assigned only by written consent of Commission and Kelly Hills.

26. Notices:

All notices hereunder, other than monthly invoices and payment of the same, shall be sent to the following addresses using regular mail unless otherwise specified in writing:

Commission:           General Manager  
                              Public Works Commission  
                              P.O. Box 1089  
                              Fayetteville, NC 28302



Kelly Hills: Chairman, Governing Board  
Kelly Hills/Slocomb Road Water and Sewer District  
P. O. Box 1829  
Fayetteville, NC 28302-1829

27. Binding Effect:

This Agreement shall be binding upon and inure to the benefit of the parties hereto, their heirs, successors and assigns.

28. Entire Agreement:

This Agreement contains the entire Agreement of the parties and there are no representations, inducements, or other provisions other than those expressed in writing.

29. Kelly Hills acknowledges that, in carrying out the terms of this agreement, PWC will disclose certain confidential customer information to Kelly Hills (the "Confidential Information"). Kelly Hills agrees not to disclose the Confidential Information to third parties, except as may be reasonably necessary to carry out the terms of this Agreement. Kelly Hills will advise PWC of any such disclosure prior to disclosure and obtain PWC's consent. In the event Kelly Hills inadvertently discloses Confidential Information, Kelly Hills will immediately notify PWC of such inadvertent disclosure and will take all appropriate actions to prevent further dissemination or disclosure of the Confidential Information.

29. Governing Law:

This Agreement shall be governed by the laws of the State of North Carolina.

30. Severability:


It is hereby declared to be the intention of Commission and Kelly Hills that the paragraphs, sentences, clauses, and phrases of this Agreement are severable. If one or more paragraphs, sections, sentences, clauses, or phrases shall be declared void, invalid, or otherwise unenforceable for any reason by valid and final judgment or decree of any court of competent jurisdiction, such judgment or decree shall not affect the remaining provisions of this Agreement and the same shall continue to be fully effective and enforceable on the basis that said remaining provisions would have been agreed to by Commission and Kelly Hills without the incorporation of such void, invalid, or otherwise unenforceable paragraph, section, sentence, clause, or phrase.

31. Effective Date:

The Effective Date, as that term is used in this Agreement, shall be the date that the Agreement is fully executed by both parties.

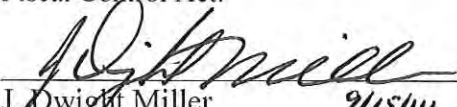
IN WITNESS WHEREOF, the parties hereto, through their duly authorized officers, have executed this contract as to the date and year first above written.

PUBLIC WORKS COMMISSION  
OF THE CITY OF FAYETTEVILLE

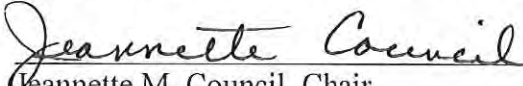
By:   
Michael G. Lallier, Chairman

ATTEST:  
  
Lynne Greene, Secretary

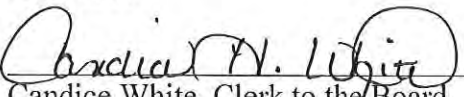
This instrument has been preaudited in the manner required by the Local Government Budget and Fiscal Control Act.

  
J. Dwight Miller 9/15/14  
PWC Chief Financial Officer

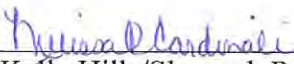
KELLY HILLS/SLOCOMB ROAD WATER AND SEWER DISTRICT

By:   
Jeannette M. Council, Chair



ATTEST:  
  
Candice White, Clerk to the Board

This instrument has been preaudited in the manner required by the Local Government Budget and Fiscal Control Act.

  
Kelly Hills/Slocomb Road Water and Sewer District  
Finance Officer

**Legal Review of the Contract between the City of Fayetteville, Acting through its Public Works Commission, and Cumberland County, Acting through its Kelly Hills/Slocumb Road Water & Sewer District, Approved by the Board of Commissioners August 18, 2014**

Section 18 of this agreement is subject to N.C.G.S. § 22B-1. Construction indemnity agreements invalid. That statute states:

Any promise or agreement in, or in connection with, a contract or agreement relative to the design, planning, construction, alteration, repair or maintenance of a building, structure, highway, road, appurtenance or appliance, including moving, demolition and excavating connected therewith, purporting to indemnify or hold harmless the promisee, the promisee's independent contractors, agents, employees, or indemnitees against liability for damages arising out of bodily injury to persons or damage to property proximately caused by or resulting from the negligence, in whole or in part, of the promisee, its independent contractors, agents, employees, or indemnitees, is against public policy and is void and unenforceable.

To the extent that any portion of this indemnity agreement is enforceable, there is no limit on the amount of the obligation that may be incurred.

Subject to proper execution by both parties and the effective dates of the term being inserted into Section 21, this agreement is approved for legal sufficiency for the reason that the Public Works Commission is the sole provider of sewer service for the Kelly Hills Water & Sewer District and the agreement terms were not negotiable.

  
\_\_\_\_\_  
County Attorney 8-19-14

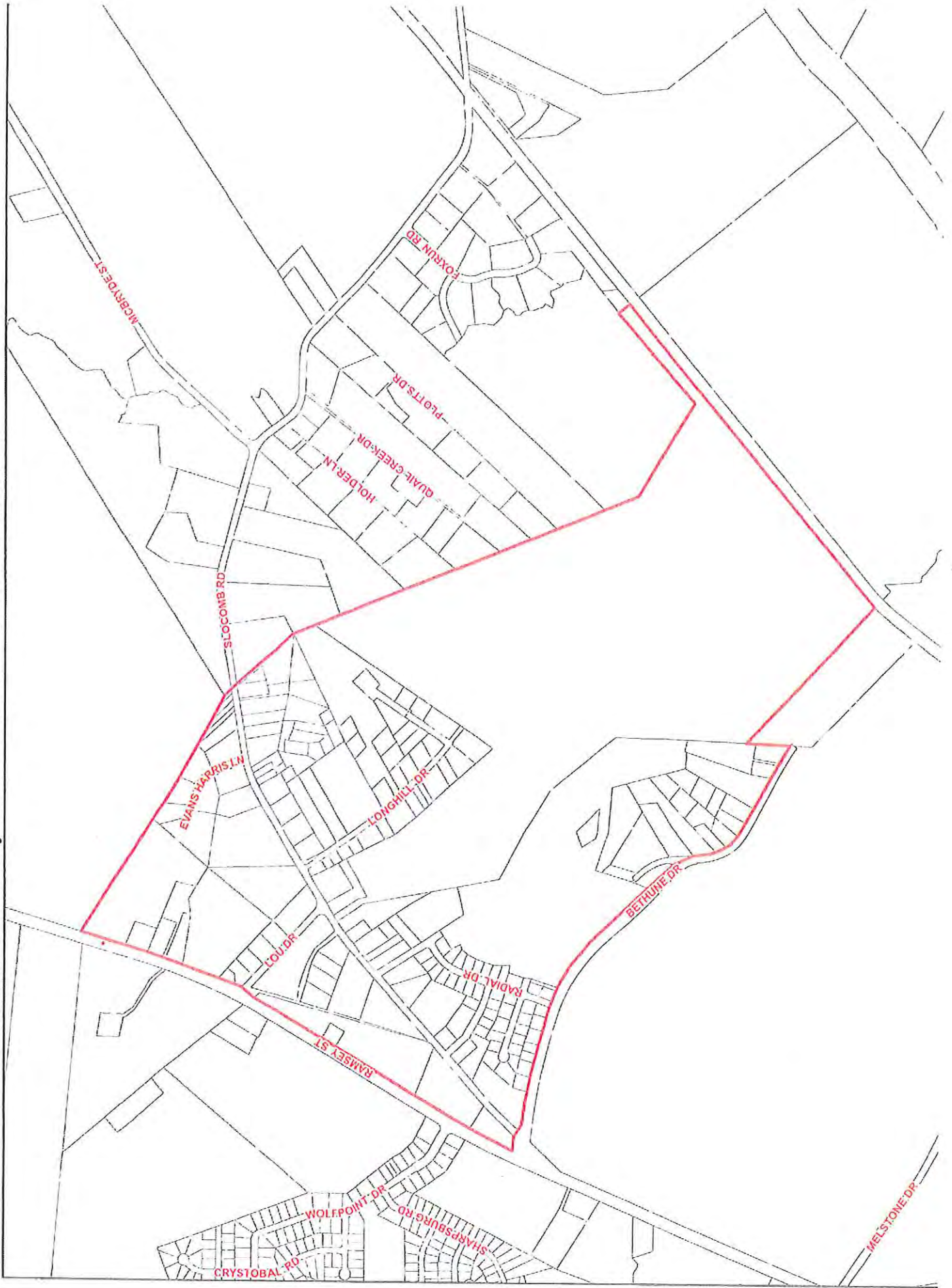


## **Exhibit A – Kelly Hills Discharge Points**

The approved discharge point(s) for Kelly Hills are:

1. The flow measurement device at the Kelly Hills force main.

EXHIBIT-B: Kelly Hills Water and Sewer District



**SEWER ASSET MANAGEMENT PLAN**

**NORTHERN CUMBERLAND REGIONAL  
SEWER SYSTEM (NORCRESS) DISTRICT**

**CUMBERLAND COUNTY, NC**



PINEHURST, NORTH CAROLINA

**SEWER ASSET MANAGEMENT PLAN**

**NORTHERN CUMBERLAND REGIONAL  
SEWER SYSTEM (NORCRESS) DISTRICT**

**CUMBERLAND COUNTY, NC**

**MATTHEW JONES, PE**  
matthew.jones@mcgillassociates.com



5 Regional Circle, Suite A  
Pinehurst, NC 28374  
910.295.3159

**AUGUST 2025**

**PROJECT NO. 20.02507**

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## EXECUTIVE SUMMARY

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The purpose of this Asset Management Plan (AMP) is to document the condition of the Northern Cumberland Regional Sewer System (NORCRESS) District's infrastructure to assist the County with becoming more proactive in the management, operation, and financing of its wastewater collection system. The NORCRESS District serves approximately 452 connections in the northeastern area of Cumberland County. Approximately 666 properties within the district are not currently connected and are paying the sewer availability fee. The District's wastewater collection system consists of approximately 26 miles of gravity sewer, four sewer lift stations, 15 miles of force main, and 424 manholes. Collected wastewater is pumped from the Wade 2 Lift Station to Eastover Central Lift Station and then sent to Fayetteville PWC. Flow generated from the district is ultimately treated at the Cross Creek Water Reclamation Facility (NC0023957), which is owned and operated by Fayetteville PWC. A copy of the agreement is included in Appendix F.

This asset inventory and assessment consisted of assembling data on gravity sewer pipe, manholes, and other appurtenances in the collection system. This assessment included performing inspections of selected manholes, performing smoke testing throughout the system, performing flow monitoring at select locations within the system, and reviewing existing data with County Staff. The information was evaluated and is summarized in this document which includes the asset management plan and capital improvements plan. This process resulted in the development of a 10-year Capital Improvements Plan (CIP) to guide the District with scheduling and financing the capital projects and equipment purchases necessary to maintain and improve its wastewater collection system. Through the AMP process, it is estimated that approximately 40% of the manholes in the sewer collection system are in need of rehabilitation due to deterioration.

The CIP includes a focused improvement to components within the sewer system that need rehabilitation or replacement based on existing condition, and on improvements that could improve management of the sewer system for staff. These planned projects will

bring the system into a better position to serve its customers by improving reliability of the collection system. The District should look to its CIP to guide its next projects, and the CIP should be updated regularly as priorities change and as projects are completed. It is noted that many factors may impact the priorities including failures, and funding availability both local and through grant and loan programs. This assessment project provides evidence for the prioritization of manhole rehabilitation and improvement projects in the CIP.

### ***System Evaluation***

The pipe material in the NORCRESS system is primarily PVC pipe. The collection system was first put into service in 2005, therefore the relative age of the system is low. PVC pipe is the most common material used for sewer systems today. The typical useful life for PVC pipe is anywhere from 40 to 60 years. There is some ductile iron pipe (DIP) used at culvert crossings and HDPE used for directional drill of the Falcon and Wade force mains.

As part of the AMP, McGill Associates, PA (McGill) assisted the District with evaluating the condition of its sewer infrastructure to identify projects in line with these goals. The following items were included in the AMP scope:

- Identify areas to conduct smoke testing to locate potential sources of I/I into the sewer system;
- Flow monitoring in select areas (6 sewershed areas within the Towns of Godwin and Falcon)
- Inspect selected sewer manholes within the system to establish overall system condition;
- Identify and evaluate potential sewer system improvements;
- Prioritize sewer system improvements;
- Prepare opinions of probable costs for sewer system improvements; and
- Create a Capital Improvements Plan.

### Flow Monitoring

McGill met with County staff to identify areas of concern within the sewer system and select locations to place flow meters. From these discussions, the NORCRESS wastewater collection system was divided into six total sewersheds between the Towns of Godwin and Falcon, according to the GIS mapping as depicted in Figure 2. These sites were selected to favor areas where County staff suspected I/I and the sewershed was easily able to be isolated within the total system. Overall, flow monitoring revealed that while all sites had sufficient capacity to handle dry weather flow, there was additional flow during dry weather conditions that raises some concern. Falcon Site 2 had peak flows which used around 40% of the estimated capacity during dry weather conditions, and Falcon Site 1 had peak flows over 60% existing capacity. There was only one significant rainfall event during the flow monitoring period, and I/I did seem to be an issue for the system. All six flow monitoring locations logged higher flows immediately following the event.

### Smoke Testing

McGill and the Cumberland County staff smoke tested segments of gravity sewer lines connected to multiple manholes across the system, enabling the full smoke testing of the entire 26 miles of the sewer system. This testing occurred over a period of several days to determine locations where I/I could enter the wastewater collection system. For each segment, McGill and County staff selected a centrally located manhole on which to place the blower based on the manhole's accessibility. The crew recorded smoke emerging from 240 abnormal locations, which divided generally into four categories- broken or uncapped cleanouts, broken lines, unsealed manholes, and unknown defects. All smoke occurrences are recorded in Appendix A and shown in Figure 3.

### Manhole Inspections

All manholes in the NORCRESS system are precast concrete based on information provided by County staff. The results of the selected manhole inspections performed as a part of this inventory were used to develop an assessment of manhole conditions in the

system. Based on the inspections performed, manholes that were inspected were assigned a condition score, and these scores were combined into an overall condition rating for each manhole- excellent, good, fair, or poor. Of the 37 manholes inspected, approximately 34 were in good condition and four were in fair condition. These results are recorded in Figure 7 and included in Appendix A.

### Lift Station Inspections

The NORCRESS System is served by four lift stations: one in Godwin, one in Falcon, and two in Wade. The County previously contracted with Freese and Nichols to perform an analysis and report on the lift stations. Lift station inspection was not included in the scope of this assessment. Analysis of the lift stations was included the NOCRESS Comprehensive Sewer Evaluation study completed by Freese and Nichols in June 2021. For reference, record drawings for the lift stations are included in Appendix G of this report.

### Findings and Recommendations

The system evaluation allowed McGill to assemble a list of general recommendations and high priority projects to guide the County in the next 10 years. General recommendations to the District included establishing its own flow monitoring and smoke testing programs in high priority areas to determine sewer rehabilitation needs and inspecting sewer lines and manholes with CCTV equipment during routine cleanings to track the condition of these items. McGill also recommended the County begin rehabilitation and/or replacement of existing manholes within the collection system in order to reduce the risk of I/I.

Data and field investigation reporting were utilized to identify the priority projects within the collection system, focusing on manhole rehabilitation.

Table 1 summarizes projects identified during this assessment, centering around additional flow monitoring, flow meters, and manhole rehabilitation projects. A project to

install flow monitors is included to give greater control and understanding of flows from the collection system.

**Table 1: Summary of Capital Improvements Projects**

<b>No.</b>	<b>Project Name</b>	<b>Cost</b>
1	Flow Monitoring Study	\$25,440.00
2	Manhole Rehabilitation Project 1	\$118,600.00
3	Flow Monitoring Improvements	\$203,900.00
4	Manhole Rehabilitation Project 2	\$118,600.00
5	Manhole Rehabilitation Project 3	\$118,600.00
6	Manhole Rehabilitation Project 4	\$118,600.00
7	New Generators All Lift Stations	\$640,000.00
8	Upgrade SCADA	\$240,000.00
9	Falcon Force Main-Inspect, Clean, and Replace ARVs	\$80,000.00
<b>10-Year CIP Total Project Cost</b>		<b>\$1,714,620.00</b>

***Capital Improvements Plan***

The purpose of this asset inventory and assessment was to document the condition of the District’s inventoried infrastructure to assist the County with becoming proactive in the management of its wastewater system, to include capital project planning. The County does not currently have a Capital Improvements Plan (CIP) for its wastewater system. The CIP being developed from this current assessment will guide the County through its planning for projects within the 10-year window. The CIP will remain a living document and be updated in the future so that it remains current to the Districts’ highest priorities and provides accurate cost estimates. The CIP included in this assessment includes projects focused on rehabilitation of existing manholes, which have been identified to be potential sources for I/I into the system. Through discussion with County staff, field investigation and review of existing system data, the specific defects and general problematic areas within the wastewater system have been summarized. These results were used to update the CIP and formulate a ten-year plan.

The complete asset inventory and assessment task consisted of five parts culminating in the development of the NORCRESS Water and Sewer District’s CIP. McGill developed

cost estimates for all projects based on current 2024 materials and construction costs. The updated CIP is intended to be adopted by the County to guide its selection of sewer system improvement projects over the next decade. This plan also includes a budget-level recommendation for staffing associated with system operations and maintenance for all County utility districts.



**1.1 BACKGROUND**

The NORCRESS District is located in Cumberland County, North Carolina, and is owned and operated by Cumberland County. The District includes a wastewater collection system that currently serves 452 customers. A summary of customer type based on use is provided in Table 2. The collection system consists of approximately four and a half miles of gravity sewer mains that are 8-inch, 12-inch, 15-inch, and 16-inch in diameter. These gravity sewer mains are constructed of PVC and Ductile Iron pipe and are all 15 years old. Figure 1 shows the existing sewer collection system.

Developing a Capital Improvements Plan (CIP) will allow the District to update its current rate setting model to better estimate future revenue and expenses, capital outlay, indebtedness, and overall health of the sewer system enterprise fund reserves. A model of this nature would continue to balance revenues and expenditures with a longer-term approach to rate setting and establish a financially sound framework for the District to follow.

The District has experienced the degradation of manholes within its sewer collection system due to the age of the system and resulting from wear over time.

Even with the relatively young age of the NORCRESS system, County staff remains cognizant that infiltration and inflow (I/I) is always a concern, particularly in a scenario where the County's operation costs are based on the gallons of flow that enter into the existing lift station. The County is also aware that during dry weather there tend to be excessive flows in Godwin and Falcon (and therefore Wade, where flows are pumped from both Towns). Therefore, the top challenges for the NORCRESS system are mitigating I/I that results from deteriorated infrastructure and identifying the source of any additional flows into the collection system that do not first enter via water connection and are therefore billable. This additional information will help the County anticipate typical flows and assist with operations and maintenance planning. The information collected

throughout this assessment project will help identify system deficiencies and develop improvement projects to reach these goals.

This process resulted in the development of a 10-year Capital Improvements Plan (CIP) to guide the District with scheduling and financing the capital projects and equipment purchases necessary to restore its wastewater collection system. Through the AMP process, the McGill and County staff have estimated that approximately eighty-four (84) manholes would benefit from rehabilitation due to their poor condition.

The purpose of this Asset Management Plan (AMP) is to document the condition of the Districts' inventoried infrastructure to assist the District with becoming more viable and proactive in the management and financing of its wastewater system. The District continues to look to its CIP to guide its next projects; therefore, it is vital that the CIP remains current to the Districts' highest priorities and provides accurate cost estimates. This assessment project was utilized for the prioritization of replacement lines and improvements projects in the CIP.

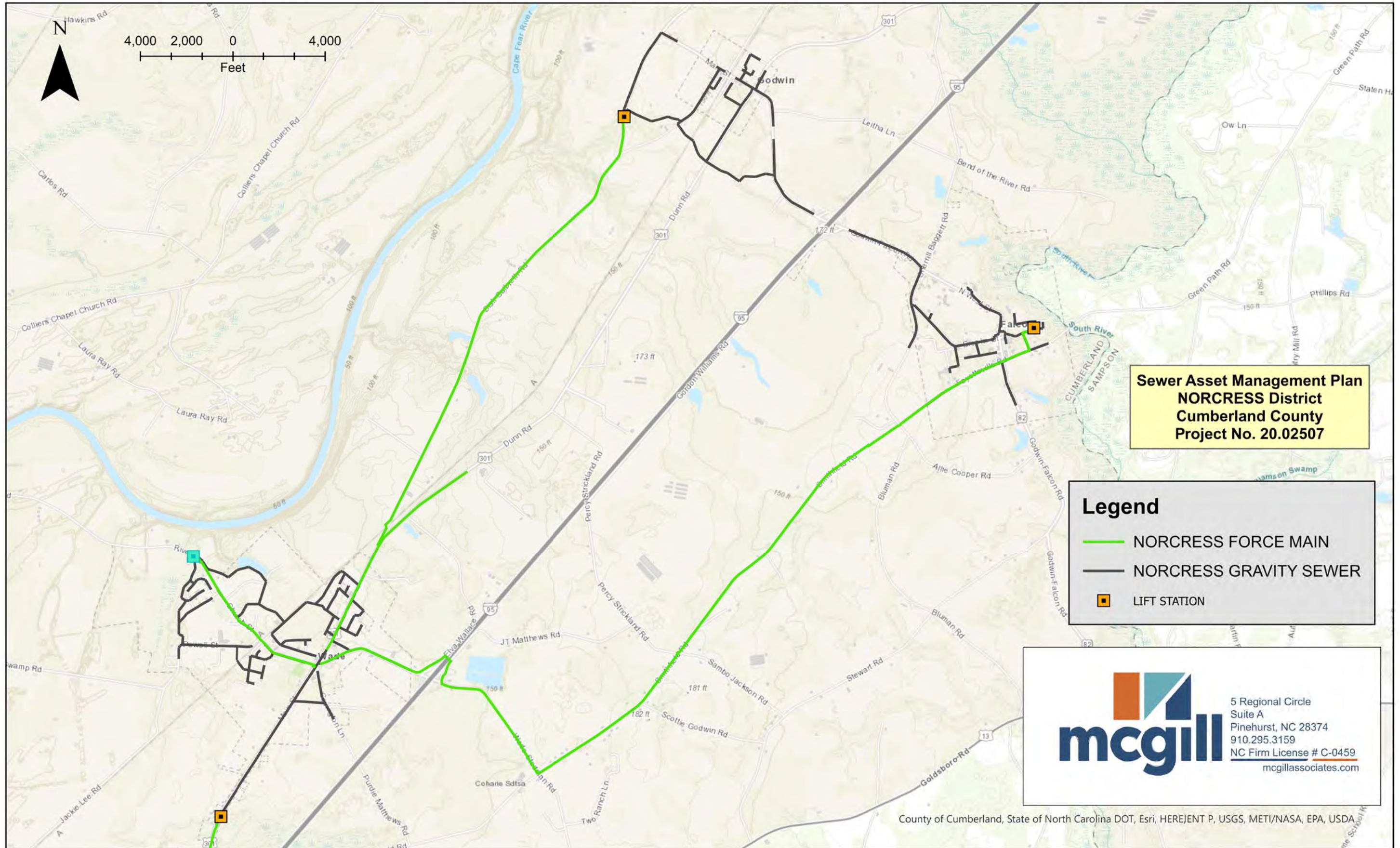
**Table 2: Summary of Customers by Use**

<b>Diameter</b>	<b>Total</b>	<b>% of System</b>
<b>Residential</b>	<b>394</b>	<b>87.1%</b>
<b>Commercial</b>	<b>50</b>	<b>11.1%</b>
<b>Industrial</b>	<b>3</b>	<b>0.7%</b>
<b>Flat Rate</b>	<b>5</b>	<b>1.1%</b>
<b>Total LF</b>	<b>452</b>	<b>100%</b>



# NORCRESS Overall System Map

## Figure 1



**Sewer Asset Management Plan**  
**NORCRESS District**  
**Cumberland County**  
**Project No. 20.02507**

**Legend**

- NORCRESS FORCE MAIN
- NORCRESS GRAVITY SEWER
- LIFT STATION



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## 2.1 FLOW MONITORING

### 2.1.1 Overview

The purpose of flow monitoring was to determine the capacity, average daily flow, and wet-weather flows within areas of the NORCRESS system. This information reveals locations where significant Infiltration and Inflow (I/I) enters the system causing a reduction in available capacity and potential for overflows and sewer backups in the system. Infiltration and Inflow have similar impacts but are contributed to by different sources and can be located and/or resolved using different methods.

Infiltration is water, besides wastewater, that seeps into the sewer system through the ground. Typical infiltration sources include broken pipes, defective pipe joints, damaged manhole walls, and broken service connections. Infiltration typically enters a system slowly and may remain evident in the sewer system for several days following a rainfall event. Although infiltration generally does not produce high peak flows, infiltration regularly results in large volumes if I/I.

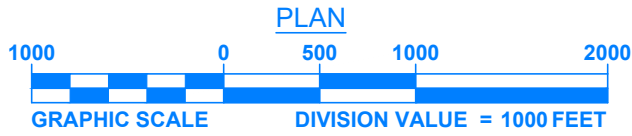
Inflow is water, besides wastewater, that enters the sewer system directly. Typical inflow sources include storm/sewer cross-connections, roof leader connections to sewers, vented manhole covers, and missing cleanout caps. Inflow produces rapid flow increases and often causes sewer system surcharging and overflows during rainfall events. Inflow regularly results in peak I/I flow and high peaking factors.

### 2.1.2 Investigation

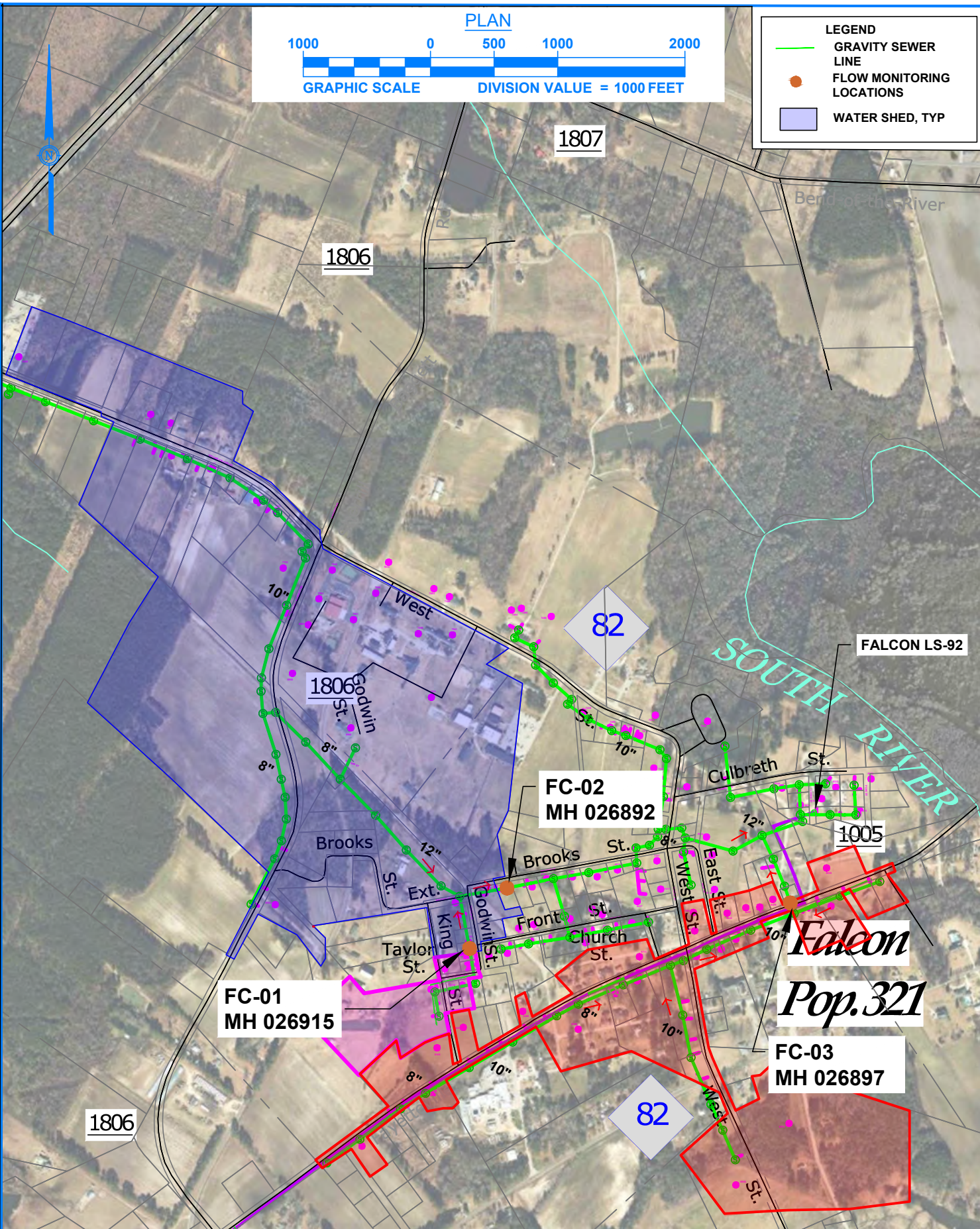
Meetings were held with County staff to identify areas of concern within the sewer system and select locations to place flow meters. McGill reviewed the results of the 2021 Freese and Nichols NORCRESS Study, in which the recommendation was to further monitor the flow in Godwin and Falcon. Both of those Towns produced higher than anticipated flow during the period of monitoring during that study. From discussions with County staff, it

was determined that flow monitors would be placed within the Towns of Godwin and Falcon. Three sewersheds were developed for each Town, resulting in the placement of three flow monitors in each Town. Utilizing staff from KRG Utility, McGill owned flow monitors were installed and flow was monitored from October 18 through November 28, 2023. A map of both Towns and the sewersheds and monitoring locations is shown in Figure 2 and Figure 3. The shaded areas denote the sewersheds for each site.





LEGEND	
	GRAVITY SEWER LINE
	FLOW MONITORING LOCATIONS
	WATER SHED, TYP



P:\2020\20.02507-CUMBERLAND-ENGINEERING\DRAWINGS\FIGURES\20.02507 FLOW MONITORING FIGURE.DWG PLOT DATE 3/21/2024 3:52 PM DEMI WATKINS

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<b>DATE</b>	OCTOBER 2023
<b>PROJECT #</b>	20.02507
<b>PROJECT MANAGER</b>	M. JONES

**ASSET MANAGEMENT PLAN**  
**CUMBERLAND COUNTY PUBLIC UTILITIES**  
CUMBERLAND COUNTY, NORTH CAROLINA

NORCRESS FLOW  
MONITORING IN FALCON

SHEET  
**FIG 2**







### 2.1.3 Methodology

Average dry-weather flows provide the basis for capacity and wet-weather flow analyses. To develop the average dry-weather flows, McGill averaged the flows for each day with typical flow (no rain events or evidence of silt/debris). Several days that fit this criterion were used in the calculation to acquire the dry-weather flow each respective meter. If present, daily groundwater infiltration into the sewer system is included in the reported average daily flows.

During the flow monitoring period, rain events were recorded on October 21, Nov 11-13, and November 23 based on rainfall data recorded at the Fayetteville Regional Airport (provided in Appendix C). The flows at each of the six flow monitoring devices were recorded during these events. The rainfall event on October 21 was less than 0.5 inches and did not cause I/I based on the monitoring data. The events from November 11-13 and November 22 recorded over 2 inches of rainfall and did contribute I/I into the system. Anticipated flows for each basin were estimated based on the dwellings served. The range represents the estimated value based on usage of 225 gpd/dwelling, which is the updated estimate from 360 gpd/dwelling based on NCAC 02T rules. Dry weather flows were approximated based on the flow seen between rain events at the meter. Actual average daily flow recorded by the meters is also noted.

**Table 3: Summary of Flow Monitoring Drainage Areas**

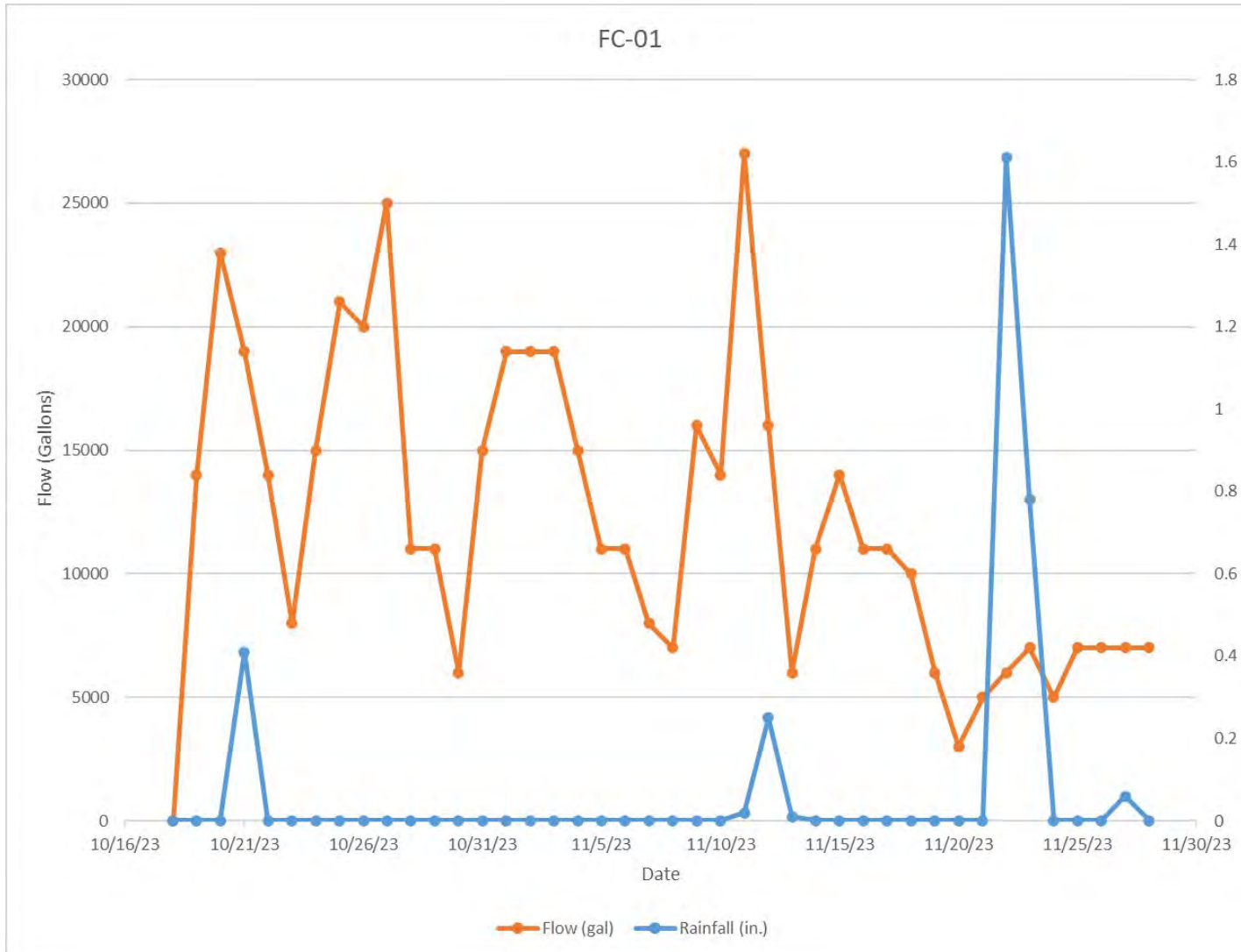
Site	Flow Meter Location	Structures/Dwellings	Area (acres)	Estimated Flow (gpd)	Dry Average Flow (gpd)	Total Average Flow (gpd)
FC-01	Godwin St	5	14.4	22,925*	11,970	12,070
FC-02	Brooks St	22	224.3	16,050*	23,170	24,970
FC-03	Fayetteville Rd	22	88.9	4,950	1,660	1,625
GW-01	Burnette Rd	17	111.8	6120	7,800	7,930
GW-02	Dunn Rd	21	84.1	7560	7,875	7,290
GW-03	Dunn Rd	13	95.0	4680	4,560	4,340

\*FC-01 and FC-02 Expected Flows include estimated average daily flows for Martins Meats and the Falcon Children’s home. These two entities represent the largest water users in the system.

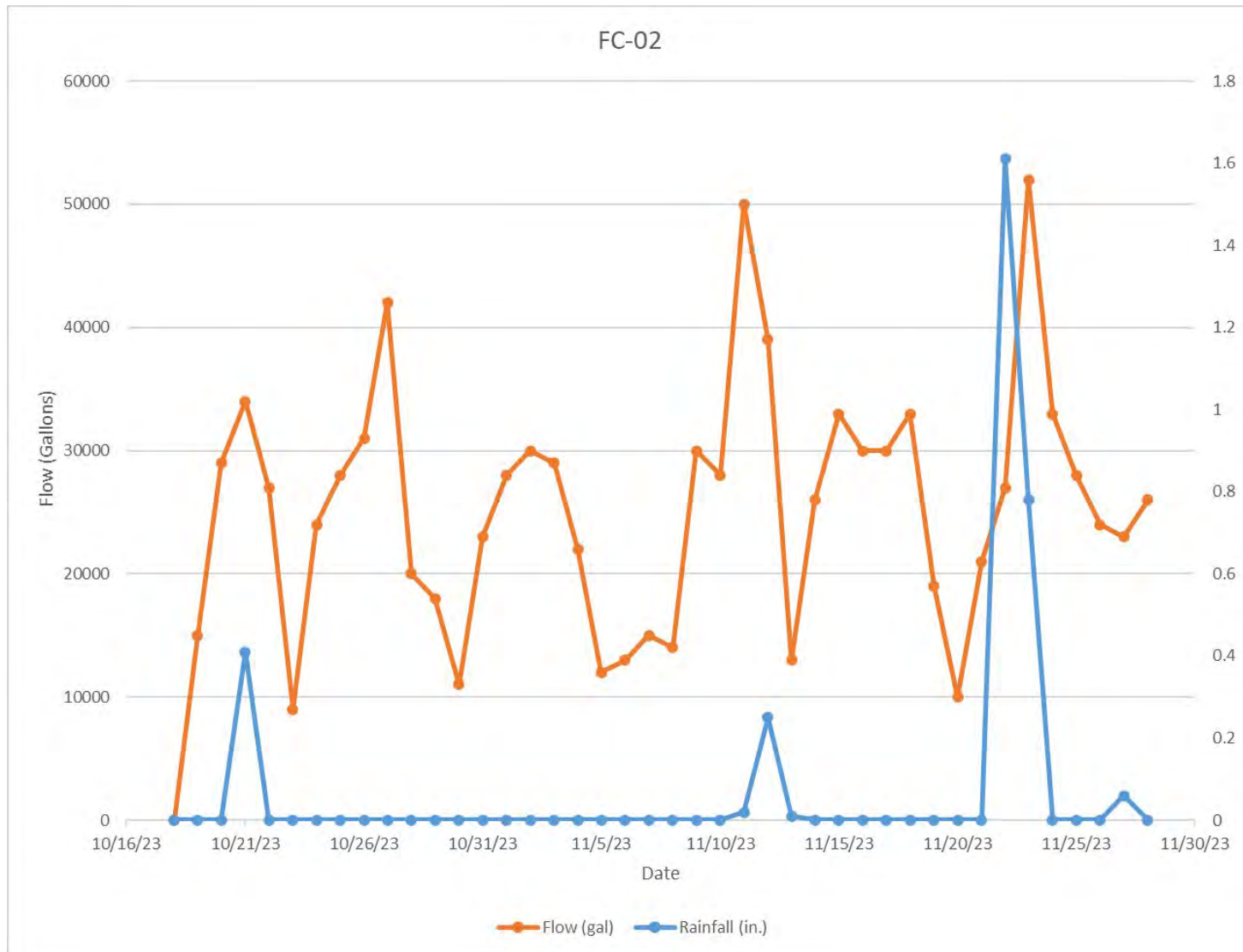
**Table 4: Summary of Large Users In Falcon**

	<b>Total Water Usage (gal)</b>	<b>Total Sewer flow (gal)</b>	<b>Notes</b>
<b>Martins (Accts: 562,665,808)</b>			
October	736,630	202,000	<i>Sewer Flow monitored 10/18-10/31</i>
November	573,810	305,000	<i>Sewer Flow monitored 11/1-11/28</i>
Avg Flow (gpd)	21,840.67		
<b>Falcon Children's Home (Accts: 96,97,98,101,102,103,208,209,210,211,213,328,378,495,585,913,914,915,982,1052)</b>			
October	406,750	109,000	<i>Sewer Flow monitored 10/18-10/31</i>
November	258,500	433,000	<i>Sewer Flow monitored 11/1-11/28</i>
Avg Flow (gpd)	11,087.50		

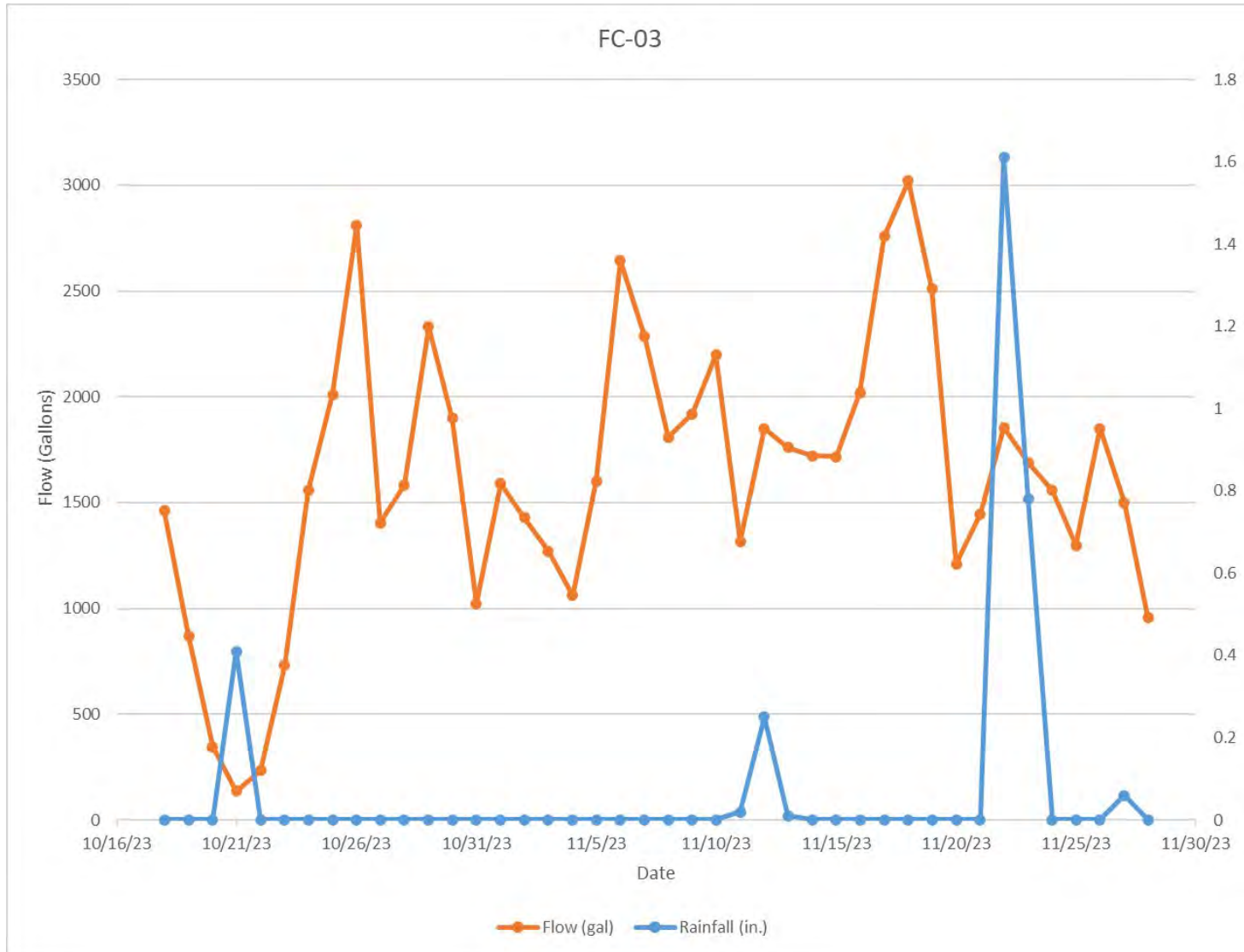
**Graph 1: Falcon Location 01, Daily Flow vs. Rainfall**



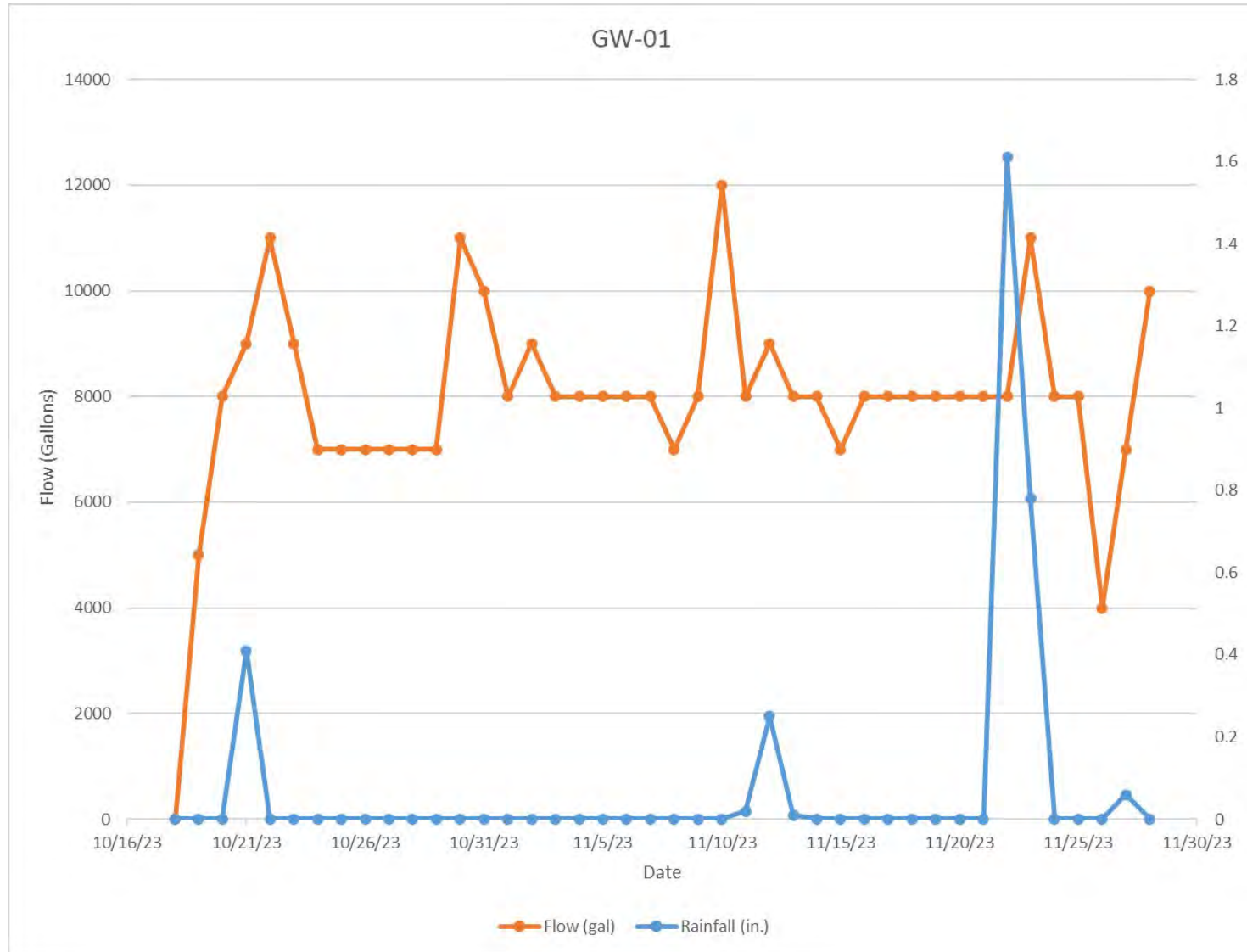
**Graph 2: Falcon Location 02, Daily Flow vs. Rainfall**



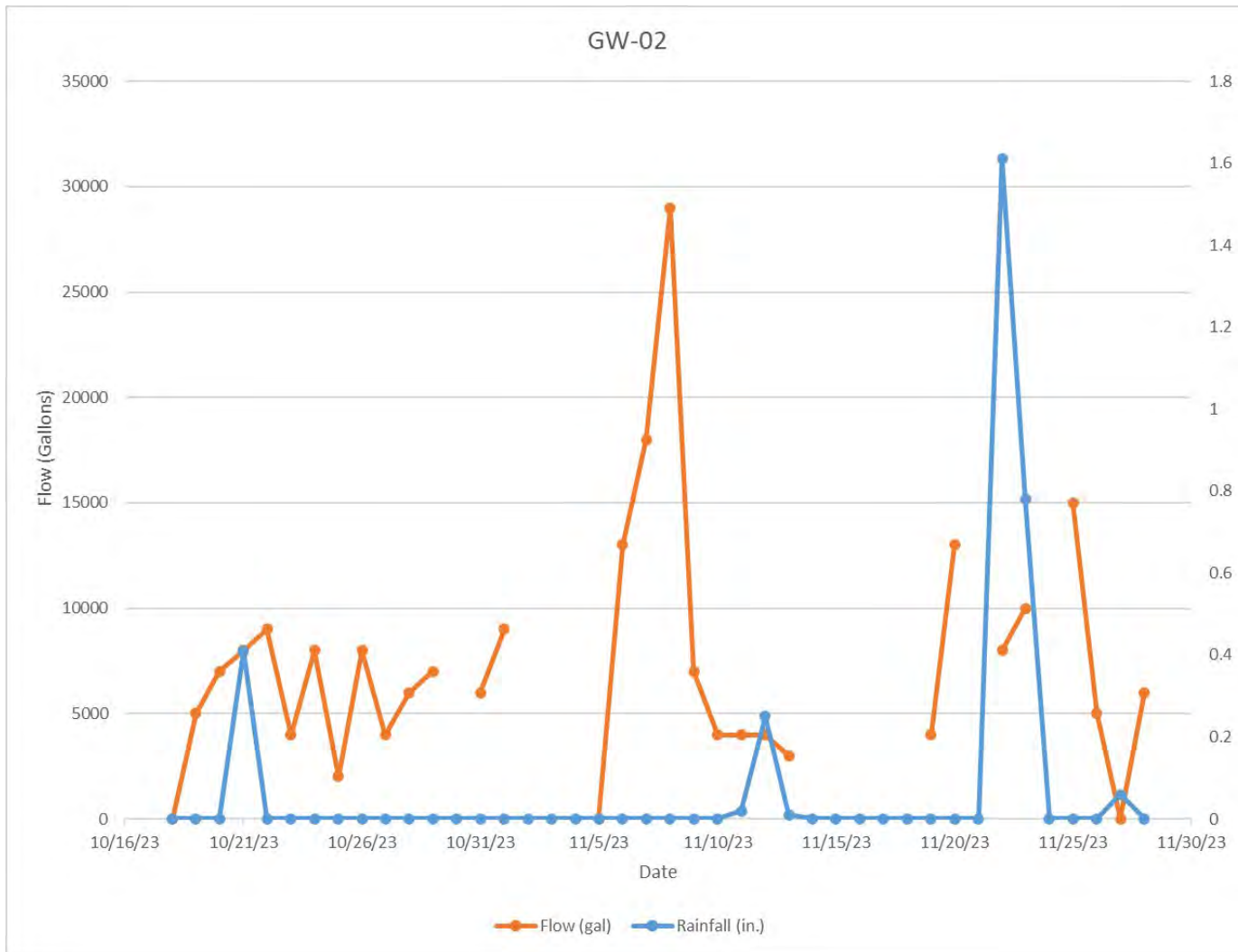
**Graph 3: Falcon Location 03, Daily Flow vs. Rainfall**



**Graph 4: Godwin Location 01, Daily Flow vs. Rainfall**



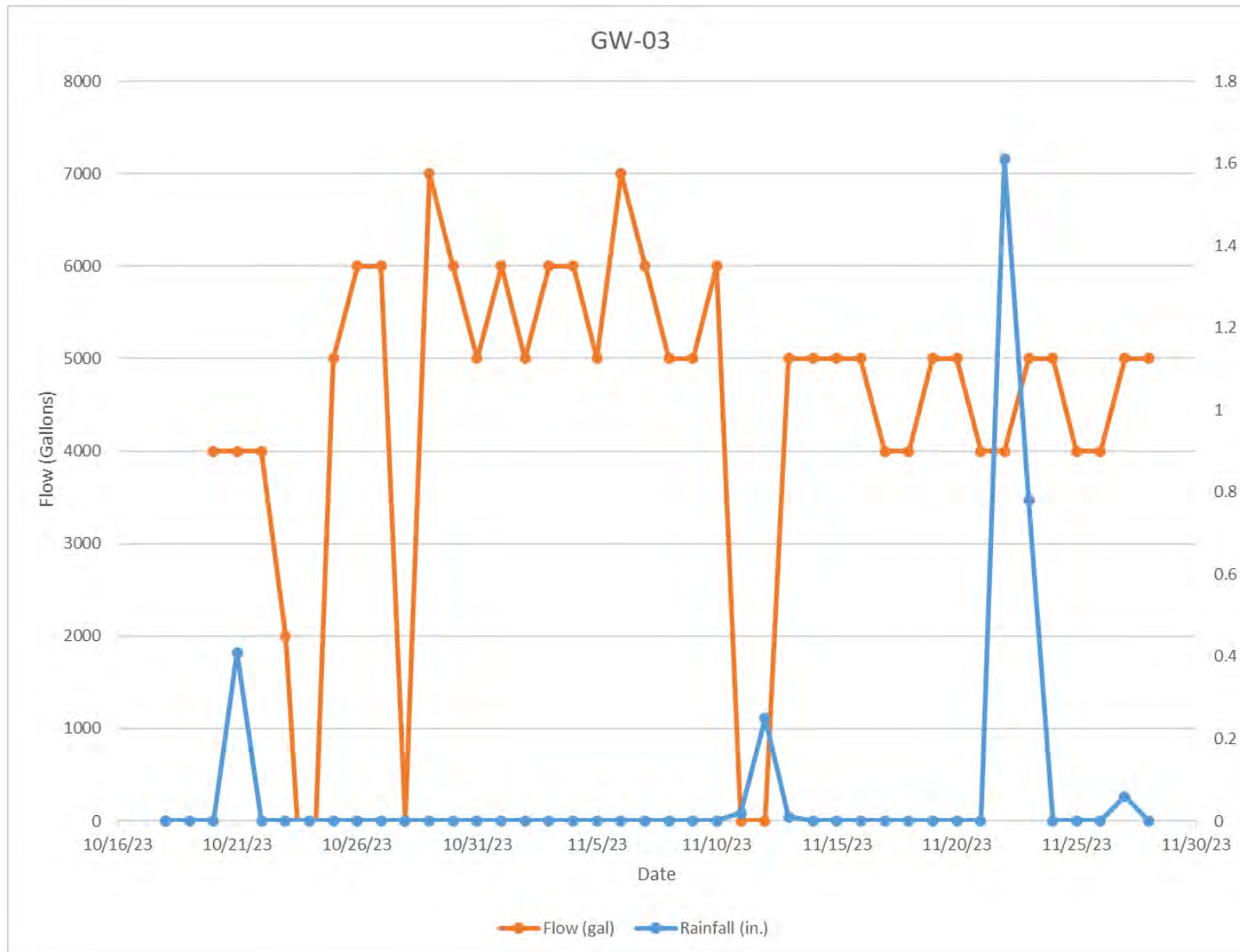
**Graph 5: Godwin Location 02, Daily Flow vs. Rainfall**



Note: Several segments on the graphed flow line show no recorded flow as a result of a negative recorded reading for total flow during the day. There was evidence in the manhole of flow backing up to the mounted meter during this period.



**Graph 6: Godwin Location 03, Daily Flow vs. Rainfall**



#### **2.1.4 Results**

The purpose of the flow monitoring was to determine which locations in the NORCRESS wastewater collection system were the best candidates for further field testing to uncover sources of I/I and other issues. Flow monitoring revealed the following behaviors for the sites/sewersheds depicted in Figure 1:

- All sites had sufficient capacity to handle current dry-weather flow.
- No locations exhibited significant I/I indicators
- Location FC-02 had evidence of inflow as the flow spiked during rain event but then returned quickly.
- Most of the locations monitored showed flows following events that were typical based on dry weather conditions.
- Flow from Martin's Meats do not appear to exceed water usage based on FC-01.
- Flow from Falcon Children's Home does appear to exceed water usage based on FC-02.

The County experiences frequent issues with increased flow from the NORCRESS system that exceeds water usage in the system. Given the results of flow monitoring, it is recommended that additional flow monitoring be performed in Falcon. Additionally, further investigation of possible groundwater or other sources of flow into the system from the Falcon Children's Home property.

In terms of additional monitoring, McGill recommends mid-term flow monitoring of the Falcon area (and any other areas where I/I or unaccounted flow is suspected). Duration would be for a year to begin with, in order to have 12-months of data to review against rainfall and water usage.

## **2.2 SMOKE TESTING**

### **2.2.1 Overview**

Smoke testing is one of the most cost-effective ways to locate defects in sewer mains and laterals. In this process, artificially produced non-harmful smoke is injected into the sewer line via a blower placed over a selected manhole. The pressurized smoke travels up and down the sewer line and connections and emerges at openings in the system. This visual aide allows test crews to easily identify, record, and mark locations where defects are present. If the sewer is in good condition, one should only see smoke rising from manhole lids and house roof vents. If the line has defects, such as breaks or illegal connections, the smoke will emerge at these points.

### **2.2.2 Investigation**

McGill met with County staff to identify areas that would benefit most from smoke testing. Based on the size of the NORCRESS District and having the use of the County's team and equipment in addition to McGill, it was determined that the entire system could be smoke tested. McGill prepared a detailed map of the areas based on the County's GIS database. The Fire Department and customers along the route were alerted to the upcoming testing.

### **2.2.3 Methodology**

McGill and County staff smoke tested all 26 miles of gravity sewer lines over a period of three days to determine locations where I/I enter the wastewater collection system. For each line to be tested, County staff recommended a centrally-located manhole on which to place the blower based on the manhole's accessibility and avoidance of traffic. The manhole nomenclature used by the County was utilized and the location, configuration and condition of each one was recorded.

At each location, the following procedure was executed.

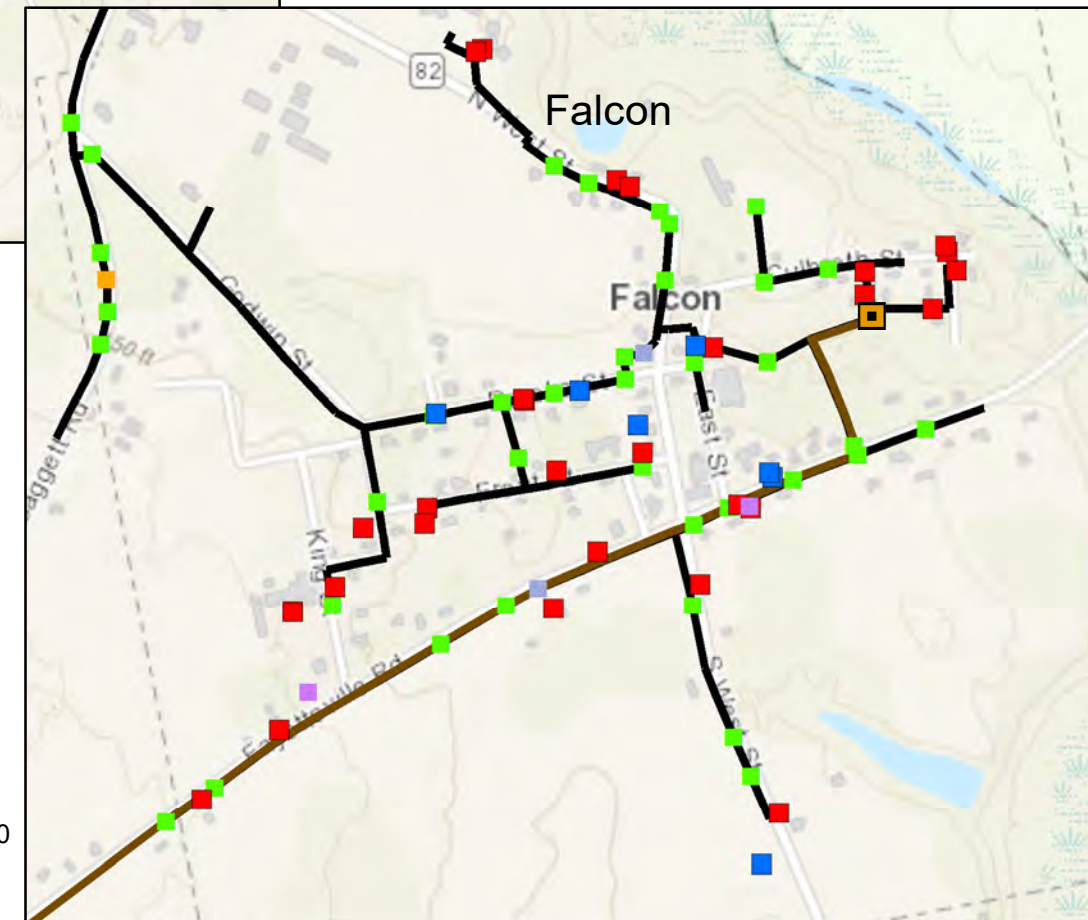
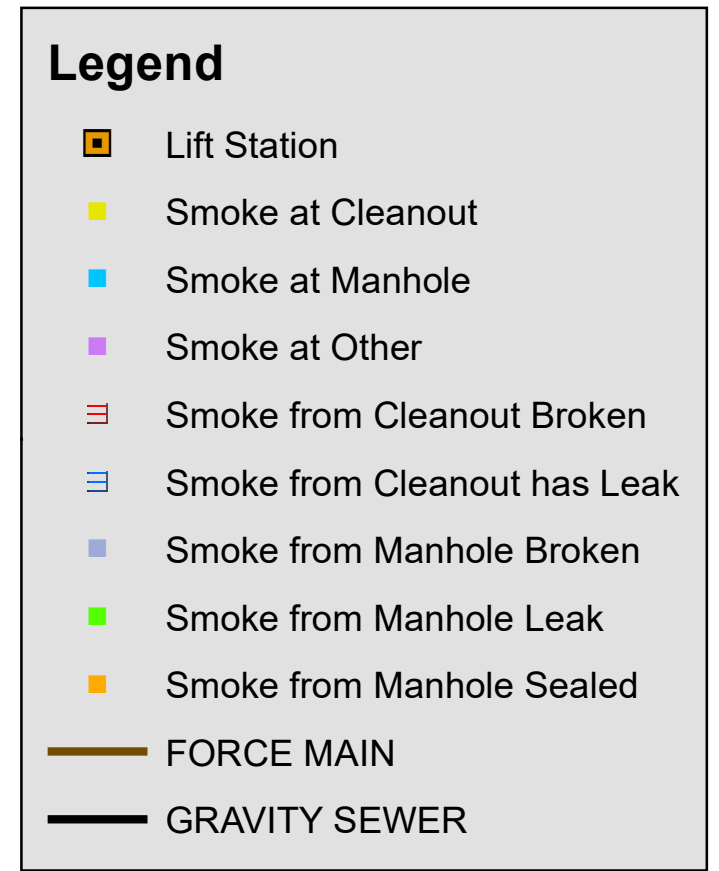
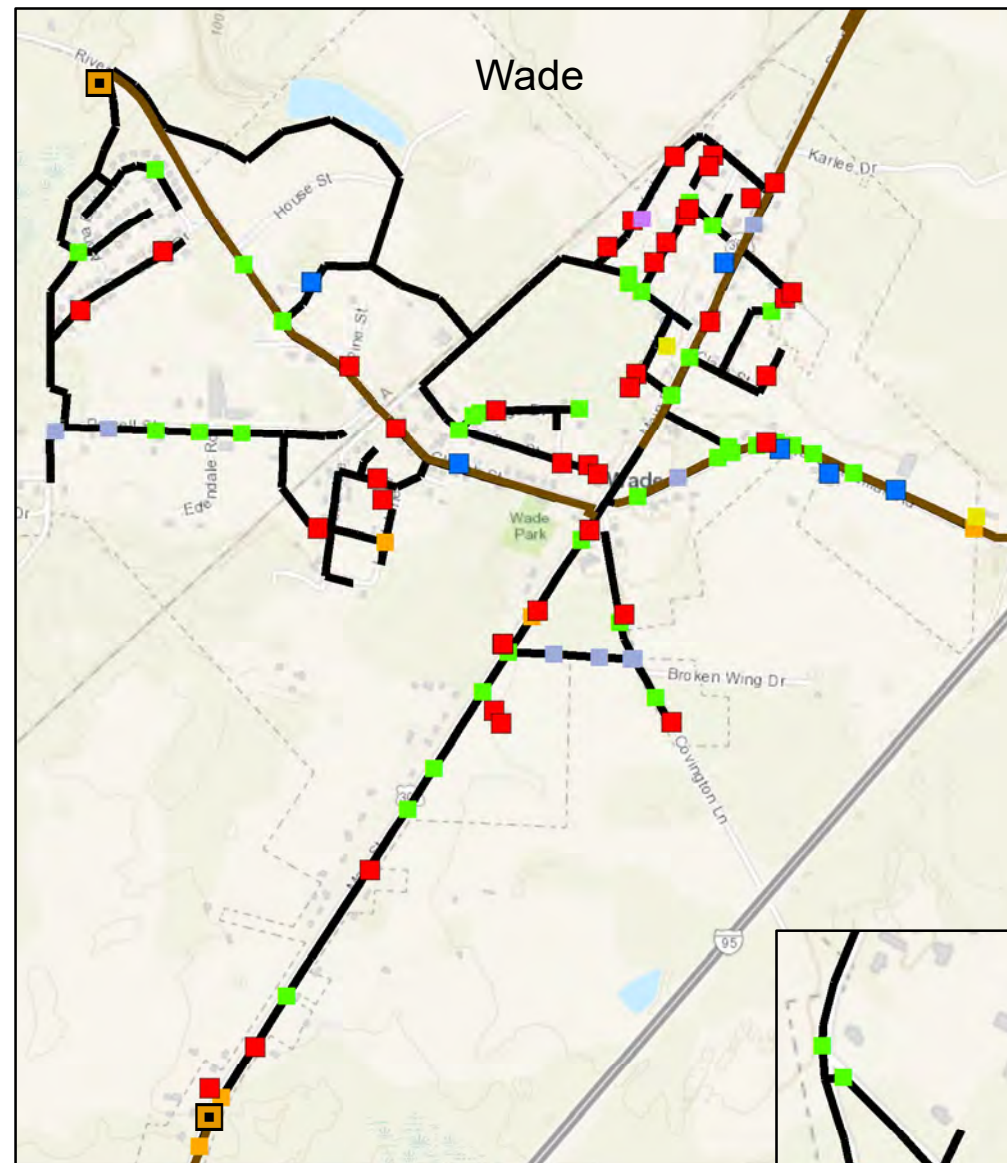
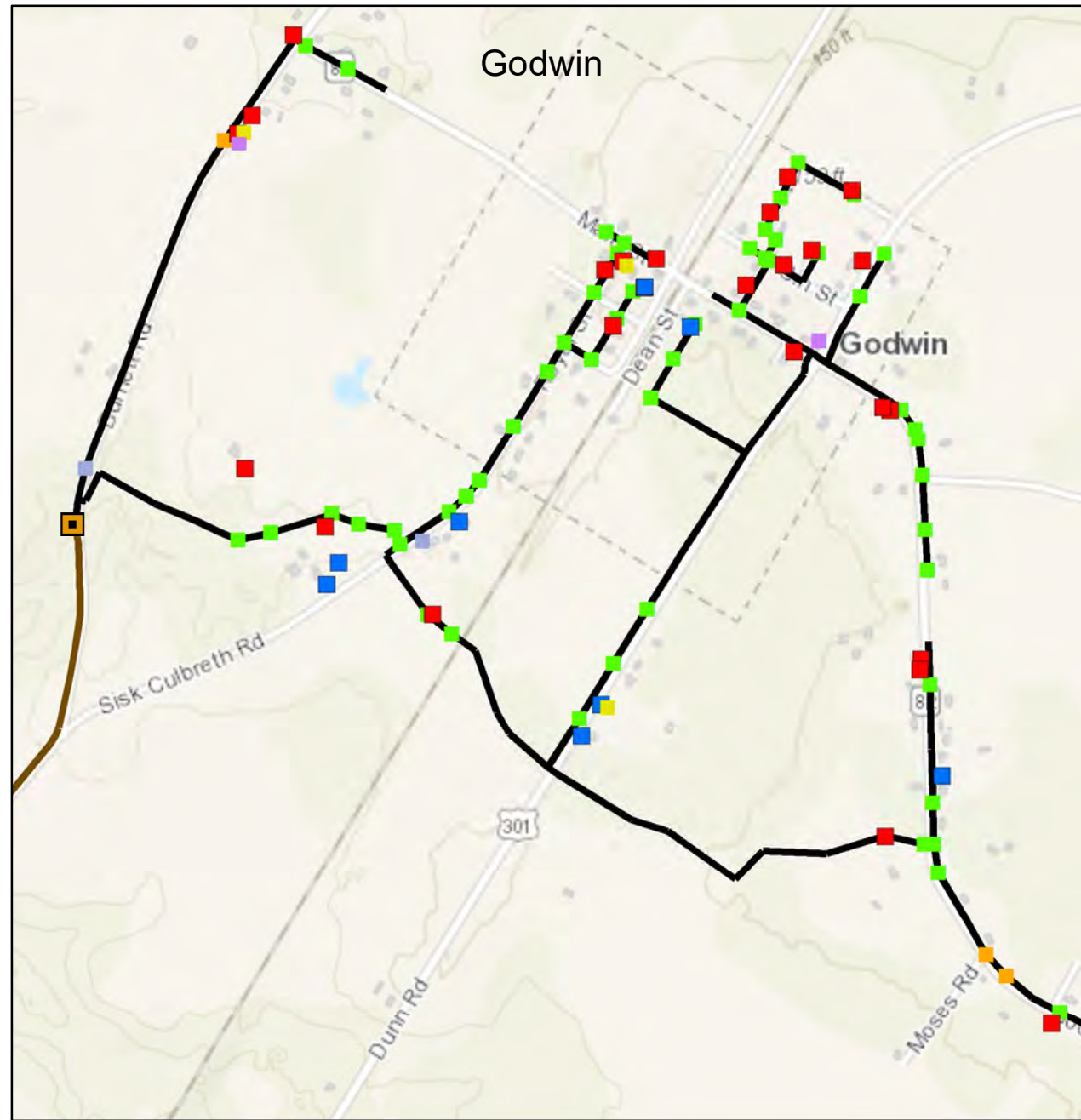
1. Place the blower on the manhole (with the rubber seal, if necessary).
2. Fill smoke pump up to  $\frac{3}{4}$  with liquid smoke.
3. Close all smoke pump valves.
4. Start blower and allow to warm up.
5. Open smoke pump valves.
6. Pressurize smoke pump by pumping the canister manually.
7. Once smoke begins emerging from roof vents, begin surveying for smoke emergencies indicating defects or problem areas in the pipeline.
8. For each defect, record the opening type, address, manhole identifier, and notes.
9. Additionally, mark each defect with paint.

This process continued until all visible defects were marked and recorded. Figure 4 shows some problematic system openings.



# NORCRESS Smoke Testing Map

## Figure 4

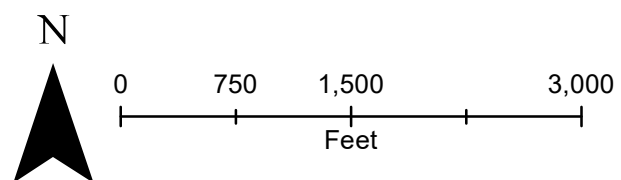


**Sewer Asset Management Plan**  
**NORCRESS District**  
**Cumberland County**  
**Project No. 20.02507**



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### **2.2.4 Results**

The crew recorded 240 abnormal smoke outlets, which divided generally into five categories.

1. Broken or uncapped cleanouts: Several cleanout caps were missing or broken. The cumulative number of broken cleanouts in the District can contribute to significant I/I. County staff had repair caps on hand during the testing and was able to install new caps where needed.
2. Ground Smoke: Ground smoke can be the result of broken lines, joint separation, etc. Any of these problems can cause significant I/I.
3. Unsealed manholes: Some manholes emitted excess smoke indicating cracked concrete or offset rings. Manholes located in ditches are most likely to contribute I/I.
4. Connected storm drains and culverts: Storm drains and culverts connected to the sanitary sewer systems contribute significant amounts of I/I into the system. These connections are good candidates for video testing.
5. Unknown: Some smoke occurrences require further investigation to determine the type of opening.

A spreadsheet describing all smoke occurrences can be found in Appendix A and all locations were documented in the mapping information in ArcGIS for the County staff to use.

## **2.3 SEWER MAINS**

### **2.3.1 Overview**

NORCESS sewer mains consist of polyvinyl chloride (PVC) and ductile iron pipe. The District's existing sewer lines range from 8-16 inches in diameter. The age of the system and system materials were confirmed by the County based records from construction of the system in 2005. Condition was determined based on visual inspection of select manholes and smoke testing of the system.

### **2.3.2 Investigation**

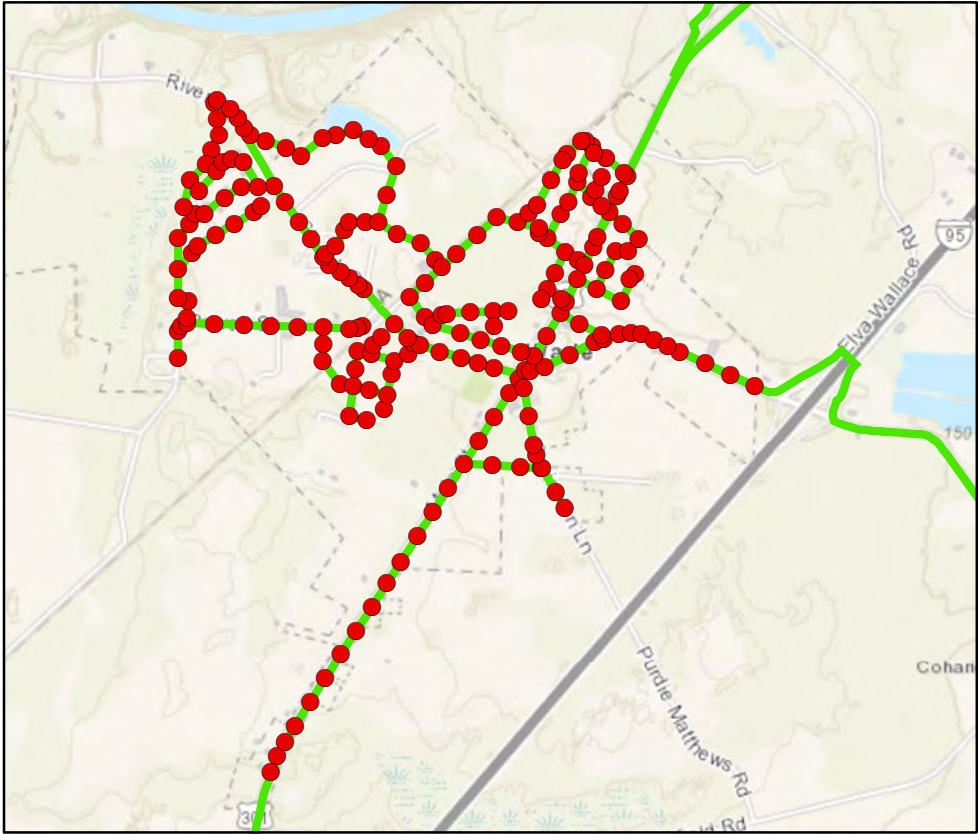
With County input, McGill has reviewed the District's data on sewer mains throughout the collection system. The sewer main material and diameters were verified by the County and updated according to GIS records. Figure 5 shows the sewer line materials in the system, and Figure 6 shows the sewer line diameter throughout the system.

The purpose of this portion of the assessment was to create a working system inventory and then review which areas of the NORCESS District have system components in need of replacement or rehabilitation.

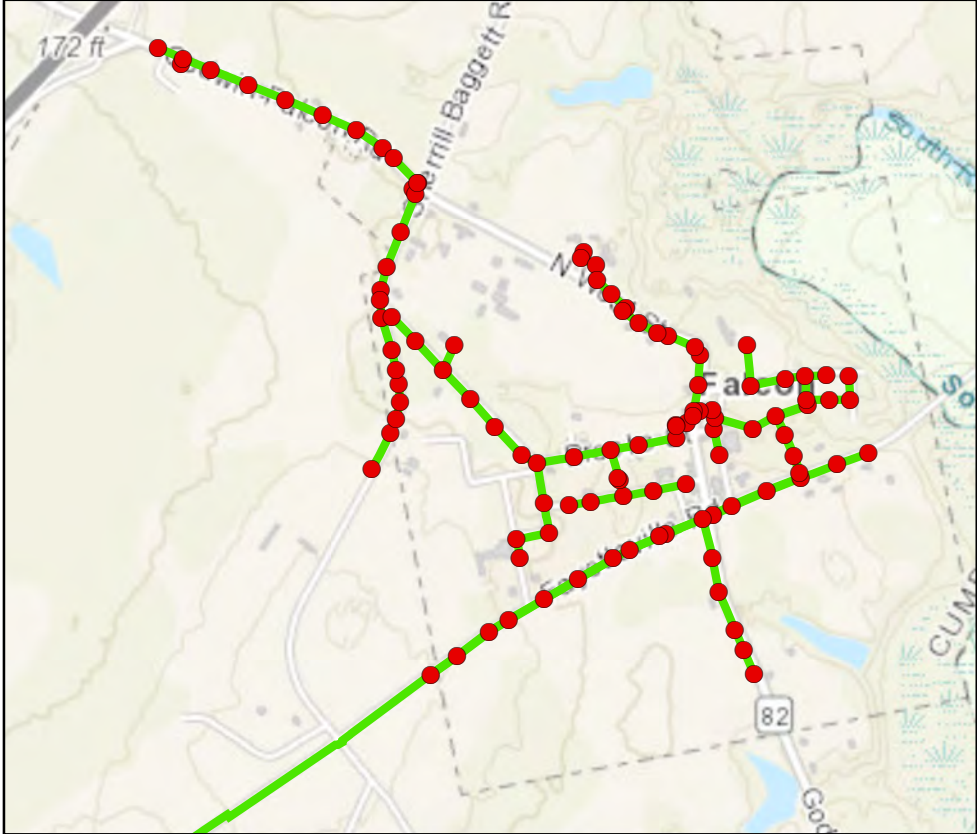


# Norcross Line Material Map Figure 5

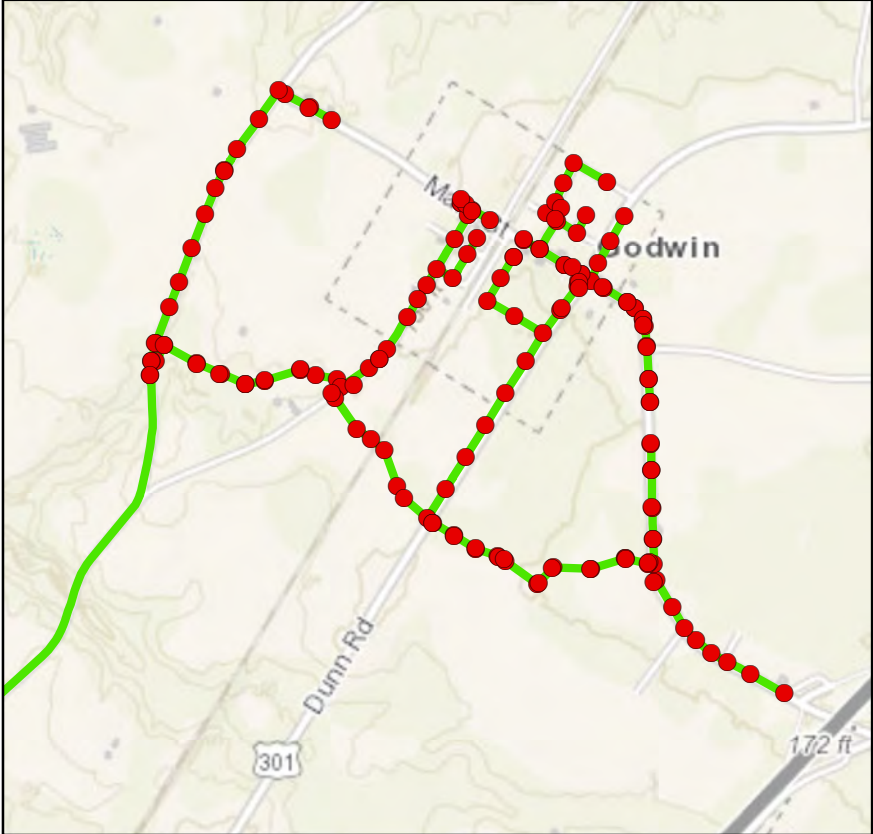
Wade



Falcon



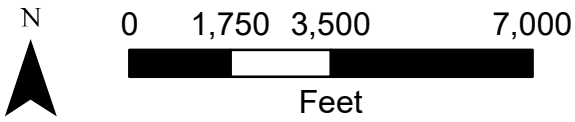
Godwin



**Sewer Asset Management Plan  
NORCRESS District  
Cumberland County  
Project No. 20.02507**

**Legend**

- PVC
- Norcross Manholes



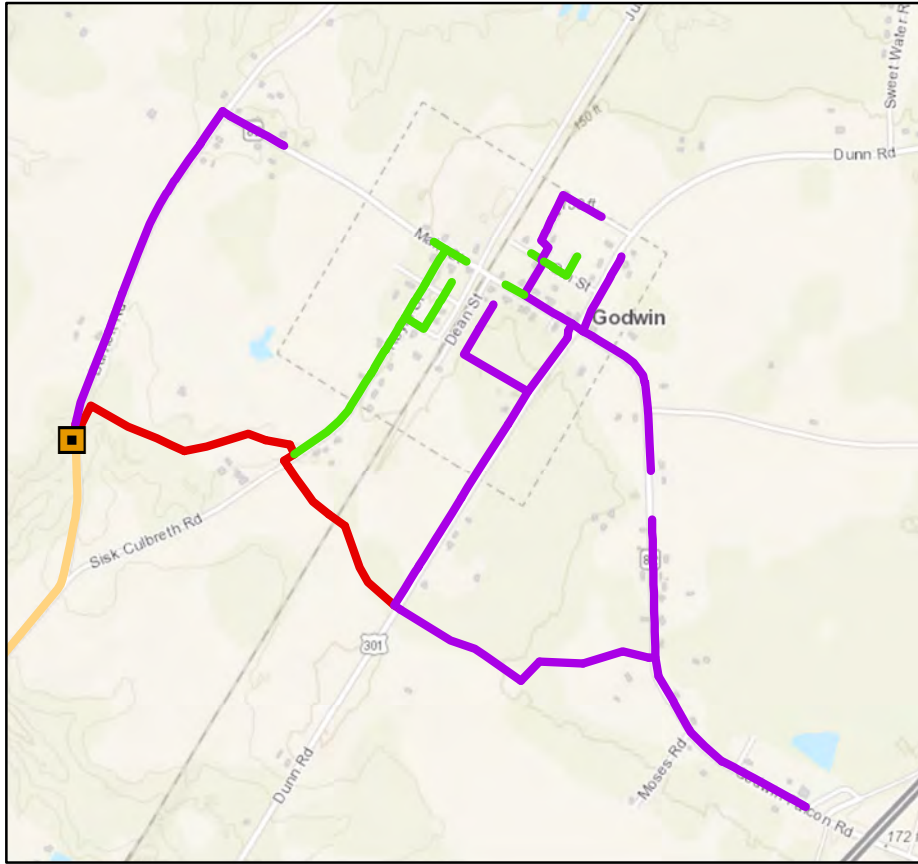

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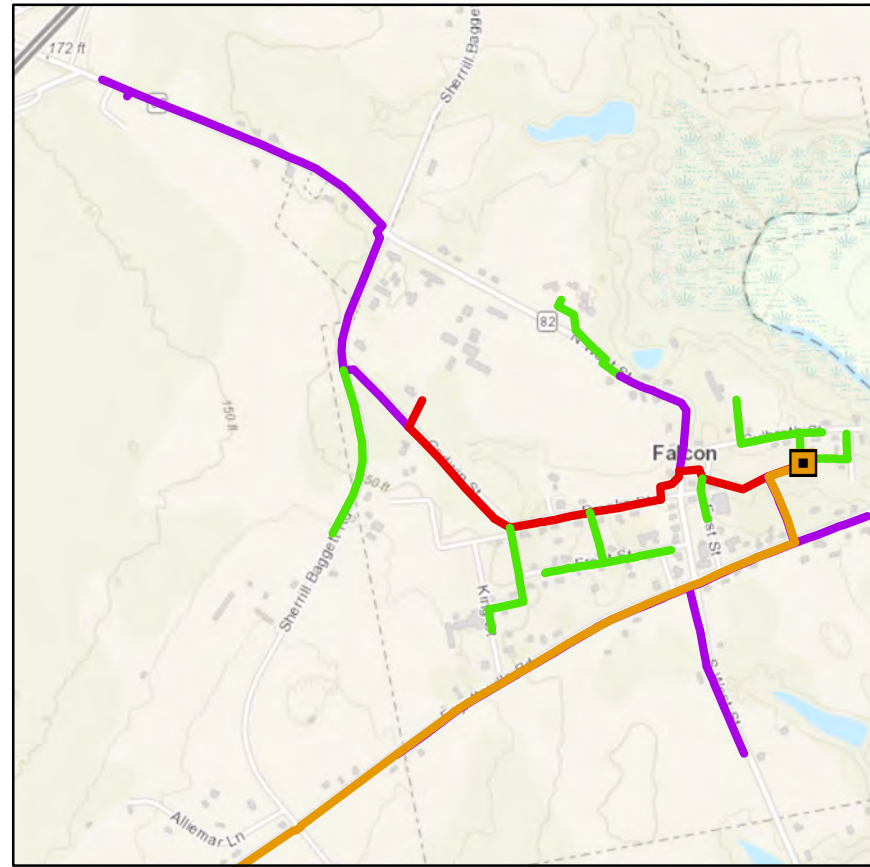
# NORCRESS Sewer Line Diameter Map

## Figure 6

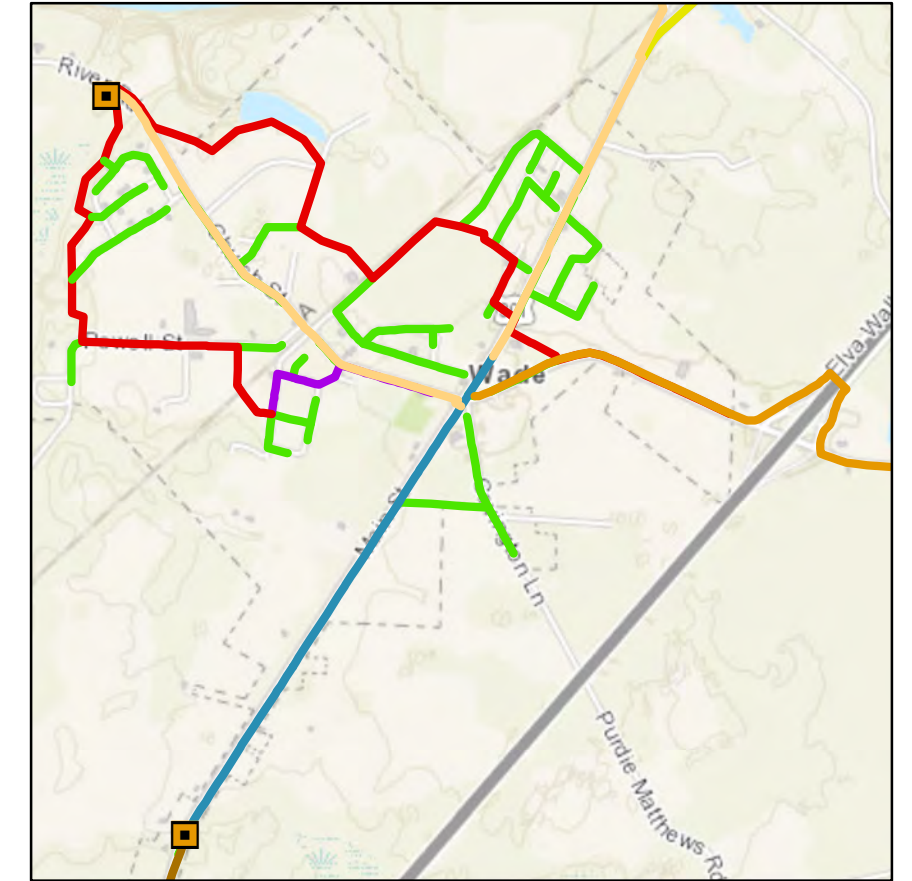
Godwin



Falcon



Wade



**Legend**

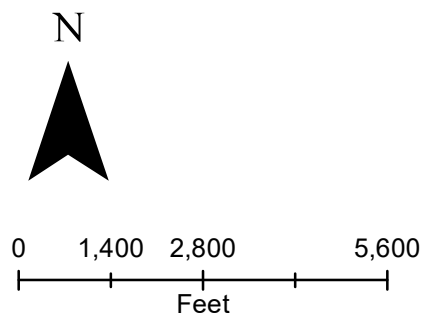
**GRAVITY SEWER DIAMETER**

- 8"
- 10"
- 12"
- 15"

**FORCE MAIN DIAMETER**

- 3"
- 6"
- 8"
- 10"

Lift Station



**Sewer Asset Management Plan**  
**NORCRESS District**  
**Cumberland County**  
**Project No. 20.02507**

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\*PVC Material throughout Norcross System



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### 2.3.3 Methodology

McGill reviewed the County's GIS data for the sewer collection system. County staff provided information on manholes where deterioration was suspected. Flow monitoring and smoke testing were performed throughout the system. The County's GIS mapping was utilized to create maps that document the collection system by material and by diameter.

### 2.3.4 Results

The existing gravity sewer pipe in the sewer system ranges from 8-inch to 16-inch in diameter based on County records. All pipe diameters therefore do meet current NCDEQ minimum design standards. Based on the age of the system, the PVC and ductile iron pipe installed in 2005 have not exceeded its useful life, and therefore replacement is not recommended outright. Recommendations will include planned CCTV inspections by the County of the existing piping in order to verify existing condition and provide future updates to this AMP/CIP. Based on the age of the pipes and no documented issues from County staff, pipe in the system has been noted to be in good/excellent condition. Tables 5 through 9 show the assessment based on material and then broken out by diameter and age.

**Table 5: Summary of Gravity Sewer Main by Material**

<b>Material</b>	<b>Diameters (in)</b>	<b>Total LF</b>	<b>% of System</b>
<b>Polyvinyl Chloride</b>	<i>8, 12, 15</i>	<b>134,275</b>	<b>97.2%</b>
<b>Ductile Iron</b>	<i>8, 16</i>	<b>3,907</b>	<b>2.8%</b>
<b>Total LF</b>	<b>N/A</b>	<b>138,182</b>	<b>100%</b>

**Table 6: Summary of Gravity Main Sewer Main by Diameter**

Diameter	Total LF	% of System
8"	85,144	37.71%
10"	23,235	27.29%
12"	22,720	26.68%
15"	7,083	8.32%
<b>Total LF</b>	<b>138,182</b>	<b>100%</b>

**Table 7: Summary of Force Main by Material**

Material	Diameters (in)	Total LF	% of System
Polyvinyl Chloride	8, 12, 15	73,650	93.6%
Ductile Iron	8, 16	4,015	5.1%
HDPE	8	1,013	1.3%
<b>Total LF</b>	<b>N/A</b>	<b>78,678</b>	<b>100%</b>

**Table 8: Summary of Force Main Sewer Main by Diameter**

Diameter	Total LF	% of System
3"	4,082	5.2%
6"	28,123	35.7%
8"	35,364	45.0%
10"	11,109	14.1%
<b>Total LF</b>	<b>78,678</b>	<b>100%</b>

**Table 9: Summary of Pipe Condition by Age**

Year Put Into Service	Type	Total LF	% of System
2005	Gravity	138,182	64%
2005	Force Main	78,678	36%
<b>Total LF</b>		<b>216,860</b>	<b>100%</b>

## **2.4 MANHOLE INSPECTIONS**

### **2.4.1 Overview**

Manholes are the primary access points to the sanitary sewer system and are essential for its operation and maintenance. As they allow personnel access to the sewer system, manholes are also likely culprits for allowing I/I to enter the sewer system. Manholes in low-lying areas with improperly sealed lids, manhole joints, and poor connection practices can all be sources of I/I. Storm drains or the presence of manholes in ditches and low-lying areas in NORCRESS frequently allow standing water to remain for hours or days after a storm event which can exacerbate inflow through manhole lids.

One of the most cost-effective practices for managing this intrusion is visual manhole inspections, where the various components of the manhole are rated according to their condition. Some examples of noticeable deficiencies are benches which have deteriorated from abrasion and corrosion and rings which can be moved by traffic, soil, and the freeze/thaw cycle. Defects in any aspect of the manhole can lead to I/I, structural instability, and manhole failure.

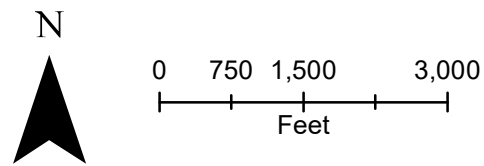
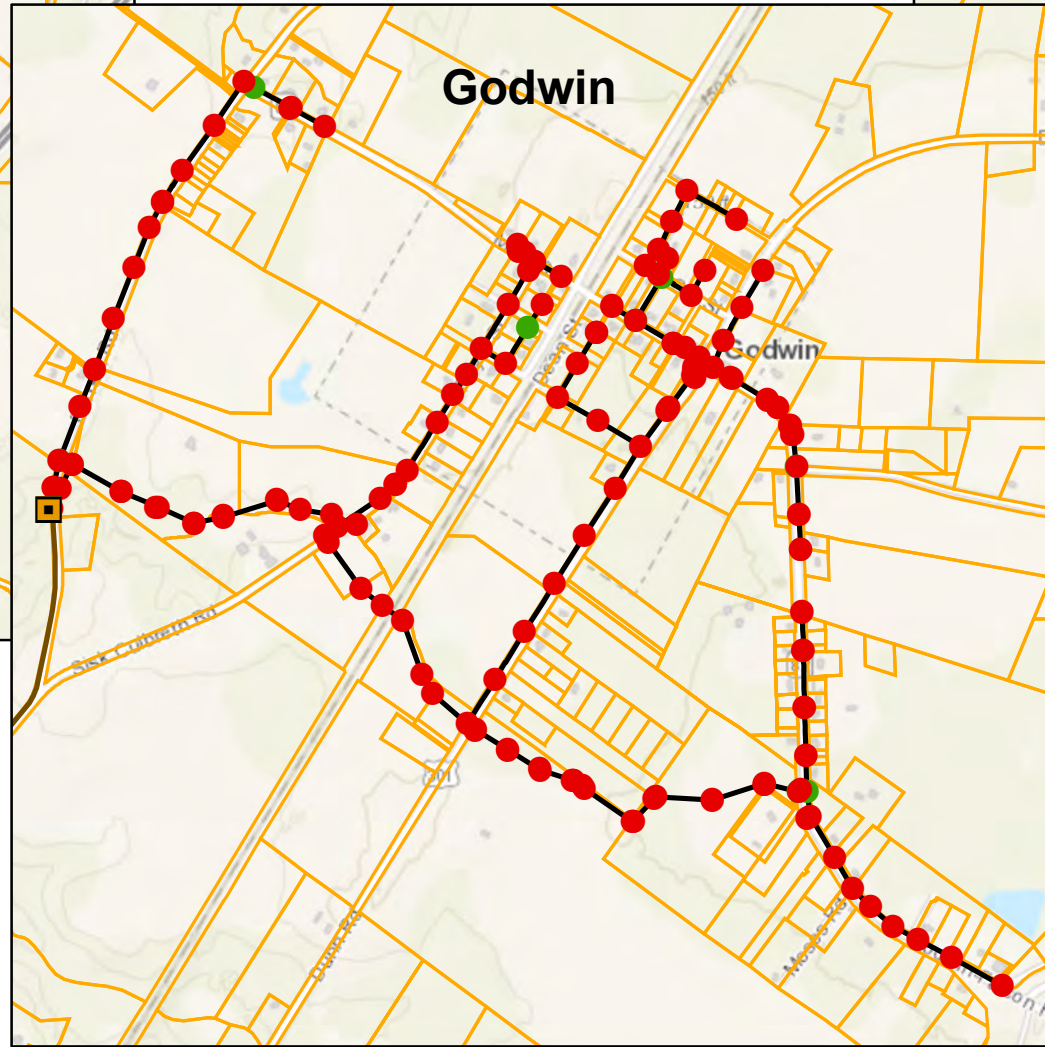
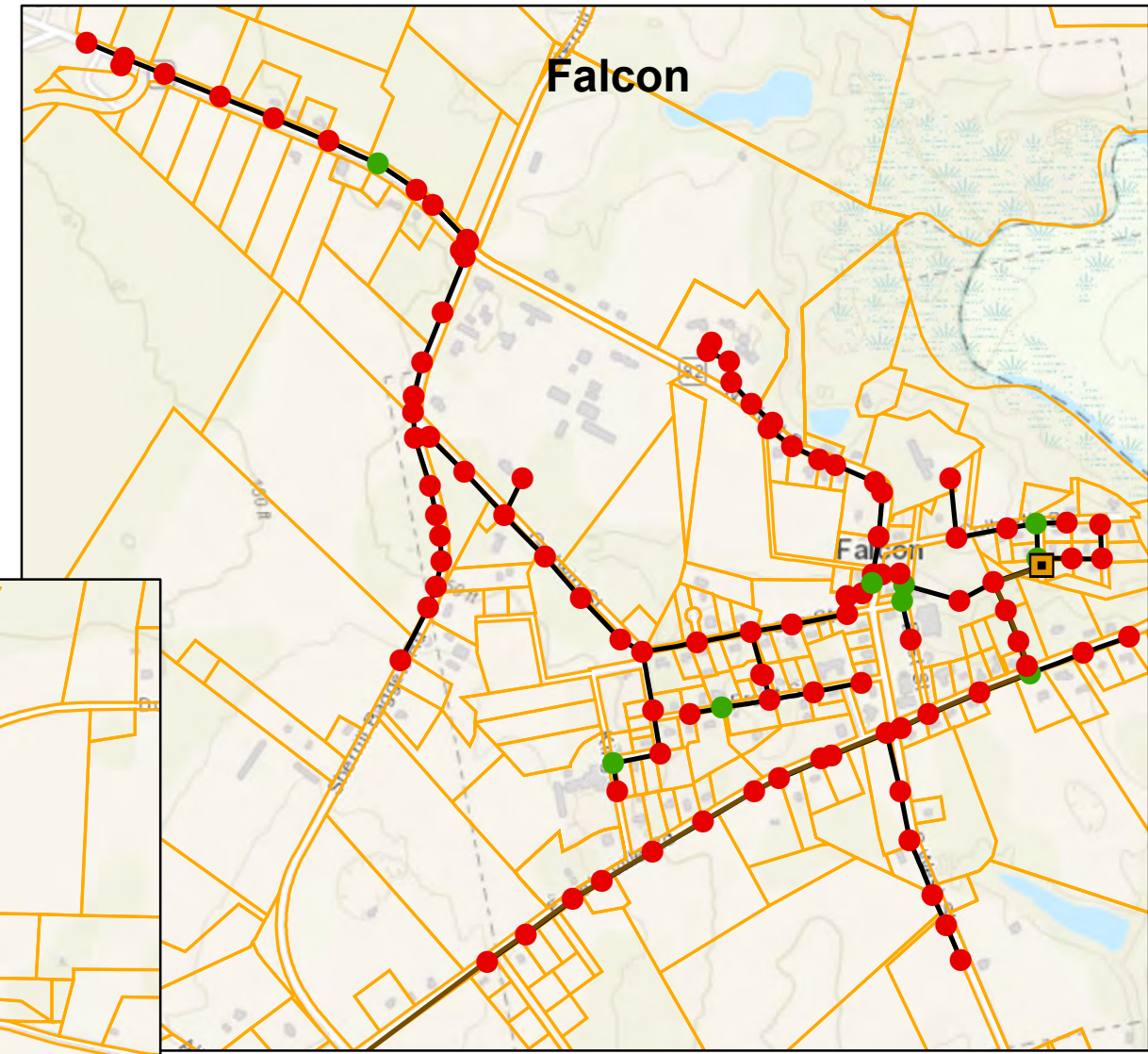
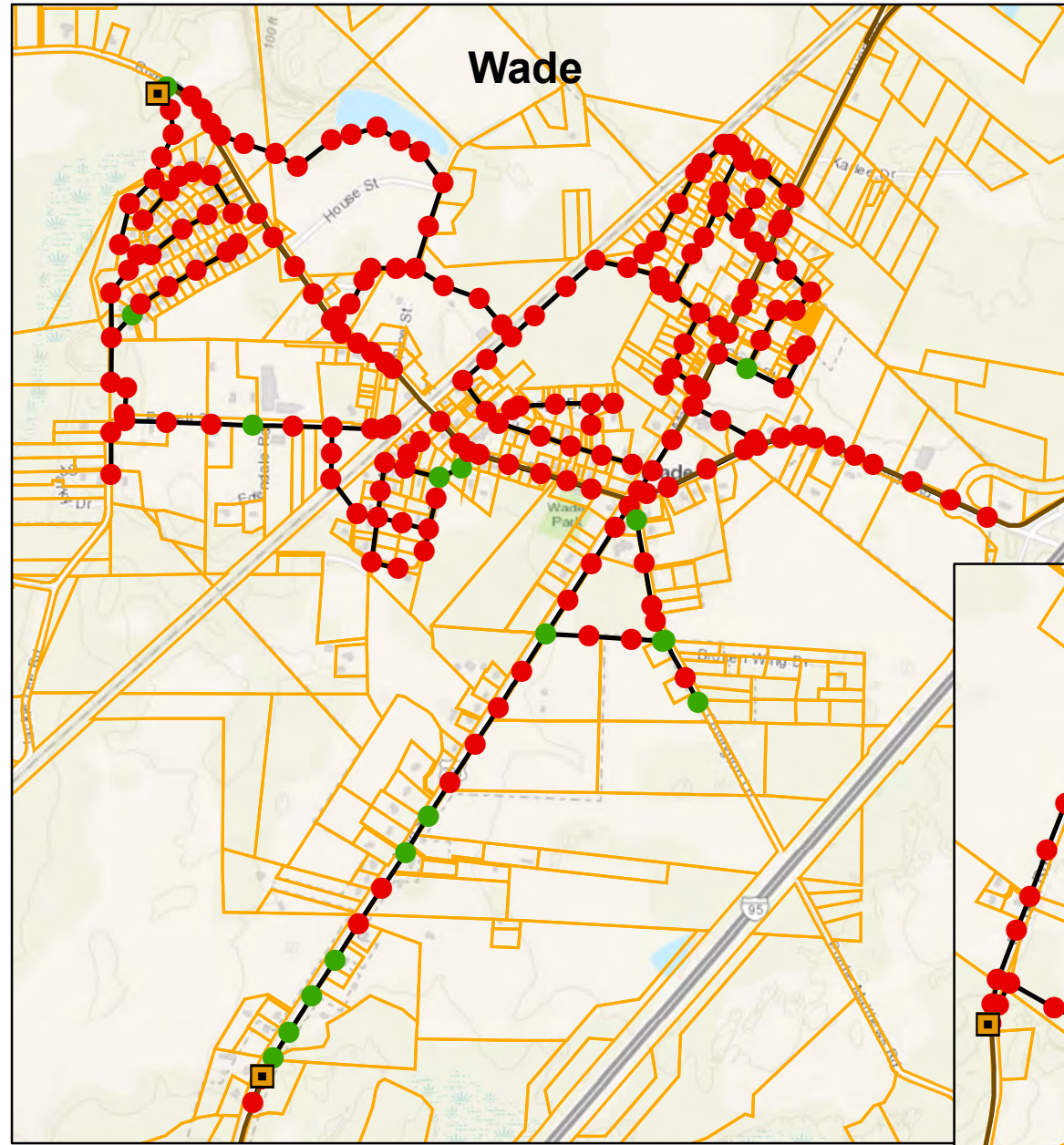
### **2.4.2 Investigation**

After the NORCRESS system was put into service, the GIS record was created in 2006. The purpose of this portion of the assessment was to perform field inspections of select manholes within the system to develop an overall system assessment. A total of 424 manholes are currently inventoried by the District. Approximately 37 manholes were inspected as a part of this inventory and assessment. The map including all manholes that were inspected is shown in Figure 7.



# NORCRESS Manhole Inspection Map

## Figure 7



**Legend**

**Manholes**

**Condition**

- Not Visited
- Good
- NORCRESS FORCE MAIN
- NORCRESS SEWER MAIN
- Lift Station
- Tax Parcels



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**Sewer Asset Management Plan**  
**NORCRESS District**  
**Cumberland County**  
**Project No. 20.02507**

### **2.4.3 Methodology**

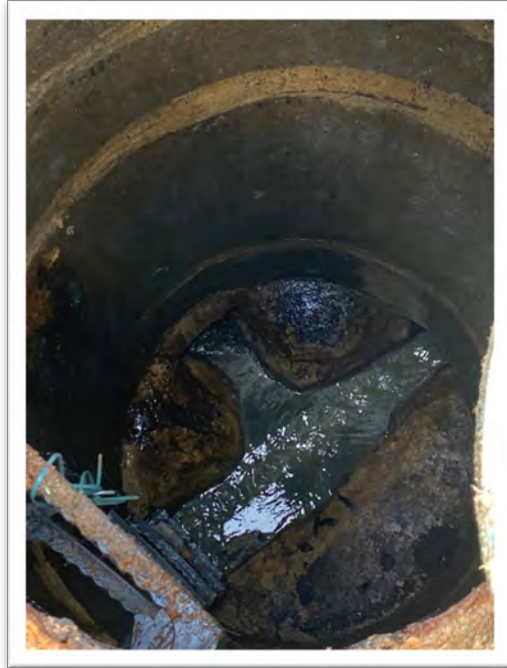
The NORCRESS District sewer collection system contains 424 sewer manholes. Working with County staff, McGill inspected selected manholes within the sewer system to obtain a representative condition sampling. County staff determined which manholes to inspect in each area based on manhole location and orientation. Manholes prioritized for inspection include those located in existing ditches or low-lying areas where the manhole would be susceptible to degradation and inflow from surface water. At each manhole, the inspector recorded the manhole's location, dimensions, material, and condition of its various components. All information including photographs of the interior of the manhole and top area were uploaded into the GIS mapping.

Some typical distresses include:

- Wear and asphalt paving on the cover;
- Corrosion and mud seepage on the ring and frame;
- Gas residue, corrosion, seepage, and deteriorating concrete on the cone and riser;
- Wetness, silt, root intrusion, and deteriorating concrete on the barrel;
- Dirt and corrosion on the rungs;
- Silt accumulation on the bench; and
- Misaligned pipes, obstructions, trough deteriorating, standing water, and no flow in the channel.

Based on the recorded comments, each component was assigned a condition score, and these scores were combined into an overall condition rating for each manhole- excellent, good, fair, or poor. The images below depict the interiors of various condition manholes.





*SMH 028208, River Road in Wade. Manhole shows minor corrosion over time.*



*SMH 028044, Main Street in Wade. Rehabilitated manhole with lining, some corrosion on frame.*



*SMH 027930, Main Street in Godwin. Manhole in good condition.*



*SMH 026913, King Street in Falcon. Manhole in good condition.*

#### **2.4.4 Results**

All of the 37 inspected manholes were precast manholes. Due to the relative low age of the system, County staff confirmed that all of the existing manholes in NORCRESS are precast sewer manholes. Of the manholes observed, a majority were noted as good condition, and others observed were described as poor condition. Based on the condition of those observed, it is suspected that the remaining manholes not inspected would have similar condition to those observed. Tables 10 and 11 summarize the manhole materials and condition.

**Table 10: Summary of Manholes by Material**

<b>Material</b>	<b>Total</b>
<b>Precast Concrete</b>	<b>424</b>
	<b>424</b>

**Table 11: Summary of Manholes by Condition**

<b>Material</b>	<b>Total</b>
<b>Excellent-Good</b>	<b>33</b>
<b>Fair-Poor</b>	<b>4</b>
<b>Unknown</b>	<b>387</b>
	<b>424</b>

The County maintains its collection system using the ESRI platform and includes the attribute data for each manhole. A spreadsheet including condition comments for each manhole can be found in Appendix A.

## 2.5 LIFT STATIONS

### 2.5.1 Overview

The NORCRESS Lift Station is owned and operated by Fayetteville PWC. The station includes a flow meter that is used for recording flow generated by the NORCRESS Sewer Collection System. The capacities of each lift station are listed below.

Falcon Lift Station #92:

Lift Station Design Capacity	70,000 GPD
------------------------------	------------

Wade Lift Station #89:

Lift Station Design Capacity	45,000 GPD
------------------------------	------------

Wade Lift Station #90:

Lift Station Design Capacity	125,000 GPD
------------------------------	-------------

Godwin Lift Station # 91:

Lift Station Design Capacity	10,000 GPD
------------------------------	------------

\*Lift Station Design Capacity information is from the Freese and Nichols report called Northern Cumberland Regional Sewer System Comprehensive Sewer Evaluation.

## 3.0

## CAPITAL IMPROVEMENTS PLAN

---

Recommendations for various sewer system improvements to include the gravity sewer pipe and manholes in the collection system include general recommendations, high priority projects (within 10-years) and future projects (past the 10-year planning window). General recommendations are typically less costly and can be implemented more quickly, whereas high priority projects may require financial assistance and be undertaken in phases.

### 3.1 GENERAL RECOMMENDATIONS

#### 3.1.1 *Smoke Testing*

Smoke testing is a valuable tool that can be used to locate broken pipe, cleanouts, or manholes that need repair. Any of these issues can be a source for the inflow and infiltration (I&I) of surface water into the sewer collection system. It is recommended that the District perform comprehensive smoke testing of the entire system at least every other year. Additionally, the District should utilize smoke testing on an “as needed” basis to troubleshoot possible problem areas. The most common repairs that would result from smoke testing include replacing missing or broken cleanout caps and removing buildup from manholes. Other repairs that can be performed at this time are patching the exterior concrete or replacing the rings/lids of manholes identified to be leaking during smoke testing. These may be contributing significant I/I into the wastewater collection system. Similarly, line breaks in flooded areas should also be addressed promptly. It is also recommended that the District continue to perform regular smoke testing to monitor the system’s ongoing wear and identify specific areas for improvement.

#### 3.1.2 *Video Evaluations*

Based on information provided from the County, video evaluations were performed by Hydrostructures. Hydrostructures cleaned and provided CCTV inspections of the gravity lines in 2016 as part of the system inventory. It is recommended that the District plan to

perform video evaluation of the system every 5 years as a part of O&M in order to stay vigilant concerning potential issues within the collection system.

### **3.1.3 Manhole Inspections**

Manhole inspections uncovered some infrastructure deficiencies which can be repaired immediately to improve the condition and function of the wastewater collection system. The full list of manholes and their field assessment is included in Appendix A. Manhole rehabilitation and replacement is the priority work that is targeted by the CIP. The proposed projects are divided out over an annual basis in order to include the improvements as a reasonable component of annual budgeting.

### **3.1.4 Flow Monitoring**

The County and McGill have discussed that additional flow monitoring would be beneficial to the County in this system. It is recommended that the County perform flow monitoring at a frequency of every 3 to 5 years to monitor I/I within the system. Initially, we recommend focusing the monitoring in the Town of Falcon.

Additionally, should the County begin to suspect the presence of I&I at specific locations within the system, they will engage in flow monitoring to verify as needed. The PWC Lift Station does provide for metering of flow received within the district. It is recommended within the CIP that the County install an in-line flow meter within the collection system just upstream of the lift station, in order to assist with recording of data and calibration with the PWC maintained lift station.

## **3.2 PRIORITY PROJECTS**

### **3.2.1 Manhole Rehabilitation Projects**

In these projects, manholes will be repaired and lined where possible, unless replacement is needed. The projects are scoped to be undertaken every three years. Each project is priority targeting any manhole deficiencies or evidence of I/I observed during manhole inspections. There are a range of issues from broken risers to cracks in the frame of the manhole that warrant various repairs. To reduce the amount of I/I that enters the system it is imperative to repair these manholes. The project will be ongoing as to spread out the cost for the County over a 10-year period. There are 424 manholes in the system, and based on inspections and smoke testing, it is estimated that approximately 20% of the manholes would benefit from rehabilitation and lining. In order to fit a reasonable budgeting target, the rehabilitation of 84 manholes is broken into 4 projects, which are included in the CIP separately, but can be combined or modified as needed given annual budgetary considerations.

This project is recommended to be pursued with a manhole rehabilitation specialty company with scopes large enough to get competitive pricing for each mobilization. The manholes proposed for rehabilitation or replacement range in depth, therefore an average depth of seven vertical feet (VF) was used per manhole for estimating purposes. The capital improvements plan breaks this project into 4 phases with a budget of approximately \$118,600 every three years over a 10-year span, as outlined in Table 12. The total cost of the manhole rehabilitation projects is estimated to be \$474,400.



**Table 12: Preliminary Opinion of Probable Cost for Manhole Rehab Projects**

Item	Description	Units	Quantity	Unit Price	Total Cost
1	Mobilization	LS	3%	N/A	\$ 2,800
2	Rehabilitate Existing Manhole	VF	147	\$ 500	\$ 73,500
3	Additional Manhole Repairs	LS	1	\$ 10,000	\$ 10,000
4	Asphalt Surface Restoration	LS	1	\$ 12,500	\$ 12,500
<b>Construction Subtotal</b>					<b>\$ 98,800</b>
Contingency (15%)					\$ 14,800
Engineering Coordination					\$ 5,000
<b>Total Base Project Cost</b>					<b>\$ 118,600</b>

*\*Cost estimates are based on the knowledge of a professional engineer based on 2024 construction costs and are subject to change due to bidding environment and other factors.*

**3.2.2 Flow Meter Project**

This project includes installing four in-line flow meters on the existing gravity lines upstream of the four lift stations the sewer system. These devices will allow the County to monitor its own sewer flow. This data can be utilized by staff for planning and budgeting purposes.

The project includes two 8-inch electromagnetic flow meters in a precast underground bypass vault with associated piping and appurtenances. The meters will be installed on the County’s gravity sewer lines outside of the existing lift stations. The preliminary cost estimate for this project is \$203,900 as outlined in Table 13 below.

**Table 13: Preliminary Opinion of Probable Cost for Flow Meter Project**

Item	Description	Units	Quantity	Unit Price	Total Cost
1	Mobilization	LS	3%	N/A	\$ 4,900
2	8-inch Mag Meter	EA	4	\$ 25,000	\$ 100,000
3	Precast Concrete Valve Vault	EA	4	\$ 8,000	\$ 32,000
4	Piping, Valves, Fittings	LS	1	\$ 30,000	\$ 30,000
<b>Construction Subtotal</b>					<b>\$ 166,900</b>
Construction Contingency (15%)					\$ 25,000
Engineering Coordination					\$ 12,000
<b>Total Base Project Cost</b>					<b>\$ 203,900</b>

*\*Cost estimates are based on the knowledge of a professional engineer based on 2024 construction costs and are subject to change due to bidding environment and other factors.*

**3.2.3 Flow Monitoring Study**

This project includes the rental of four non-contact flow monitors. These devices will give the County the ability to develop a database of real-time sewer flow data in the collection system in order to pinpoint potential sources for I/I and uncaptured flow. Additionally, the budget includes utilizing the Flow Works software, a cloud-based data management program that will put flow monitoring and rainfall data into usable format for tracking and reporting. This data can be utilized by staff for planning and budgeting purposes.

The project includes rental of four Hach Flo-Dar Area/Velocity Flow Meter Sensors with wireless data transmission. The monitors are designed to be installed above the flow, therefore can typically be installed from the surface without the need for confined-space entry permit. The project also includes the purchase of a rain gauge with RTU. The project is quoted for 2-months of monitoring with the FlowWorks Software. Longer duration and the option for flow monitoring equipment purchase can be further explored. The preliminary cost estimate for this project is \$25,440 as outlined in Table 14 below.

**Table 14: Preliminary Opinion of Probable Cost for Flow Monitoring Study**

Item	Description	Units	Quantity	Unit Price	Total Cost
1	Hach Flo-Dar Rental	EA	8	\$ 1,925	\$ 15,400
2	Device Data Hosting	EA	4	\$ 555	\$ 2,220
3	FlowWorks Device Monthly	EA	8	\$ 100	\$ 800
4	FlowWorks Device Setup	EA	4	\$ 180	\$ 720
5	Rain Guage with RTU	EA	1	\$ 3,000	\$ 3,000
<b>Construction Subtotal</b>					<b>\$ 22,140</b>
Construction Contingency (15%)					\$ 3,300
<b>Total Base Project Cost</b>					<b>\$ 25,440</b>

*\*Cost estimates are based on the knowledge of a professional engineer based on 2024 construction costs and are subject to change due to bidding environment and other factors.*

**3.2.4 Air Release Valve Replacement and Ice Pigging**

This project includes replacement of existing air release valves along the 8-inches force main that extends from the Falcon lift station to a sewer manhole in the Town of Wade. These devices will give improvement performance of force main by more adequately allowing for release of built up air within the over seven miles of existing force main.

**Table 155: Preliminary Opinion of Probable Cost for ARV and Ice Pigging**

Item	Description	Units	Quantity	Unit Price	Total Cost
1	Mobilization	LS	3%	N/A	\$ 2,400
2	2" Combination Air Release Valve	EA	8	\$ 10,000	\$ 80,000
3	Install Pigging Stations and Perform Ice Pigging on Force Main	LS	1	\$ 150,000	\$ 150,000
<b>Construction Subtotal</b>					<b>\$ 232,400</b>
Construction Contingency (15%)					\$ 34,900
<b>Total Base Project Cost</b>					<b>\$ 267,300</b>

### **3.3 CIP PROJECTS SUMMARY**

The purpose of this asset management plan was to document the condition of the NORCRESS sewer infrastructure to assist the County with becoming more viable and proactive in the management and financing of its wastewater system. The County intends to look to its CIP to guide its next projects; therefore, it is vital that the CIP be established as an accurate depiction of current conditions and reflect the District's highest priorities with accurate cost estimates. The development of this AMP will serve as a positive step towards ensuring that the District can maintain its level of service agreement.

Sewer manhole rehabilitation was evaluated based on current staff input and the results of the field inspections. The existing manholes were divided into projects recommended for the next 10 years.

McGill prepared cost estimates for all projects based on current materials and construction costs. The 10-year CIP is intended to be adopted by the District to guide its selection of sewer system improvement projects over the next two decades. The cost summary for the 10-year CIP is shown below in Table 16.

**Table 16: CIP Projects Cost Summary**

Year <sup>1</sup>	Flow Monitoring Study	Manhole Rehabilitation Project 1	Flow Meter Project	Manhole Rehabilitation Project 2	Manhole Rehabilitation Project 3	Manhole Rehabilitation Project 4	New Generators- All Lift Stations <sup>2</sup>	Upgrade SCADA <sup>2</sup>	Falcon Force Main- Inspect, Clean, Replace ARVs <sup>2</sup>	TOTAL COST
1	\$ 25,440.00						\$ 640,000.00			\$ 665,440.00
2		\$ 118,600.00						\$ 240,000.00		\$ 358,600.00
3			\$ 203,900.00						\$ 80,000.00	\$ 283,900.00
4				\$ 118,600.00						\$ 118,600.00
5	\$ 25,440.00									\$ 25,440.00
6										\$ -
7					\$ 118,600.00					\$ 118,600.00
8										\$ -
9										\$ -
10	\$ 25,440.00					\$ 118,600.00				\$ 144,040.00
<b>TOTAL ESTIMATED CIP COST</b>										<b>\$ 1,714,620.00</b>

**Notes:**

- 1: Considering the timeline for adoption of this plan and County budget planning cycle, Year 1 is anticipated to be FY 2026
- 2: Project was previously included in a Capital Improvements Plan developed by Freese and Nichols for the NORCRESS District.

## 4.0

## OPERATIONS AND MAINTENANCE PLAN

---

### 4.1 GENERAL RECOMMENDATIONS

The purpose of an Operations and Maintenance (O&M) Program is to provide an organized and cost-effective approach to ongoing maintenance, repair and replacement activities that will maintain the sewer collection system, so it performs as intended and meets the requirements of the sewer utility's System-Wide Collection System Permit, issued under North Carolina General Statutes Article 21 of Chapter 143.

This section provides a general description of proactive O&M, that can be defined as scheduled maintenance activities (preventive maintenance), performed on a regular basis in order to achieve the highest level of system performance using available resources and minimizing failures that can result in Sewer System Overflows (SSOs)

Developing an O&M Program begins with accurate records of infrastructure inventory, asset locations and physical condition. Coupled with work records and system performance history, preventive maintenance schedules can be developed to efficiently address general system needs, from cleaning and debris removal to site-specific maintenance work such as cutting and repair work.

The following elements provide the foundation for an effective O&M program:

- Maintain up-to-date wastewater treatment plant equipment documentation, sewer collection system maps and related work history and operational data.
- Develop a routine preventive O&M program and activities for staff and contractors maintaining the sewer collection system and a system to document scheduled activities
- Develop a rehabilitation and replacement plan identifying and prioritizing system deficiencies and implement short- and long-term actions to address the deficiencies
- Develop and implement training programs to build technical competence and emergency preparedness.
- Develop and provide equipment and replacement part inventories, including critical replacement parts



## **Sewer System Mapping**

Sewer system maps and related databases are typically managed using a Geographic Information System (GIS). The NORCRESS District currently utilizes ESRI as the GIS platform from which to manage the utility systems. This GIS mapping is supported by a database that records sewer main size, material types, and locations of manholes and clean-out connections. The platform has the ability to store more information that is currently being utilized by the County, including invert and rim elevations and other attributes of system appurtenances. If the County intends to utilize the GIS platform for managing and recording maintenance performed and planned, it is recommended that the County investigate alternative software to ensure that they are utilizing a software that meets their needs with respect to budget.

The GIS database should be updated on a regular basis. Software applications such as work order systems are available to allow field staff to update GIS data as inspection and maintenance activities are completed. Other applications can also allow staff to update and edit maps. Field information that was gathered by McGill and County staff as a part of this assessment is now included in the County's GIS system database for future reference.

GIS can organize work history along with operational data, inspection records and images to provide managers, operations staff and engineers with powerful data sets to track current resource allocations and forecast short and long-term operational and capital needs. Outcomes of detailed analysis such as recommended sewer main rehabilitation work versus sewer overflows can be mapped to present the relationship visually for ease of understanding.

## **Preventive Operation and Maintenance (O&M)**

Preventive maintenance is performing routine and scheduled maintenance activities before wastewater treatment plant and lift station equipment or buried infrastructure fails, for the purpose of extending useful life, reducing overall operating costs, and increasing system reliability. This proactive approach to maintenance work is more efficient and cost effective than reactive and curative operations. Preventive maintenance activities will also help operations staff to better understand the lift station equipment, and collection system components and how they work under various conditions. This knowledge is essential to setting maintenance priorities and developing the scope and timing of long-term rehabilitation and replacement projects.

## **Scheduled Cleaning of Sewers**

EPA recommends, at a minimum, that 100% of sewer mains should be cleaned every 5-years, or 20% of the system annually. The sewer utility's Collection System Operating Permit requires 10% of the gravity sewers to be cleaned annually. High pressure jetting is the most common approach using various spray nozzles for general cleaning and debris removal. Mechanical cutters are used to address root intrusion and cleaning agents can be added to help remove fats, oils, and grease (FOG).

More frequent cleaning is scheduled for areas with a history of heavy debris, grease buildup and roots. CCTV inspections are also used to identify areas to clean more often, such as sections with minor defects such as offset joints and service taps protruding into the main line. Sewer sections near siphons are cleaned more frequently to ensure continuous and uninterrupted operation.

As part of the O&M Program, a master list of cleaning operations, priority locations and scheduling can be incorporated into GIS. Maps can be produced to define work areas, schedule resources, including contracted services, track progress and task completion. Updating GIS maintenance operations data (partial blockages found, debris quantity, etc.)

will help managers adjust cleaning frequency and area boundaries as needed to increase program efficiency, reduce sewer blockages, and avoid SSOs.

## **Routine Visual Inspections**

Routine inspections are used to assess the condition of lift stations, manholes and surface facilities, recording general conditions and evidence of possible structural problems or failures (offset structures, etc.), corrosion, surcharging, overflows and excessive Inflow and Infiltration (I&I). Work orders are generated based on inspection records to effect operational adjustments, scheduling more detailed inspections and/or making necessary repairs.

## **Manhole Inspection Program**

Manhole inspections keep the asset inventory up-to-date and are used not only to update collection system maps, but to determine structural condition. During manhole inspections, a complete inventory is taken of each manhole including construction materials, ring size, depth to invert, flow conditions and evidence of problems. The National Association of Sewer Service Companies (NASSCO) Manhole Assessment and Certification Program (MACP) may be adopted or used as a guide to ensure consistency and reliability of evaluation and ranking methodology.

The results from routine manhole inspections and monitoring are used to prioritize areas needing CCTV inspections to assess pipe condition such as manholes with evidence of slow flow or surcharging. Information is recorded and used to schedule maintenance and repairs.

## **CCTV Inspection Program**

While routine cleaning and visual inspection are used to assess the condition of surface facilities and manholes, CCTV video inspections are the primary method used to assess the condition of the sewer pipes. Using conventional defect criteria is highly recommended to provide standardization and consistency in sewer pipe condition

assessment and ranking. The NASSCO Pipeline Assessment and Certification Program (PACP) may be adopted or used as a guide to ensure consistency and reliability of evaluation and ranking methodology.

## **Maintenance Activity Records**

Detailed records and daily logs of O&M work provide valuable information to help managers evaluate the effectiveness of maintenance activities and make adjustments to optimize the use of limited resources. Equipment, manpower and other resources are tracked along with detailed descriptions of defects and/or obstructions encountered including debris, FOG, structural failures, etc. Maintenance work resulting in system modifications or extensions is required to be incorporated into record drawings and system maps. Scheduled testing of emergency and standby equipment is also a requirement of the collection system permit.

These records are required to be reviewed periodically to identify problems that cannot be resolved in a short period of time in order to develop a plan to address the problem(s). Maintaining these records for an extended period of time (5-years or more) will also provide accurate reference points of maintenance investments made over time that will track the effectiveness of operation and maintenance activities.

In the event of a sewer spill or system overflow, maintenance records will need to provide sufficient detail to satisfy reporting requirements for the event, including location(s), volume of wastewater, corrective actions, etc. This data may also be integrated into GIS to allow mapping of these events over time in order to identify patterns and/or trends that will assist with scheduling maintenance and planning rehabilitation and other capital improvements.

## **Resolution of Customer Complaints**

Customer complaints are primarily about sewer backups and odors. Sewer backups require an immediate response to diagnose and resolve the problem. These complaints can occur outside normal business hours, significantly escalating costs. Detailed records of the problems found, and the resources needed to address the failed condition, provide valuable feedback for making adjustments to the preventive maintenance program that can reduce these types of calls and help lower overall maintenance costs.

These records can also identify areas where private service laterals frequently fail. Notifying customers in these areas will allow them the opportunity to address deficiencies proactively, which will also help reduce customer “emergency” calls.

## **Capital Improvements Plan**

A Capital Improvements Plan (CIP) is required by the collection system permit to identify rehabilitation, replacement and expansion needs of the system. The CIP is required to address the short and long-term needs of the system, covering at least a 3 to 5-year planning period, and must include the estimated cost of each capital project.

CIP development incorporates maintenance activity, cleaning and inspection records, and system performance data that may include flow monitoring and hydraulic modeling to evaluate the existing system and to recommend improvements needed to correct existing deficiencies, and ensure adequate capacity is maintained throughout the system.

Capital planning includes consideration of on-going funding for rehabilitation and replacement of the collection system as it wears out, and potential upgrades for expansion as needed.

## **Training Program**

Training programs provide a mechanism for educating employees and establishing their technical competence to perform operations, maintenance, and emergency responses safely and effectively. A combination of in-house skill training and specialized training purchased or provided through state and national associations, conferences and vendor training programs are typically used to build and enhance skills for performing daily work duties. Periodic training reinforces previous efforts, as people often overlook things that are used infrequently. It also provides an opportunity to train new staff and learn about new problems, new techniques, and changes in equipment.

Emergency training educates system personnel about emergency situations and resulting effects on the wastewater system, public health, and environmental impacts. It also provides an opportunity to practice responses. Good record keeping ensures personnel are properly trained and prepared to effectively operate and maintain the collection system under any given circumstance. Regular review of training records is essential for keeping content up-to-date and maintaining proper employee awareness.

## **Equipment and Replacement Parts**

A reasonable supply of equipment and replacement parts should be maintained to fully support all operations and maintenance activities. A detailed inventory is essential to ensure availability under normal operations and emergency conditions. Specialized equipment or parts may be too costly to keep in stock, so arrangements with vendors and/or contractors may be necessary to ensure availability during non-business hours or during emergencies.

## 4.2 STAFFING RECOMMENDATIONS

Cumberland County is responsible for three wastewater collection systems and one water system: NORCRESS, Overhills, Kelly Hills, and Southpoint Water System. While each of these districts maintains its own operating budget, the Board leadership and operational management is performed solely by Cumberland County. Therefore, in consideration of the typical utility system management and operations and maintenance that is necessary for maintaining each of the systems, McGill has considered all of the four (4) utility systems cumulatively. While each system could be analyzed separately, considering the systems together is more consistent with actual management of the systems.

Typical metrics for analyzing full-time equivalent (FTE, representing quantity full-time workers) are based on either the population served by the system or by miles of utility piping (water main or sewer line) within each system. For reference, Table 17 below summarizes the customers and piping in each of the County’s utility systems.

**Table 17: Utility System Comparison**

DISTRICT	Number of Connections		Paying Avail. Fee	Pipe in System (mi.)
	Water	Sewer		
<b>Southpoint</b>	84		129	2.8
<b>Kelly Hills</b>		102	166	4.5
<b>Overhills</b>		107	318	4.0
<b>NORCRESS</b>		452	666	41.1
<b>TOTALS</b>	<b>84</b>	<b>661</b>	<b>1279</b>	<b>52.4</b>



**Table 18: Typical Population vs. Pipe Length**

<b>Population</b>	<b>Pipe in System (mi.)</b>
0-100	5
101-500	5
501-3300	21
3301-10000	62

The typical sizes of utility systems from a community system EPA study<sup>1</sup> are shown in Table 18, and are generally consistent when compared to the County's systems. This study was selected as a basis for comparison due to its comprehensive nature, having included water systems nationwide in its breadth. NORCRESS is the exception when compared to Table 18. This is mostly likely indicative of the system serving a more rural population where the connection density is less, and resulting from the length of force main piping in the system that increases the overall length but does not contribute to population density. Overall, these metrics were found to be reasonably consistent with the County's systems. Similarly, the data is consistent regardless of whether the utility system is a water systems or wastewater collection system.

The objective is to make budget-level staffing recommendations for the County's utility systems based on what is typical across the industry and other utility systems of comparable size. The EPA study utilized provides typical FTE for the roles of manager, plant operator, distribution (and collection, for our purposes), and administrative functions. All of these were considered applicable to management and operation of the County's utility systems. Note: while the County is not responsible for plant operation in any system, the lift stations in the NORCRESS and Overhills systems are the County's responsibility, therefore this metric was used, albeit in a smaller percentage, to account for the management of those resources.

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<sup>1</sup> Analysis conducted using excerpts from US EPA document, "National Characteristics of Drinking Water Systems Serving 10,000 or Fewer People," published July 2011.

Table 19 shows Further utilizing the EPA statistics as base for typical FTE for each of the positions, based on the system size in terms of miles of pipe main.

**Table 19: Average Community System Statistics**

Employee Category	System Size (miles of Main)		Mean	Cumberland County
	Pop. 500-3300	Pop. 3300-10000		
	21	62	41.5	51.7
<b>Manager FTE</b> per mile	0.6	1.1	0.85	1.06
	0.029	0.018	0.020	0.020
<b>Plant Operator FTE</b> per mile	0.6	1.3	0.95	1.03
	0.029	0.021	0.023	0.023
<b>Distribution FTE</b> per mile	0.8	2.5	1.65	2.06
	0.038	0.040	0.040	0.040
<b>Administrative FTE</b> per mile	0.6	1.5	1.05	1.31
	0.029	0.024	0.025	0.025

The green highlighted cells are the calculated FTEs that were applied to estimate staffing size based on the quantity of pipe across the County’s four utility systems. Those calculated FTEs are based on the size of systems managed by the County and reasonable estimate of staffing needed for these systems.

Each of the FTEs is applied to each respective employee category. McGill utilized wage information from Zip Recruiter and a benefits multiplier of 1.38 from the U.S. Bureau of Labor Statistics to develop the summary shown in Table 20.

**Table 20: Overall Salary Estimates**

Employee Category	Hourly Rate	Annual Salary	Ben. Mult.	Total	Applied FTE	Applied Budget Cost
Manager	\$38.50	\$80,080.00	1.38	\$110,510.40	1.06	\$117,000
Operator	\$24.52	\$51,001.60	1.38	\$70,382.21	1.03	\$72,700
Distribution	\$23.57	\$49,025.60	1.38	\$67,655.33	2.06	\$139,100
Administrative	\$21.33	\$44,366.40	1.38	\$61,225.63	1.31	\$80,100
<b>Total Applied Budget Cost Based FTEs</b>						<b>\$408,900</b>

Utilizing industry metrics and comparing to systems of comparable size, McGill offers the proceeding section as a general staffing recommendation. This section and these budget values are provided for preliminary planning purposes only.

Staffing levels appear to be reasonable based on the District's ability to operate and maintain the system while providing a reliable level service to its customers.

While this budget number is higher than the current budget staffing, consideration should also be given to the cumulative effect cost to the County for contracted operation and distribution support in the NORCRESS and Kelly Hills district.

# **APPENDICES**



## **Appendix A**

### **Manhole Inspection List**





<b>Norcross Manhole Inspection</b>		
<b>Date:</b>	<b>Nov. 28 and 30, 2023, Feb. 5, 2024</b>	
<b>Manhole ID</b>	<b>Condition</b>	<b>Notes</b>
SMH028220	Poor	Crack on interior from being hit by mower
SMH028209	Poor	
SMH026946	Poor	Black inside manhole and corrosion around collar
SMH028208	Good	
SMH028215	Good	
SMH029390	Good	
SMH028093	Good	
SMH027974	Good	
SMH027985	Good	
SMH028003	Good	
SMH028033	Good	
SMH028025	Good	
SMH028026	Good	
SMH027171	Good	
SMH026913	Good	Outside of Martin's Meats
SMH026927	Good	
SMH026896	Good	
SMH026879	Good	
SMH026880	Good	
SMH026933	Good	
SMH026934	Good	
SMH027941	Good	
SMH027930	Good	
SMH028067	Good	
SMH028038	Good	
SMH028039	Good	
SMH028054	Good	
SMH028053	Good	
SMH028040	Good	
SMH028061	Good	
SMH028045	Good	
SMH028050	Good	
SMH028041	Good	
SMH028044	Good	Ring very rusted
SMH028146	Good	
SMH028145	Good	
SMH026946	Poor	Black inside manhole and corrosion around collar



## **Appendix B**

### **Smoke Testing Results List**

# Norcross Smoke Testing Manholes

Date: October 24-26th 2023		
Manhole ID	Smoke Status	Notes in the field
SMH026878	Leak	
SMH026879	Leak	Smoke around concrete
SMH026880	Leak	Cracked ring
SMH026885	Broken	smoke
SMH026886	Leak	
SMH026887	Leak	Smoking from edges
SMH026887	Leak	Smoking from edges
SMH026892	Leak	Smoking from edges
SMH026895	Leak	Smoking from edges
SMH026896	Leak	Small amount of smoke
SMH026897	Leak	
SMH026900	Leak	Smoking from edges
SMH026901	Leak	Small amount of smoke
SMH026904	Broken	concrete collar broken
SMH026905	Leak	Rim broken
SMH026906	Leak	
SMH026906	Leak	
SMH026911	Leak	
SMH026912	Leak	Buried in front of Martin's
SMH026915	Leak	Smoking
SMH026916	Leak	smoking
SMH026918	Leak	Smoking
SMH026919	Leak	Small amount of smoke
SMH026921	Leak	
SMH026922	Leak	
SMH026923	Leak	
SMH026925	Leak	Smoke around lid
SMH026929	Leak	
SMH026930	Leak	
SMH026931	Leak	
SMH026932	Leak	
SMH026934	Leak	
SMH026941	Leak	Smoking
SMH026942	Leak	Small amount of smoke
SMH026944	Leak	Cracked concrete smoke around lid and collar
SMH026945	Leak	
SMH027168	Leak	
SMH027170	Leak	Smoking from edges
SMH027172	Leak	
SMH027173	Leak	
SMH027174	Leak	
SMH027175	Leak	

SMH027176	Leak	
SMH027179	Leak	smoking
SMH027180	Leak	smoking
SMH027183	Leak	smoke around lid
SMH027184	Leak	smoking
SMH027185	Seal	smoking around sealed lid
SMH027188	Leak	
SMH027441	Leak	
SMH027929	Leak	
SMH027930	Leak	
SMH027933	Broken	Lid removed, possible dumping
SMH027941	Broken	Lid missing, possible dumping
SMH027947	Leak	smoking from lid edges
SMH027948	Leak	
SMH027950	Leak	
SMH027951	Leak	
SMH027952	Leak	smoking from edges
SMH027955	Leak	Smoking from edges
SMH027956	Leak	Smoking from edges
SMH027963	Leak	
SMH027964	Leak	
SMH027965	Leak	
SMH027966	Leak	
SMH027967	Leak	
SMH027968	Leak	Smoking from edges
SMH027969	Leak	Smoking from edges
SMH027970	Leak	
SMH027971	Leak	
SMH027972	Leak	
SMH027973	Leak	Smoking from edges
SMH027974	Leak	Smoking from edges
SMH027975	Leak	
SMH027976	Leak	
SMH027985	Leak	Smoking from edges
SMH027987	Leak	
SMH027988	Leak	
SMH027989	Leak	
SMH027993	Leak	
SMH027994	Leak	
SMH027995	Leak	
SMH027996	Leak	
SMH027997	Leak	
SMH027998	Leak	
SMH027999	Leak	Smoke around lid and ground
SMH028000	Leak	smoke around lid

SMH028002	Leak	
SMH028003	Leak	
SMH028004	Leak	
SMH028006	Leak	
SMH028007	Leak	Smoking from edges
SMH028008	Leak	
SMH028018	Leak	Riser is shifted
SMH028019	Leak	Smoke around lid
SMH028021	Seal	smoking
SMH028022	Seal	smoking
SMH028024	Leak	
SMH028025	Leak	
SMH028026	Leak	
SMH028027	Leak	
SMH028029	Leak	
SMH028031	Leak	smoke around ground and concrete
SMH028032	Leak	
SMH028033	Leak	
SMH028034	Leak	
SMH028035	Leak	
SMH028036	Leak	
SMH028038	Seal	smoke around rim
SMH028041	Leak	
SMH028046	Leak	
SMH028047	Leak	Smoking from edges
SMH028048	Leak	
SMH028049	Leak	
SMH028050	Leak	Smoking from edges
SMH028051	Broken	smoke from collar
SMH028052	Broken	smoke from collar
SMH028053	Broken	smoke from collar
SMH028054	Broken	collar busted
SMH028056	Leak	
SMH028057	Seal	
SMH028059	Leak	Smoking from edges
SMH028073	Broken	Concrete cracked around mh
SMH028074	Leak	
SMH028075	Leak	
SMH028076	Leak	
SMH028077	Leak	
SMH028078	Leak	
SMH028079	Leak	
SMH028080	Leak	
SMH028081	Leak	
SMH028084	Leak	

SMH028092	Leak	Smoking from edges
SMH028099	Leak	Smoking from top sides of mh
SMH028104	Leak	Small amount of smoke from edges of mh. Concrete base is cracked
SMH028105	Leak	Smoking from edges of mh and ground around it
SMH028106	Leak	Small amount of smoke come from edges. Looks like holes in top from missing screw or bolt
SMH028113	Leak	Small amount of smoke coming from sides of mh
SMH028114	Leak	Smoking from mh and ground around it
SMH028117	Broken	
SMH028129	Seal	Smoking from mh
SMH028142	Seal	Broken around concrete
SMH028160	Leak	Small amount of smoke from edges of mh
SMH028164	Leak	Very small amount of smoke coming from mh
SMH028165	Leak	Smoking from edges of mh
SMH028169	Leak	Small amount of smoke coming from edges of mh
SMH028181	Leak	
SMH028189	Leak	Small amount of smoke coming from edges of mh
SMH028214	Leak	
SMH028215	Leak	
SMH028216	Leak	
SMH028217	Broken	Smoke coming up around the ground near manhole
SMH028230	Seal	Smoke around seal
SMH029404	Leak	Small amount of smoke from edges of mh



## Norcross Smoke Testing Cleanouts

Date: October 24-26th 2023

Facility ID	Smoke Status	Notes in the field
32849	Leak	Smoking from c/o and house
32851	Leak	Leaking from broken cap
32853	Broken	
32855	Leak	
32866	Broken	
32867	Broken	
32870	Broken	
32871	Broken	
32874	Broken	
32877	Broken	Busted pipe
32878	Broken	Busted pipe
32900	Broken	Stack
32901	Leak	
32905	Leak	
32907	Broken	
32909	Broken	Smoking
32915	Broken	
32918	Broken	Busted pipe
32930	Broken	
32943	Broken	
32964	Leak	Small amount of smoke
32967	Broken	Missing cap broken sides on c/o
36922	Broken	
36925	Broken	Broken off cap
36926	Broken	
36934	Broken	Pipe busted
36935	Broken	Pipe busted
36946	Broken	Broken stack
36947	Broken	Stack broke no cap
36948	Broken	
36949	Broken	Broken needs cap
36955	Broken	Needs cap
36964	Leak	
36990	Broken	
36991	Broken	
36999	Broken	Pipe busted
37003	Broken	Pipe broken
37005	Broken	
37009	Broken	
37018	Broken	
37019	Broken	
37020	Broken	

37023	Broken	
37023	Broken	
37025	Broken	
37236	Broken	
37238	Broken	
37265	Broken	
37266	Broken	Smoking from house, c/o and ground
37272	Broken	
37058	Broken	
37070	Broken	Broken cap but fixed in field
37078	Broken	Pipe broken
37079	Broken	Pipe broken
37080	Broken	Broken ring and cap
37091	Broken	Cap broken
37138	Leak	Small amount of smoke coming from c/o
37145	Broken	Cap missing
37149	Broken	
37169	Broken	
37172	Broken	Vacant lot near manhole
37181	Leak	
37202	Broken	
37219	Broken	
37222	Broken	
37225	Broken	
37277	Leak	Smoking from cap and ground around c/o
37284	Broken	
37287	Broken	
37291	Broken	Stack cracked
37292	Broken	Broken cap
37307	Broken	
37314	Broken	
41110	Leak	
41695	Broken	
41712	Broken	
43878	Broken	
42156	Leak	
46282	Broken	Smoke coming from holes in cap
54547	Broken	Busted pipe
59583	Broken	
62262	Leak	
32864	Leak	
32865	Broken	
32882	Leak	No cap
32883	Broken	Pipe busted



## **Appendix C**

### **Rainfall Data**



Daily Precipitation from Fayetteville Regional Airport  
Cumberland County 20.02507

<b>Time</b>	<b>Precipitation (in)</b>
Day	Total
18-Oct	0
19-Oct	0
20-Oct	0
21-Oct	0.41
22-Oct	0
23-Oct	0
24-Oct	0
25-Oct	0
26-Oct	0
27-Oct	0
28-Oct	0
29-Oct	0
30-Oct	0
31-Oct	0
1-Nov	0
2-Nov	0
3-Nov	0
4-Nov	0
5-Nov	0
6-Nov	0
7-Nov	0
8-Nov	0
9-Nov	0
10-Nov	0
11-Nov	0.02
12-Nov	0.25
13-Nov	0.01
14-Nov	0
15-Nov	0
16-Nov	0
17-Nov	0
18-Nov	0
19-Nov	0
20-Nov	0
21-Nov	0
22-Nov	1.61
23-Nov	0.78
24-Nov	0
25-Nov	0
26-Nov	0
27-Nov	0.06
28-Nov	0
29-Nov	0
	<b>3.14</b>

Source: <https://www.wunderground.com/history/weekly/us/nc/fayetteville/KFAY/date>



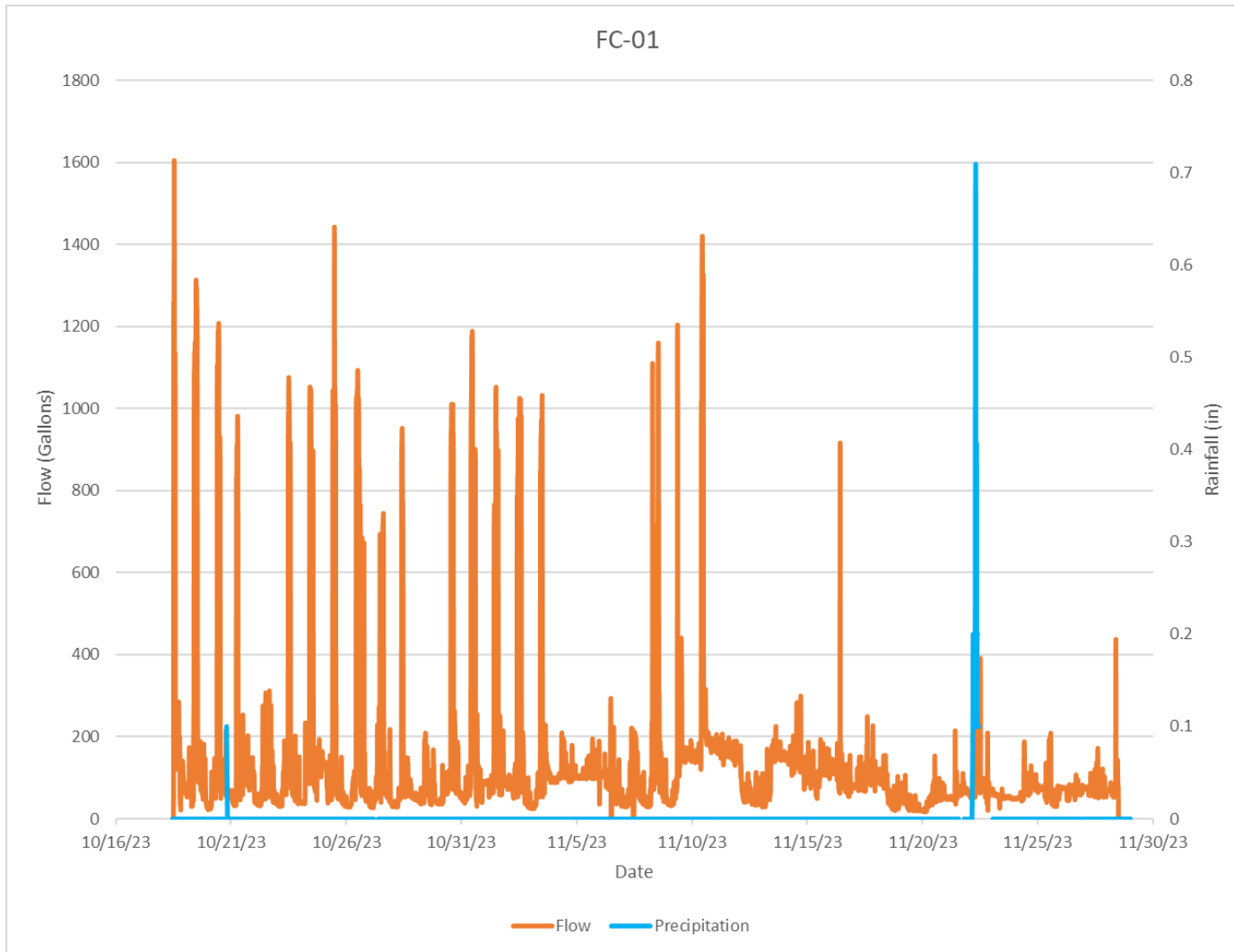


## **Appendix D**

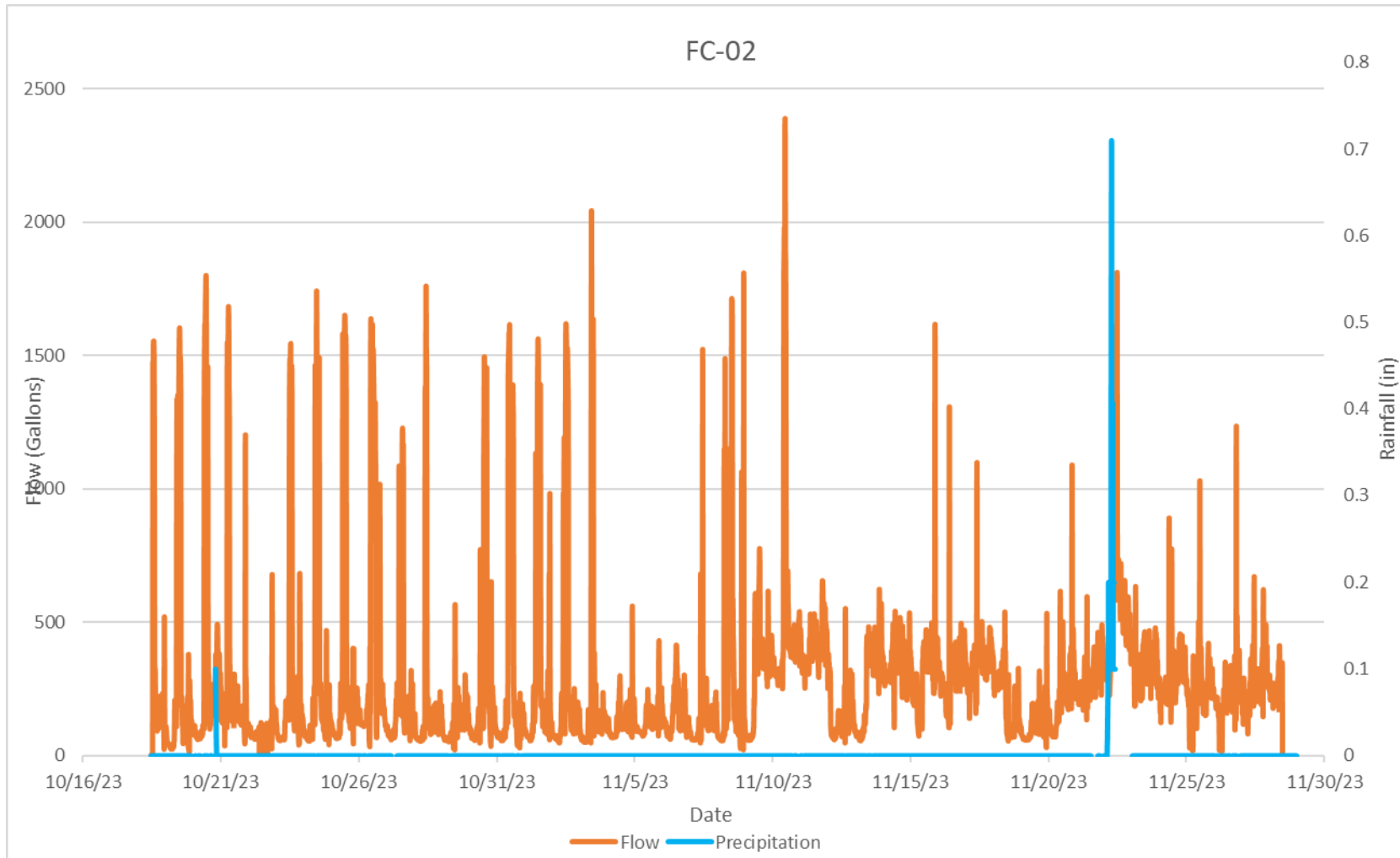
### **Flow Monitoring Data, Hourly Graphs**



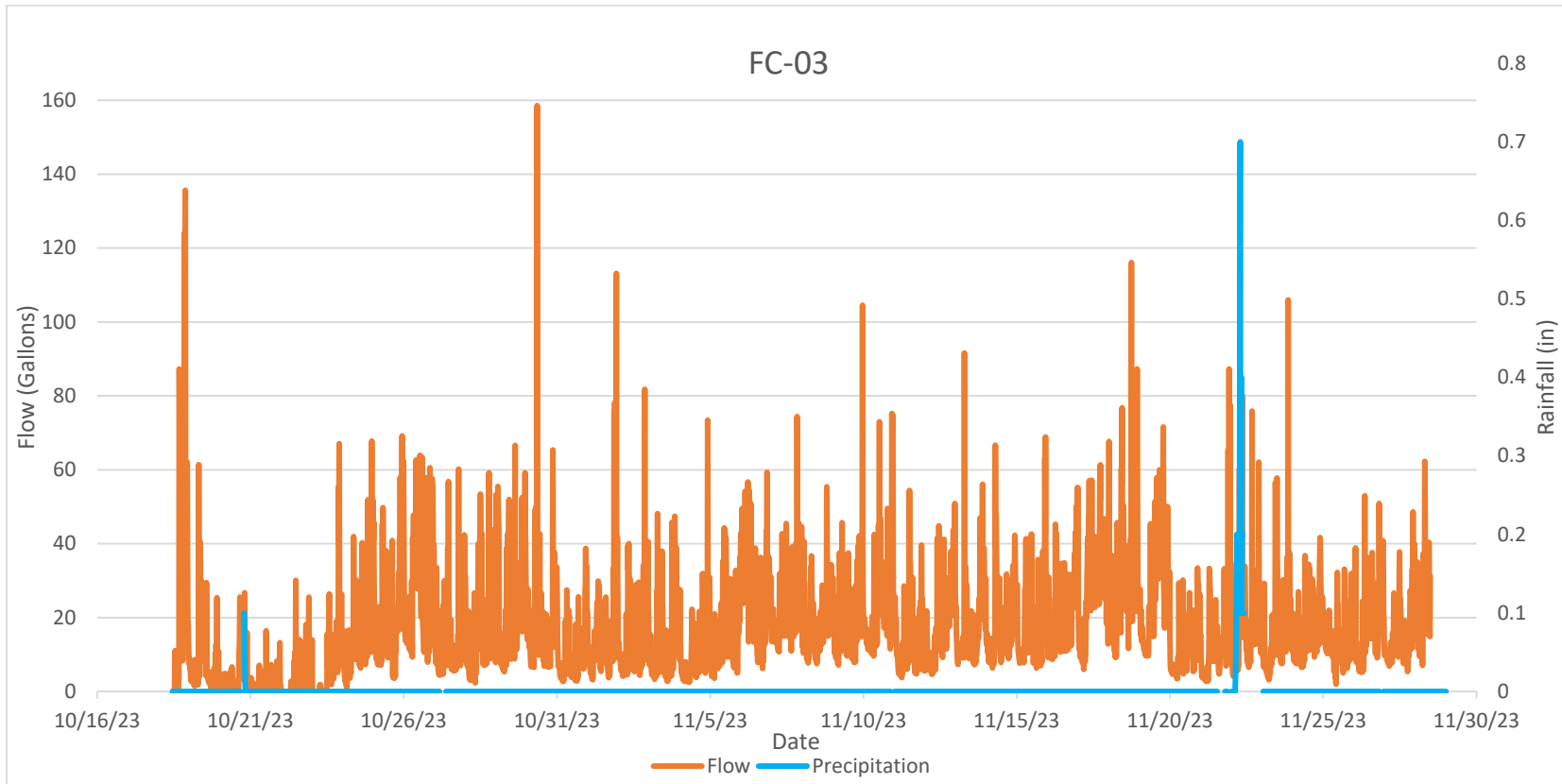
**Graph 1A: Falcon Location 01, Hourly Flow vs. Rainfall**



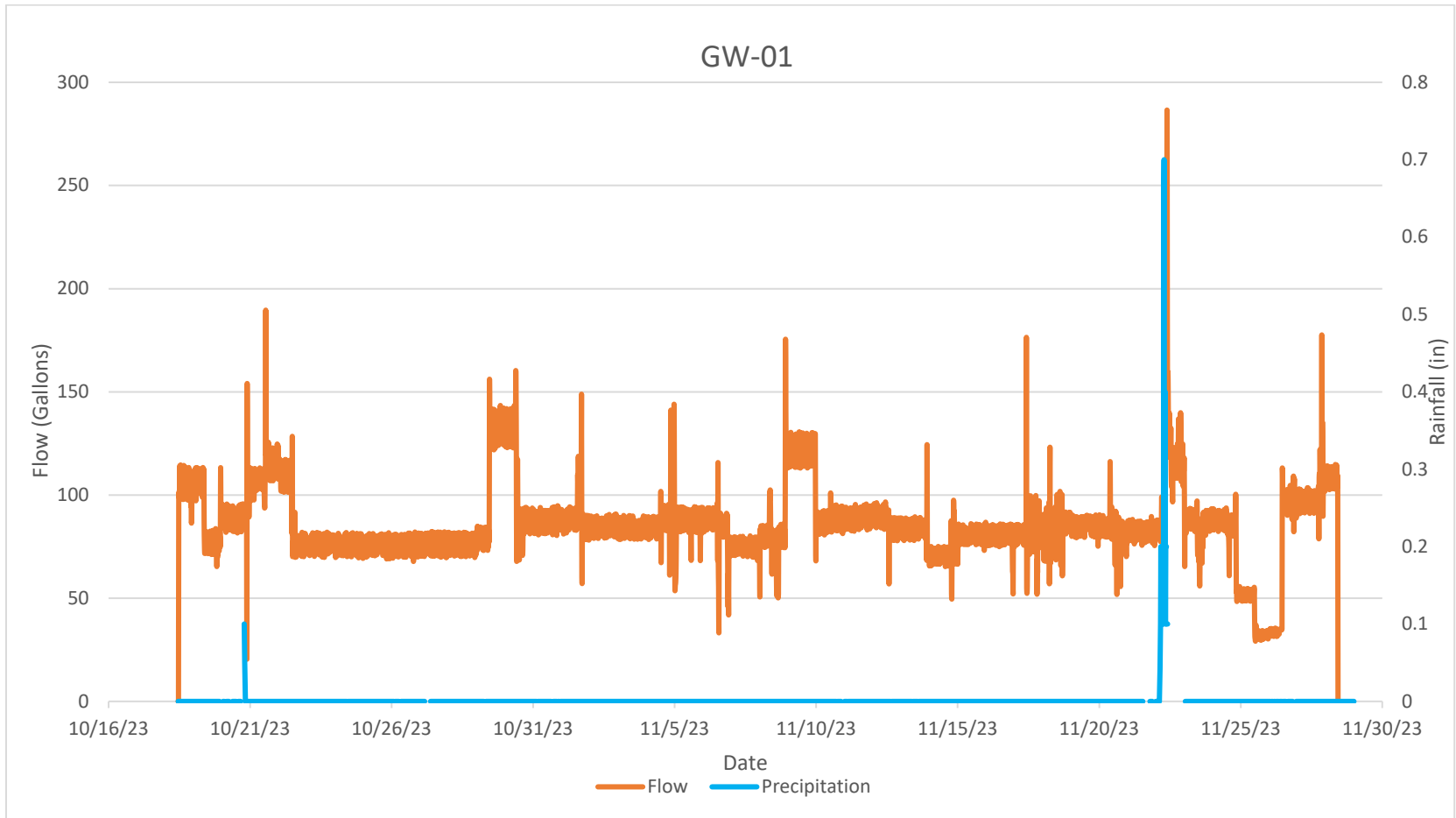
**Graph 2A: Falcon Location 02, Hourly Flow vs. Rainfall**



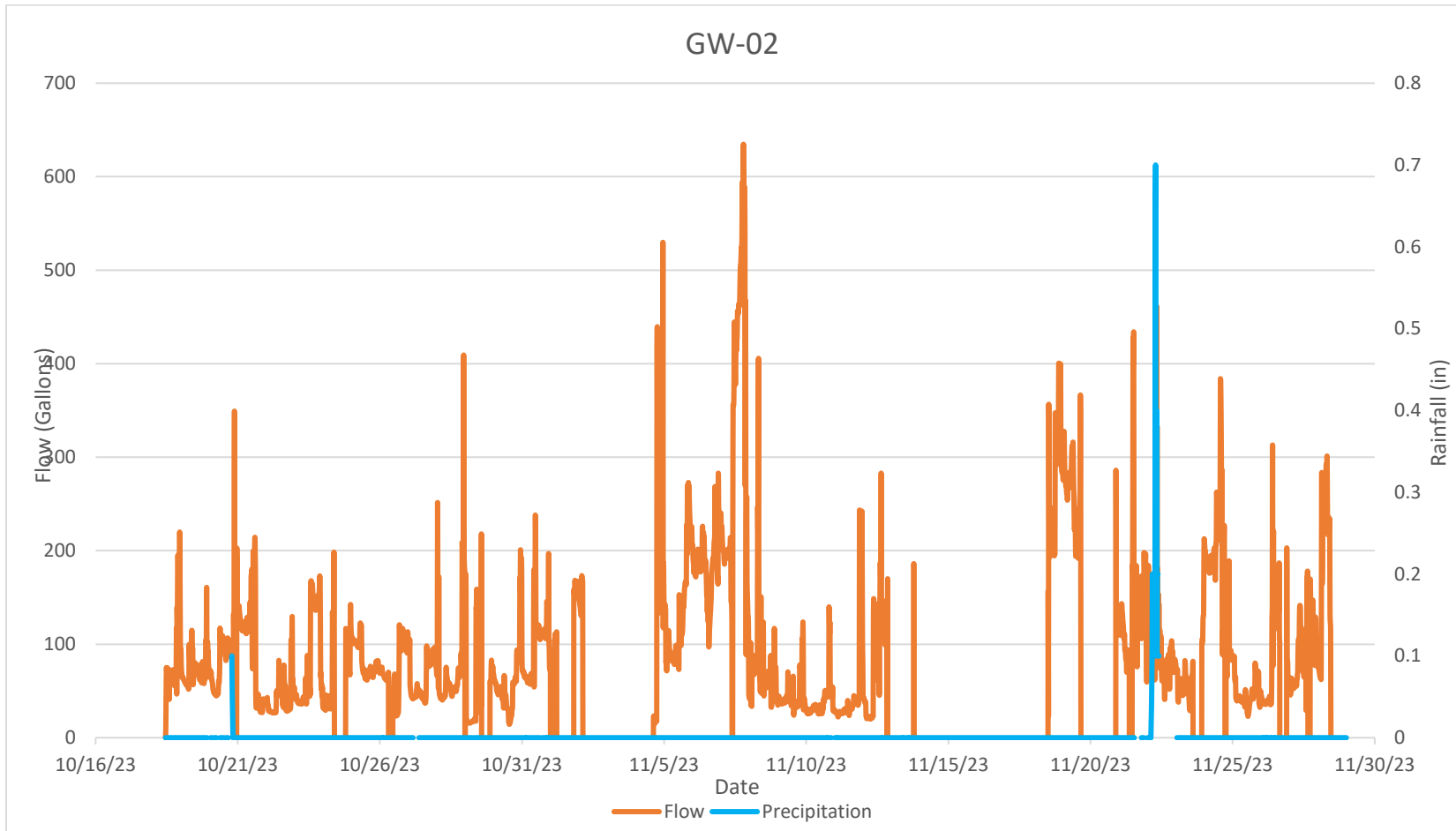
**Graph 3A: Falcon Location 03, Hourly Flow vs. Rainfall**



**Graph 4A: Godwin Location 01, Hourly Flow vs. Rainfall**

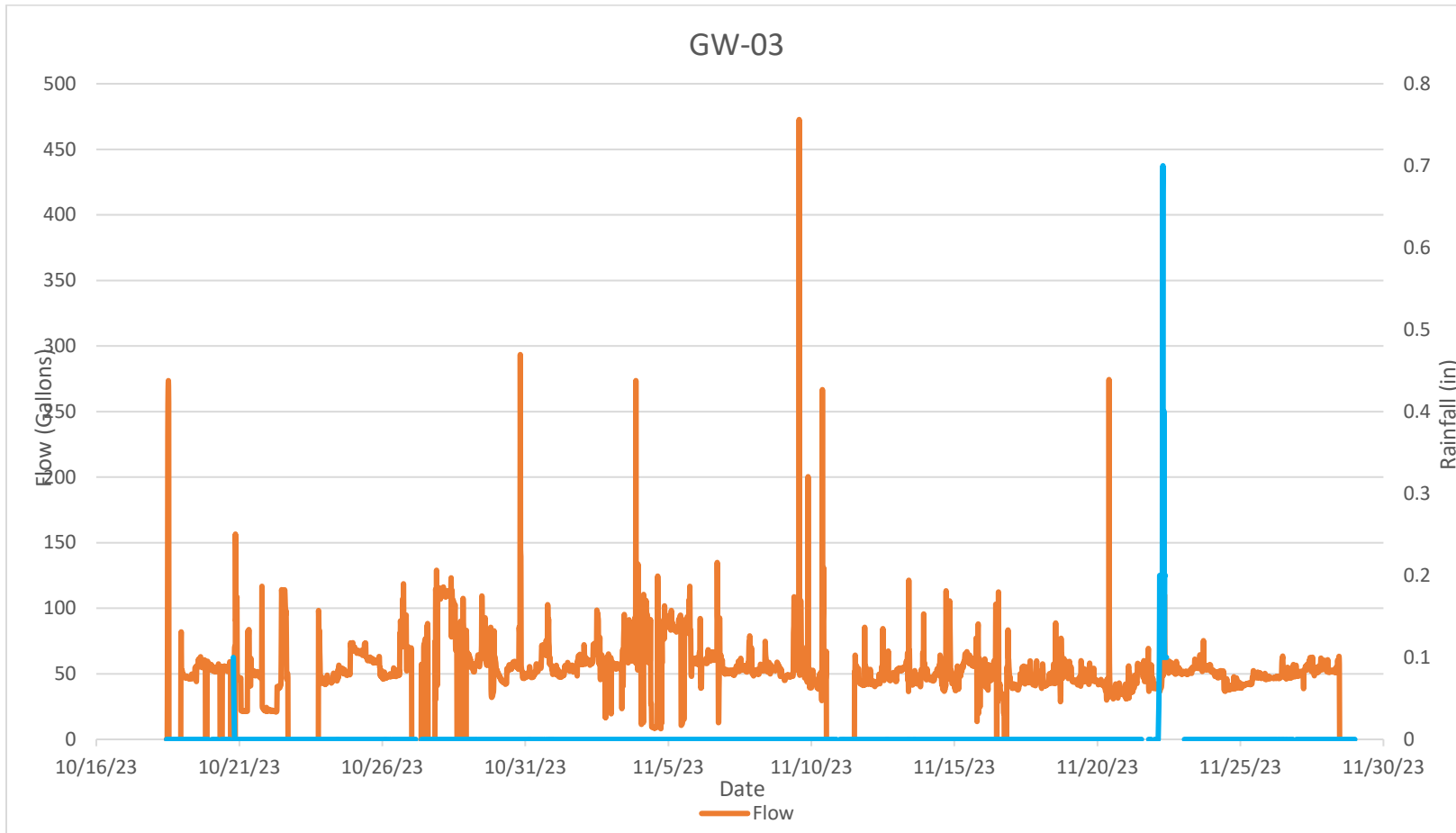


**Graph 5A: Godwin Location 02, Hourly Flow vs. Rainfall**





**Graph 6A: Godwin Location 03, Hourly Flow vs. Rainfall**



## **Appendix E**

### **Capital Improvement Project Product Data**



# HACH FL900 SERIES FLOW LOGGER -WIRELESS

**The wireless Hach FL900 Series Flow Logger revolutionizes open channel flow monitoring by providing reliable, innovative solutions for any sewer flow measurement challenge.**

From wireless communication with free data hosting to longer battery life, the FL900 is designed to reduce monitoring costs, increase efficiency, and provide better data 24/7 with less hassle than you ever thought possible. When combined with any of our full array of smart sensors, the FL900 wireless flow monitoring system will provide reliable flow data for any wastewater flow monitoring application. And with the FL900's included software tool, *fsDATA*® Online Data Manager, site time is reduced dramatically, allowing for increased time for data analysis and proactive actions for solving any flow related issue.

## Plug and Play Sensor Ports

The FL900 is available with 1, 2 or 4 sensor ports. The sensor ports are "plug and play"; the logger auto detects the type of sensor connected to allow customers maximum flexibility for their Hach flow sensor inventories.

Compatible FL900 Flow Logger sensors include:

- *FLO-DAR*® AV Sensor with optional Surcharge Velocity Sensor
- *FLO-TOTE*® 3 AV Sensor
- *Sigma Submerged AV Sensor*
- *Hach US9001 Down-Looking Ultrasonic Sensor*
- *Hach US9003 In-Pipe Ultrasonic Sensor*

## Quick Installation/On-Site Confirmation

Not only is the FL900 easy to install with a variety of mounting options, it also includes an LED status light so that you know it's fully functional before leaving the site.



## Applications

- Wastewater
- Collection Systems
- Industrial Water

## Affordable Alarming Capabilities

User-selectable alarms can be sent by email or text (SMS) to specified recipients to keep you continuously informed on your monitoring sites. Up to 16 channel alarms can be selected, as well as alarms for low battery, low RTC battery, low slate memory, slate memory full, sensor timeout, sensor ID error or missed call.

## Wireless Data Available 24/7 with *fsDATA*

Eliminate risk and make smarter, more-timely decisions with your sewer flow data. The *fsDATA* Online Data Manager provides secure 24/7 access to your flow data and wireless meter from the comfort of the internet. With *fsDATA*, site visits to collect flow data or to adjust meter settings are eliminated, decreasing maintenance costs. Set alarms and view sensor diagnostics remotely to maximize uptime. Multiple users can be granted different data access levels based on job function.

## Redundant-Level Flow Monitoring

With FL900 Series plug-and-play flow meters, you can pair a Sigma Submerged AV Sensor with a Hach US9003 In-Pipe Ultrasonic Sensor for integrated redundant-level flow monitoring.



## Specifications\*

### Portable DC Powered Electronics (Includes Models FL901, FL902 & FL904)

<b>Dimensions (W x D x H)</b>	25.4 x 22 x 40 cm (10.0 x 8.7 x 16.0 in.)
<b>Enclosure</b>	PC/ABS structural foam
<b>Environmental Rating</b>	NEMA 6P (IP68)
<b>Weight (Using Model FL900)</b>	4.5 kg (10 lb)—no batteries; 6.3 kg (14 lb)—2 batteries; 8.2 kg (18 lb)—4 batteries
<b>Operating Temperature</b>	-18 to 60°C (0 to 140°F) at 95% RH
<b>Storage Temperature</b>	-40 to 60°C (-40 to 140°F)
<b>Power Requirements</b>	8 to 18 Vdc from batteries or external power source, 2.5W max.

#### Battery Life

Varies with sensor type, logging intervals, telemetry and environment.

For a 15-minute logging interval, 60 minute call frequency, four 6 V lantern batteries at room temperature:  
130 days with 4 lantern batteries and a FLO-DAR sensor  
180 days with 4 lantern batteries and a FLO-TOTE 3 sensor  
160 days with 4 lantern batteries and a Sigma Submerged AV sensor with AV9000 Analyzer  
200 days with 4 lantern batteries and Ultrasonic Down-Looking or In-Pipe sensor

The optional long life alkaline battery pack can be used to extend battery life, if the Flow Logger is ordered with the external power option connector.

#### LED Status Indicator

- Green Flashes every 3 seconds during normal operation.  
Flashes every 15 seconds during sleep mode.
- Red Flashes when an attached sensor does not agree with the logger program, when an expected sensor is not found or the sensor is not working properly.

#### LED Modem Indicator

- Stays green during a call to the server. Goes blank after the call is successfully completed and terminated.
- Flashes red if the call to the server failed.

**Sensor Ports** 1, 2 or 4 ports

**Connectors** Stainless steel connectors

**Datalog Channels** 16 maximum

#### Alarms

Maximum of 16 channel alarms including high/high, high, low, low/low and system alarms including low battery, low RTC battery, low slate memory, slate memory full, sensor timeout, sensor ID error.

#### Alarm Actions

Trigger sampler, change logging interval, change call interval, send an e-mail, or send text message (SMS).

#### Call Monitor

Sends a message by e-mail or text (SMS) if a logger has not called the server within an user-defined amount of time.

#### Logging Intervals

1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30 or 60 minutes  
Primary and secondary intervals for dynamic logging.

#### Data Storage

Event Log: 1,000 events maximum in non-volatile flash memory  
Sample History: 2,000 sample events maximum in non-volatile flash memory  
Datalog: 325,000 data points; 1128 days for 3 channels at 15-minute log intervals

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#### Local Communication

USB  
RS232 (Baud rates: 9600, 19200, 38400, 57600, 115200)

#### Remote Communication

Wireless modem; CDMA or GPRS technology with a mobile provider.

#### Protocols

Local Modbus RTU

#### Timebase Accuracy

±0.002%, synchronized every 24 hours with server software and modem

#### Supported Sensors

FLO-TOTE 3, FLO-DAR, FLO-DAR with SVS, Sigma Submerged AV Sensor†, Sigma 950†, and Rain Gauge

#### Sampler Interface

Compatible with Sigma 900 Standard, Sigma 900MAX, Sigma SD900 to support set-point sampling, flow pacing, and logging sample history.

#### Desktop Software

FLO-WARE software is required for programming the logger and can be used for data management and report generation. It is compatible with desktop/laptop computers utilizing Windows operating system. Minimum resolution needed is 1024x768.

#### Internet Application Software

FSDATA web-based software for flow meter programming, data management and report generation for wireless flow meters.

#### Certifications

Logger: CE; optional AC power supply: UL/CSA/CE

#### Warranty

1 year

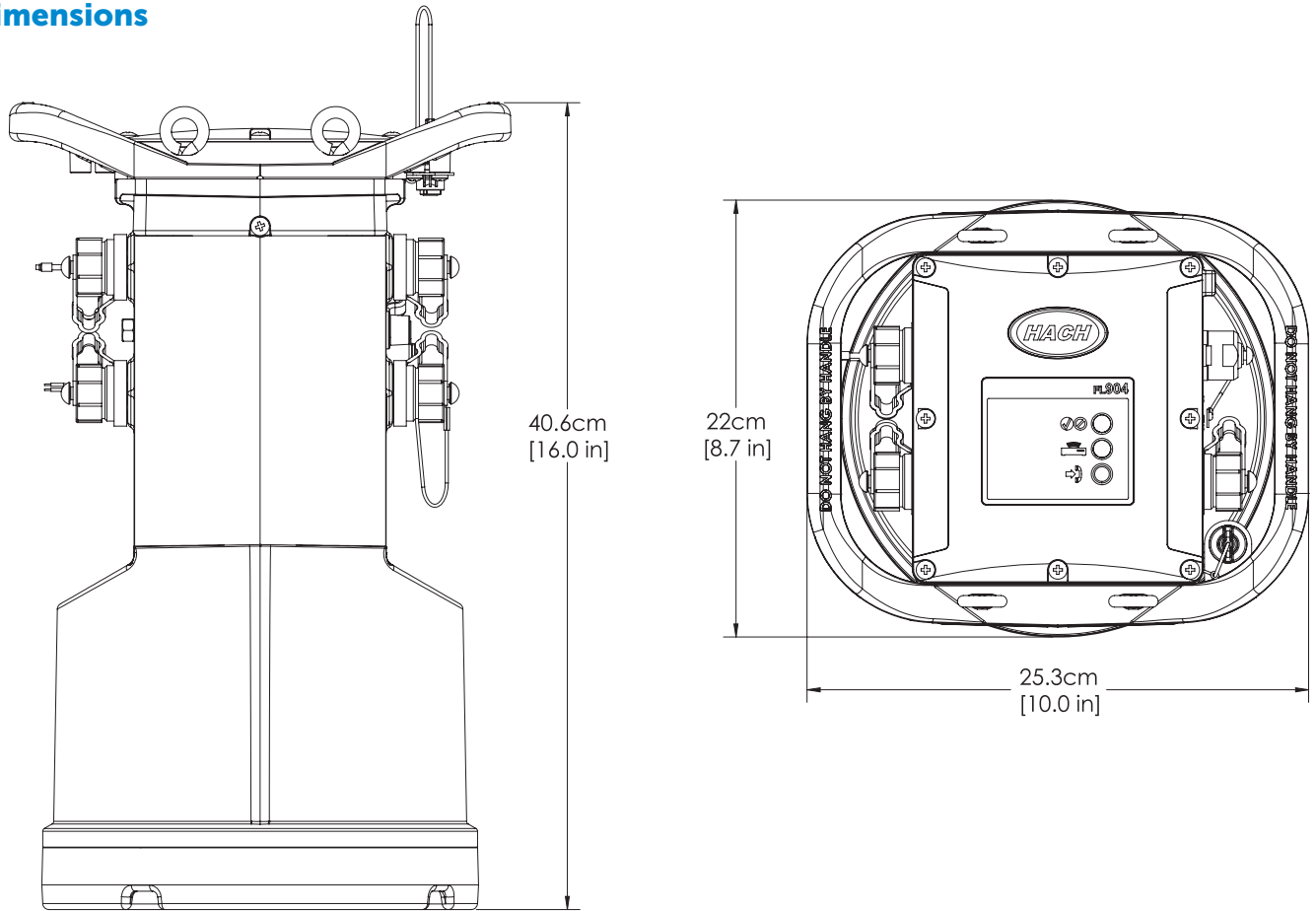


The FL900 Series Loggers meet CE requirements.

†Requires external module.

\*Subject to change without notice.

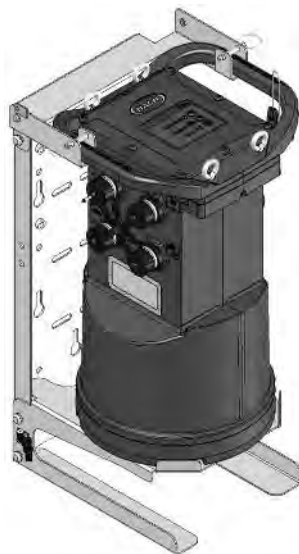
### Dimensions



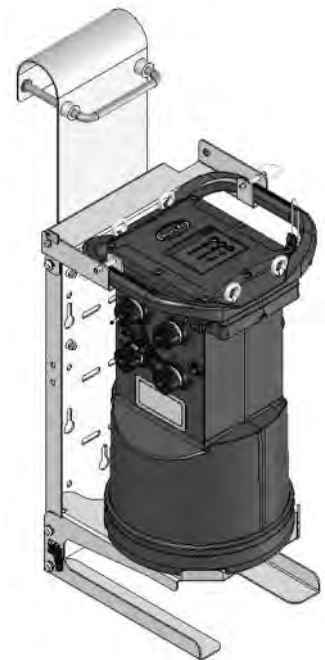
### Installation/Mounting Options



*Flow Logger Suspension Cable with Carabiner (Standard)*



*Flow Logger Wall Mount Prod. No. 8542700 (Optional)*



*Flow Logger Ladder Rung Mount Prod. No. 8544500 (Optional)*

## Ordering Information

		Sensor Connector(s)	Country Code	Modem	Rain Gauge
<b>FL90X Electronics (Flow Logger)</b>	<b>Model FL90</b>	—	97	—	—
1 Sensor Connector		1			
2 Sensor Connectors		2			
4 Sensor Connectors		4			
None				X	
AT&T (Activated)				A	
GPRS no SIM				G	
Sprint (Inactive)				R	
Sprint (Activated)				S	
Verizon (Inactive)				U	
Verizon (Activated)				V	
No Rain Gauge Connector					X
With Rain Gauge Connector					R

### External Modules

- 8531300** AV9000 Area Velocity Analyzer module (required to attach a Sigma Sub AV sensor)
- 8549800** IM9001 Interface module (required to attach a Sigma 950 flow meter)

### Cables

- 8528700** Cable, External power, 2 wire, 9 ft.
- 8528200** Cable, Communication, RS232
- 8528300** Cable, Communication, USB
- 8528400** Cable, Aux, 7pin MIL 5015 (Connect to Sigma Sampler), 9 ft.
- 8528401** Cable, Aux, 7pin MIL 5015 (Connect to Sigma Sampler), 25 ft

### Software

- Model T200-900** FLO-WARE Desktop Software
- FS-HOSTING** Monthly data hosting service for FS-DATA
- FS-DATA XFR** Monthly wireless service

### Mounting Hardware

- 8543800** Wall mount bracket (304 Stainless)
- 8545600** Wall mount bracket with ladder hanger (304 Stainless)
- 8542700** Wall mount bracket with AC Power Supply shelf (304 Stainless)
- 8544500** Wall mount bracket with AC Power Supply Shelf with ladder hanger (304 Stainless)

### Replacement Parts

- 8755500** Desiccant refill beads, Bulk 1.5 lb
- 11013M** Battery, 6V lantern
- 8542900** Battery, long-life alkaline
- 8543000** Battery pack top cap adaptor and cable (for long-life alkaline battery pack 800017701)
- 8542800** Rain Gauge with 100 ft. cable

For additional information on products mentioned in this data sheet, request the following data sheets:

**FS-DATA® Online Data Manager (LIT2707)**

**FLO-DAR® AV Sensor (LIT2708)**

**FLO-TOTE® 3 AV Sensor (LIT2712)**

**HACH US9000 Ultrasonic Sensors (LIT2804)**

**HACH Redundant Flow Monitoring System (LIT2805)**

**HACH Wireless Level Alarming System (LIT2806)**

## HACH COMPANY World Headquarters: Loveland, Colorado USA

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Outside United States: 970-622-7120 tel

**hachflow.com**

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In the interest of improving and updating its equipment,

Hach Company reserves the right to alter specifications to equipment at any time.



Be Right™



# Marsh-McBirney FLO-DAR® Area/Velocity Radar Flow Meter Sensor



*The Flo-Dar Sensor provides an ideal solution for non-contact, maintenance-free portable or permanent sewer flow monitoring.*

## Features and Benefits

The Flo-Dar Area/Velocity Radar Flow Meter provides a revolutionary approach to open channel flow monitoring. The sensor combines advanced Digital Doppler Radar velocity sensing technology with ultrasonic pulse echo depth sensing to remotely measure open channel flow. Use with FL900 Series Flow Logger or Flo-Logger/Logger XT for portable monitoring; for permanent monitoring sites, the Flo-Dar can be connected to the Flo-Station which displays flow rate, velocity, and level. (See Lit. No. 2709 [standard] or Lit. No. 2711 [wireless] for Flow Logger product information, or Lit. No. 2616 for Flo-Station product information). Intrinsically safe models available.

### Accurate Flow Measurement

Flo-Dar provides the user with highly accurate flow measurements under a wide range of flows and site conditions. By measuring the velocity of the fluid from above, Flo-Dar eliminates accuracy problems inherent with submerged sensors including sensor disturbances, high solids content and distribution of reflectors.

### Non-Contact Sensor Eliminates Lost Data

No lost data with non-contact, above the flow sensor that is unaffected by fouling due to debris and grease.

### Easy Installation and Maintenance

As the sensor is mounted above the flow, personnel have little or no contact with the flow during installation. Future sensor removal can be done without the need for confined space entry.

### Independent Accuracy / Long-Term Stability Verification

Flo-Dar sensor accuracy and long-term stability (up to 3 years without need for site calibration) from low flow depths up to surcharge conditions has been independently verified

many times over the years including a formal evaluation by the Alden Research Laboratory, Inc. and recent field evaluations done by municipalities and consulting engineering firms.

### Perfect Solution for Difficult Flow Conditions

Operates in the most difficult conditions including flows with high solids content, high temperature, shallow and caustic flows, large man-made channels, and high velocities up to 20 ft/s.

### Optional Surcharge Velocity Sensor

During surcharge events Flo-Dar's optional electromagnetic sensor will continue to provide uninterrupted and accurate flow monitoring through dry and wet weather flows without the need for routine sensor cleaning or maintenance.

### Applications

#### Municipal

- Sanitary Sewer Evaluation Studies
- Collection Systems
- Capacity Studies
- Combined Sewer Overflows
- Inflow and Infiltration (I&I) Studies
- Billing / Custody Transfer
- Plant Influent and Effluent

#### Industrial

- Process Waste
- Plant Influent
- Plant Effluent
- Non-contact Cooling Water
- Stormwater Monitoring and Compliance

DW = drinking water WW = wastewater municipal PW = pure water / power  
IW = industrial water E = environmental C = collections FB = food and beverage



Be Right™

WW

IW

C

## Specifications\*

### FLO-DAR SENSOR

#### Enclosure

IP68 Waterproof rating, Polystyrene

#### Dimensions

160.5 W x 432.2 L x 297 D mm (6.32 x 16.66 x 11.7 in.), with SVS, D = 387 mm (15.2 in.)

#### Weight

4.8 kg (10.5 lbs.)

#### Operating Temperature

-10 to 50°C (14 to 122°F)

#### Storage Temperature

-40 to 60°C (-40 to 140°F)

#### Power Requirements

Supplied by FL900 Flow Logger, Flo-Logger, or Flo-Station

#### Interconnecting Cable

**-Disconnectable at both sensor and logger or Flo-Station**

Polyurethane, 0.400 (±0.015) in. diameter; IP68  
Standard length 9M (30 ft), maximum 305 m (1000 ft)

Cables are available in two styles:

- connectors both ends
- connector from sensor with open leads to desiccant hub, desiccant hub with connector to logger. A potting/sealant kit will be included. This can be used to run the cable through conduit.

Important Note: The sensor cable assembly with desiccant hub is compatible with either the Marsh-McBirney Flo-Logger/Logger XT or the Hach FL900 Series Flow Loggers. When using this cable assembly with the Marsh-McBirney Flo-Logger, do not disconnect the desiccant cartridge that is attached to the Flo-Logger itself. It is important to keep the air tube plugged.

If using Flo-Dar cable with Flo-Station, the cable will have bare leads to the Flo-Station (30 to 1000 ft. lengths) and there will be no desiccant hub, as the air tube terminates inside of the Flo-Station housing.

#### Warranty

1 year

#### Set-up/Data Retrieval

Flo-Ware for Windows software is the user on-site set-up, data management, and report generation software. It is compatible with desktop/laptop computers utilizing Windows operating system.

#### Certification

The Flo-Dar Transmitter is certified to the following requirements:

- Transmitter type: Field Disturbance Sensor
- Frequency: 24.125 GHz - Doppler pulse
- Maximum rated power output: 128 dbuV (ave) @ 3 meters

Certified to: FCC Part 15.245: FCC ID: VIC-FLODAR24  
Industry Canada Spec. RSS210. v7: IC No.: 6149A-FLODAR24

Use of this device is subject to the following conditions:

1. There are no used serviceable items inside this device.
2. The user must install this device in accordance with the supplied installation instructions and must not modify the device in any manner whatsoever.
3. Any service involving the transmitter must only be performed by Hach Company.
4. The user must ensure that no one is within 20 cm of the face of the transmitter when operating.

### SURCHARGE DEPTH MEASUREMENT

Auto zero function maintains zero error below 0.5 cm (0.2 in.)

#### Method

Piezo-resistive pressure transducer with stainless steel diaphragm

#### Range

3.5 m (138 in.), overpressure rating 2.5 x full scale

### VELOCITY MEASUREMENT

#### Method

Radar

#### Range

0.23 to 6.10 m/s (0.75 to 20 ft/s)

#### Frequency Range

24.075 to 24.175 G-Hz, 15.2mW (max.)

#### Accuracy

±0.5%; ±0.03 m/s (±0.1 ft/s)

### DEPTH MEASUREMENT

#### Method

Ultrasonic

#### Standard Operating Range from Flo-Dar Housing to Liquid

0 to 152.4 cm (0 to 60 in.)

#### Optional Extended Level Operating Range from Transducer Face to Liquid

0 to 6.1 m (0 to 20 ft.) with 43.18 cm (17 in.) dead band, temperature compensated.

#### Accuracy

±1%; ±0.25 cm (±0.1 in.)

### FLOW MEASUREMENT

#### Method

Based on Continuity Equation

#### Accuracy

±5% of reading typical where flow is in a channel with uniform flow conditions and is not surcharged, ±1% full scale max.

### SURCHARGE CONDITIONS DEPTH/VELOCITY

#### DEPTH (Std with Flo-Dar Sensor)

Surcharge depth supplied by Flo-Dar sensor.

#### VELOCITY (Optional Surcharge Velocity Sensor)

#### Method

Electromagnetic

#### Range

±4.8 m/s (±16 ft/s)

#### Accuracy

±0.15 ft/s or 4% of reading, whichever is greater.

#### Zero Stability

> ±0.05 ft/s

### CERTIFICATION INTRINSICALLY SAFE

The Flo-Dar and Surcharge Velocity Sensors are certified to Class I, Zone 1 Standards. They conform to ANSI/UL 60079-11 and are certified to CAN/CSA E60079-11 and EN 60079-11 standards.

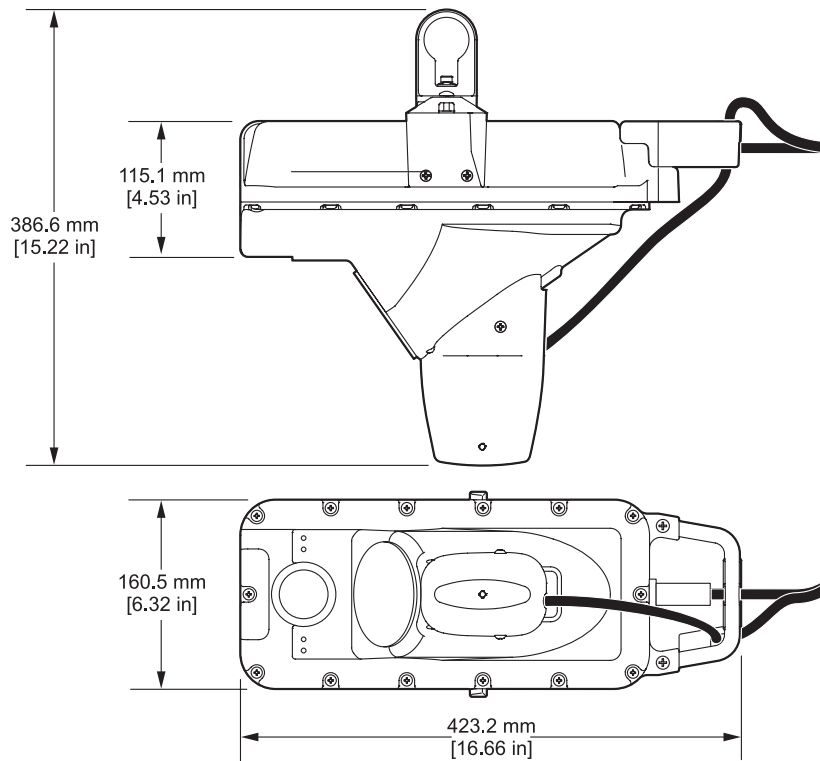


The Flo-Dar sensor meets CE requirements.

## Engineering Specifications

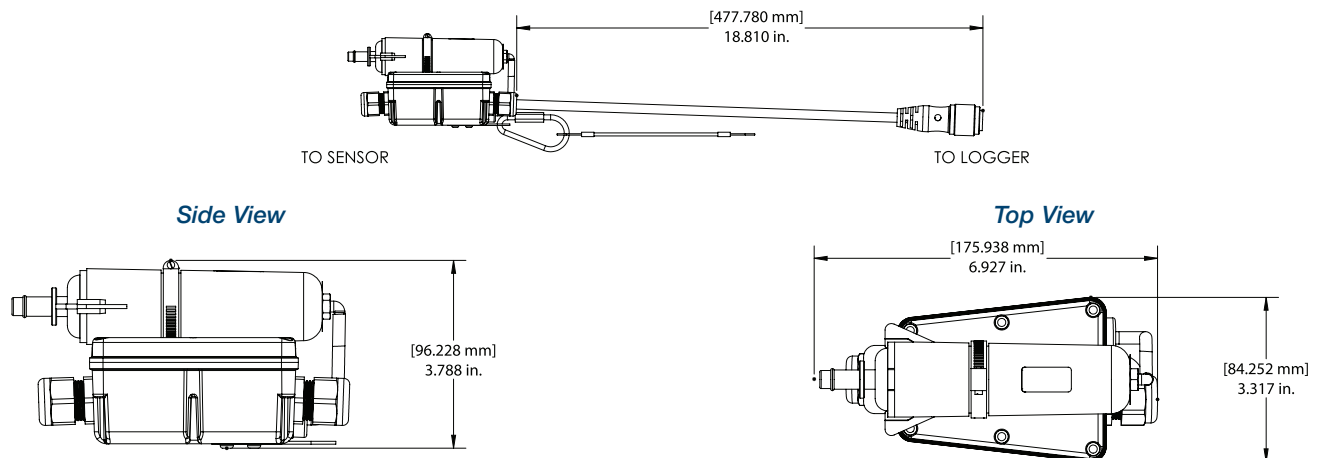
- The flow meter shall be capable of measuring level, average velocity and surcharge depth.
- The method of velocity measurement shall be Doppler radar.
- The sensor shall combine advanced Doppler Radar velocity sensing technology with ultrasonic pulse echo depth sensing to remotely measure open channel flow.
- Flow shall be calculated based on the Continuity Equation ( $Q=V \times A$ ), where  $Q$ =Flow,  $V$ =Average Velocity and  $A$ =Area.
- The range of velocity measurement shall be 0.23 to 6.10 m/s (0.75 to 20 ft/s).
- The method of depth measurement shall be ultrasonic.
- The standard operating range for depth measurement shall be 0 to 152.4 cm (0 to 60 in.) with an optional operating range of 0 to 6.1 m (0 to 20 ft.) with 43.18 cm (17 in.) deadband, temperature compensated.
- The flow meter shall have a surcharge condition velocity sensor option.
- Exterior dimensions of the sensor shall not exceed 160.5 W x 432.2 L x 297 D mm (6.32 W x 16.66 L x 11.7 D in.) or 160.5 W x 432.2 L x 387 D mm (6.32 W x 16.66 L x 15.2 D in.) with Surcharge Velocity option.
- The sensor shall be able to measure bi-directional surcharge flow.
- Optional Intrinsically Safe models available for flow monitoring in hazardous locations.
- The model shall be the Marsh-McBirney Flo-Dar Open Channel Flow Meter Sensor.

## Dimensions



*Flo-Dar Area/Velocity Radar Flow Meter*

The desiccant hub assembly includes a junction box to connect sensor cable to the desiccant and subsequently to the FL900 Logger. The desiccant can easily be replaced without need to purchase a separate desiccant module.



*Desiccant Hub Assemblies for use with portable FL900 Series Loggers and Flo-Logger.  
(Sensor cable for use with Flo-Station will not contain a desiccant hub and will have bare wires on cable end.)*

## Ordering Information

### Configure FLO-DAR Sensor to Logger (Portable)

Flo-Dar Sensor	Model 4000	-	4	X	X
<b>Flo-Dar Sensor with specified cable length</b> (need to add cable as separate line item)			4		
<b>Non Intrinsically Safe</b> <b>Surcharge Velocity Sensor Option</b> (IMPORTANT NOTE: SVS cable length MUST MATCH FloDar Sensor Cable length)				0 3	
<b>Non Extended Range</b> <b>Extended Range Option</b> —Allows use in flow depths up to 18 feet. Allow for 18" deadband. Standard unit max depth is 60". SVS Option requires Remote Extended Range below. <b>Remote Extended Range Option with 6' sensor cable</b> —Flow depths up to 18 feet. Allow for 18" deadband. Standard unit max depth is 60".					0 1 2

### Configure FLO-DAR Sensor to Flo-Station (Permanent)

Flo-Dar Sensor	Model 4000	-	9	X	X
<b>Flo-Dar Sensor with specified cable length</b> (need to add cable as separate line item)			9		
<b>Non Intrinsically Safe</b> <b>Surcharge Velocity Sensor Option</b> (IMPORTANT NOTE: SVS cable length MUST MATCH Flo-Dar Sensor Cable length)				0 3	
<b>Non Extended Range</b> <b>Extended Range Option</b> —Allows use in flow depths up to 18 feet. Allow for 18" deadband. Standard unit max depth is 60". SVS Option requires Remote Extended Range below. <b>Remote Extended Range Option with 6' sensor cable</b> —Flow depths up to 18 feet. Allow for 18" deadband. Standard unit max depth is 60".					0 1 2

### Cables

<b>FD9000CBL-XXX*</b>	FL900 Series Logger to Flo-Dar sensor. Cable w/two connectors.
<b>FDJCTBOXCBL-XXX*</b>	FL900 Series Logger to Flo-Dar sensor. Cable with connector to sensor, open end to desiccant hub, desiccant hub with connector to sensor. Includes finishing kit for potting/sealing desiccant hub. For use with conduit.
<b>6000062XX*</b>	SVS Sensor with connector for use with FL900 Series Logger.
<b>570011800-XXX*</b> <b>Model 4000-9</b>	Flo-Station to Flo-Dar sensor Cable with one connector and bare leads.
<b>6000059XX*</b>	SVS Sensor with bare leads for use with Flo-Station. *Contact customer service for product numbers.
Available Cable Lengths (in feet)	
30	125 225 400 700
60	150 250 450 800
75	175 300 500 900
100	200 350 600 1000

See Lit. No. 2709 (standard models) and Lit. No. 2711 (wireless models) for FL900 Series Flow Logger ordering information. See Lit. No. 2616 for Flo-Station ordering information.

### Mounting Hardware

<b>800016701</b>	Permanent Sensor Mount—Includes sensor frame & all mounting hardware. Portable Sensor Mounts Available (Sizes 34-107") Contact Sales.
------------------	---

### Accessories & Spares

<b>245000501</b>	Sensor Retrieval Pole - Used to place and retrieve sensor from mounting bracket. Pole extends to 7.3 m (21 ft.)
<b>510012701</b>	Sensor Retrieval Hook - Used with Sensor Retrieval Pole
<b>570011401</b>	Grounding Strap (required with Retrieval Pole and Hook when used with IS units)
<b>8755500</b>	Bulk desiccant beads (1.5 pounds)

Lit. No. 2708 Rev 2  
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In the interest of improving and updating its equipment, Hach Company reserves the right to alter specifications to equipment at any time.



*At Hach, it's about learning from our customers and providing the right answers. It's more than ensuring the quality of water—it's about ensuring the quality of life. When it comes to the things that touch our lives...*

*Keep it pure.*

*Make it simple.*

*Be right.*

*For current price information, technical support, and ordering assistance, contact the Hach office or distributor serving your area.*

*In the United States and all other countries except Europe, contact:*

HACH COMPANY  
4539 Metropolitan Court  
Frederick, MD 21704-9452, U.S.A.  
Telephone: 800-368-2723  
Fax: 301-874-8459  
E-mail: hachflowsales@hach.com  
[www.hachflow.com](http://www.hachflow.com)

*In Europe contact:*

Flow-Tronic  
Rue J.H. Cool 19a  
B-4840 Welkenraedt Belgium  
Telephone: +32-87-899799  
Fax: +32-87-899790  
E-mail: site@flow-tronic.com  
[www.flow-tronic.com](http://www.flow-tronic.com)



**Be Right™**

# US3 Rain Gauge

## Rain Gauge Tipping Bucket With Leaf Filter



The US3 Rain Gauge tipping bucket uses a standard tipping bucket mechanism that allows for straightforward and effective rainfall measurement. The geometry and material selection of the bucket, along with the inclusion of a leaf filter, help minimize contamination and errors in the measurement process.

The rain gauge features a 8" (200mm) diameter collector funnel. The tipping bucket device is divided into two compartments to enable the measurement of rainfall in fixed increments. The bucket is pivoted at its center and has a preset calibration to tip for a specific amount of rainfall, either 0.5 mm or 1 mm. The tipping action of the bucket magnetically opens and closes a reed switch. When the bucket is full and tips, it triggers the reed switch, generating a pulse signal. The pulse signal from the reed switch is sent to a data logger or RTU.

### Ordering information

**Code**            **US3-RGTB**

### Applications

- Water management
- Rain Measurement
- Flood Control Monitoring
- Environmental telemetry
- Intelligent Irrigation systems
- Integrates with Most Loggers/PLCs

### Technical characteristics

Item	Specification
Measurement object	Rain
Measured rainfall intensity	0-9.5 inch/hour
Sample interval	1s
Resolution	0.004 inch
Accuracy(0.08 inch/min)	±4%
Power consumption	1.6W
Supply	7-24VDC
Output	RS485, RS232, SDI-12 optional
Operating temperature	-40-+176F -40-+80°C
Main material	SS+ABS
Weight (unpacked)	1.4 lbs (0.65kg)



## **Appendix F**

### **PWC Agreement**



THIS AGREEMENT, made this 2nd day of FEBRUARY, 2004 by and between the NORCRESS WATER AND SEWER DISTRICT (hereinafter referred to as "NORCRESS"); and the PUBLIC WORKS COMMISSION of the City of Fayetteville, North Carolina (hereinafter referred to as "COMMISSION").

WITNESSETH THAT

WHEREAS, NORCRESS has contracted with COMMISSION to furnish sanitary sewer treatment service to NORCRESS as per an agreement dated October 14, 2002; and

WHEREAS, both COMMISSION and NORCRESS recognize the complexity of providing sanitary sewer utility service; and

WHEREAS, NORCRESS requests that COMMISSION operate and maintain NORCRESS's proposed sanitary sewer collection system; and

WHEREAS, COMMISSION agrees to operate and maintain said sanitary sewer collection system.

NOW THEREFORE, and in consideration of the benefits each shall derive, the parties mutually agree as follows:

I. COMMISSION will provide the following services:

A. Basic Operation and System Maintenance, to include:

- (1) Repairing damaged, deteriorated, or broken sanitary sewer mains, not to include outright system replacement of large segments (more than 500') of the sanitary sewer collection system which cannot be repaired due to structural failure, natural or manmade disasters, or were not installed with COMMISSION approved plans and specifications;
- (2) Repairing damaged, deteriorated, or broken sanitary sewer service laterals from the main to edge of road right-of-way or easement;
- (3) Routine maintenance and repair of pump station equipment, if any, not to include replacement of major components (parts and/or equipment valued over \$1,000);
- (4) Cleaning and rodding of clogged sewer mains;
- (5) Repairing of manholes, including rings and covers;
- (6) Other routine maintenance and repairs as needed;

- (7) Administrative and engineering support of above, as required;
- (8) 24 hours, 7 days per week on-call dispatch with appropriate response forces;
- (9) Responding to inquiries by existing and potential users of sanitary sewer service;
- (10) Investigating and working to resolve complaint issues;
- (11) Keeping NORCRESS abreast of changes in regulations concerning sanitary sewer utility services;
- (12) Maintaining metered electric service at pumping stations as well as chemicals associated with pump station operation. The cost of metered electric service shall be a recoverable expense to be included in the monthly billing statement;
- (13) Plan review by COMMISSION engineering staff of NORCRESS's plans and/or plans submitted to NORCRESS by others to ensure utility extensions are designed to meet COMMISSION specifications and are compatible with NORCRESS's goals and objectives for meeting overall system needs.

B. COMMISSION will provide other services, upon request, but which will be billed separately and not included in the monthly basic operation and maintenance billing. A partial list of the "other services" that may be available to NORCRESS include the following:

- (1) Sanitary sewer service lateral installation;
- (2) Promote participation agreements with other benefited parties;
- (3) Preparation and administration of utility extension contracts;
- (4) Right-of-way acquisition services for land and easement requirements to be secured in the name of NORCRESS within the limits permitted by law but not to include actions in eminent domain;
- (5) Inspection services during construction;
- (6) Meter reading and billing;
- (7) Miscellaneous services such as GIS mapping as requested.

II. OPERATION AND MAINTENANCE COST – COMMISSION shall render accurate monthly bills to NORCRESS. Such bills shall be computed by multiplying NORCRESS's sewer flow, expressed in thousand (M) gallons, by the applicable rate per thousand (M) gallons for this customer class. The rate per thousand (M) gallons shall be subject to change annually. In addition, COMMISSION shall submit an itemized statement monthly for the



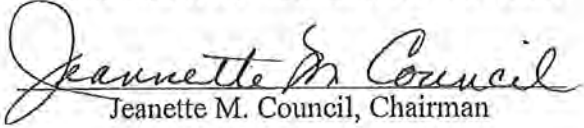
actual cost associated with metered electric service and "other services" as set forth in Paragraph I-B performed by COMMISSION, reflecting the appropriate regular hourly or overtime rate for labor, equipment, and materials (to include an amount for all direct and indirect charges plus profit at 10%).

- III. REPAIRS - COMMISSION shall not be financially responsible for any repairs or cost of repairs needed to the sanitary sewer collection system unless such repairs are due to negligence of COMMISSION or its employees. However, COMMISSION will repair or arrange for all repair services. If not covered under Basic Operation and Maintenance (Paragraph I-A), COMMISSION will seek prior approval from NORCRESS if the anticipated cost of such repairs exceeds \$1,000, unless delay in making repairs could create or prolong discontinuance of sanitary sewer utility services, or create unsafe conditions for customers, COMMISSION's employees or other persons, or create an environmental hazard.
- IV. PAYMENT - Monthly bills rendered for services as provided hereunder are payable within 10 days from their date, at COMMISSION's office, Robert C. Williams Business Center, 201 Hay Street, (28301) P.O. Box 7000, Fayetteville, NC 28302. A late charge of one percent per month from final payment date shall apply to all such bills.
- V. TERM OF AGREEMENT - NORCRESS and COMMISSION mutually agree that the term of this Agreement shall be ten years from the date of COMMISSION's execution thereof, and continuing annually thereafter until terminated by either party's written notice at least three months prior to the end of any such annual term.
- VI. TERMINATION OF AGREEMENT - If NORCRESS or COMMISSION fails to fulfill in a timely and proper manner the obligations under this Agreement, either party shall have the right to terminate this Agreement by specifying the reason for termination in written notice to the other party at least 60 days prior to the date of termination.
- VII. AMENDMENTS - This Agreement shall not be modified, amended, or changed in any respect except in a writing, duly signed by the parties hereto. Each party hereby waives any right to amend the Agreement in any other manner.
- VIII. ASSIGNMENT - This Agreement shall be binding upon and shall inure to the benefit of NORCRESS and its successors and assigns. COMMISSION may only assign this agreement with the written consent of NORCRESS.
- IX. LIABILITY - COMMISSION shall not be liable for injury or damage to NORCRESS or

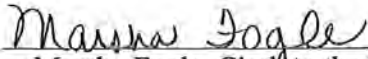
persons or property, unless such injury or damage was caused by the negligence or willful misconduct by COMMISSION or its employees. COMMISSION shall not be responsible for any injuries or damages resulting from acts, omissions, or occurrences, which occurred prior to the date COMMISSION, began operations pursuant to this Agreement. NORCRESS shall indemnify, defend, and save COMMISSION harmless against other/all liability, claims, judgments, losses, costs and expenses for injury, loss, or damage to persons or property, including fines by any federal or state agency, and also including personal injury or property damage to NORCRESS, its employees, sanitary sewer customers, and citizens on account of operation and maintenance of NORCRESS's sanitary sewer system, including any defective construction (other than by COMMISSION or its agents) or equipment of NORCRESS's sanitary sewer system, on NORCRESS's side of the point of delivery from COMMISSION's facilities or on its sanitary sewer customers' side of the service lateral. COMMISSION assumes responsibility for and shall indemnify, defend, and save NORCRESS harmless against all liability, claims, judgments, losses, costs and expenses for injury loss, or damage to persons or property, including fines by any federal or state agency, and also including personal injury or property damage to sanitary sewer customers and citizens on account of operation of NORCRESS's sanitary sewer system on the NORCRESS's side of the point of delivery of sanitary sewer service (metering point) due to the negligence or willful misconduct of COMMISSION.

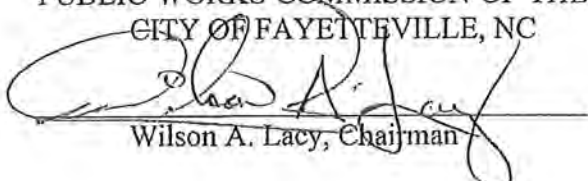
- X. ENTIRE AGREEMENT - This writing embodies the entire Agreement and understanding between the parties hereto and there are no other agreements or understandings, oral or written, with reference to the subject matter hereof that are not merged herein and superseded hereby.

IN TESTIMONY WHEREOF, NORCRESS has executed this instrument by its Chairman and COMMISSION has executed this instrument by its Chairman, each being duly authorized to execute this Agreement.

NORCRESS WATER & SEWER DISTRICT  
  
Jeanette M. Council, Chairman

ATTEST:

  
Marsha Fogle, Clerk to the Board

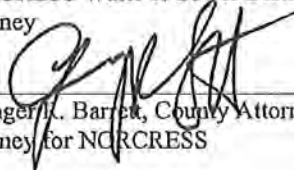
PUBLIC WORKS COMMISSION OF THE  
CITY OF FAYETTEVILLE, NC  
  
Wilson A. Lacy, Chairman

ATTEST:


  
Terri Union, Secretary

NORCRESS:

APPROVED for Legal Sufficiency  
NORCRESS Water & Sewer District  
Attorney

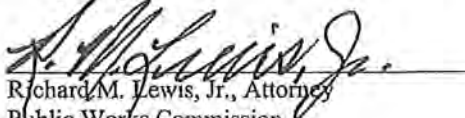
  
Grainger L. Barrett, County Attorney  
Attorney for NORCRESS

This instrument has been pre-audited in the manner  
required by the Local Government Budget and Fiscal  
Control Act.

  
Amy H. Cannon, Assistant County Manager  
Finance Officer for NORCRESS

COMMISSION:

APPROVED as to form this 14<sup>th</sup> day of  
MAY, 2004

  
Richard M. Lewis, Jr., Attorney  
Public Works Commission

This instrument has been pre-audited in the manner  
required by the Local Government Budget and Fiscal  
Control Act.

  
Dwight Miller, Chief Financial Officer  
Public Works Commission

---

NORTH CAROLINA – CUMBERLAND COUNTY

I, Anna L. Hymes, a Notary Public of said County and State do hereby certify that Marsha Fogle personally appeared before me this day and acknowledged that he/she is Clerk of NORCRESS Water and Sewer District, and that the authority duly given and as the act of said, the foregoing instrument was signed in its name by its Chairman, sealed with its corporate seal, and attested by himself/herself as its Clerk.

WITNESS my hand and Notarial Seal, this the 2nd day of Feb., 2004.

My COMMISSION Expires: 8-13-08

Anna L. Hymes  
Notary Public

---

NORTH CAROLINA - CUMBERLAND COUNTY

I, Joan D. Starling, a Notary Public of said County and State do hereby certify that TERRI WATSON, personally appeared before me this day and acknowledged that he is Secretary of The Public Works Commission, an agency of the City of Fayetteville, North Carolina, and that the authority duly given and as the act of the agency, the foregoing instrument was signed in its name by its Chairman, sealed with its seal, and attested by himself as its Secretary.  
herself

WITNESS my hand and Notarial Seal, this the 26 day of May, 2004.

My COMMISSION Expires: April 1, 2007

Joan D. Starling  
Notary Public





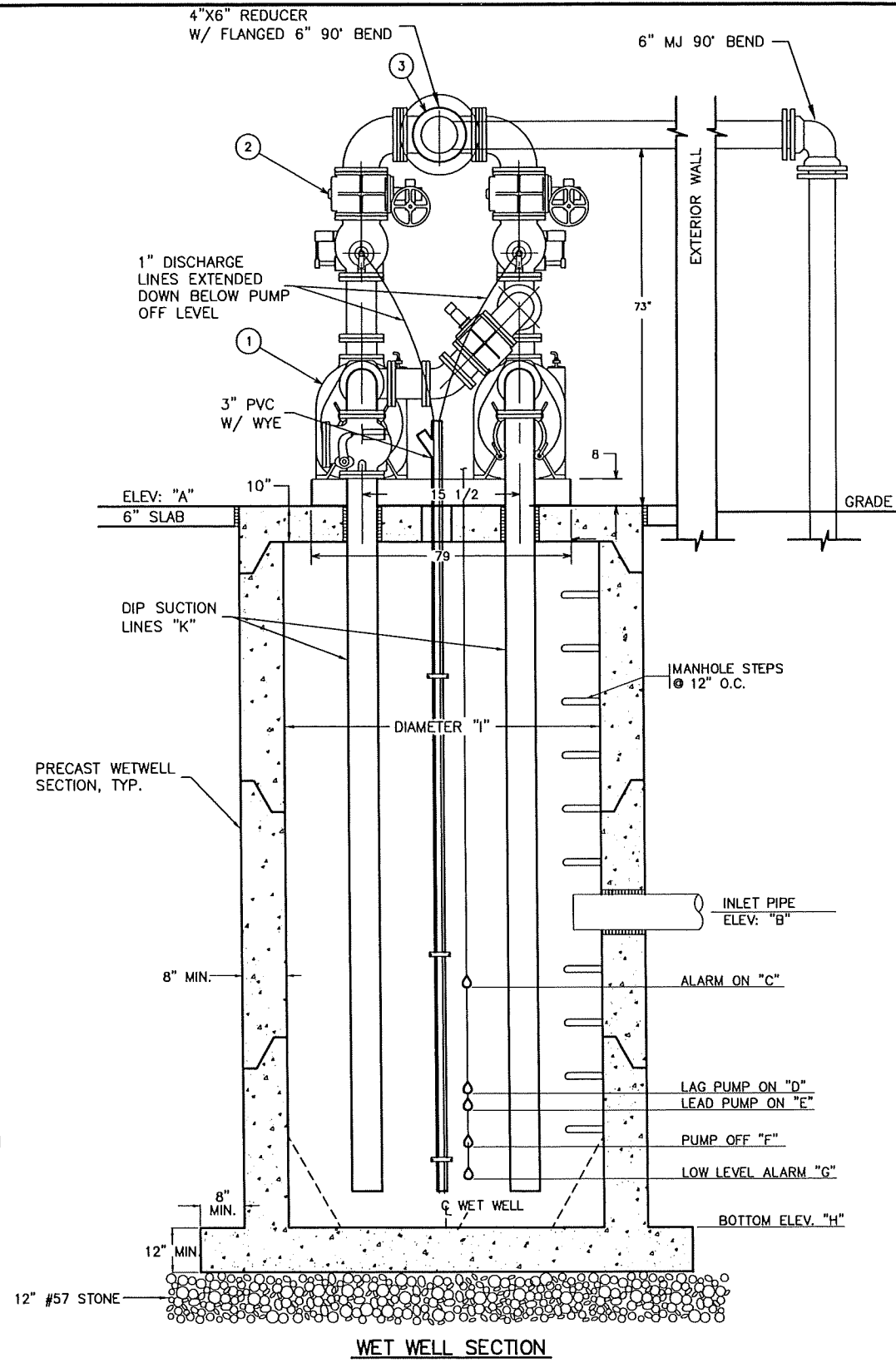
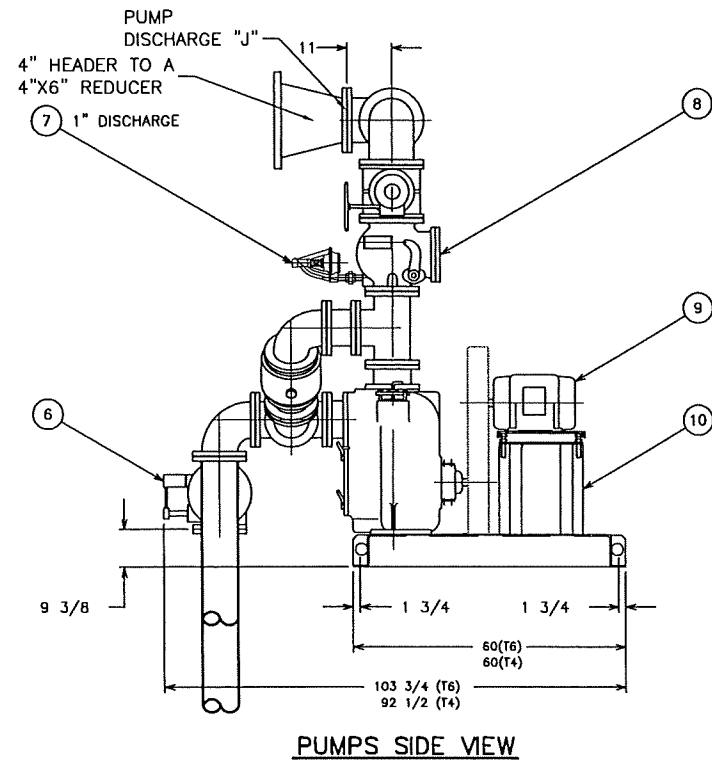
## **Appendix G**

### **Lift Station Record Drawings**



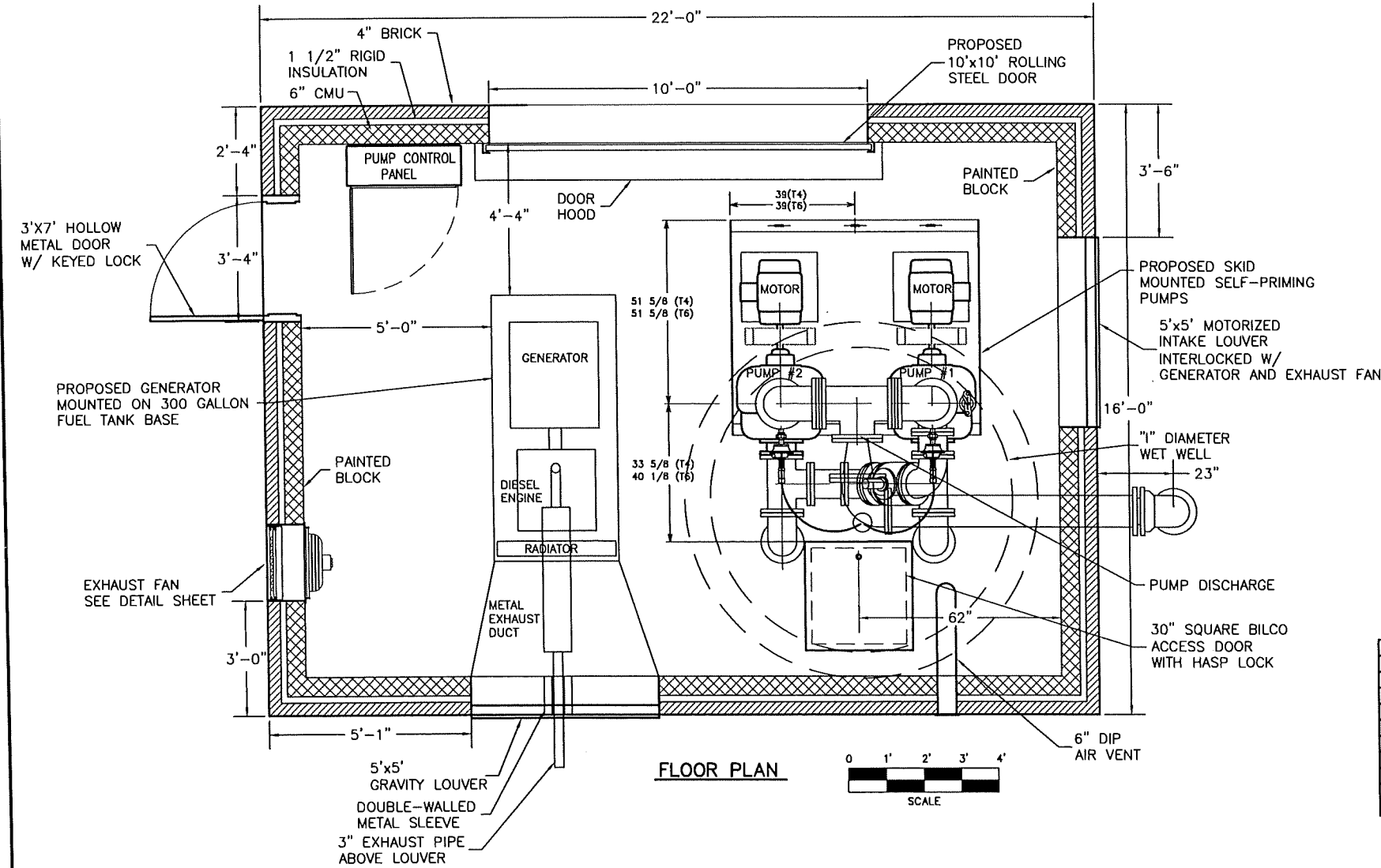


BASE BID-SELF PRIMING PUMP STATION DATA	
	PUMP STATION F-1
DESIGN FLOW	70,000 GPD
PUMP CAPACITY	350 GPM
TDH	108
FM SIZE	8 IN
FM EFFECTIVE LENGTH	18,225
FM HIGH POINT	175.5
VEL. @ PUMP RATE	2.24 FT/SEC
PUMP ON TIME	2.63 MIN
PUMP OFF TIME	16.31 MIN
SELECTED PUMP (OR EQUAL)	GORMAN RUPP T4A-B
RPM	1950
MIN HORSEPOWER	30
MIN EFFICIENCY	44%
IMPELLER	9.75
DISCHARGE	4 IN
WET WELL DIMENSIONS:	
A-RIM	125.28
B-INLET PIPE/ INVERT	EL 116.11 FT
C-HIGH WATER ALARM	EL 115.1 FT
D-LAG PUMP ON	EL 114.8 FT
E-LEAD PUMP ON	EL 113.8 FT
F-LEAD PUMP OFF	EL 111.80 FT
G-LOW LEVEL ALARM	EL 111.10 FT
H-BOTTOM WET WELL	EL 109.80 FT
I-DIAM WET WELL	8 FT
J-DISCHARGE PIPING	6 IN
K-SUCTION PIPING	6 IN

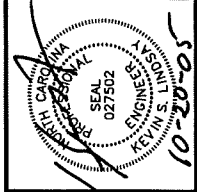


ITEM	DESCRIPTION	MATERIAL
1	PUMP	CAST IRON
2	DISCHARGE PLUG VALVE	CAST IRON
3	DISCHARGE TEE	CAST IRON
4	INTERCONNECT PLUG VALVE	CAST IRON
5	BELT GUARD ASSY	STEEL
6	SUCTION CHECK VALVE	CAST IRON
7	AIR RELEASE VALVE	CAST IRON 1" (SHIPPED LOOSE)
8	DISCHARGE CHECK VALVE	CAST IRON
9	MOTOR	CAST IRON
10	PUMP & MOTOR BASE ASSY	STEEL

**NOTE:**  
CONTROL PANELS PROVIDED BY OWNER  
ALONG WITH TELEMETRY CONTROL  
UNIT, REMOTE TERMINAL UNIT  
WITH ANTENNA, FLOATS AND  
FLOAT SUPPORTS.



REVISIONS	DATE	BY
SYMBOL	DESCRIPTION	DATE
	REVISED WITH	2011-23-04
		DFW



**Hobbs, Upchurch & Associates, P.A.**  
Consulting Engineers  
SOUTHERN PINES, NC - CHARLOTTE, NC  
MAGS HEAD, NC - RALEIGH, NC  
MYRTLE BEACH, SC - BEAUFORT, SC  
300 S.W. Broad Street, Southern Pines, North Carolina 28387  
Phone: (910) 692-5616 - Fax: (910) 692-4795



PUMP STATIONS  
FOR THE  
NORCROSS WATER AND SEWER DISTRICT  
CUMBERLAND COUNTY, NORTH CAROLINA  
SELF PRIMING PUMP STATION F1

DATE:	JAN., 2004
DESIGNED:	DFW
DRAWN:	DFW
CHECKED:	KSL
SCALE:	SCALE
SHEET NO.	58
OF:	68

H:\CU10103-95\PUMP\BLOG\001\PPBLDGSrev.dwg, FLOORPLAN-FALCON, 10/20/2005 9:12:45 AM, DWG, \\exchange\HPLJ3500, 1,2

# LEGEND

- GFI 20A, 120V, DUPLEX RECEPT, GFI
- WP WEATHERPROOF
- JUNCTION BOX
- S 20A, 120V, SINGLE POLE SWITCH
- DISCONNECT RATING AS SHOWN
- POWER PANEL
- AUTOMATIC TRANSFER SW
- FLOW TRANSMITTER

PANEL TYPE: SQ D I-LINE TYPE HCM  
 VOLTS: 120/240  
 PHASE: 3 PHASE, 4 WIRE  
 30 KAIC

250 AMP MLO  
**"MDP"**

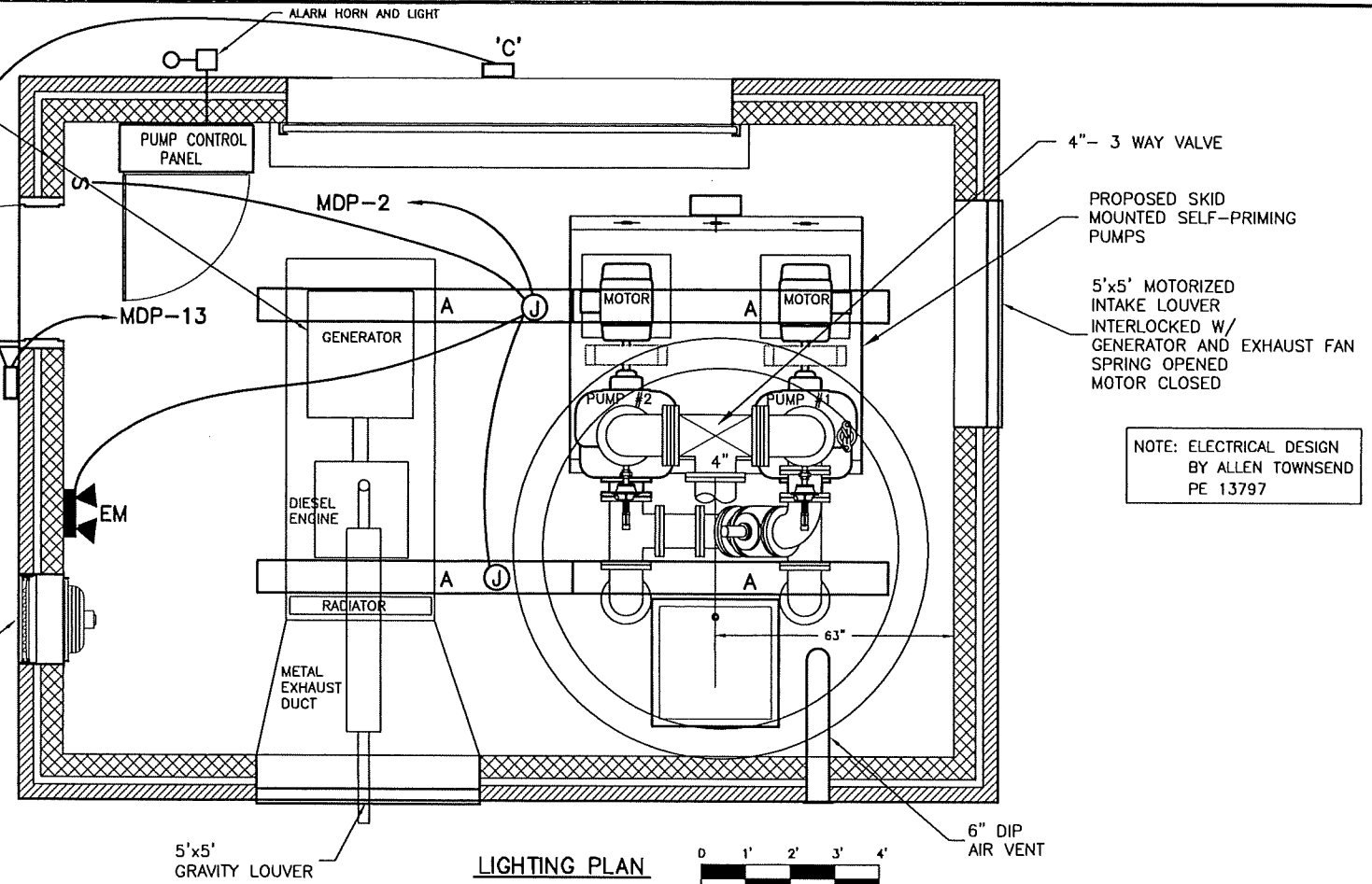
PROVIDE GROUND BAR  
 NEMA 1 ENCLOSURE

W	LOAD DESCRIPTION	WIRE SIZE	BKR. SIZE	CKT. NO.	L1 L2 L3	CKT. NO.	BKR. SIZE	WIRE SIZE	LOAD DESCRIPTION	W
980	EXHAUST FAN / LOUVER	12	20	1		2		4/0	PUMP CONTROL PANEL	26600
984	LIGHTS	12	20	3		4	200	4/0	PUMP CONTROL PANEL	26600
3000	RECEPTACLES	12	20	5		6	3	4/0	PUMP CONTROL PANEL	26600
1500	GEN. BLOCK HEATER	12	20	7		8		10	UNIT HEATER	1666
400	GEN. BATTERY CHARGER	12	20	9		10	30	10	UNIT HEATER	1666
800	SCADA PANEL	12	20	11		12	3	10	UNIT HEATER	1666
300	EXTERIOR LIGHTS	12	20	13		14			SPACE	
				15		16			SPACE	
				17		18			SPACE	
				19		20			SPACE	

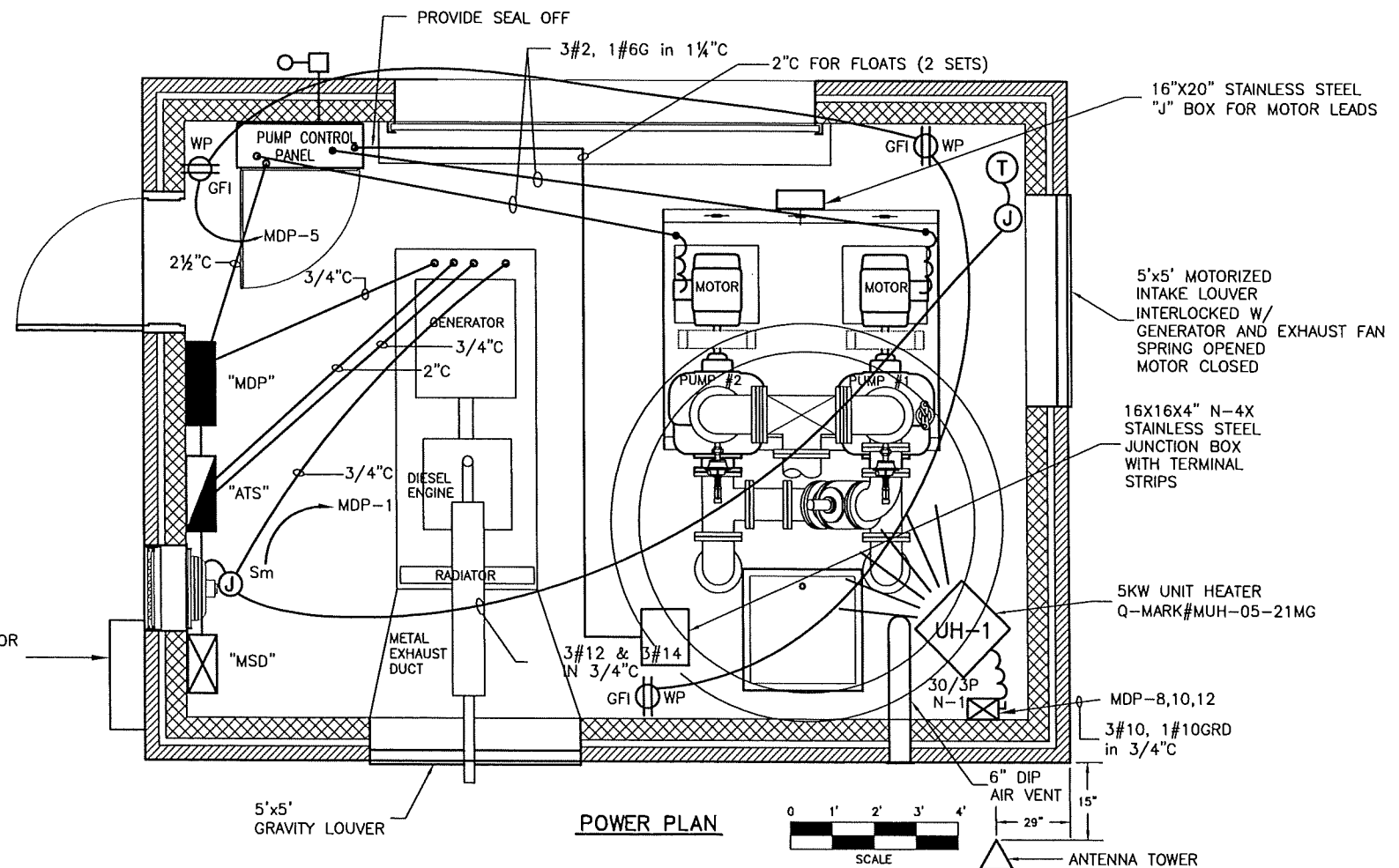
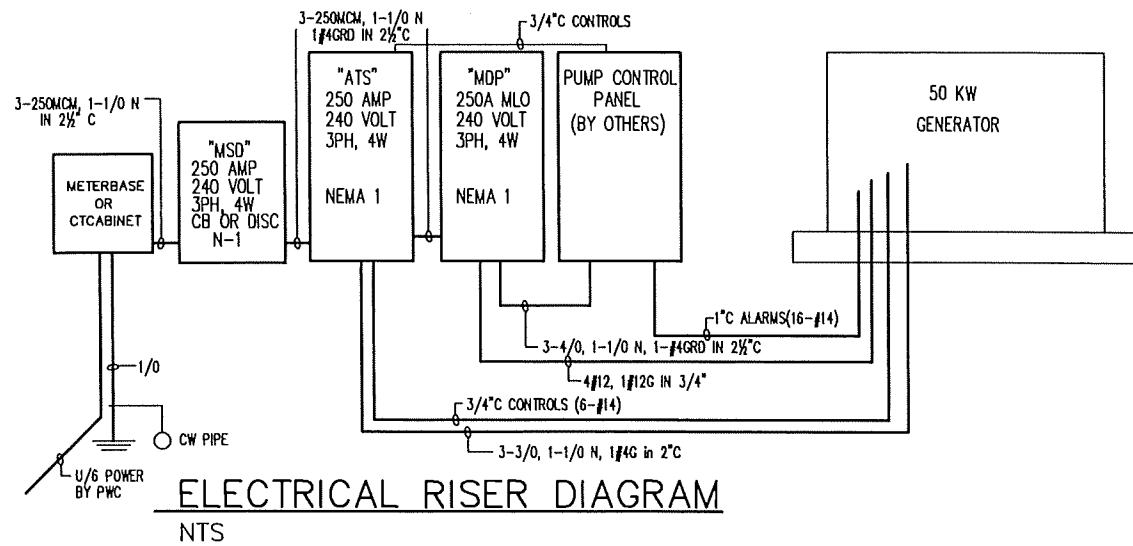
PROPOSED GENERATOR MOUNTED ON 300 GALLON FUEL TANK BASE

PROVIDE PHOTOCELL B IN THIS LIGHT TO CONTROL BOTH OUTSIDE LIGHT FIXTURES

EXHAUST FAN SEE DETAIL SHEET



NOTE: ELECTRICAL DESIGN BY ALLEN TOWNSEND PE 13797



# FIXTURE SCHEDULE

SYMBOL	MANUF.	CAT NO.	LAMPS	REMARKS
A	COLUMBIA	LU8-296HO-120	2-F96T12HO (110 WATT)	PROVIDE SPACER BETWEEN LIGHT & CEILING
B	SPAULDING	WGS1-M100PS-MT	1-100WMH	MOUNT 10'0" AFG
C	SPAULDING	WGST-M175-MT	1-175MH	MOUNT OVER DOOR 12'0" AFG
EM	PRESCOLITE	LMP-16	2-7.2W	MOUNT 10'0" AFF

REVISIONS

NO.	DATE	DESCRIPTION
1	11-23-04	DFW
2	12-27-04	DFW

Professional Engineer Seal: ALLEN TOWNSEND, PE 13797, License No. 027502, State of North Carolina.

**Hobbs, Upchurch & Associates, P.A.**  
 Consulting Engineers  
 SOUTHERN PINES, NC - CHARLOTTE, NC  
 MAYS HEAD, NC - RALEIGH, NC  
 MYRTLE BEACH, SC - BEAUFORT, SC

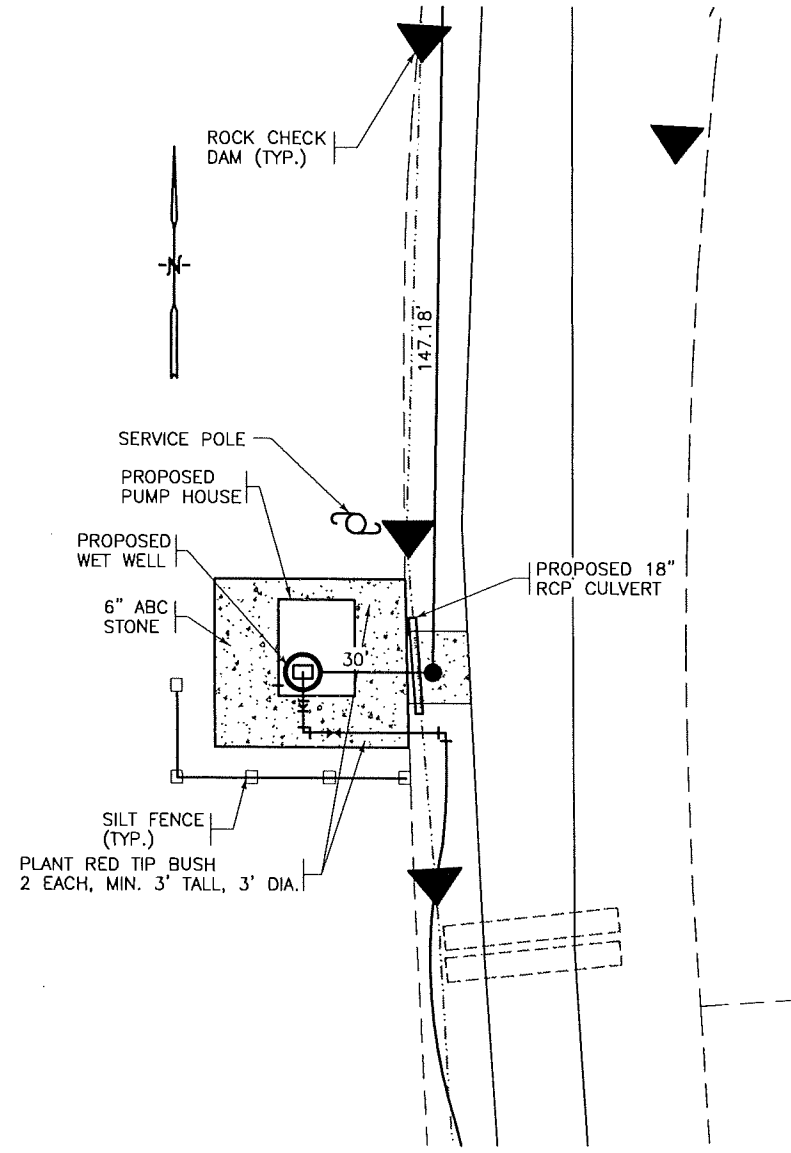
300 S.W. Broad Street, Southern Pines, North Carolina 28387  
 Phone: (910) 692-5616 - Fax: (910) 692-4795

**PUMP STATIONS FOR THE NORCRESS WATER AND SEWER DISTRICT CUMBERLAND COUNTY, NORTH CAROLINA**

**PUMP STATION F-1 POWER AND LIGHTING PLANS**

DATE: DEC., 2003  
 DESIGNED: DFW  
 DRAWN: DFW  
 CHECKED: KSL  
 SCALE: SCALE  
 SHEET NO. E1

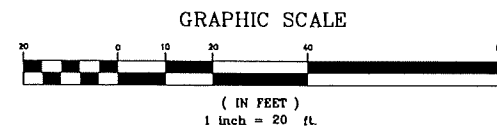
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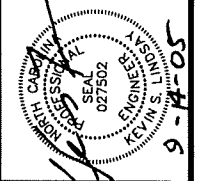
NOTE:  
CONTRACT 3 INCLUDES  
MANHOLE AND 5' STUBOUT  
FOR PUMP STATION

PROPOSED PUMP STATION G-1  
SITE PLAN

SITE ELEVATION 127.67'



SY. NO.	DESCRIPTION	DATE	BY



**Hobbs, Upchurch & Associates, P.A.**  
Consulting Engineers  
SOUTHERN PINES, NC - CHARLOTTE, NC  
MAYS HEAD, NC - RALEIGH, NC  
MYRTLE BEACH, SC - BEAUFORT, SC

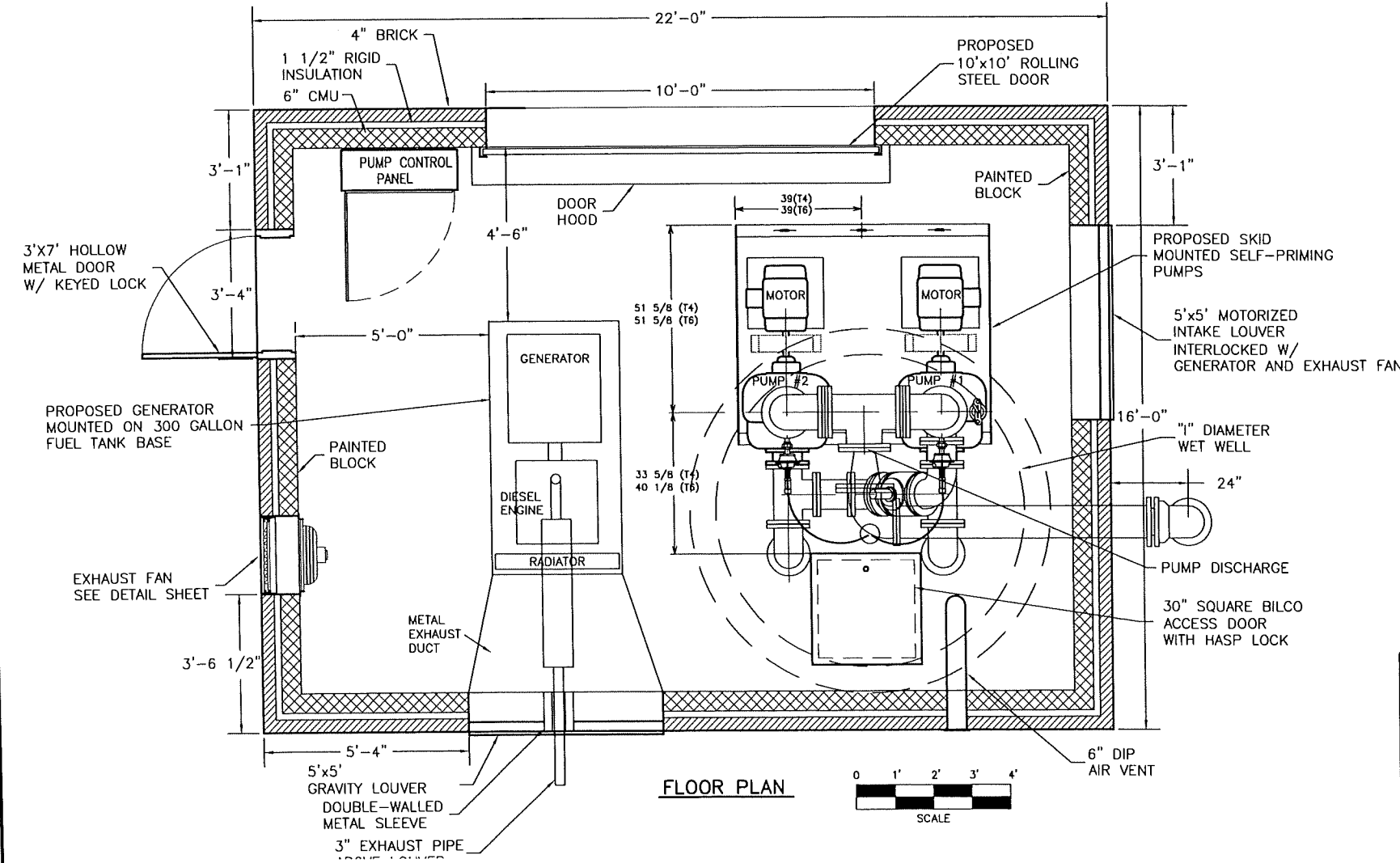
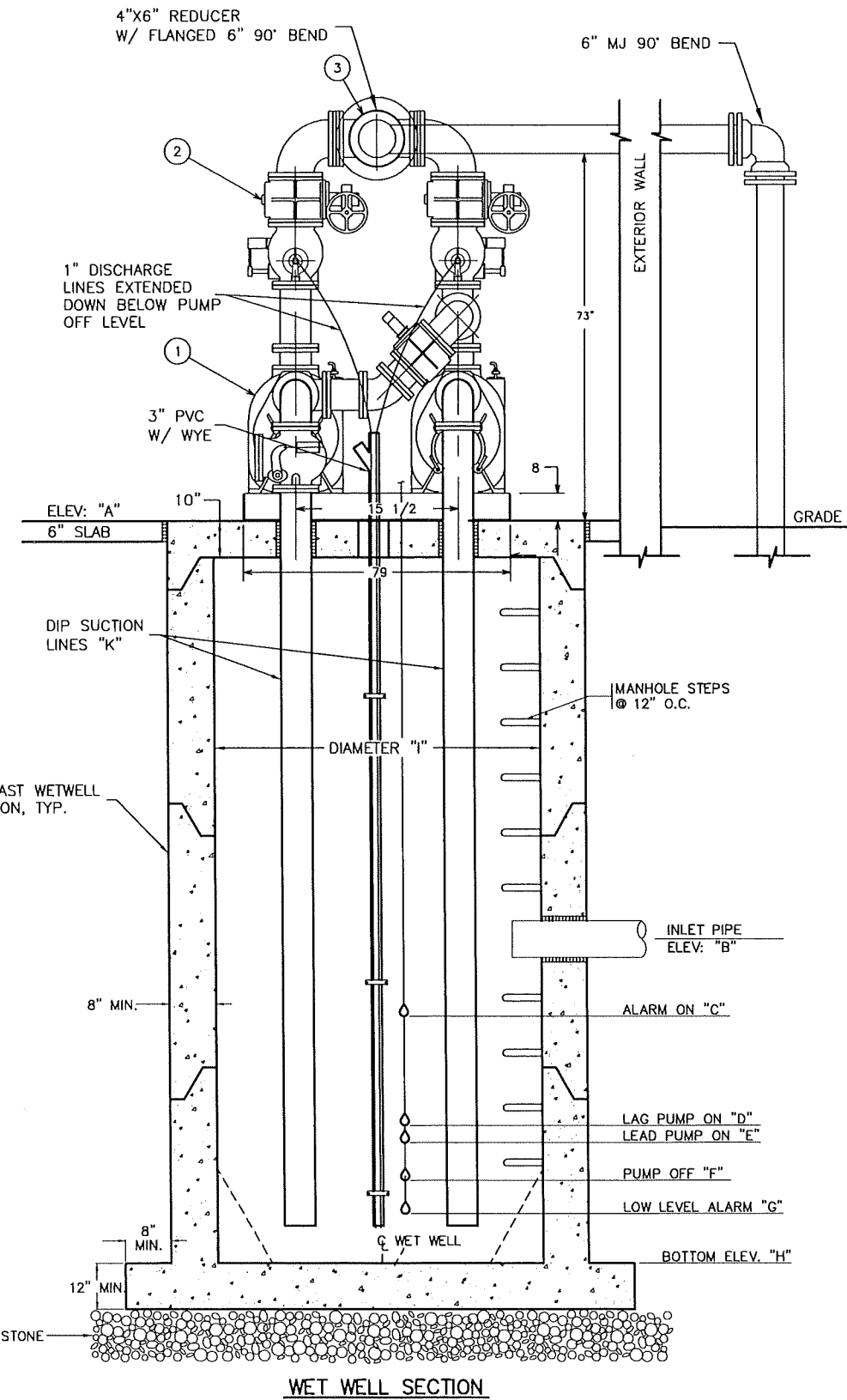
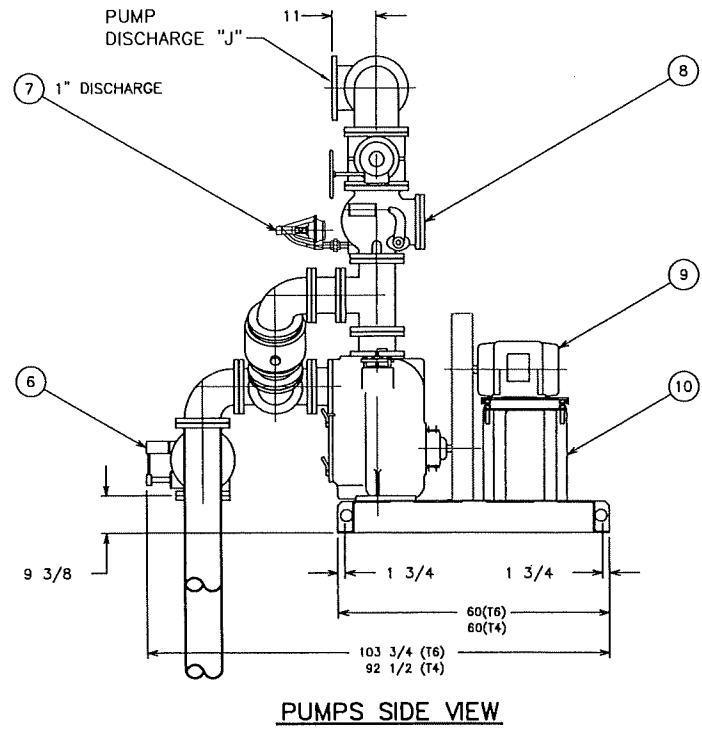
300 S.W. Broad Street, Southern Pines, North Carolina 28387  
Phone: (910) 692-5616 - Fax: (910) 692-4795

TOWN OF GODWIN SANITARY SEWER SYSTEM  
FOR THE  
NORCROSS WATER AND SEWER DISTRICT  
CUMBERLAND COUNTY, NORTH CAROLINA

LAYOUT PUMP STATION G-1

DATE:	DECEMBER, 2002
DESIGNED:	KSL
DRAWN:	HMW3
CHECKED:	KSL
SCALE:	AS SHOWN
SHEET NO.	48
OF:	59

SELF PRIMING PUMP STATION DATA	
PUMP STATION G-1	
DESIGN FLOW	10,000 GPD
PUMP CAPACITY	200 GPM
TDH	114
FM SIZE	6 IN
FM LENGTH	21,987 FT
FM HIGH POINT	151.00 FT
VEL. @ PUMP RATE	2.27 FT/SEC
PUMP ON TIME	0.55 MIN
PUMP OFF TIME	15.22 MIN
SELECTED PUMP (OR EQUAL)	GORMAN RUPP T3A3SB-B
RPM	2,200
MIN HORSEPOWER	25
MIN EFFICIENCY	36%
IMPELLER	8.75 IN
DISCHARGE	4 IN
WET WELL DIMENSIONS:	
A-RIM	127.67
B-INLET PIPE/ INVERT	12 INCH, @ EL 120.30 FT
C-HIGH WATER ALARM	EL 116.8 FT
D-LAG PUMP ON	EL 116.3 FT
E-LEAD PUMP ON	EL 115.8 FT
F-LEAD PUMP OFF	EL 115.3 FT
G-LOW LEVEL ALARM	EL 114.80 FT
H-BOTTOM WET WELL	EL 113.3 FT
I-DIAM WET WELL	6 FT
J-DISCHARGE PIPING	4 IN



SELF PRIMING PUMPS WITH PARALLEL SERIES PIPING

ITEM	DESCRIPTION	MATERIAL
1	PUMP	CAST IRON
2	DISCHARGE PLUG VALVE	CAST IRON
3	DISCHARGE TEE	CAST IRON
4	INTERCONNECT PLUG VALVE	CAST IRON
5	BELT GUARD ASSY	STEEL
6	SUCTION CHECK VALVE	CAST IRON
7	AIR RELEASE VALVE	CAST IRON 1" (SHIPPED LOOSE)
8	DISCHARGE CHECK VALVE	CAST IRON
9	MOTOR	CAST IRON
10	PUMP & MOTOR BASE ASSY	STEEL

**NOTE:**  
CONTROL PANELS PROVIDED BY OWNER ALONG WITH TELEMETRY CONTROL UNIT, REMOVE TERMINAL UNIT WITH ANTENNA, FLOATS AND FLOAT SUPPORTS.

REVISIONS	DATE	BY
DESCRIPTION	20	DFW
REVISED WIDTH	20	DFW

**Hobbs, Upchurch & Associates, P.A.**  
Consulting Engineers  
SOUTHERN PINES, NC - CHARLOTTE, NC  
MAGS HEAD, NC - RALEIGH, NC  
MYRTLE BEACH, SC - BEAUFORT, SC  
300 S.W. Broad Street, Southern Pines, North Carolina 28387  
Phone: (910) 692-5616 - Fax: (910) 692-4795

PUMP STATIONS FOR THE  
NORCROSS WATER AND SEWER DISTRICT  
CUMBERLAND COUNTY, NORTH CAROLINA

SELF PRIMING PUMP STATION G1

DATE: JAN., 2004  
DESIGNED: DFW  
DRAWN: DFW  
CHECKED: KSL  
SCALE: SCALE  
SHEET NO. 49

RECORD DRAWINGS SEPTEMBER 2005

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# LEGEND

- GFI 20A, 120V, DUPLEX RECEPT, GFI
- WP WEATHERPROOF
- JUNCTION BOX
- S 20A, 120V, SINGLE POLE SWITCH
- DISCONNECT RATING AS SHOWN
- POWER PANEL
- AUTOMATIC TRANSFER SW
- FLOW TRANSMITTER

PANEL TYPE: SQ D I-LINE TYPE HCM  
VOLTS: 120/240  
PHASE: 3 PHASE, 4 WIRE  
30 KAIC

225 AMP MLO  
"MDP"

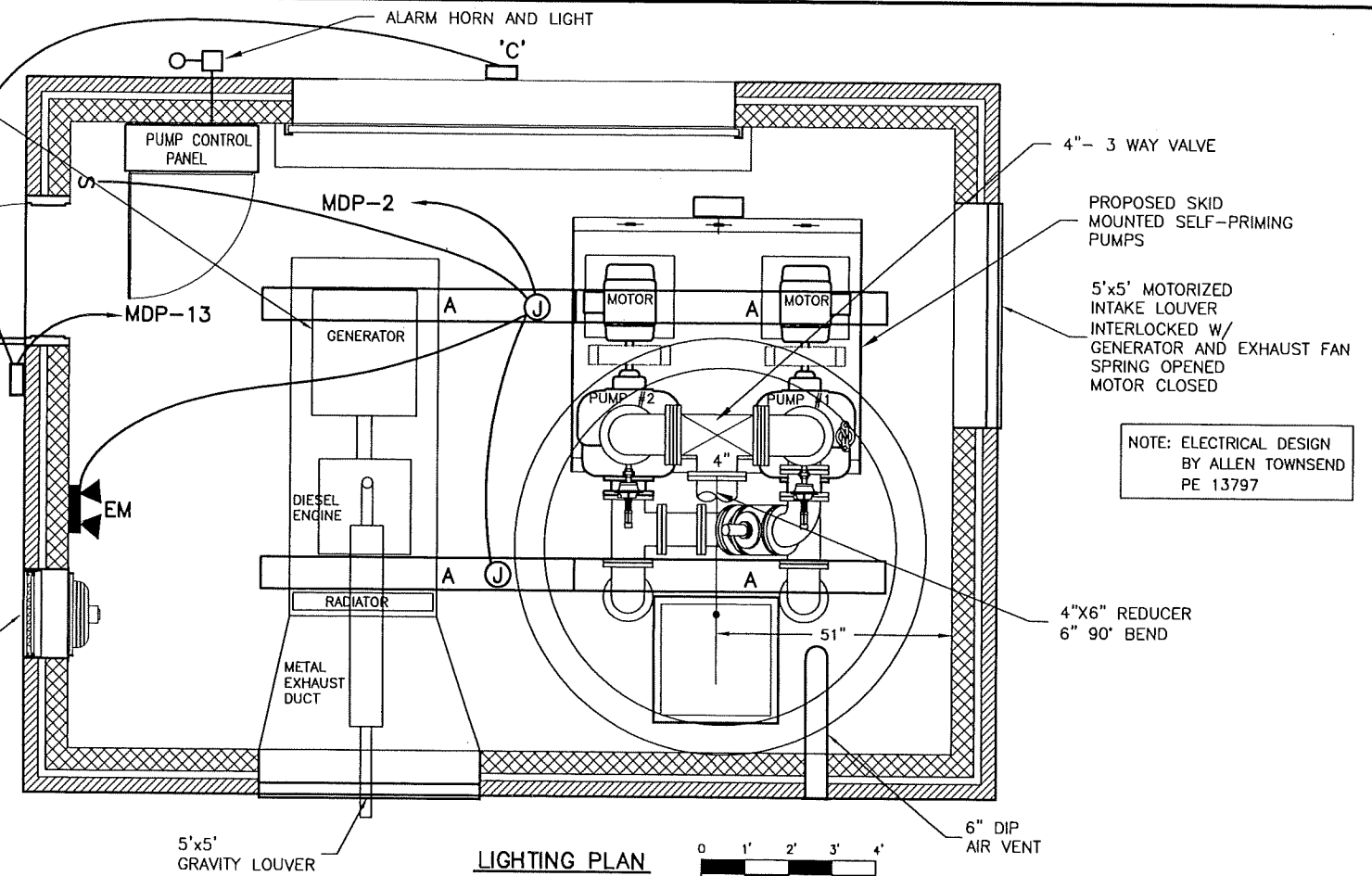
PROVIDE GROUND BAR  
NEMA 1 ENCLOSURE

W	LOAD DESCRIPTION	WIRE SIZE	BKR. SIZE	CKT. NO.	L1	L2	L3	CKT. NO.	BKR. SIZE	WIRE SIZE	LOAD DESCRIPTION	W
980	EXHAUST FAN / LOUVER	12	20	1				2		3/0	PUMP CONTROL PANEL	22900
984	LIGHTS	12	20	3				4	175	3/0	PUMP CONTROL PANEL	22900
3000	RECEPTACLES	12	20	5				6		3/0	PUMP CONTROL PANEL	22900
1500	GEN. BLOCK HEATER	12	20	7				8		10	UNIT HEATER	1666
400	GEN. BATTERY CHARGER	12	20	9				10	30	10	UNIT HEATER	1666
800	SCADA PANEL	12	20	11				12		10	UNIT HEATER	1666
300	EXTERIOR LIGHTS	12	20	13				14				
				15				16				
				17				18				
				19				20				

PROPOSED GENERATOR MOUNTED ON 300 GALLON FUEL TANK BASE

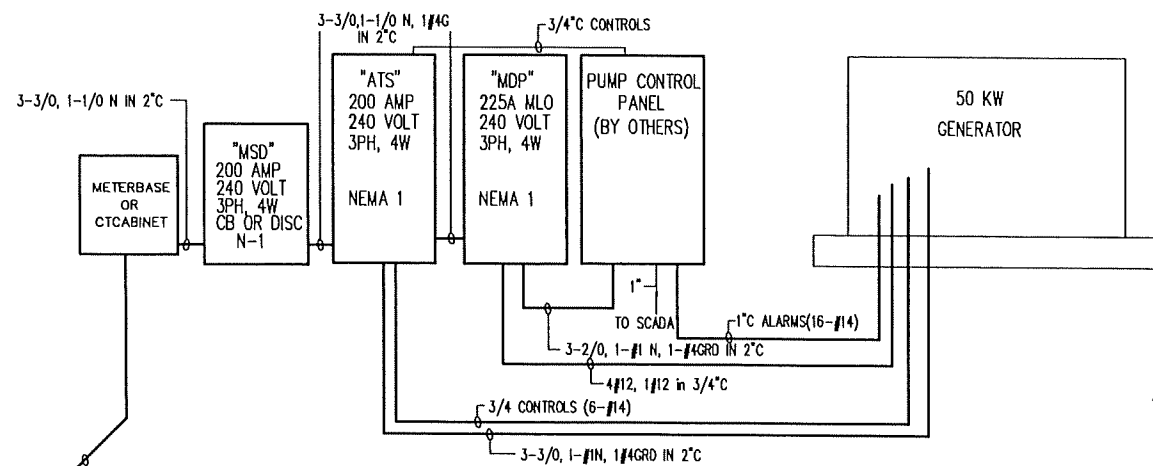
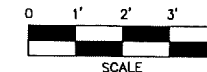
PROVIDE PHOTOCELL B IN THIS LIGHT TO CONTROL BOTH OUTSIDE LIGHT FIXTURES

EXHAUST FAN SEE DETAIL SHEET



NOTE: ELECTRICAL DESIGN BY ALLEN TOWNSEND PE 13797

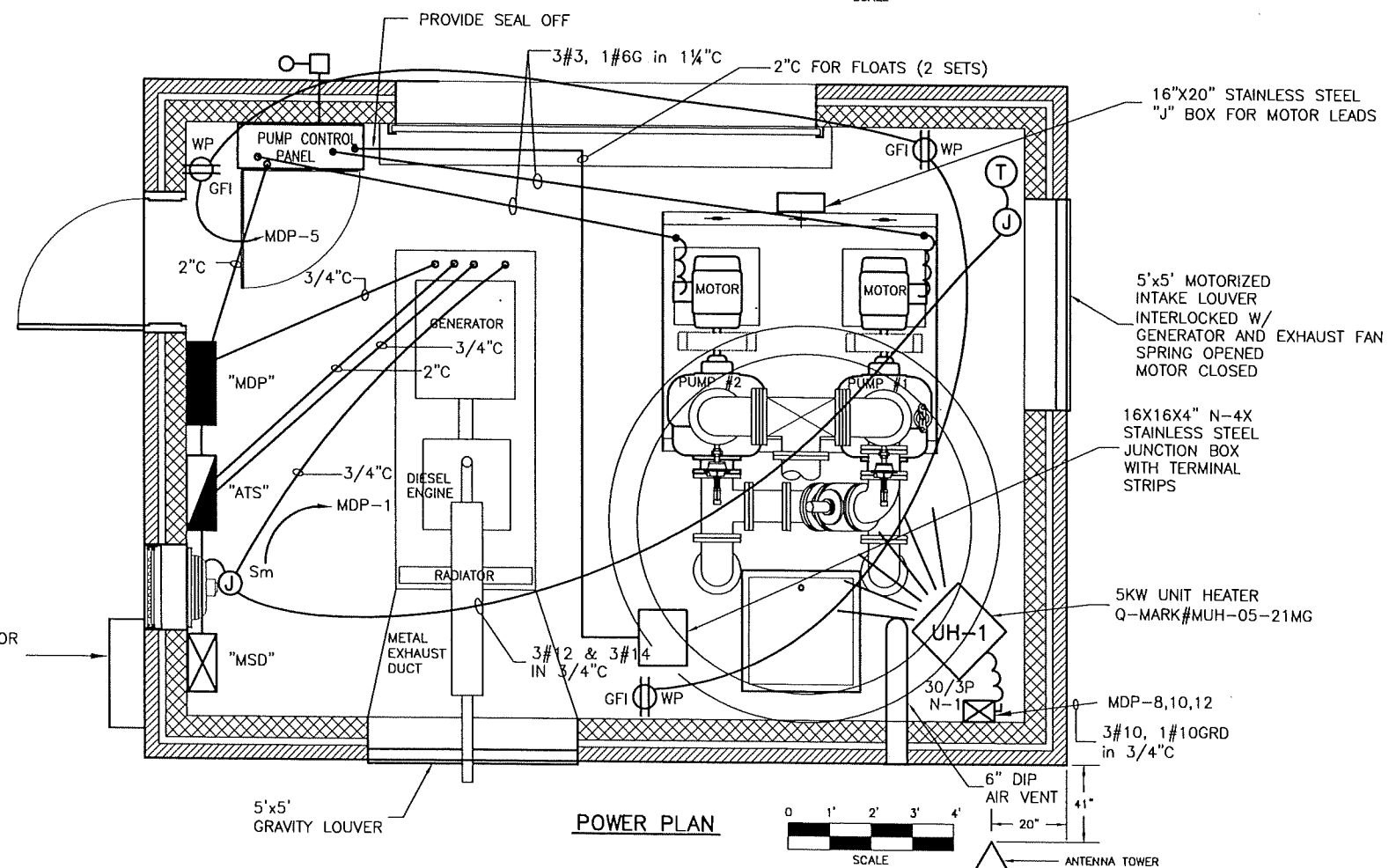
LIGHTING PLAN



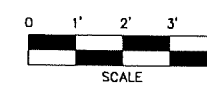
ELECTRICAL RISER DIAGRAM  
NTS

# FIXTURE SCHEDULE

SYMBOL	MANUF.	CAT NO.	LAMPS	REMARKS
A	COLUMBIA	LUB-296HO-120	2-F96T12HO (110 WATT)	PROVIDE SPACER BETWEEN LIGHT & CEILING
B	SPAULDING	WCSI-M100PS-MT	1-100WMH	MOUNT 10'0" AFG
C	SPAULDING	WGSI-M175-MT	1-175MH	MOUNT OVER DOOR 12'0" AFG
EM	PRESCOLITE	LMP-16	2-7.2W	MOUNT 10'0" AFF

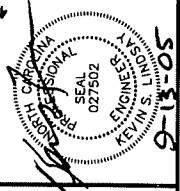


POWER PLAN



REVISIONS

SYMBOL	DESCRIPTION	DATE	BY
	REVISED WIDTH	20' TO 22'	1-23-04 DFW



**Hobbs, Upchurch & Associates, P.A.**  
Consulting Engineers  
SOUTHERN PINES, NC - CHARLOTTE, NC  
NAGS HEAD, NC - RALEIGH, NC  
MYRTLE BEACH, SC - BEAUFORT, SC  
300 S.W. Broad Street, Southern Pines, North Carolina 28387  
Phone: (910) 692-5616 - Fax: (910) 692-4795



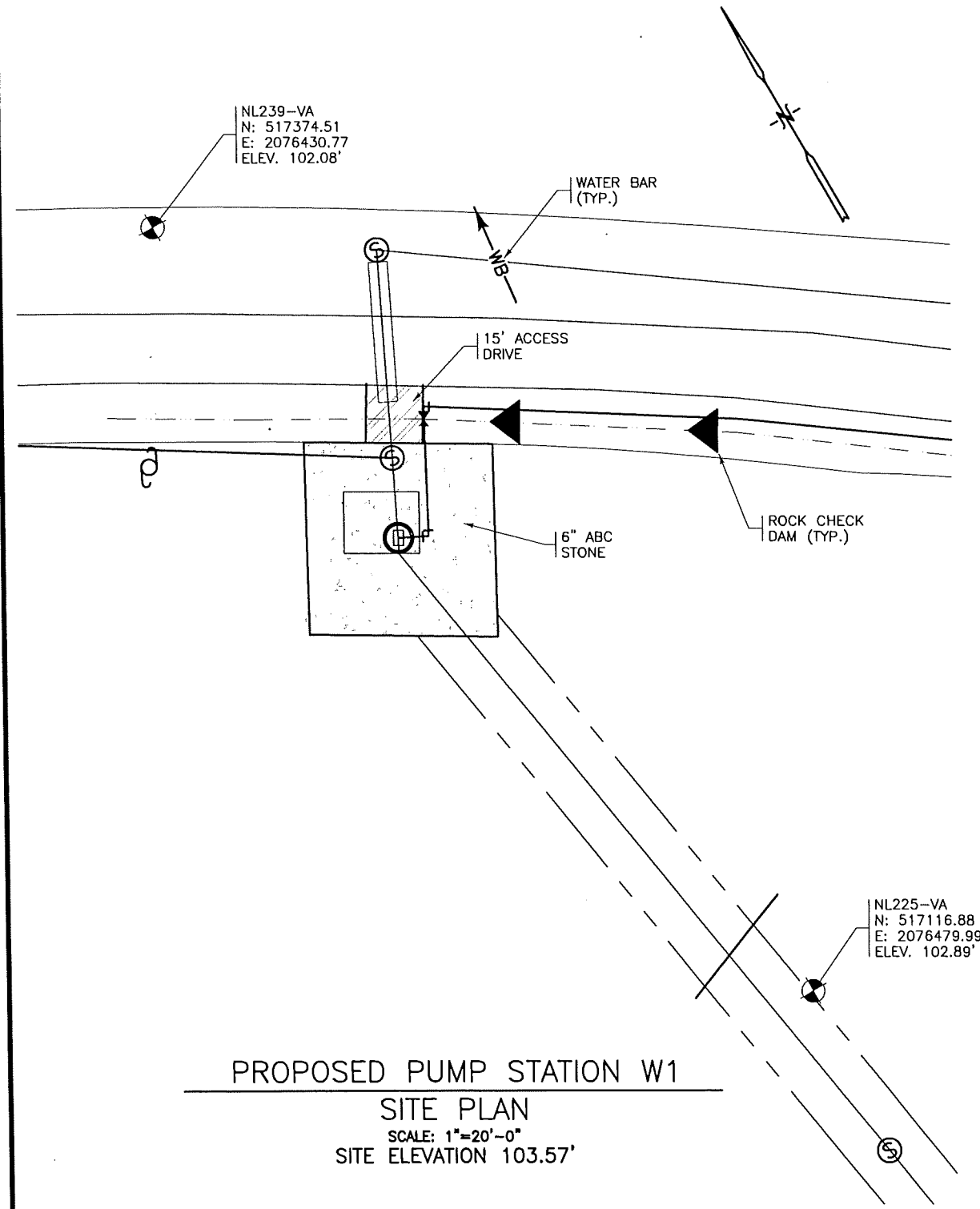
PUMP STATIONS FOR THE  
NORCROSS WATER AND SEWER DISTRICT  
CUMBERLAND COUNTY, NORTH CAROLINA  
PUMP STATION G-1 POWER  
AND LIGHTING PLANS

DATE: DEC., 2003  
DESIGNED: DFW  
DRAWN: DFW  
CHECKED: KSL  
SCALE: SCALE  
SHEET NO. E1

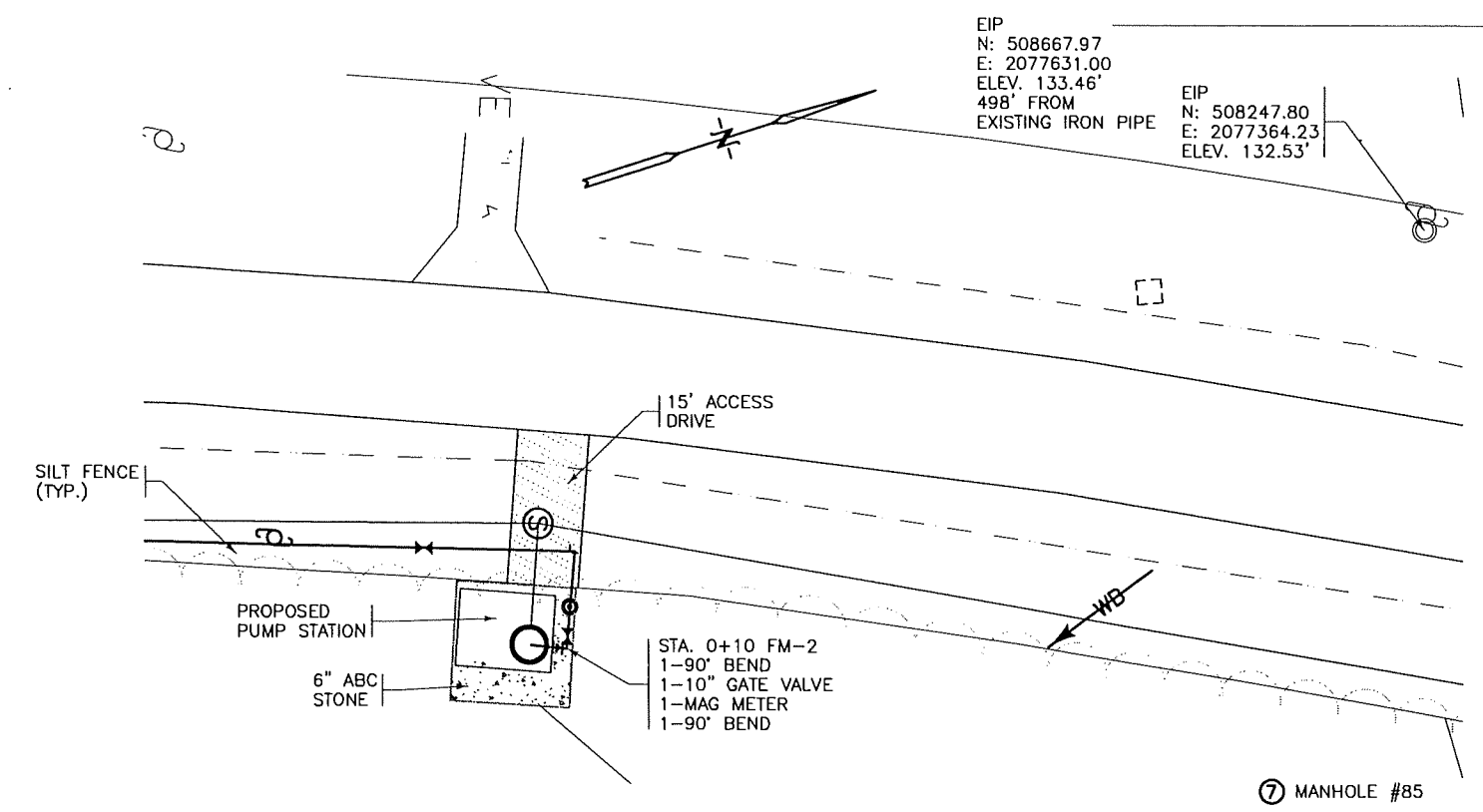
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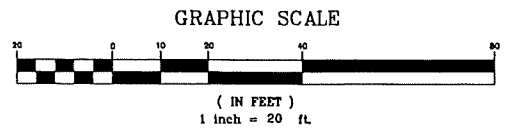
**NOTE:**  
 PUMP STATION CONTRACT WILL TIE INTO  
 LINE WORK CONTRACT AT MANHOLE NEAREST  
 TO PUMP STATION. COORDINATE WITH LINE  
 WORK CONTRACTOR AND OWNER FOR EXACT  
 LOCATION OF "STUB-OUT" FROM MANHOLE.



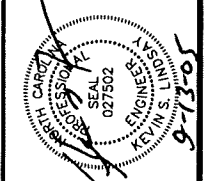
**PROPOSED PUMP STATION W1**  
**SITE PLAN**  
 SCALE: 1"=20'-0"  
 SITE ELEVATION 103.57'



**PROPOSED PUMP STATION W2**  
**SITE PLAN**  
 SCALE: 1"=20'-0"  
 SITE ELEVATION 124.56'



REVISIONS	DATE	BY



**Hobbs, Upchurch & Associates, P.A.**  
 Consulting Engineers  
 SOUTHERN PINES, NC - CHARLOTTE, NC  
 MAYS HEAD, NC - RALEIGH, NC  
 MYRTLE BEACH, SC - BEAUFORT, SC

**H**

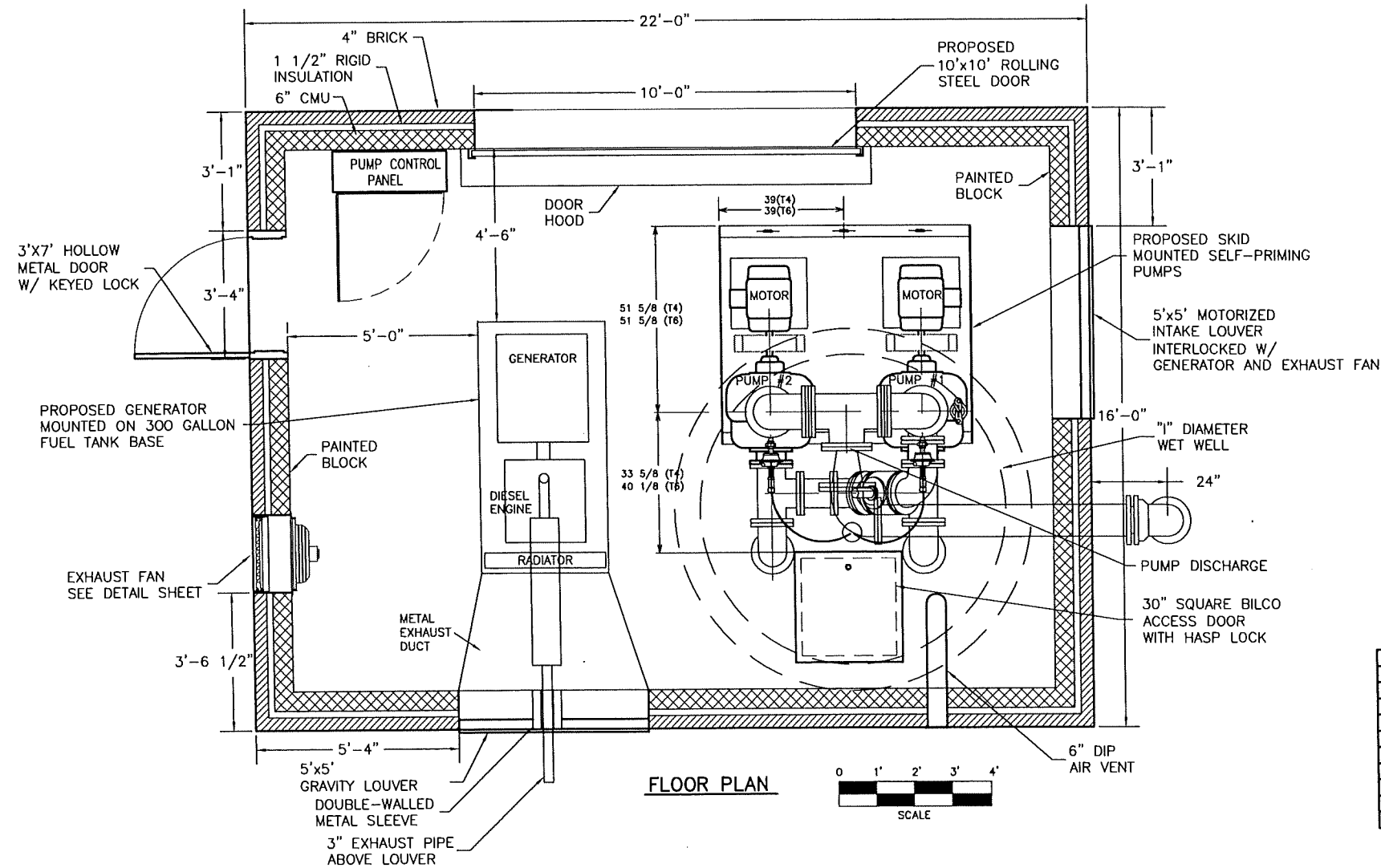
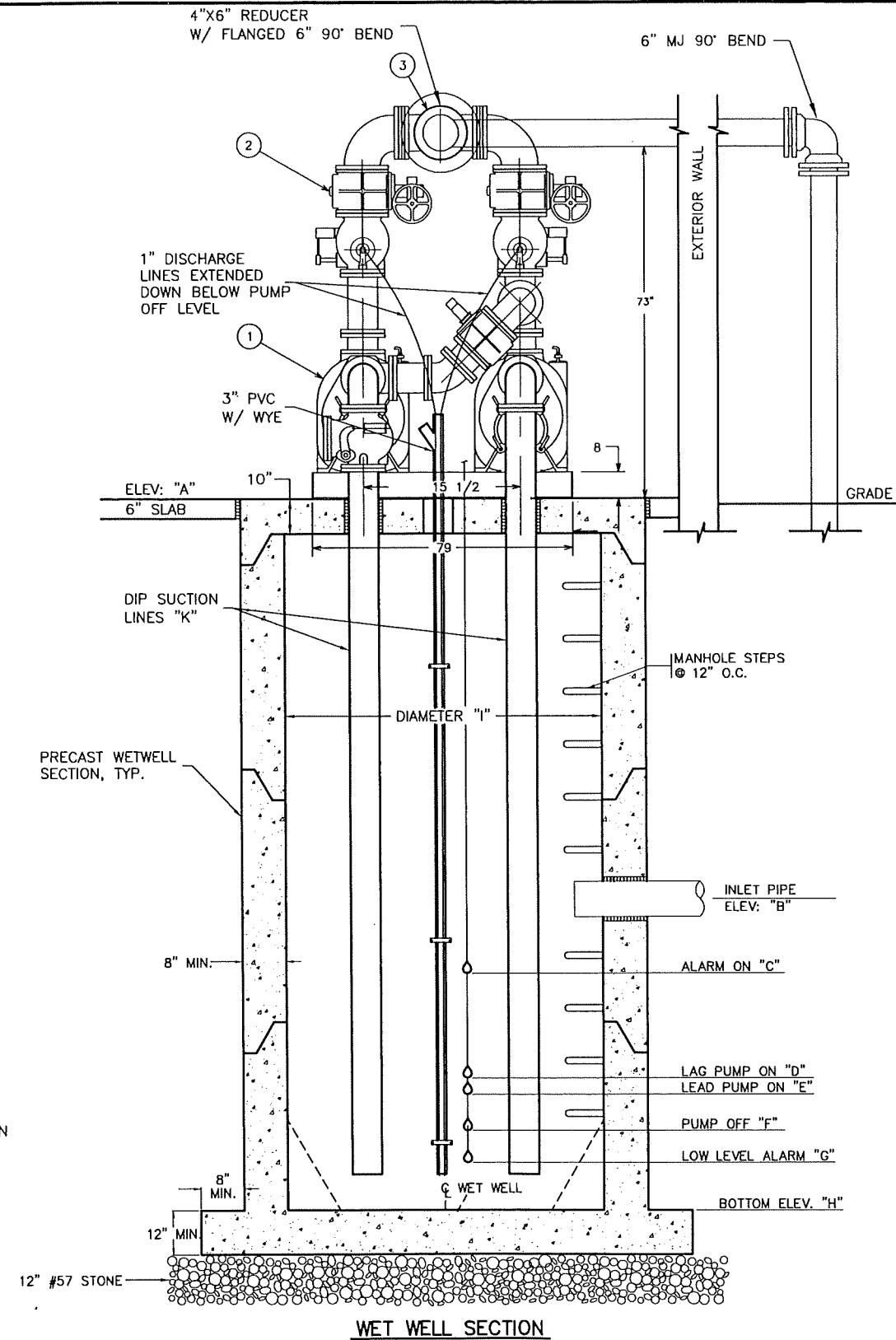
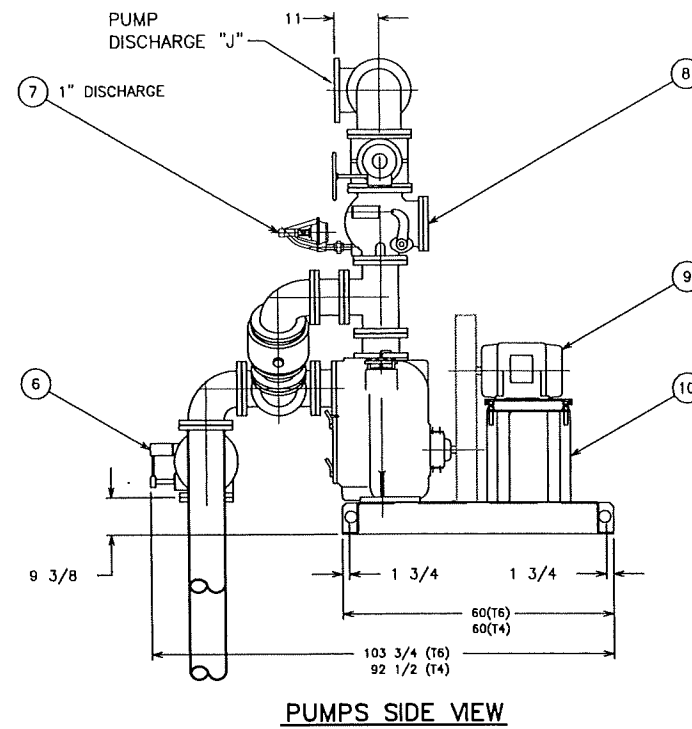
300 S.W. Broad Street, Southern Pines, North Carolina 28387  
 Phone: (910) 692-5616 - Fax: (910) 692-4795

**PUMP STATIONS**  
 FOR THE SEWER DISTRICT  
 NORCRESS WATER AND SEWER DISTRICT  
 CUMBERLAND COUNTY, NORTH CAROLINA

**SITE PLAN W-1 & W-2**

DATE:	JAN., 2004
DESIGNED:	KSL
DRAWN:	HMW3
CHECKED:	KSL
SCALE:	AS SHOWN
SHEET NO.	76
OF	89

BASE BID--SELF PRIMING PUMP STATION DATA		
	PUMP STATION W-1	PUMP STATION W-2
DESIGN FLOW	45,000 GPD	125,000 GPD
PUMP CAPACITY	200 GPM	700 GPM
TDH	87 FT	82 FT
FM SIZE	6 IN	10 IN
FM LENGTH	6,081 FT	17,941 FT
FM HIGH POINT	147.5 FT	140.5 FT
VEL. @ PUMP RATE	2.27 FT/SEC	2.86 FT/SEC
PUMP ON TIME	2.23 MIN	1.84 MIN
PUMP OFF TIME	12.03 MIN	12.99 MIN
SELECTED PUMP (OR EQUAL)	GORMAN RUPP T4A3S-B	GORMAN RUPP T6A3S-B
RPM	1700	1400
MIN HORSEPOWER	20	40
MIN EFFICIENCY	35%	55%
IMPELLER	9.75 IN	12.375 IN
DISCHARGE	4 IN	6 IN
WET WELL DIMENSIONS:		
A-RIM	103.57	124.56
B-INLET PIPE/INVERT	12 INCH, @ EL. 91.30 FT	15 INCH, @ EL. 118.30 FT
C-HIGH WATER ALARM	EL. 90.0 FT	EL. 116.5 FT
D-LAG PUMP ON	EL. 89.5 FT	EL. 115.5 FT
E-LEAD PUMP ON	EL. 89.0 FT	EL. 115.0 FT
F-LEAD PUMP OFF	EL. 86.5 FT	EL. 112.5 FT
G-LOW LEVEL ALARM	EL. 85.5 FT	EL. 111.5 FT
H-BOTTOM WET WELL	EL. 84.5 FT	EL. 110.5 FT
I-DIAM WET WELL	8 FT	8 FT
J-DISCHARGE PIPING	4 IN	6 IN



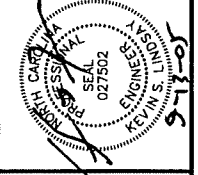
SELF PRIMING PUMPS WITH PARALLEL SERIES PIPING

ITEM	DESCRIPTION	MATERIAL
1	PUMP	CAST IRON
2	DISCHARGE PLUG VALVE	CAST IRON
3	DISCHARGE TEE	CAST IRON
4	INTERCONNECT PLUG VALVE	CAST IRON
5	BELT GUARD ASSY	STEEL
6	SUCTION CHECK VALVE	CAST IRON
7	AIR RELEASE VALVE	CAST IRON 1" (SHIPPED LOOSE)
8	DISCHARGE CHECK VALVE	CAST IRON
9	MOTOR	CAST IRON
10	PUMP & MOTOR BASE ASSY	STEEL

**NOTE:**  
CONTROL PANELS PROVIDED BY OWNER ALONG WITH TELEMETRY CONTROL UNIT, REMOTE TERMINAL UNIT WITH ANTENNA, FLOATS AND FLOAT SUPPORTS.

RECORD DRAWINGS SEPTEMBER 2005

SY. NO.	DESCRIPTION	DATE	BY
1	REVISED WIDTH 30' TO 22'	1-23-04	DFW



**Hobbs, Upchurch & Associates, P.A.**  
Consulting Engineers

SOUTHERN PINES, NC - CHARLOTTE, NC  
MAYS HEAD, NC - RALEIGH, NC  
MYRTLE BEACH, SC - BEAUFORT, SC

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Phone: (910) 692-5616 - Fax: (910) 692-4795



PUMP STATIONS FOR THE  
NORCROSS WATER AND SEWER DISTRICT  
CUMBERLAND COUNTY, NORTH CAROLINA

SELF PRIMING PUMP STATION W1, W2

DATE:	JAN., 2004
DESIGNED:	DFW
DRAWN:	DFW
CHECKED:	KSL
SCALE:	SCALE
SHEET NO.	77
OF:	89



# LEGEND

- GFI 20A, 120V, DUPLEX RECEPT, GFI
- WP WEATHERPROOF
- JUNCTION BOX
- S 20A, 120V, SINGLE POLE SWITCH
- DISCONNECT RATING AS SHOWN
- POWER PANEL
- AUTOMATIC TRANSFER SW
- FLOW TRANSMITTER

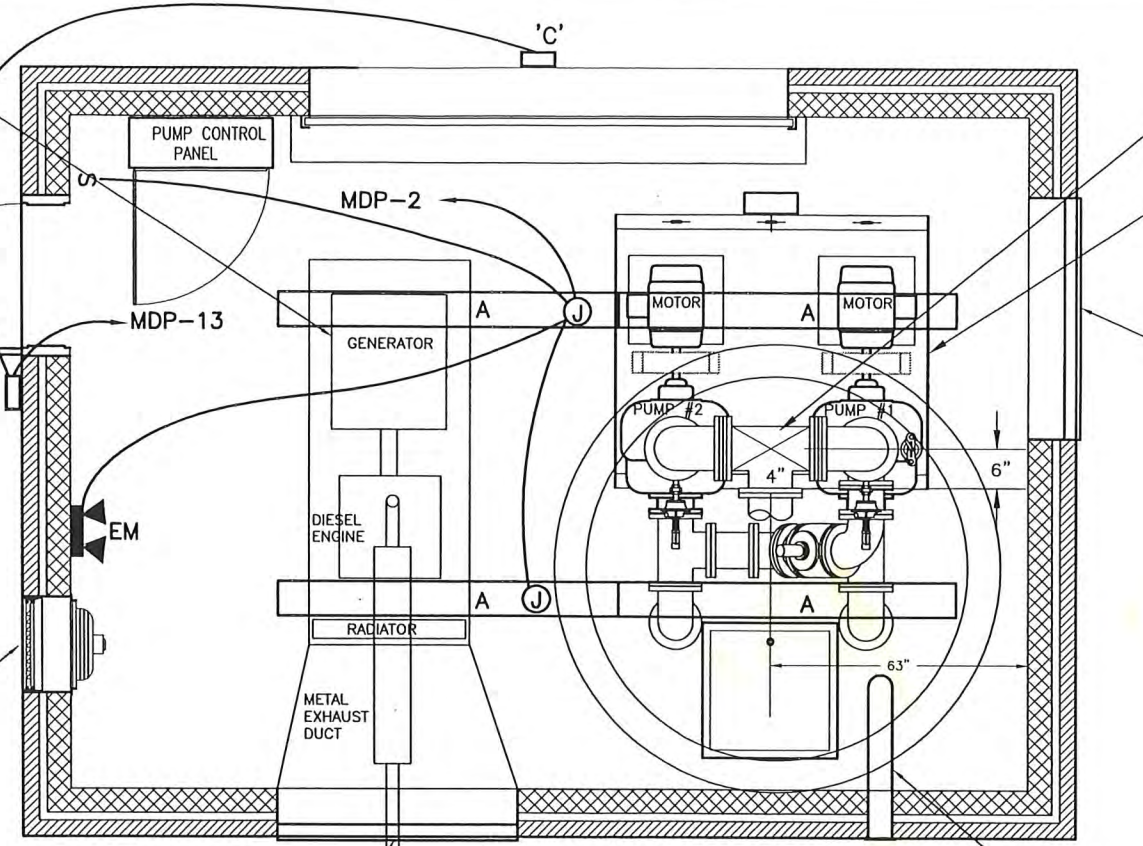
PANEL TYPE: SQ D I-LINE TYPE HCM 225 AMP MLO PROVIDE GROUND BAR  
 VOLTS: 120/240 "MDP" NEMA 1 ENCLOSURE  
 PHASE: 3 PHASE, 4 WIRE 30 KAIC

W	LOAD DESCRIPTION	WIRE SIZE	BKR. SIZE	CKT. NO.	L1	L2	L3	CKT. NO.	BKR. SIZE	WIRE SIZE	LOAD DESCRIPTION	W
980	EXHAUST FAN / LOUVER	12	20	1				2	2/0	2/0	PUMP CONTROL PANEL	18600
984	LIGHTS	12	20	3				4	2/0	2/0	PUMP CONTROL PANEL	18600
3000	RECEPTACLES	12	20	5				6	2/0	2/0	PUMP CONTROL PANEL	18600
1500	GEN. BLOCK HEATER	12	20	7				8	10	10	UNIT HEATER	1666
400	GEN. BATTERY CHARGER	12	20	9				10	3/0	10	UNIT HEATER	1666
800	SCADA PANEL	12	20	11				12	10	10	UNIT HEATER	1666
300	EXTERIOR LIGHTS	12	20	13				14			SPACE	
	SPACE							16			SPACE	
	SPACE							18			SPACE	
	SPACE							20			SPACE	

PROPOSED GENERATOR MOUNTED ON 300 GALLON FUEL TANK BASE

PROVIDE PHOTOCELL B IN THIS LIGHT TO CONTROL BOTH OUTSIDE LIGHT FIXTURES

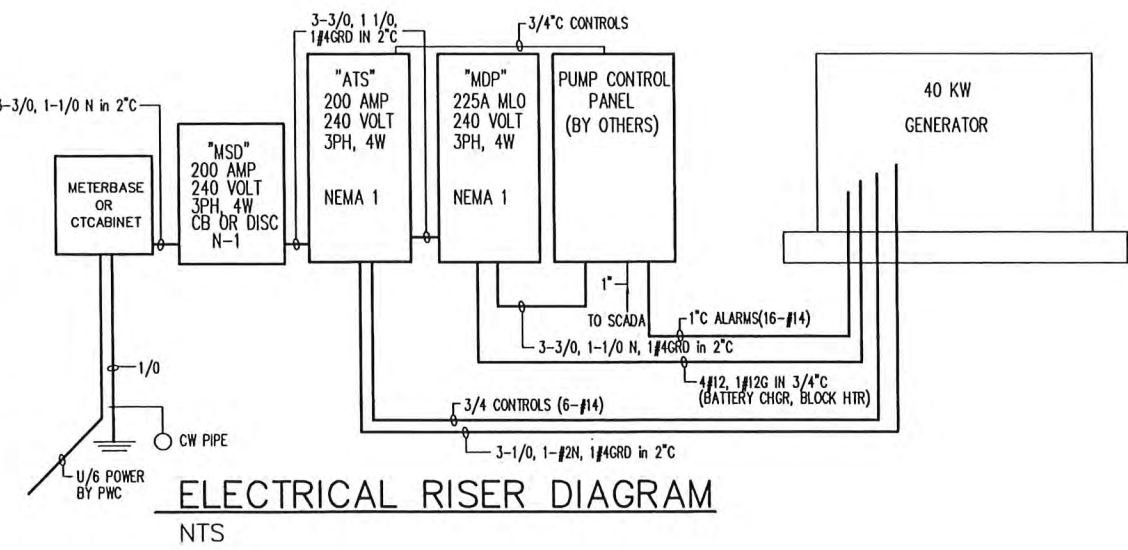
EXHAUST FAN SEE DETAIL SHEET



LIGHTING PLAN



NOTE: ELECTRICAL DESIGN BY ALLEN TOWNSEND PE 13797

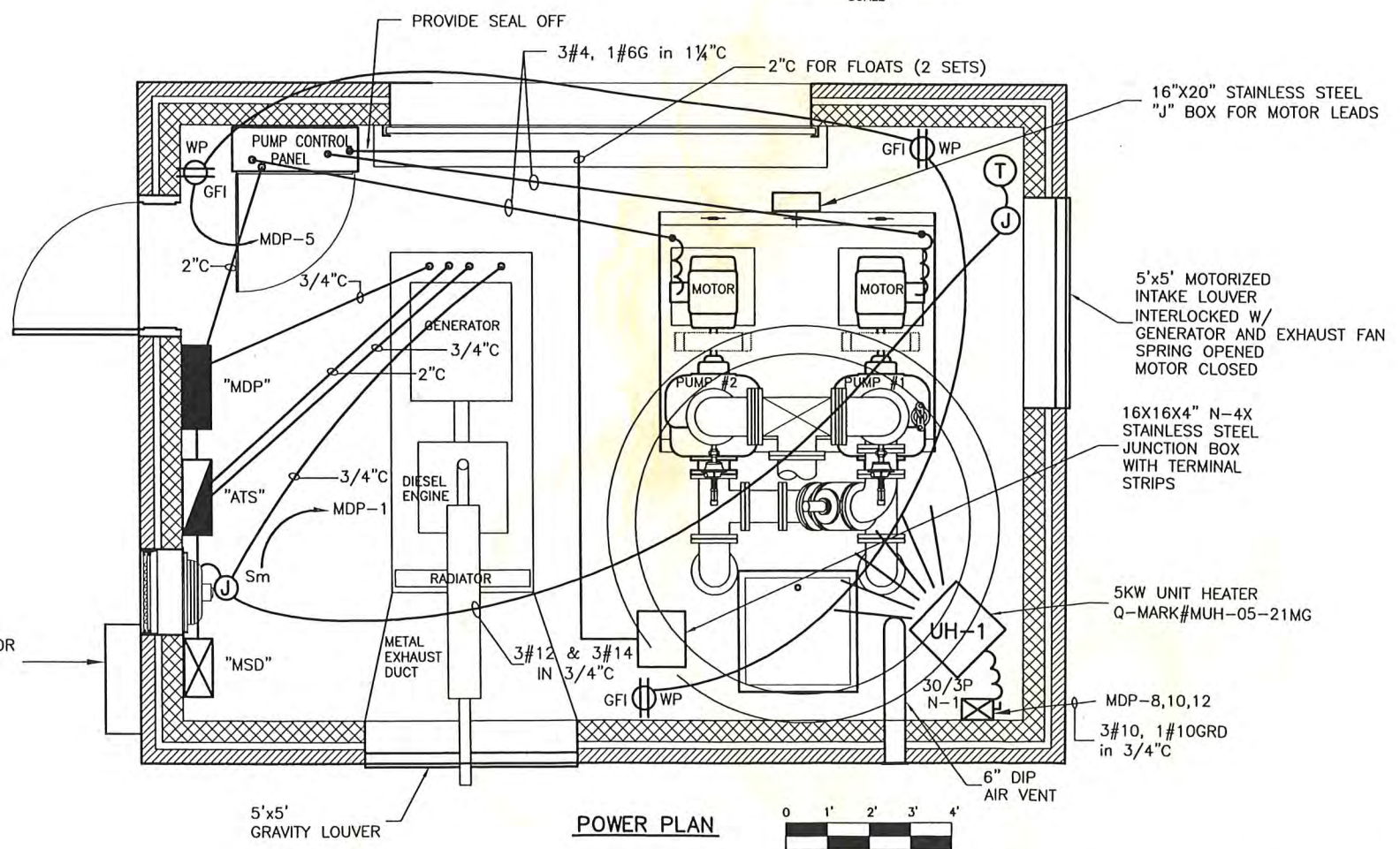


ELECTRICAL RISER DIAGRAM

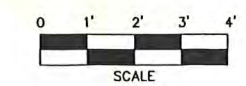
NTS

### FIXTURE SCHEDULE

SYMBOL	MANUF.	CAT NO.	LAMPS	REMARKS
A	COLUMBIA	LUB-296HO-120	2-F96T12HO (110 WATT)	PROVIDE SPACER BETWEEN LIGHT & CEILING
B	SPAULDING	WGS1-M100PS-MT	1-100WMH	MOUNT 10'0" AFG
C	SPAULDING	WGST-M175-MT	1-175MH	MOUNT OVER DOOR 12'0" AFG
EM	PRESCOLITE	LMP-16	2-7.2W	MOUNT 10'0" AFF



POWER PLAN



NO.	DESCRIPTION	DATE	BY
1	REVISED WITH 20 TO 22	11-23-04	DFW

**Hobbs, Upchurch & Associates, P.A.**  
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PUMP STATIONS FOR THE NORCROSS WATER AND SEWER DISTRICT CUMBERLAND COUNTY, NORTH CAROLINA

PUMP STATION W-1 POWER AND LIGHTING PLANS

DATE:	DEC., 2003
DESIGNED:	DFW
DRAWN:	DFW
CHECKED:	KSL
SCALE:	SCALE
SHEET NO.	E1

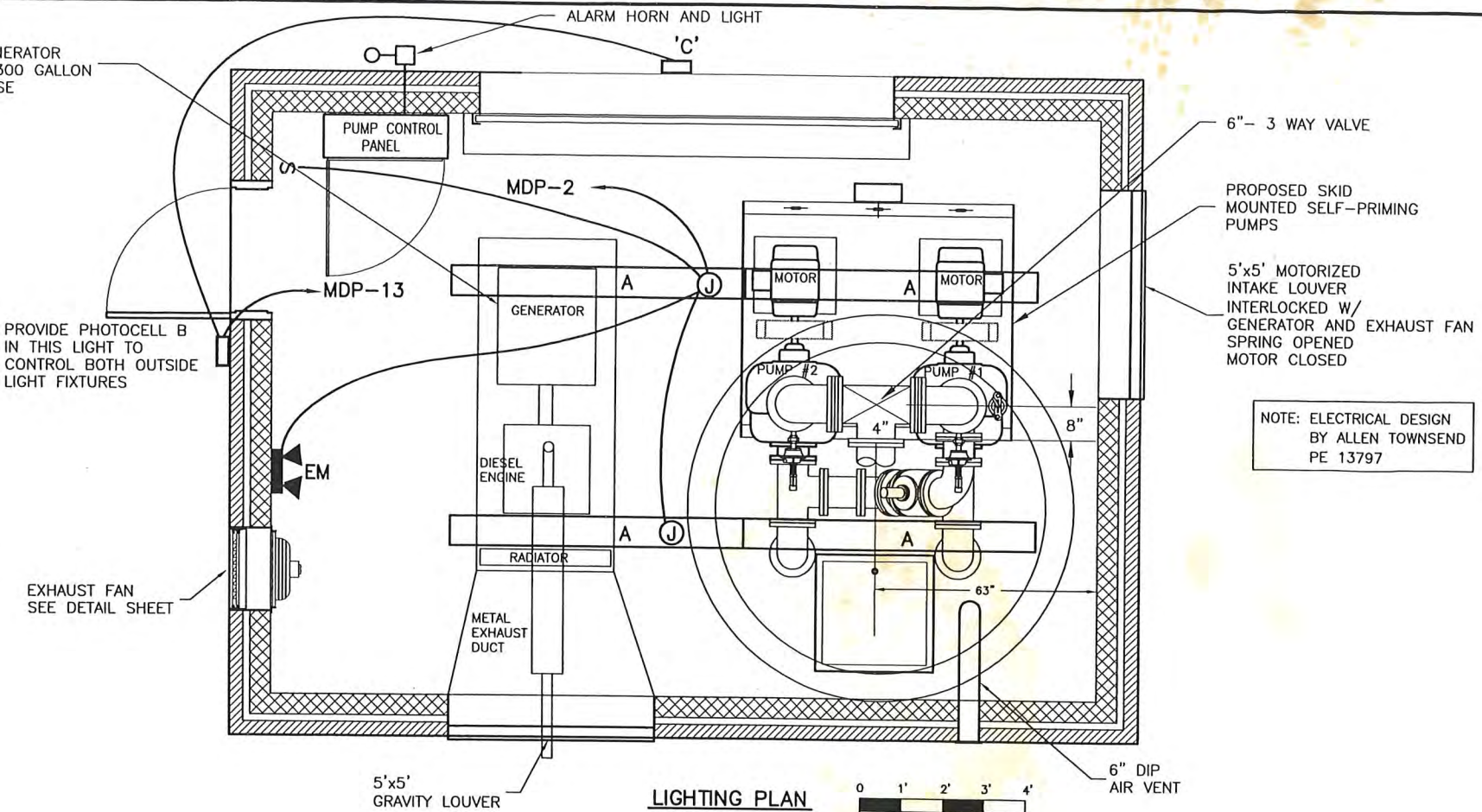
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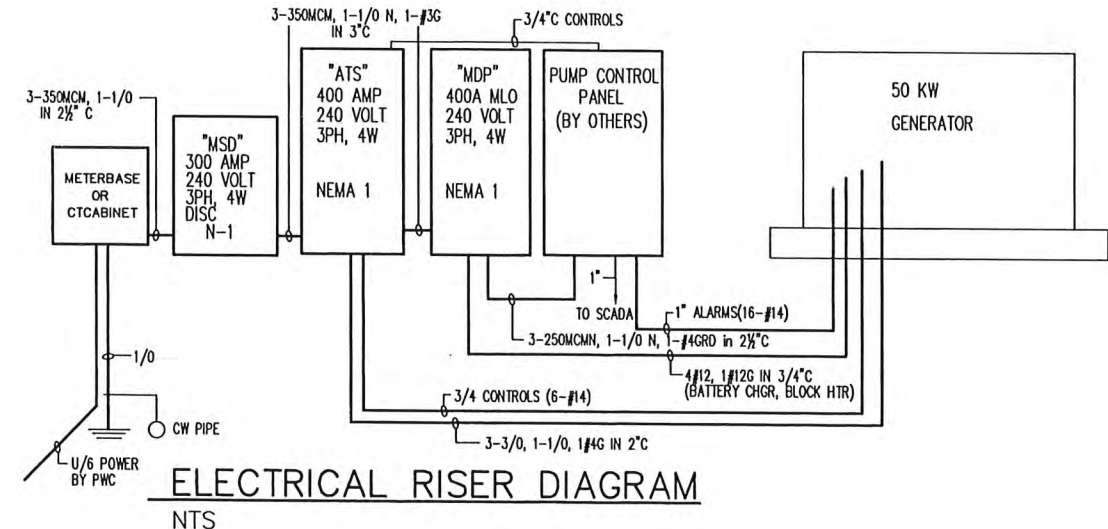
# LEGEND

- GFI 20A, 120V, DUPLEX RECEPT, GFI
- WP WEATHERPROOF
- J JUNCTION BOX
- S 20A, 120V, SINGLE POLE SWITCH
- DISCONNECT RATING AS SHOWN
- POWER PANEL
- AUTOMATIC TRANSFER SW
- FLOW TRANSMITTER

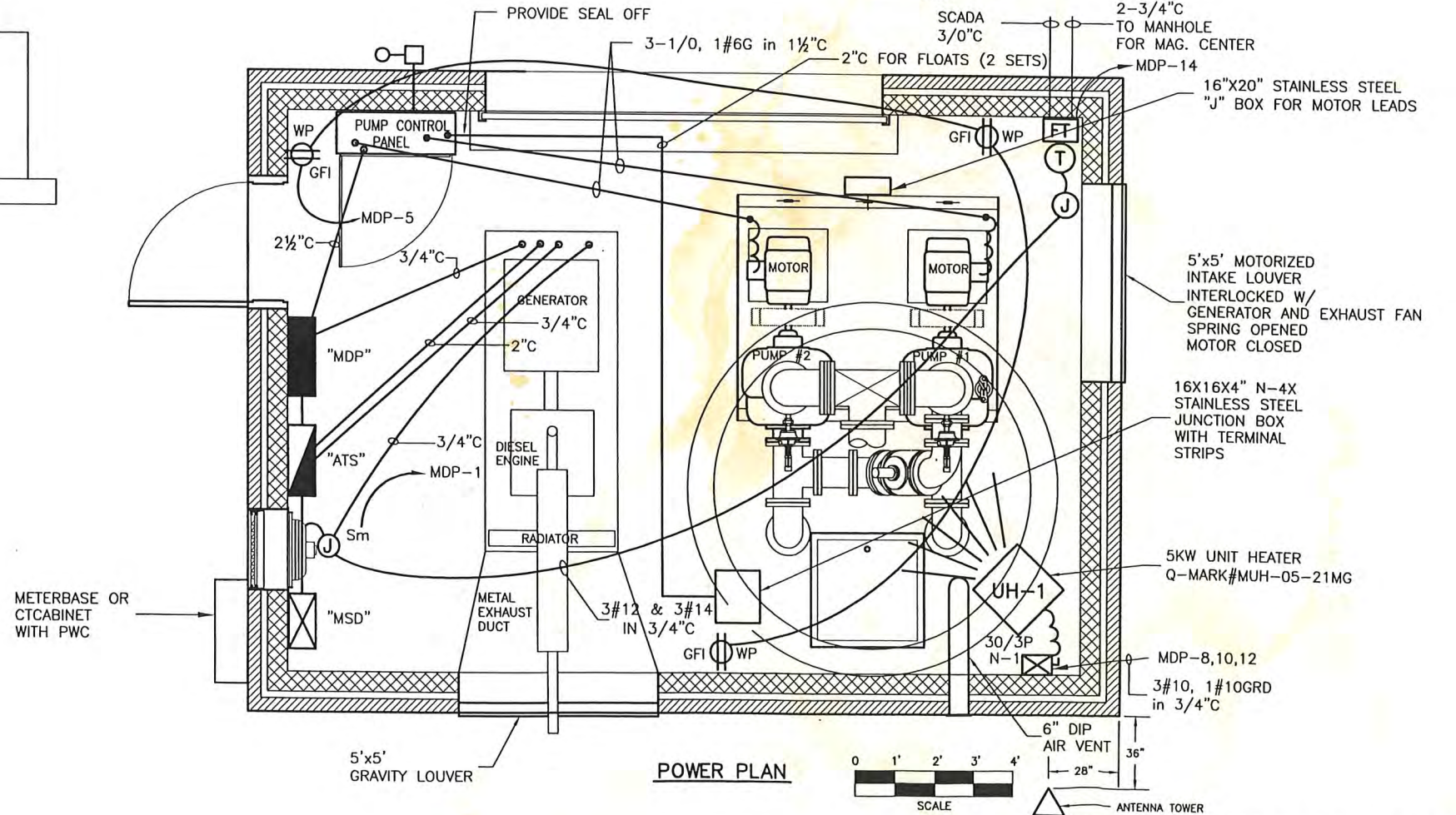
PANEL TYPE: SQ D I-LINE TYPE HCM		400 AMP MLO		PROVIDE GROUND BAR						
VOLTS: 120/240		"MDP"		NEMA 1 ENCLOSURE						
PHASE: 3 PHASE, 4 WIRE										
42 KAIC										
W	LOAD DESCRIPTION	WIRE SIZE	BKR. SIZE	CKT. NO.	L1 L2 L3	CKT. NO.	BKR. SIZE	WIRE SIZE	LOAD DESCRIPTION	W
980	EXHAUST FAN / LOUVER	12	20	1		2		250	PUMP CONTROL PANEL	34100
984	LIGHTS	12	20	3		4	250	250	PUMP CONTROL PANEL	34100
3000	RECEPTACLES	12	20	5		6	250	250	PUMP CONTROL PANEL	34100
1500	GEN. BLOCK HEATER	12	20	7		8	10	10	UNIT HEATER	1666
400	GEN. BATTERY CHARGER	12	20	9		10	30/3	10	UNIT HEATER	1666
800	SCADA PANEL	12	20	11		12	10	10	UNIT HEATER	1666
300	EXTERIOR LIGHTS	12	20	13		14	20	12	FLOWMETER	50
	SPACE			15		16			SPACE	
	SPACE			17		18			SPACE	
	SPACE			19		20			SPACE	



NOTE: ELECTRICAL DESIGN  
BY ALLEN TOWNSEND  
PE 13797



FIXTURE SCHEDULE				
SYMBOL	MANUF.	CAT NO.	LAMPS	REMARKS
A	COLUMBIA	LUB-296HO-120	2-F96T12HO (110 WATT)	PROVIDE SPACER BETWEEN LIGHT & CEILING
B	SPALDING	WCSI-M100PS-MT	1-100WMH	MOUNT 10'0" AFG
C	SPALDING	WGST-M175-MT	1-175MH	MOUNT OVER DOOR 12'0" AFG
EM	PRESCOLITE	LMP-16	2-7.2W	MOUNT 10'0" AFF



REVISIONS	DATE	BY
REVISED	10-22-04	DFW

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PUMP STATIONS FOR THE  
NORCRESS WATER AND SEWER DISTRICT  
CUMBERLAND COUNTY, NORTH CAROLINA  
PUMP STATION W-2 POWER  
AND LIGHTING PLANS

DATE:	DEC., 2003
DESIGNED:	DFW
DRAWN:	DFW
CHECKED:	KSL
SCALE:	SCALE
SHEET NO.	E2

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**SEWER ASSET MANAGEMENT PLAN**

**OVERHILLS  
WATER AND SEWER DISTRICT**

**CUMBERLAND COUNTY, NC**



PINEHURST, NORTH CAROLINA

**SEWER ASSET MANAGEMENT PLAN**

**OVERHILLS  
WATER AND SEWER DISTRICT**

**CUMBERLAND COUNTY, NC**

**MATTHEW JONES, PE**  
matthew.jones@mcgillassociates.com



5 Regional Circle, Suite A  
Pinehurst, North Carolina 28374  
910.295.3159

**AUGUST 2025**

**PROJECT NO. 20.02507**



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## **APPENDICES**

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- Appendix A – Smoke Testing Results List**
- Appendix B – Manhole Inspection List**
- Appendix C – Overhills Spring Lake Agreement**
- Appendix D – Lift Station Record Drawings**

## **EXECUTIVE SUMMARY**

---

The purpose of this Asset Management Plan (AMP) is to document the condition of the Overhills District sewer system infrastructure to assist the County with becoming more proactive in the management and financing of its sewer collection system. The Overhills Sewer District serves approximately 107 residential connections in the northern area of Cumberland County. There are 318 properties within the district are not currently connected and are paying the sewer availability fee. The District's wastewater collection system consists of approximately three miles of gravity sewer and force main with 119 manholes. Collected wastewater is pumped from the Collingwood Street Lift Station and the Brinkley Drive Lift Station, both of which are owned by Cumberland County and operated by the Town of Spring Lake. Flow generated from the district is ultimately treated at the Spring Lake Wastewater Treatment Plant (NC0030970), which is owned and operated by the Town of Spring Lake.

This asset inventory and assessment consisted of assembling data on sewer pipes, manholes, and other appurtenances in the collection system. This assessment included performing inspections of selected manholes, performing smoke testing throughout the system, and reviewing existing data with County Staff. This information was evaluated and is summarized in this document which includes the asset management plan and capital improvements plan. This process resulted in the development of a 10-year Capital Improvements Plan (CIP) to guide the District with scheduling and financing the capital projects and equipment purchases necessary to maintain and improve its wastewater collection system. Through the AMP process, no significant rehabilitation is currently needed, but additional monitoring and investigation is recommended.

The CIP includes a focused improvement to critical components within the sewer system that need rehabilitation or replacement based on existing condition, and on improvements that could improve management of the sewer system for staff. These planned projects will bring the County into a better position to serve its customers by improving the reliability of the collection system. The County should look to its CIP to guide its next

projects, and the CIP should be updated regularly as priorities change and as projects are completed. It is noted that many factors may impact the priorities including failures, and funding availability both locally and through grant and loan programs. This assessment project provides evidence for the prioritization of manhole rehabilitation and improvement projects in the CIP.

### ***System Evaluation***

All of the pipe material in the Overhills system is PVC and Ductile pipe. The collection system was first put into service in 2019, therefore the relative age of the system is low. All the piping in this system is SDR-26 PVC pipe, which is the most common material used for sewer systems today. The typical useful life for PVC pipe is anywhere from 40 to 60 years.

As part of the AMP, McGill Associates, PA (McGill) assisted the District with evaluating the condition of its sewer infrastructure to identify projects in line with these goals. The following items were included in the AMP scope:

- Identify areas to conduct smoke testing to identify potential sources of I/I into the sewer system;
- Review and analyze County-provided information for the Overhills lift station;
- Inspect selected sewer manholes within the system to establish overall system condition;
- Identify and evaluate potential sewer system improvements;
- Prioritize sewer system improvements;
- Prepare opinions of probable costs for sewer system improvements; and
- Create a Capital Improvements Plan;

### **Manhole Inspections**

All manholes in the Overhills sewer system are precast concrete based on information provided by County staff. The results of the selected manhole inspections performed as a part of this inventory were used to develop an assessment of manhole conditions in the

system. Based on the inspections performed, manholes that were inspected were assigned a condition score, and these scores were combined into an overall condition rating for each manhole- excellent, good, fair, or poor. The results of manhole inspections are summarized in Figures 8 and 9, and the full inventor is included in Appendix A.

### Lift Station Inspection

All sewer flow from the Overhills District is pumped through one of two lift stations to the Town of Spring Lake. The lift stations are on Brinkley Drive and Collingwood Street. Full inspection and assessment of the stations were not included as a part of this assessment.

### Findings and Recommendations

The system evaluation allowed McGill to assemble a list of general recommendations and high priority projects to guide the County in the next 10 years. General recommendations to the District included establishing its own flow monitoring and smoke testing programs in high priority areas to determine sewer rehabilitation needs and inspecting sewer lines and manholes with CCTV equipment during routine cleanings to track the condition of these items. McGill also recommended the County begin rehabilitation of existing manholes within the collection system in order to reduce the risk of I/I. Additionally, we made recommendations for improving the performance of the existing pumps at the Brinkley Road lift station.

Data and field investigation reporting were utilized to identify the priority projects within the collection system, focusing on manhole rehabilitation.

Table 1 summarizes projects identified during this assessment, centering around manhole rehabilitation projects. A project to install flow monitors is included to give greater control and understanding of flows from the collection system.

**Table 1: Summary of Capital Improvements Projects**

No.	Project Name	Cost
1	Manhole Rehabilitation Project 1	\$84,100.00
2	Brinkley Lift Station Improvements	\$33,100.00
3	Manhole Rehabilitation Project 2	\$84,100.00
3	Manhole Rehabilitation Project 3	\$84,100.00
<b>10-Year CIP Total Project Cost</b>		<b>\$285,400.00</b>

***Capital Improvements Plan***

The purpose of this asset inventory and assessment was to document the condition of the District’s inventoried infrastructure to assist the County with becoming proactive in the management of its wastewater system, to include capital project planning. The County does not currently have a Capital Improvements Plan (CIP) for its wastewater system. The CIP being developed from this current assessment will guide the County through its planning for projects within the 10-year window. The CIP will remain a living document and be updated in the future so that it remains current to the Districts’ highest priorities and provides accurate cost estimates. The CIP included in this assessment includes projects focused on rehabilitation of existing manholes, which have been identified to be potential sources for I/I into the system. Through discussion with County staff, field investigation, and review of existing system data, the specific defects and general problematic areas within the wastewater system have been summarized. These results were used to develop the CIP and formulate a ten-year plan.

The complete asset inventory and assessment task consisted of five parts culminating in the development of the Overhills Water and Sewer District’s CIP.

McGill developed cost estimates for all projects based on current 2024 materials and construction costs. The updated CIP is intended to be adopted by the County to guide its selection of sewer system improvement projects over the next decade. This plan also includes a budget-level recommendation for staffing associated with system operations and maintenance for all County utility districts.

### 1.1 BACKGROUND

The Overhills District is located on E. Manchester Road, just outside of the Town of Spring Lake municipal limits in Cumberland County, North Carolina. It is owned by Cumberland County and maintained by the Town of Spring Lake. The District includes a wastewater collection system that currently serves 107 residential customers as of August 2025. The collection system consists of approximately three miles of gravity sewer mains that are 8-inch in diameter and force main that is 6-inch in diameter. These gravity and force main sewer lines are constructed of PVC and were constructed in 2019. Figure 1 shows the existing sewer collection system.

Creating a Capital Improvements Plan (CIP) will allow the County to update its current rate setting model to better estimate future revenue and expenses, capital outlay, indebtedness, and overall health of the sewer system enterprise fund reserves. A model of this nature would continue to balance revenues and expenditures with a longer-term approach to rate setting and establish a financially sound framework for the County to follow.

Even with the relatively young age of the Overhills system, County staff remains cognizant that infiltration and inflow (I/I) is always a concern, particularly in a scenario where the County's operation costs are based on the gallons of flow that enter into the existing lift station. Therefore, the top challenges for the Overhills sewer system are mitigating I/I that results from deteriorating infrastructure and collecting reliable data on existing sewer flows for operations and maintenance planning. The information collected through this assessment project will help identify system deficiencies and develop improvement projects to reach these goals.



This process resulted in the development of a 10-year CIP to guide the County with scheduling and financing the capital projects and equipment purchases necessary to restore its wastewater collection system.

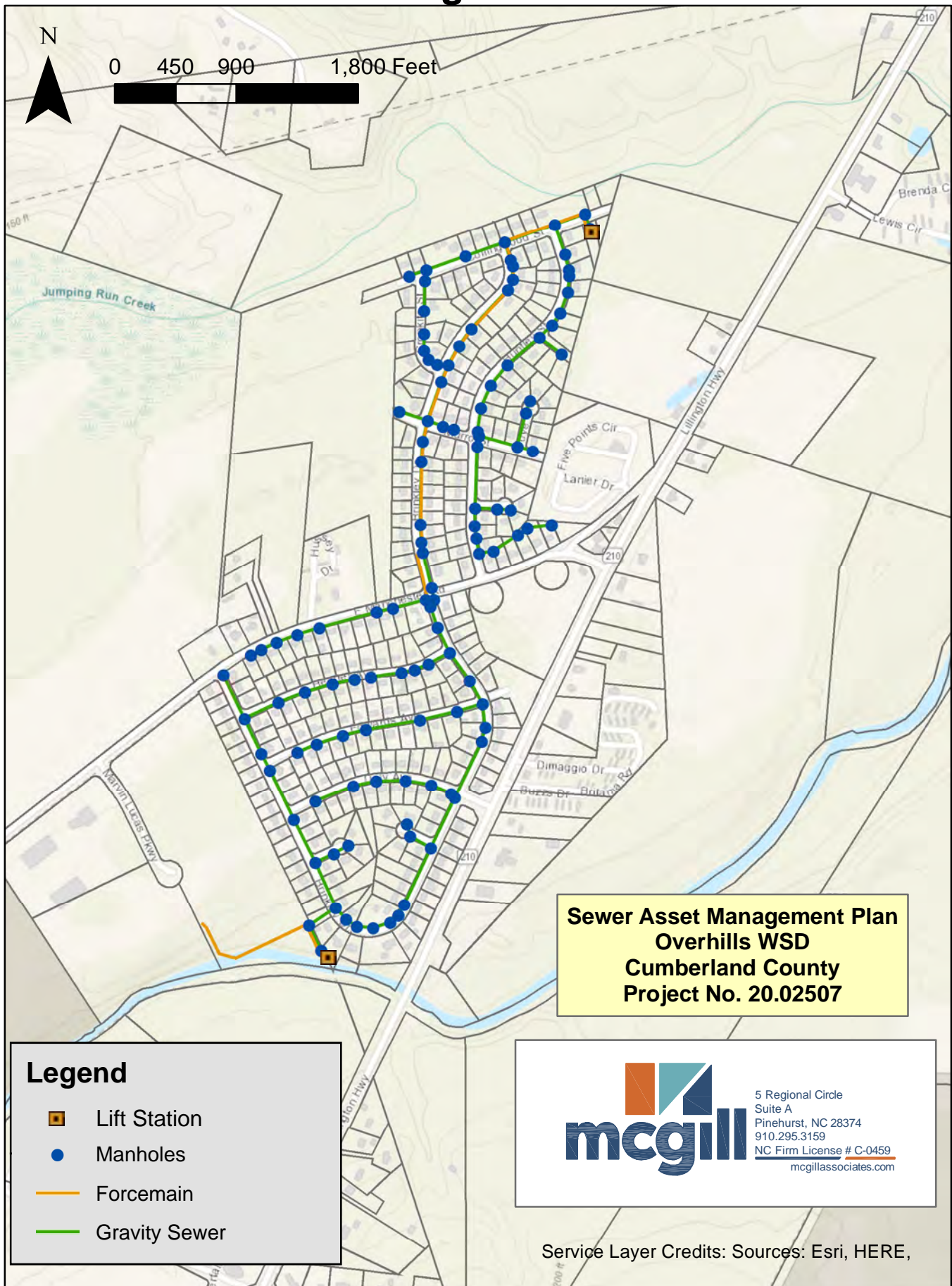
The purpose of this Asset Management Plan (AMP) is to document the condition of the Districts' inventoried infrastructure to assist the District with becoming more viable and proactive in the management and financing of its wastewater system. The District continues to look to its CIP to guide its next projects; therefore, it is vital that the CIP remains current to the Districts' highest priorities and provides accurate cost estimates. This assessment project was utilized for the prioritization of replacement of lines and improvement projects in the CIP.

**Table 2: Summary of Customers by Use**

<b>Diameter</b>	<b>Total</b>	<b>% of System</b>
<b>Flat Rate</b>	<b>107</b>	<b>100%</b>
<b>Total LF</b>	<b>107</b>	<b>100%</b>

# Overhills Overall System Map

## Figure 1



## 2.1 SMOKE TESTING

### 2.1.1 Overview

Smoke testing is one of the most cost-effective ways to locate defects in sewer mains and laterals. In this process, artificially produced non-harmful smoke is injected into the sewer line via a blower placed over a selected manhole. The pressurized smoke travels up and down the sewer line and connections and emerges at openings in the system. This visual aide allows test crews to easily identify, record, and mark locations where defects are present. If the sewer is in good condition, one should only see smoke rising from manhole lids and house roof vents. If the line has defects, such as breaks or illegal connections, the smoke will emerge at these points.

### 2.1.2 Investigation

McGill met with County staff to identify areas that would benefit most from smoke testing. Based on the size of the Overhills District, it was determined that the entire system could be smoke tested. McGill prepared a detailed map of the area based on the County's GIS database. The Fire Department and customers along the route were alerted to the upcoming testing.

### **2.1.3 Methodology**

McGill and County staff smoke tested all three miles of gravity sewer lines over a period of two days to determine locations where I/I enter the wastewater collection system. For each line to be tested, County staff recommended a centrally located manhole on which to place the blower based on the manhole's accessibility and avoidance of traffic. The manhole nomenclature used by the County was utilized and the location, configuration, and condition of each one was recorded.

At each location, the following procedure was executed.

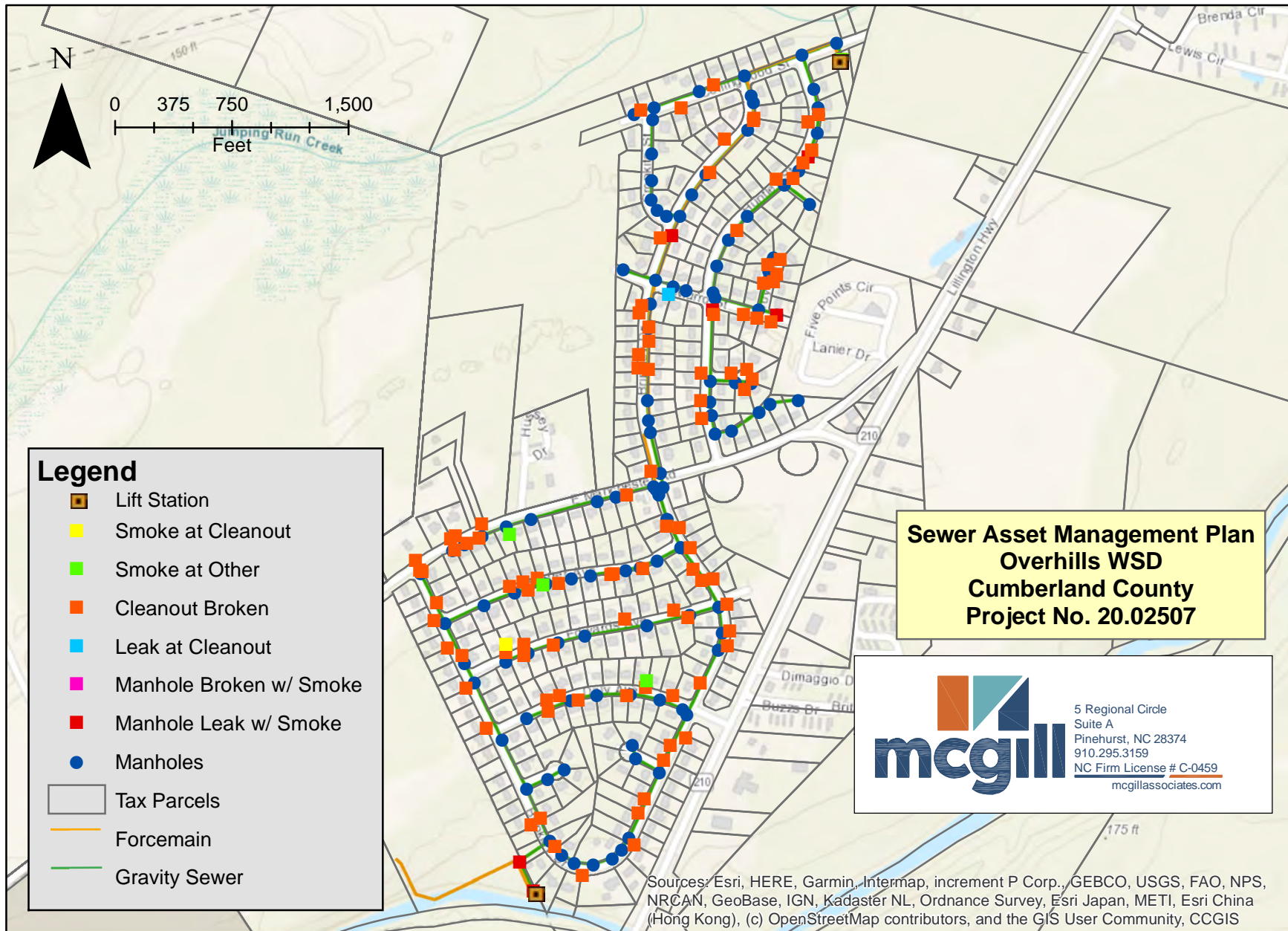
1. Place the blower on the manhole (with the rubber seal, if necessary).
2. Fill smoke pump up to  $\frac{3}{4}$  with liquid smoke.
3. Close all smoke pump valves.
4. Start blower and allow to warm up.
5. Open smoke pump valves.
6. Pressurize smoke pump by pumping the canister manually.
7. Once smoke begins emerging from roof vents, begin surveying for smoke emergencies indicating defects or problem areas in the pipeline.
8. For each defect, record the opening type, address, manhole identifier, and notes.
9. Additionally, mark each defect with paint.

This process continued until all visible defects were marked and recorded. Figure 2 shows some problematic system openings.



# Overhills Smoke Testing Map

## Figure 2



### **2.1.4 Results**

The crew recorded 107 abnormal smoke outlets, which divided generally into four categories.

1. **Uncapped cleanouts or elder valves:** Several cleanout and elder valve caps were missing or broken. The cumulative number of broken cleanouts in the District can contribute to significant I/I. County staff had repair caps on hand during the testing and were able to install new caps where needed. Some caps on cleanouts and elder valves were unscrewed and were able to be re-affixed during the testing.
2. **Broken Cleanouts:** Ground smoke was detected adjacent to the cleanout, which appeared to be damaged or below grade. Replacement of the cleanout assembly will be needed.
3. **Ground Smoke:** Ground smoke can be the result of broken lines, joint separation, etc. Any of these problems can cause significant I/I.
4. **Unsealed manholes:** Some manholes emitted excess smoke indicating cracked concrete or offset rings. Manholes located in ditches are the most likely to contribute I/I.

A spreadsheet describing all smoke occurrences can be found in Appendix A and all locations were documented in the mapping information in ArcGIS for the County staff's use.

## **2.2 SEWER MAINS**

### **2.2.1 Overview**

Overhills sewer mains consist of polyvinyl chloride (PVC) and ductile iron pipe. The District's existing sewer lines are 8-inches in diameter. The age of the system and system materials were confirmed by the County based on records from construction of the system in 2019. Condition was determined based on visual inspection of select manholes and smoke testing of the system.

### **2.2.2 Investigation**

With District input from County staff, McGill has reviewed the district's data on the sewer mains throughout the District's collection system. The sewer main material and diameters were verified by the County and updated according to GIS records. Figure 3 shows the sewer line diameter and material in the system.

The purpose of this portion of the assessment was to create a working system inventory and then review which areas of Overhills District have system components in need of replacement or rehabilitation.





### 2.2.3 Methodology

McGill reviewed the District's GIS data for the sewer collection system. County staff provided information on manholes where deterioration was suspected. Smoke testing was performed throughout the system. The County's GIS mapping was utilized to create maps that document the collection system by material and by diameter.

### 2.2.4 Results

The existing gravity sewer pipe in the sewer system is 8-inch in diameter based on Record Drawings for the system. All pipe diameters therefore do meet current NCDEQ minimum design standards. Based on the young age of the system, the PVC pipe installed in 2019 has not exceeded its useful life, and therefore replacement is not recommended outright. Recommendations will include planned CCTV inspections by the County of the existing piping in order to verify existing conditions and provide future updates to this AMP/CIP. Based on the age of the pipes and no documented issues from County staff, pipe in the system has been noted to be in good/excellent condition. Tables 3 through 6 show the assessment based on material and then broken out by diameter.

**Table 3: Summary of Gravity Sewer Main by Material**

<b>Material</b>	<b>Diameter Range (in)</b>	<b>Total LF</b>	<b>% of GS</b>
<b>Polyvinyl Chloride Pipe</b>	8	<b>17,420</b>	<b>100%</b>
<b>Total LF</b>	<i>N/A</i>	<b>17,420</b>	<b>100%</b>

**Table 4: Summary of Gravity Sewer Main by Diameter**

<b>Diameter</b>	<b>Total LF</b>	<b>% of System</b>
<b>8"</b>	<b>17,420</b>	<b>100%</b>
<b>Total LF</b>	<b>17,420</b>	<b>100%</b>

**Table 5: Summary of Force Main by Material**

<b>Material</b>	<b>Diameters (in)</b>	<b>Total LF</b>	<b>% of System</b>
<b>Polyvinyl Chloride</b>	<b>4, 6</b>	<b>3,948</b>	<b>100%</b>
<b>Total LF</b>	<b>N/A</b>	<b>N/A</b>	<b>100%</b>

**Table 6: Summary of Force Main Sewer Main by Diameter**

<b>Diameter</b>	<b>Total LF</b>	<b>% of System</b>
<b>4"</b>	<b>2,994</b>	<b>76%</b>
<b>6"</b>	<b>954</b>	<b>24%</b>
<b>Total LF</b>	<b>3,948</b>	<b>100%</b>

**Table 7: Summary of Force Main Sewer Main Conditions by Age**

<b>Year Put Into Service</b>	<b>Total LF</b>	<b>% of GS</b>
<b>2019</b>	<b>3,948</b>	<b>100%</b>
<b>Total LF</b>	<b>3,948</b>	<b>100%</b>

## **2.3 MANHOLE INSPECTIONS**

### **2.3.1 Overview**

Manholes are the primary access points to the sanitary sewer system and are essential for its operation and maintenance. As they allow personnel access to the sewer system, manholes are also likely culprits for allowing I/I to enter the sewer system. Manholes in low-lying areas with improperly sealed lids, manhole joints, and poor connection practices can all be sources of I/I. Storm drains or the presence of manholes in ditches and low-lying areas in Overhills frequently allow standing water to remain for hours or days after a storm event which can exacerbate inflow through manhole lids. Reports from construction of the sewer system noted that the existing water lines in the Overhills neighborhood experienced several breaks due to asbestos cement (AC) water lines that are heavily deteriorated in some areas. Additionally, during construction I/I was observed from either groundwater or leaking water lines into various manholes and wetwells in the project area.

One of the most cost-effective practices for managing this intrusion is visual manhole inspections, where the various components of the manhole are rated according to their condition. Some examples of noticeable deficiencies are benches which have deteriorated from abrasion and corrosion and rings which can be moved by traffic, soil, and the freeze/thaw cycle. Defects in any aspect of the manhole can lead to I/I, structural instability, and manhole failure.

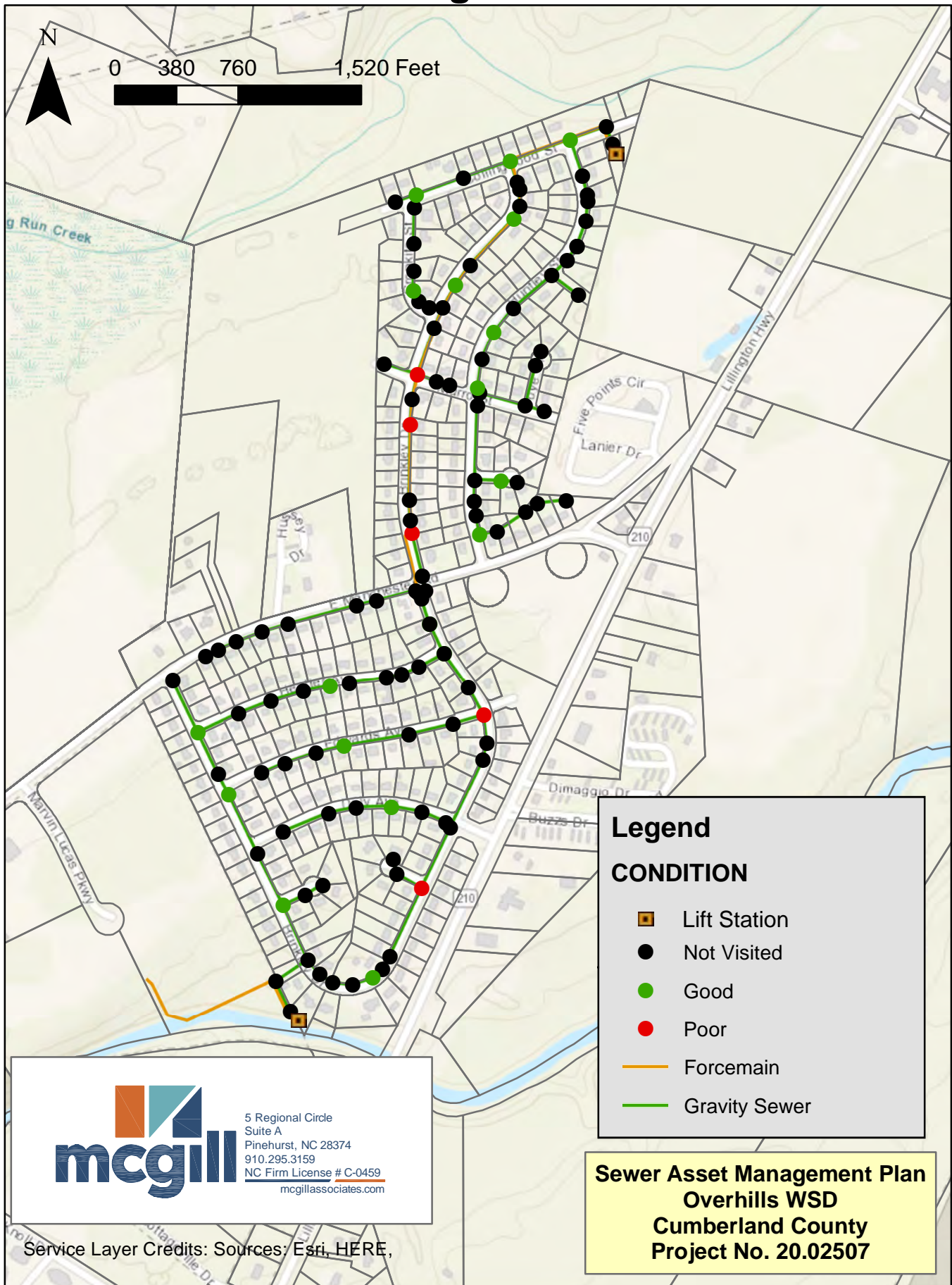
### **2.3.2 Investigation**

After the Overhills system was put into service, the GIS record was created in 2019. The purpose of this portion of the assessment was to perform selected field inspections to determine an overall system assessment. A total of one hundred and nineteen (119) manholes are currently inventoried by the District. A total of 23 manholes were inspected as a part of this inventory and assessment. The map showing which manholes were inspected is shown in Figure 4.









# Overhills Manhole Inspection Map

## Figure 4



**Legend**

**CONDITION**

-  Lift Station
-  Not Visited
-  Good
-  Poor
-  Forcemain
-  Gravity Sewer



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**Sewer Asset Management Plan**  
**Overhills WSD**  
**Cumberland County**  
**Project No. 20.02507**

Service Layer Credits: Sources: Esri, HERE,

### **2.3.3 Methodology**

The District of Overhills sewer collection system contains 119 sewer manholes. Working with County staff, McGill inspected selected manholes within the sewer system to obtain a representative condition sampling. County staff determined which manholes to inspect in each area based on manhole location and orientation. Manholes prioritized for inspection include those located in existing ditches or low-lying areas where the manhole would be susceptible to degradation and inflow from surface water. At each manhole, the inspector recorded the manhole's location, dimensions, material, and condition of its various components. All information including photographs of the interior of the manhole and top area were uploaded into the GIS mapping.

Some typical distresses include:

- Wear and asphalt paving on the cover;
- Corrosion and mud seepage on the ring and frame;
- Gas residue, corrosion, seepage, and deteriorating concrete on the cone and riser;
- Wetness, silt, root intrusion, and deteriorating concrete on the barrel;
- Dirt and corrosion on the rings;
- Silt accumulation on the bench; and
- Misaligned pipes, obstructions, trough deteriorating, standing water, and no flow in the channel.

Based on the recorded comments, each component was assigned a condition score, and these scores were combined into an overall condition rating for each manhole- excellent, good, fair, or poor. The images below depict the interiors of various condition manholes.



MH FID 30, BRINKLEY DRIVE, GOOD.



MH FID 43, BRINKLEY DRIVE, POOR.



### 2.3.4 Results

All of the 23 inspected manholes are precast manholes. Due to the relative low age of the system, County staff confirmed that all the existing manholes in Overhills are precast sewer manholes. The manholes observed were noted as poor or good to excellent condition, which is to be expected based on their age. However, evidence of I/I was observed in several manholes. Based on the condition of those observed, it is suspected that the remaining manholes not inspected would have similar condition to those observed. Tables 8 and 9 summarize the manhole materials and condition.

**Table 8: Summary of Manholes by Material**

<b>Material</b>	<b>Total</b>
<b>Precast Concrete</b>	<b>119</b>
	<b>119</b>

**Table 9: Summary of Manholes by Condition**

<b>Material</b>	<b>Total</b>
<b>Good/Excellent</b>	<b>18</b>
<b>Poor</b>	<b>5</b>
	<b>23</b>

The County maintains its collection system using the ESRI platform and includes the attribute data for each manhole. A spreadsheet including condition comments for each manhole can be found in Appendix B.

## 2.4 LIFT STATION

### 2.4.1 Overview

The Overhills sewer system includes two lift stations, one on Collingwood Street and the other on Brinkley Drive. The Collingwood Lift Station collections flow from the area north of Manchester Road and pumps to a manhole on the south side of Manchester. The Brinkley Lift Station receives all flow for the Overhills system and pumps to an manhole inside of the Spring Lake Sewer Collection System in an existing sewer easement off of Marvin Lucas Parkway.

Both lift stations include flow meters that are used for monitoring and recording flow generated by the Overhills sewer system. The monthly records from the Brinkley station are used for billing and have been used to calculate the average use per user for the system.

Collingwood Street Lift Station:

Lift Station Design Capacity	216,000 GPD
------------------------------	-------------

Brinkley Drive Lift Station:

Lift Station Design Capacity	367,200 GPD
------------------------------	-------------

Overhills Sewer System:

FY 2025 Estimated Average Daily Use per User*	165 GPD
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\*Note: Estimated based on FY 2025 monthly usage, metered at Brinkley Lift Station and data provided to Cumberland County by Town of Spring Lake. Average GPD for Overhills System is 17,606 GPD, with 107 customers as of June 2025.

Recommendations for various sewer system improvements to include the gravity sewer pipe and manholes in the collection system include general recommendations, high priority projects (within 10-years) and future projects (past the 10-year planning window). General recommendations are typically less costly and can be implemented more quickly, whereas high priority projects may require financial assistance and be undertaken in phases.

### **3.1 GENERAL RECOMMENDATIONS**

#### **3.1.1 *Smoke Testing***

Smoke testing is a valuable tool that can be used to locate broken pipe, cleanouts, or manholes that need repair. Any of these issues can be a source for the inflow and infiltration (I&I) of surface water into the sewer collection system. The most common repairs that result from smoke testing include replacing missing or broken cleanout caps and removing buildup from manholes. Other repairs that can be performed at this time are patching the exterior concrete or replacing the rings/lids of manholes identified to be leaking during smoke testing. These may be contributing significant I/I into the wastewater collection system. Similarly, line breaks in flooded areas should also be addressed promptly. It is also recommended that the District continue to perform regular smoke testing to monitor the system's ongoing wear and identify specific areas for improvement. However, if there is a suspected problem in a specific area the District should utilize smoke testing on a more "as needed" basis to troubleshoot possible problem areas.

#### **3.1.2 *Video Evaluations***

Based on information provided by the County, video evaluations were not performed as part of the system inventory. County staff reports that no video evaluations have been performed on the collection system to date. It is recommended that the County plan to perform video evaluation of the system as a part of O&M in order to stay vigilant concerning potential issues within the collection system.

### **3.1.3 Manhole Inspections**

Manhole inspections uncovered some infrastructure deficiencies which can be repaired immediately to improve the condition and function of the wastewater collection system. The full list of manholes and their field assessment is included in Appendix A. Manhole rehabilitation and replacement is the priority work that is targeted by the CIP. The proposed projects are divided out on an annual basis in order to include the improvements as a reasonable component of annual budgeting.

### **3.1.4 Flow Monitoring**

The District and McGill have discussed that flow monitoring is not needed at this time. Should the County begin to suspect the presence of significant I&I, they will engage with a subcontractor to perform flow monitoring to verify as needed. Both existing lift stations have 8-inch flow meters on the lift station discharge, which provide metering of flow received within the district. The flow recorded from these meters are utilized by the County to determine the monthly quantity of wastewater sent for treatment to the Town of Spring Lake.

## **3.2 PRIORITY PROJECTS**

### ***3.2.1 Manhole Rehabilitation Projects***

In these projects for the Overhills system, manholes will be lined where possible, unless a significant amount of deterioration has occurred that would necessitate replacement. The projects are scoped to be undertaken every 2 years. Each project is priority targeting any manhole deficiencies based on the results of the smoke testing performed. There are a range of issues from broken risers to cracks in the frame of the manhole that warrant various repairs. To reduce the amount of I/I that enters the system it is imperative to repair these manholes. The project will be ongoing to spread out the cost for the County over a ten-year period. With 119 manholes in the system, it is estimated that approximately 40% of the manholes in the system would benefit from rehabilitation through lining. As a result, manhole rehabilitation is broken into three projects, which are included in the CIP separately, but can be combined or modified as needed given annual budgetary considerations. The projects also include replacement of existing cleanout assemblies for select residences. The results of the smoke testing identified that some cleanouts were damaged below grade, therefore replacement of the assembly would be necessary.

This project is recommended to be pursued with a manhole rehabilitation specialty company with scopes large enough to get competitive pricing for each mobilization. The manholes proposed for rehabilitation or replacement range in depth; therefore, an average depth of 7 vertical feet (VF) was used per manhole for estimating purposes. The capital improvements plan breaks this project into 3 projects with a budget of approximately \$84,100 every 3 years over a 10-year span, as outlined in Table 10. A preliminary cost estimate for a single project is included in Table 8. The total cost of the manhole rehabilitation/replacement projects is estimated to be \$252,300.

**Table 10: Preliminary Opinion of Probable Cost for Manhole Rehabilitation Projects**

<b>Item</b>	<b>Description</b>	<b>Units</b>	<b>Quantity</b>	<b>Unit Price</b>	<b>Total Cost</b>
1	Mobilization	LS	3%	N/A	\$1,900
2	Rehabilitate Existing Manhole	VF	112	\$500	\$56,000
3	Additional Manhole Repairs	LS	1	\$10,000	\$10,000
<b>Construction Subtotal</b>					<b>\$ 67,900</b>
Construction Contingency (15%)					\$ 10,200
Engineering Assistance (If needed)					\$ 6,000
<b>Total Base Project Cost</b>					<b>\$ 84,100</b>

*\*Cost estimates are based on the knowledge of a professional engineer based on 2024 construction costs and are subject to change due to bidding environment and other factors.*

### 3.2.2 Brinkley Lift Station Improvements Project

This project includes installing a p-trap on the discharge force main line to help allow the pumps to maintain prime with consistent downstream head. The work would involve installing a 4-inch p-trap in the existing force main, as well as a ¾-inch water service line to the trap to provide a drip supply to the trap to keep it full.

The project includes one 4-inch p-trap connected to the existing force main with associated excavation, compaction and backfill. The trap will be installed on the existing force main on the current lift station site. The preliminary cost estimate for this project is \$33,100 as outlined in Table 11 below.

**Table 11: Preliminary Opinion of Probable Cost for Brinkley LS Improvements**

Item	Description	Units	Quantity	Unit Price	Total Cost
1	Mobilization	LS	3%	N/A	\$ 800
2	4-inch P-Trap	LS	1	12,000	\$ 12,000
3	¾" Service Line and Tap	LS	1	16,000	\$ 16,000
<b>Construction Subtotal</b>					<b>\$ 28,800</b>
Construction Contingency (15%)					\$ 4,300
<b>Total Base Project Cost</b>					<b>\$ 33,100</b>

*\*Cost estimates are based on the knowledge of a professional engineer based on 2024 construction costs and are subject to change due to bidding environment and other factors.*



### **3.3 CIP PROJECTS SUMMARY**

The purpose of this asset management plan was to document the condition of the Overhills sewer infrastructure to assist the County with becoming more viable and proactive in the management and financing of its wastewater system. The County intends to look to its CIP to guide its next project; therefore, it is vital that the CIP be established as an accurate depiction of current conditions and reflect the Districts' highest priorities with accurate cost estimates. The development of this AMP will serve as a positive step towards ensuring that the District can maintain its level of service agreement.

Sewer manhole rehabilitation and cleanout replacement was evaluated based on current staff input and the results of the field inspections. The existing manholes and cleanouts were divided into projects recommended for the next 10 years.

McGill prepared cost estimates for all projects based on current materials and construction costs. The 10-year CIP is intended to be adopted by the District to guide its selection of sewer system improvement projects over the next two decades. The cost summary for the 10-year CIP is shown below in Table 12.

**Table 12: CIP Cost Summary**

<b>Year<sup>1</sup></b>	<b>Manhole Rehabilitation Project 1</b>	<b>Brinkley Lift Station Improvements</b>	<b>Manhole Rehabilitation Project 2</b>	<b>Manhole Rehabilitation Project 3</b>	<b>TOTAL COST</b>
1	\$ -	\$ 33,100.00	\$ -	\$ -	\$ 33,100.00
2	\$ 84,100.00	\$ -	\$ -	\$ -	\$ 84,100.00
3	\$ -	\$ -	\$ -	\$ -	\$ -
4	\$ -	\$ -	\$ -	\$ -	\$ -
5	\$ -	\$ -	\$ 84,100.00	\$ -	\$ 84,100.00
6	\$ -	\$ -	\$ -	\$ -	\$ -
7	\$ -	\$ -	\$ -	\$ -	\$ -
8	\$ -	\$ -	\$ -	\$ 84,100.00	\$ 84,100.00
9	\$ -	\$ -	\$ -	\$ -	\$ -
10	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL ESTIMATED CIP COST<sup>2</sup></b>					<b>\$ 285,400.00</b>

*Notes:*

- 1: Considering timeline for adoption of this plan and County budget planning cycle, Year 1 is anticipated to be FY 2026
- 2: Cost estimates are based on the knowledge of a professional engineer based on 2025 construction costs and are subject to change due to bidding environment and other factors

## 4.0

## OPERATIONS AND MAINTENANCE PLAN

### 4.1 GENERAL RECOMMENDATIONS

The purpose of an Operations and Maintenance (O&M) Program is to provide an organized and cost-effective approach to ongoing maintenance, repair and replacement activities that will maintain the sewer collection system, so it performs as intended and meets the requirements of the sewer utility's System-Wide Collection System Permit, issued under North Carolina General Statutes Article 21 of Chapter 143.

This section provides a general description of proactive O&M, which can be defined as scheduled maintenance activities (preventive maintenance), performed on a regular basis in order to achieve the highest level of system performance using available resources and minimizing failures that can result in Sewer System Overflows (SSOs)

Developing an O&M Program begins with accurate records of infrastructure inventory, asset locations, and physical condition. Coupled with work records and system performance history, preventive maintenance schedules can be developed to efficiently address general system needs, from cleaning and debris removal to site-specific maintenance work such as cutting and repair work.

The following elements provide the foundation for an effective O&M program:

- Maintain up-to-date wastewater treatment plant equipment documentation, sewer collection system maps and related work history and operational data.
- Develop a routine preventive O&M program and activities for staff and contractors maintaining the sewer collection system and a system to document scheduled activities.
- Develop a rehabilitation and replacement plan identifying and prioritizing system deficiencies and implement short- and long-term actions to address the deficiencies.
- Develop and implement training programs to build technical competence and emergency preparedness.
- Develop and provide equipment and replacement part inventories, including critical replacement parts.

## **Sewer System Mapping**

Sewer system maps and related databases are typically managed using a Geographic Information System (GIS). The District currently utilizes ESRI as the GIS platform from which to manage the utility systems. This GIS mapping is supported by a database that records sewer main size, material types, and locations of manholes and clean-out connections. The platform has the ability to store more information that is currently being utilized by the County, including invert and rim elevations and other attributes of system appurtenances. If County intends to utilize the GIS platform for managing and recording maintenance performed and planned, it is recommended that the County investigate alternative software to ensure that they are utilizing a software that meets their needs with respect to budget.

The GIS database should be updated on a regular basis. Software applications such as work order systems are available to allow field staff to update GIS data as inspection and maintenance activities are completed. Other applications can also allow staff to update and edit maps. Field information that was gathered by McGill and County staff as a part of this assessment is now included in the County's GIS system database for future reference.

GIS can organize work history along with operational data, inspection records and images to provide managers, operations staff and engineers with powerful data sets to track current resource allocations and forecast short and long-term operational and capital needs. Outcomes of detailed analysis such as recommended sewer main rehabilitation work versus sewer overflows can be mapped to present the relationship visually for ease of understanding.

## **Preventive Operation and Maintenance (O&M)**

Preventive maintenance is performing routine and scheduled maintenance activities before wastewater treatment plant and lift station equipment or buried infrastructure fails, for the purpose of extending useful life, reducing overall operating costs, and increasing system reliability. This proactive approach to maintenance work is more efficient and cost effective than reactive and curative operations. Preventive maintenance activities will also help operations staff to better understand the wastewater treatment plant equipment, lift station equipment, and collection system components and how they work under various conditions. This knowledge is essential to setting maintenance priorities and developing the scope and timing of long-term rehabilitation and replacement projects.

## **Scheduled Cleaning of Sewers**

EPA recommends, at a minimum, 100% of sewer mains should be cleaned every 5 years, or 20% of the system annually. The sewer utility's Collection System Operating Permit requires 10% of the gravity sewers to be cleaned annually. High pressure jetting is the most common approach using various spray nozzles for general cleaning and debris removal. Mechanical cutters are used to address root intrusion and cleaning agents can be added to help remove fats, oils, and grease (FOG).

More frequent cleaning is scheduled for areas with a history of heavy debris, grease buildup and roots. CCTV inspections are also used to identify areas to clean more often, such as sections with minor defects such as offset joints and service taps protruding into the main line. Sewer sections near siphons are cleaned more frequently to ensure continuous and uninterrupted operation.

As part of the O&M Program, a master list of cleaning operations, priority locations and scheduling can be incorporated into GIS. Maps can be produced to define work areas, schedule resources, including contracted services, track progress and task completion. Updating GIS maintenance operations data (partial blockages found, debris quantity, etc.)

will help managers adjust cleaning frequency and area boundaries as needed to increase program efficiency, reduce sewer blockages, and avoid SSOs.

## **Routine Visual Inspections**

Routine inspections are used to assess the condition of lift stations, manholes and surface facilities, recording general conditions and evidence of possible structural problems or failures (offset structures, etc.), corrosion, surcharging, overflows and excessive Inflow and Infiltration (I&I). Work orders are generated based on inspection records to effect operational adjustments, scheduling more detailed inspections and/or making necessary repairs.

## **Manhole Inspection Program**

Manhole inspections keep the asset inventory up-to-date and are used not only to update collection system maps, but to determine structural condition. During manhole inspections, a complete inventory is taken of each manhole including construction materials, ring size, depth to invert, flow conditions and evidence of problems. The National Association of Sewer Service Companies (NASSCO) Manhole Assessment and Certification Program (MACP) may be adopted or used as a guide to ensure consistency and reliability of evaluation and ranking methodology.

The results from routine manhole inspections and monitoring are used to prioritize areas needing CCTV inspections to assess pipe condition such as manholes with evidence of slow flow or surcharging. Information is recorded and used to schedule maintenance and repairs.

## **CCTV Inspection Program**

While routine cleaning and visual inspection are used to assess the condition of surface facilities and manholes, CCTV video inspections are the primary method used to assess the condition of the sewer pipes. Using conventional defect criteria is highly recommended to provide standardization and consistency in sewer pipe condition

assessment and ranking. The NASSCO Pipeline Assessment and Certification Program (PACP) may be adopted or used as a guide to ensure consistency and reliability of evaluation and ranking methodology.

## **Maintenance Activity Records**

Detailed records and daily logs of O&M work provide valuable information to help managers evaluate the effectiveness of maintenance activities and make adjustments to optimize the use of limited resources. Equipment, manpower and other resources are tracked along with detailed descriptions of defects and/or obstructions encountered including debris, FOG, structural failures, etc. Maintenance work resulting in system modifications or extensions is required to be incorporated into record drawings and system maps. Scheduled testing of emergency and standby equipment is also a requirement of the collection system permit.

These records are required to be reviewed periodically to identify problems that cannot be resolved in a short period of time in order to develop a plan to address the problem(s). Maintaining these records for an extended period of time (5-years or more) will also provide accurate reference points of maintenance investments made over time that will track the effectiveness of operation and maintenance activities.

In the event of a sewer spill or system overflow, maintenance records will need to provide sufficient detail to satisfy reporting requirements for the event, including location(s), volume of wastewater, corrective actions, etc. This data may also be integrated into GIS to allow mapping of these events over time in order to identify patterns and/or trends that will assist with scheduling maintenance and planning rehabilitation and other capital improvements.



## **Resolution of Customer Complaints**

Customer complaints are primarily for sewer backups and odors. Sewer backups require an immediate response to diagnose and resolve the problem. These complaints can occur outside normal business hours, significantly escalating costs. Detailed records of the problems found, and the resources needed to address the failed condition, provide valuable feedback for making adjustments to the preventive maintenance program that can reduce these types of calls and help lower overall maintenance costs.

These records can also identify areas where private service laterals frequently fail. Notifying customers in these areas will allow them the opportunity to address deficiencies proactively, which will also help reduce customer “emergency” calls.

## **Capital Improvements Plan**

A Capital Improvements Plan (CIP) is required by the collection system permit to identify rehabilitation, replacement and expansion needs of the system. The CIP is required to address the short and long-term needs of the system, covering at least a 3 to 5-year planning period, and must include the estimated cost of each capital project.

CIP development incorporates maintenance activity, cleaning and inspection records, and system performance data that may include flow monitoring and hydraulic modeling to evaluate the existing system and to recommend improvements needed to correct existing deficiencies, and ensure adequate capacity is maintained throughout the system.

Capital planning includes consideration of on-going funding for rehabilitation and replacement of the collection system as it wears out, and potential upgrades for expansion as needed.

## **Training Program**

Training programs provide a mechanism for educating employees and establishing their technical competence to perform operations, maintenance, and emergency responses safely and effectively. A combination of in-house skill training and specialized training purchased or provided through state and national associations, conferences and vendor training programs are typically used to build and enhance skills for performing daily work duties. Periodic training reinforces previous efforts, as people often overlook things that are used infrequently. It also provides an opportunity to train new staff and learn about new problems, new techniques, and changes in equipment.

Emergency training educates system personnel about emergency situations and resulting effects on the wastewater system, public health, and environmental impacts. It also provides an opportunity to practice responses. Good record keeping ensures personnel are properly trained and prepared to effectively operate and maintain the collection system under any given circumstance. Regular review of training records is essential for keeping content up-to-date and maintaining proper employee awareness.

## **Equipment and Replacement Parts**

A reasonable supply of equipment and replacement parts should be maintained to fully support all operations and maintenance activities. A detailed inventory is essential to ensure availability under normal operations and emergency conditions. Specialized equipment or parts may be too costly to keep in stock, so arrangements with vendors and/or contractors may be necessary to ensure availability during non-business hours or during emergencies.

## 4.2 STAFFING RECOMMENDATIONS

Cumberland County is responsible for three wastewater collection systems and one water system: NORCRESS, Overhills, Kelly Hills, and Southpoint Water System. While each of these districts maintains its own operating budget, the Board leadership and operational management is performed solely by Cumberland County. Therefore, in consideration of the typical utility system management and operations and maintenance that is necessary for maintaining each of the systems, McGill has considered all of the four (4) utility systems cumulatively. While each system could be analyzed separately, considering the systems together is more consistent with actual management of the systems.

Typical metrics for analyzing full-time equivalent (FTE, representing quantity full-time workers) are based on either the population served by the system or by miles of utility piping (water main or sewer line) within each system. For reference, Table 13 below summarizes the customers and piping in each of the County’s utility systems.

**Table 13: Utility System Comparison**

DISTRICT	Number of Connections		Paying Avail. Fee	Pipe in System (mi.)
	Water	Sewer		
<b>Southpoint</b>	84		129	2.8
<b>Kelly Hills</b>		102	166	4.5
<b>Overhills</b>		107	318	4.0
<b>NORCRESS</b>		452	666	41.1
<b>TOTALS</b>	<b>84</b>	<b>661</b>	<b>1279</b>	<b>52.4</b>

**Table 14: Typical Population vs. Pipe Length**

<b>Population</b>	<b>Pipe in System (mi.)</b>
0-100	5
101-500	5
501-3300	21
3301-10000	62

The typical sizes of utility systems from a community system EPA study<sup>1</sup> are shown in Table 14, and are generally consistent when compared to the County’s systems. This study was selected as a basis for comparison due to its comprehensive nature, having included water systems nationwide in its breadth. NORCRESS is the exception when compared to Table 14. This is mostly likely indicative of the system serving a more rural population where the connection density is less, and resulting from the length of force main piping in the system that increases the overall length but does not contribute to population density. Overall, these metrics were found to be reasonably consistent with the County’s systems. Similarly, the data is consistent regardless of whether the utility system is a water systems or wastewater collection system.

The objective is to make budget-level staffing recommendations for the County’s utility systems based on what is typical across the industry and other utility systems of comparable size. The EPA study utilized provides typical FTE for the roles of manager, plant operator, distribution (and collection, for our purposes), and administrative functions. All of these were considered applicable to management and operation of the County’s utility systems. Note: while the County is not responsible for plant operation in any system, the lift stations in the NORCRESS and Overhills systems are the County’s responsibility, therefore this metric was used, albeit in a smaller percentage, to account for the management of those resources.

---

<sup>1</sup> Analysis conducted using excerpts from US EPA document, “National Characteristics of Drinking Water Systems Serving 10,000 or Fewer People,” published July 2011.

Table 15 shows Further utilizing the EPA statistics as base for typical FTE for each of the positions, based on the system size in terms of miles of pipe main.

**Table 15: Average Community System Statistics**

Employee Category	System Size (miles of Main)		Mean	Cumberland County
	Pop. 500-3300	Pop. 3300-10000		
	21	62	41.5	51.7
<b>Manager FTE</b> per mile	0.6	1.1	0.85	1.06
	0.029	0.018	0.020	0.020
<b>Plant Operator FTE</b> per mile	0.6	1.3	0.95	1.03
	0.029	0.021	0.023	0.023
<b>Distribution FTE</b> per mile	0.8	2.5	1.65	2.06
	0.038	0.040	0.040	0.040
<b>Administrative FTE</b> per mile	0.6	1.5	1.05	1.31
	0.029	0.024	0.025	0.025

The green highlighted cells are the calculated FTEs that were applied to estimate staffing size based on the quantity of pipe across the County’s four utility systems. Those calculated FTEs are based on the size of systems managed by the County and reasonable estimate of staffing needed for these systems.

Each of the FTEs is applied to each respective employee category. McGill utilized wage information from Zip Recruiter and a benefits multiplier of 1.38 from the U.S. Bureau of Labor Statistics to develop the summary shown in Table 16.

**Table 16: Overall Salary Estimates**

Employee Category	Hourly Rate	Annual Salary	Ben. Mult.	Total	Applied FTE	Applied Budget Cost
Manager	\$38.50	\$80,080.00	1.38	\$110,510.40	1.06	\$117,000
Operator	\$24.52	\$51,001.60	1.38	\$70,382.21	1.03	\$72,700
Distribution	\$23.57	\$49,025.60	1.38	\$67,655.33	2.06	\$139,100
Administrative	\$21.33	\$44,366.40	1.38	\$61,225.63	1.31	\$80,100
<b>Total Applied Budget Cost Based FTEs</b>						<b>\$408,900</b>

Utilizing industry metrics and comparing to systems of comparable size, McGill offers the proceeding section as a general staffing recommendation. This section and these budget values are provided for preliminary planning purposes only.

Staffing levels appear to be reasonable based on the District's ability to operate and maintain the system while providing a reliable level service to its customers.

While this budget number is higher than the current budget staffing, consideration should also be given to the cumulative effect cost to the County for contracted operation and distribution support in the NORCRESS and Kelly Hills district.





# **APPENDICES**



## **Appendix A**

### **Smoke Testing Results List**



**Overhills Smoke Testing Cleanouts**

Date:		September 19th, 2024	
Facility ID	Status	Notes	
2	Broken		
3	Broken	Cap replaced	
5	Broken		
13	Broken	Smoking from c/o	
15	Broken	Smoking from c/o	
18	Broken		
23	Broken		
26	Broken	Smoking from c/o	
28	Broken		
29	Broken		
42	Broken		
48	Broken		
50	Broken		
10	Broken	No smoke but lid is broken	
53	Broken	Smoking lid needs to be replaced	
	Broken	Lateral broken, smoke around elder valve and ground	
58	Broken		
59	Broken		
66	Broken	Missing elder valve cap	
68	Broken	Both valves smoking and house	
69	Broken		
70	Broken	Cap missing on elder valve	
74	Broken	Smoking from valve	
79	Broken	Elder valve missing cap	
80	Broken		
82	Broken	Lid unscrewed	
87	Broken	Smoking, Replaced on site	
89	Broken	Smoking from c/o	
92	Broken		
94	Broken		
96	Broken	Smoking from c/o	
96	Broken		
97	Broken		
100	Broken	Smoking from valve	
101	Broken	Smoking from c/o	
107	Broken		
116	Broken	Smoking from valve and house	
119	Broken		
121	Broken	Valve and house smoking	
	Broken	Multiple clean outs smoking in yard and from house	
125	Broken		
127	Broken	Smoking from valve	
128	Broken	Smoking from valve	
129	Broken		
136	Broken	Smoking from valve and ground	
139	Broken	Smoking from house and valve	
142	Broken		
143	Broken	Smoking from c/o	
149	Broken		
150	Broken		
152	Broken	Smoking from c/o	
154	Broken	No smoke but cap broken	
157	Broken	Missing cap	
159	Broken	Cap broken no smoke	
160	Broken	Broken	
162	Broken	Broken	
163	Broken		
164	Broken	Broken valve smoking	
165	Broken		
168	Broken	Elder valve cap missing	
169	Broken		
170	Broken		
172	Broken	Lid bent	
175	Broken		
177	Broken	Lid unscrewed	
178	Broken		
180	Broken		
181	Broken		
183	Broken		
184	Broken		
187	Broken		
188	Broken		
201	Broken	Smoking from ground/co	
204	Broken		
206	Broken		
	Broken	Smoking, C/o broken and filled w/trash	
207	Broken		
208	Broken	C/o smoking	
210	Broken		
220	Broken		
225	Broken		
226	Broken	Elder valve lid	
235	Broken	Elder valve cap	
240	Broken		
243	Broken		
247	Broken	Lid loose	
260	Broken	Elder valve	
246	Broken		
266	Broken	Smoking c/o	
264	Broken		
267	Broken		
270	Broken	Smoking	
272	Broken		
273	Broken	Smoking c/o	
285	Broken	Smoking c/o replaced on site	
286	Broken	Cap missing	
317	Broken		
1112	Broken		
1512	Broken		
1513	Broken		
1514	Broken		
2712	Broken		
2713	Broken		

Overhills Smoke Testing Manholes		
Date:		September 19th, 2024
Facility ID	Status	Notes
53	Leak	
54	Leak	Smoking from MH and underneath lift station
62	Leak	
64	Leak	
73	Leak	
99	Leak	MH smoking (inside fence w/ lift station fence locked)
120	Leak	

## **Appendix B**

### **Manhole Inspection List**





# Overhills Manhole Inspection

Date: April 10th, 2024

Manhole/Facility ID	Condition	Notes
7	Good	
11	Good	
16	Good	
17	Good	
21	Good	
25	Good	
26	Good	
30	Good	
35	Poor	
43	Poor	
52	Poor	
56	Good	
60	Poor	
68	Poor	
74	Good	
80	Good	
81	Good	
86	Good	
94	Good	
96	Good	
101	Good	
104	Good	
110	Good	

Total Manhole Inspected	23
Total Good Comdition	18
Total Poor Condition	5



## **Appendix C**

### **Overhills Spring Lake Agreement**



THIS AGREEMENT made and entered into this 8<sup>th</sup> day of September, 2014 by and between the Town of Spring Lake, a North Carolina municipal corporation, (hereinafter referred to as "Spring Lake"), and the County of Cumberland, a North Carolina Body Politic, acting by and through its Overhills Park Water & Sewer District, (hereinafter referred to as "Overhills").

WITNESSETH

THAT WHEREAS, Overhills wishes to contract with Spring Lake to furnish sanitary sewer treatment and provide for the operation and maintenance of the Overhills Park Water & Sewer District in an area as shown on Exhibit "A" attached hereto; and

WHEREAS, Spring Lake has agreed to treat sanitary sewer for Overhills to include operation and maintenance of the sanitary sewer collection system installed by Overhills within the delineated service area according to the following terms and conditions:

1. The sanitary sewer collection system being constructed by Overhills shall be built in accordance with engineering plans and specifications and constructed by a contractor licensed to perform utility construction in North Carolina.

2. Overhills will be responsible for the cost of constructing the sanitary sewer collection system as sized accordingly to serve the delineated service area as approved by USDA with Spring Lake being responsible for upgrades, in materials and line sizing as it may deem necessary.

3. The cost of operation and maintenance of the sanitary sewer collection system is built into the sanitary sewer rate being charged to Overhills as shown on Exhibit "B". Spring Lake shall render accurate monthly bills to Overhills. Such bills shall be computed by multiplying Overhills' sewer flow, expressed in thousand (M) gallons, by the applicable rate per thousand (M) gallons for this customer class. The rate per thousand (M) gallons shall be subject to change annually. Routine operation and maintenance includes: (1) Repair damaged, deteriorated, or broken sewer mains; (2) Repair damaged, deteriorated, or broken sewer service laterals from the main to edge of road right-of-way or easement; (3) Routine maintenance and repair of pump station equipment; (4) Cleaning and rodding of clogged sewer mains; (5) Repair of manholes to include rings and covers; and (6) Other routine maintenance and repairs as needed; (7) Administrative and engineering support of above, as required; (8) 24 hours, 7 days per week on-call dispatch with appropriate response forces; (9) Responding to inquiries by existing and potential users of sanitary sewer service; (10) Investigating and working to resolve complaint issues; (11) Maintaining metered electric service at pumping stations, as well as, chemicals associated with pump station operation.

4. Monthly bills rendered for services as provided hereunder are payable within 30 days from their date, at Spring Lake's office, Town of Spring Lake, P.O. Box 617, Spring Lake, NC 28390.

5. Spring Lake will be responsible for the cost associated with upsizing mains within the delineated Overhills service as may be deemed necessary in order to meet Spring Lake's existing and future sanitary sewer needs which would not be otherwise required for the sanitary sewer collection system being installed by Overhills pursuant to this Agreement.

6. All sanitary sewer lines installed by Overhills that are funded with USDA loan and/or grant funds will not be charged a capacity or impact fee and shall be owned and operated by Overhills subject to Spring Lake's right to upsize such mains at its expense and to transmit sanitary sewer through such mains to areas beyond the Overhills area.

7. Overhills will acquire all rights-of-way and/or encroachments as may be needed for construction of the sanitary sewer collection system as referenced herein. Spring Lake currently controls an existing easement that was dedicated to the Town of Spring Lake for the sole purpose of constructing a lift station to serve the Overhills Park Subdivision. The Town of Spring Lake will not charge Overhills any fees for the use of the easement and Overhills will own the lift station.

8. Spring Lake reserves the right to extend or continue sanitary sewer mains from such mains as initially constructed by Overhills to points outside of the delineated Overhills service area. Future connections or main extensions that occur outside of the delineated Overhills area are not subject to this Agreement and shall be the property of Spring Lake unless the Overhills boundary is expanded by mutual agreement of the parties herein in order to serve development of contiguous properties.

9. The further extension of or connection to mains within the delineated Overhills service area will be pursuant to applicable extension and connection policies and procedures of Overhills in effect at the time a request for service is made.

10. Overhills may by resolution adopt a policy whereby future customers and/or extenders of sanitary sewer infrastructure in the Overhills service area will be subject to the then current applicable Spring Lake Policies and Procedures to simplify the application process for customers with the understanding that such customers remain responsible to Overhills for compliance with such policies and procedures.

11. Laterals not installed during the initial sanitary sewer collection system as constructed by Overhills will be subject to the applicable lateral charge and facility investment fee charged by Spring Lake. Overhills customers will not be charged a main charge by Spring Lake if located within the Overhills service area on mains installed by Overhills.

12. Annual Notification of Anticipated Usage and Restriction: (a) Spring Lake reserves the right and authority to limit the annual increase in usage by Overhills to an amount not greater than 20% of the previous calendar year's usage. However, additional limits may be imposed if an outside agency having jurisdiction over the treatment facilities requires restrictions on increases in usage on the Spring Lake's system. Consideration will be given on a case-by-case basis to address anticipated sanitary sewer needs in excess of the above stated 20% increase; (b) any limitations or restrictions on sanitary sewer usage due to situations beyond Spring Lake's control will also apply to Overhills. Overhills will be responsible to ensure the individual sanitary sewer customers on its system comply with these restrictions or limitations.

13. The term of this Agreement may be amended by written agreement between Spring Lake and Overhills. The term of this Agreement is for five years from Sept. 8, 2014, and at the end of each anniversary date of this Agreement, the termination date of the term of this Agreement shall automatically extend for an additional period of one year unless terminated by said parties giving not less than two years written notice to the other party including the initial term or by mutual consent of both parties.

14. *Severability*: It is hereby declared to be the intention of Spring Lake and Overhills that the paragraphs, sentences, clauses and phrases of this Agreement are severable. If one or more paragraphs, sections, sentences, clauses or phrases shall be declared void, invalid or otherwise unenforceable for any reason by valid and final judgment or decree of any court of competent jurisdiction, such judgment or decree shall not affect the remaining provisions of this Agreement and the same shall continue to be fully effective and enforceable on the basis that said remaining provisions would have been agreed to by Spring Lake and Overhills without the incorporation of such void, invalid or otherwise unenforceable paragraph, section, sentence, clause or phrase.



15. *Notices:* Whenever written notices are required under this Agreement, said notice shall be in writing and shall be delivered personally or shall be sent by prepaid registered or certified mail. If notice is mailed to Spring Lake, it should be addressed as follows:

Mayor, Town of Spring Lake  
P.O. Box 617  
Spring Lake, NC 28390

If notice is mailed to Overhills, it should be addressed as follows:

Chairman, Board of Governors  
Overhills Park Water & Sewer District  
P.O. Box 1829  
Fayetteville, NC 28302-1829

Either party may change its mailing address by giving written notice of the new address. Unless so changed, the addresses set forth above shall apply.

18. *Binding Effect:* This contract shall be binding upon and inure to the benefit of the parties hereto, their heirs, successors and assigns.

19. *Entire Agreement:* This contract contains the entire agreement of the parties and there are no representations, inducements or other provisions other than those expressed in writing.

20. *Governing Law:* This contract shall be governed by the laws of the State of North Carolina.

IN WITNESS WHEREOF, the parties hereto through their duly authorized officers has executed this contract as to the date and year first above written.

OVERHILLS PARK WATER & SEWER DISTRICT



ATTEST:

Candice White  
Candice White, Clerk to the Board

By: Jeannette M. Council  
Jeannette M. Council, Chair

APPROVED for Legal Sufficiency  
OVERHILLS PARK Water & Sewer District  
Attorney

Rick L. Moorefield  
Rick L. Moorefield, County Attorney  
Attorney for OVERHILLS PARK  
*it properly executed*

This instrument has been pre-audited in the manner required by the Local Government Budget and Fiscal Control Act.

Melissa Cardinali  
Melissa Cardinali, Finance Director  
Finance Officer for OVERHILLS PARK

THE TOWN OF SPRING LAKE



ATTEST:

Rhonda Webb  
Rhonda Webb, Town Clerk

By: Chris V. Rey  
Chris V. Rey, Mayor

APPROVED, as to form this 8<sup>th</sup> day of  
September, 2014.

Robert A. Buzzard  
Robert A. Buzzard  
Spring Lake Attorney

This instrument has been preaudited in the manner required by the Local Government Budget and Fiscal Control Act.

Tina J. West  
Allen L. Coats, Finance Director  
Financial Officer for Spring Lake  
Tina J. West, Interim Finance Director

NORTH CAROLINA - CUMBERLAND COUNTY

I, \_\_\_\_\_, a Notary Public of said County and State do hereby certify that \_\_\_\_\_ personally appeared before me this day and acknowledged that he/she is the Clerk to the Board of the OVERHILLS PARK Water and Sewer District, and that the authority duly given and as the act of said, the foregoing instrument was signed in its name by its Chairman, sealed with its corporate seal and attested by himself/herself as its \_\_\_\_\_.

WITNESS my hand and Notarial Seal, this the \_\_\_\_ day of \_\_\_\_\_, 2014.

My Commission Expires: \_\_\_\_\_

Notary Public

NORTH CAROLINA - CUMBERLAND COUNTY

I, Patricia M. Hickman, a Notary Public of said County and State do hereby certify that Khonda D. Webb, personally appeared before me this day and acknowledged that she is Clerk of The Town of Spring Lake, North Carolina, and that the authority duly given and as the act of the agency, the foregoing instrument was signed in its name by its Mayor, sealed with its seal and attested by himself/herself as the Town Clerk.

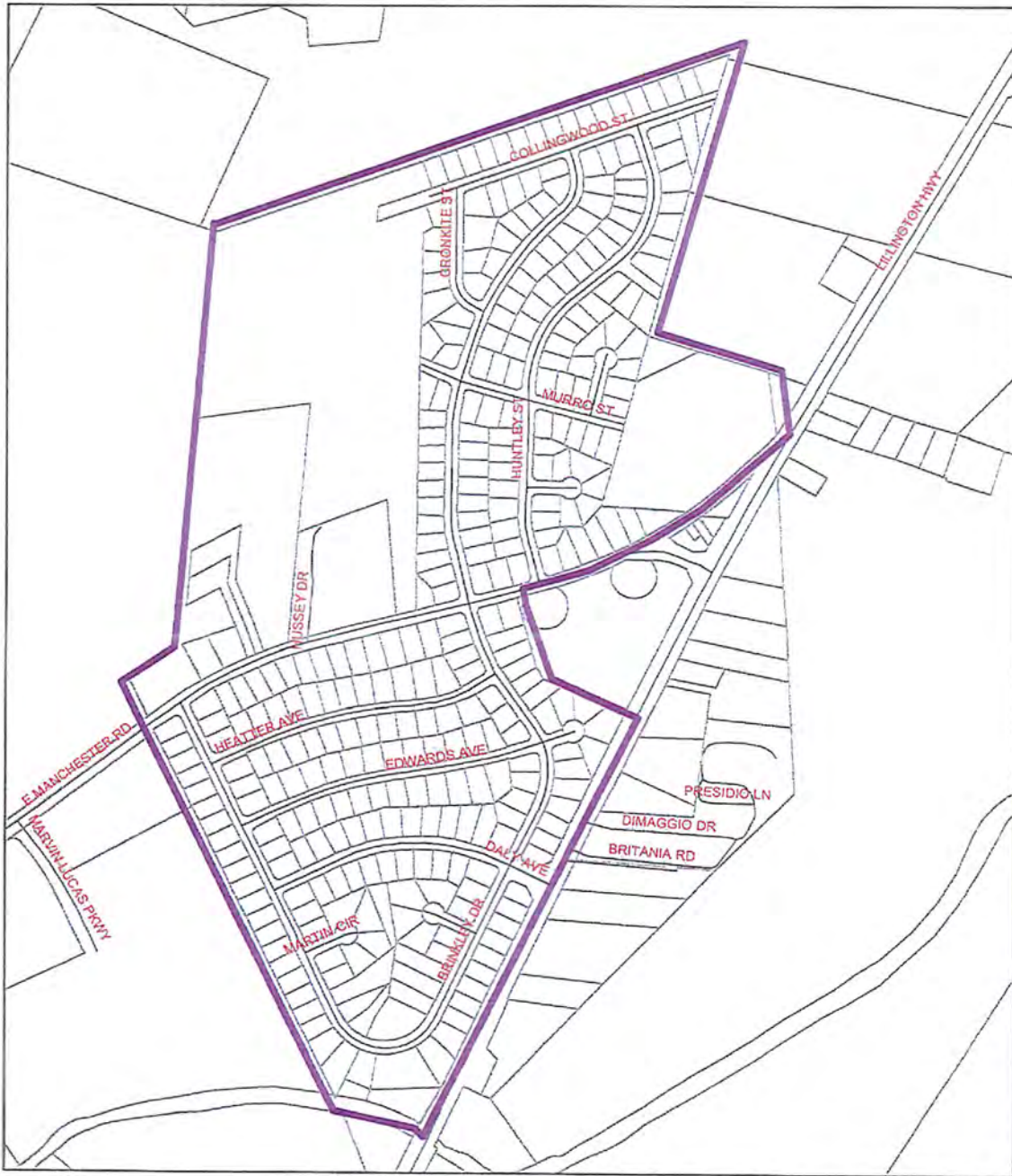
WITNESS my hand and Notarial Seal, this the 8th day of September, 2014.

My Commission Expires:

November 26, 2016

Patricia M. Hickman  
Notary Public  


Exhibit A



OVERHILLS PARK WATER & SEWER DISTRICT

## Exhibit B

### Rate Schedule

\$4.00 per thousand gallons

\$9.25 per tap



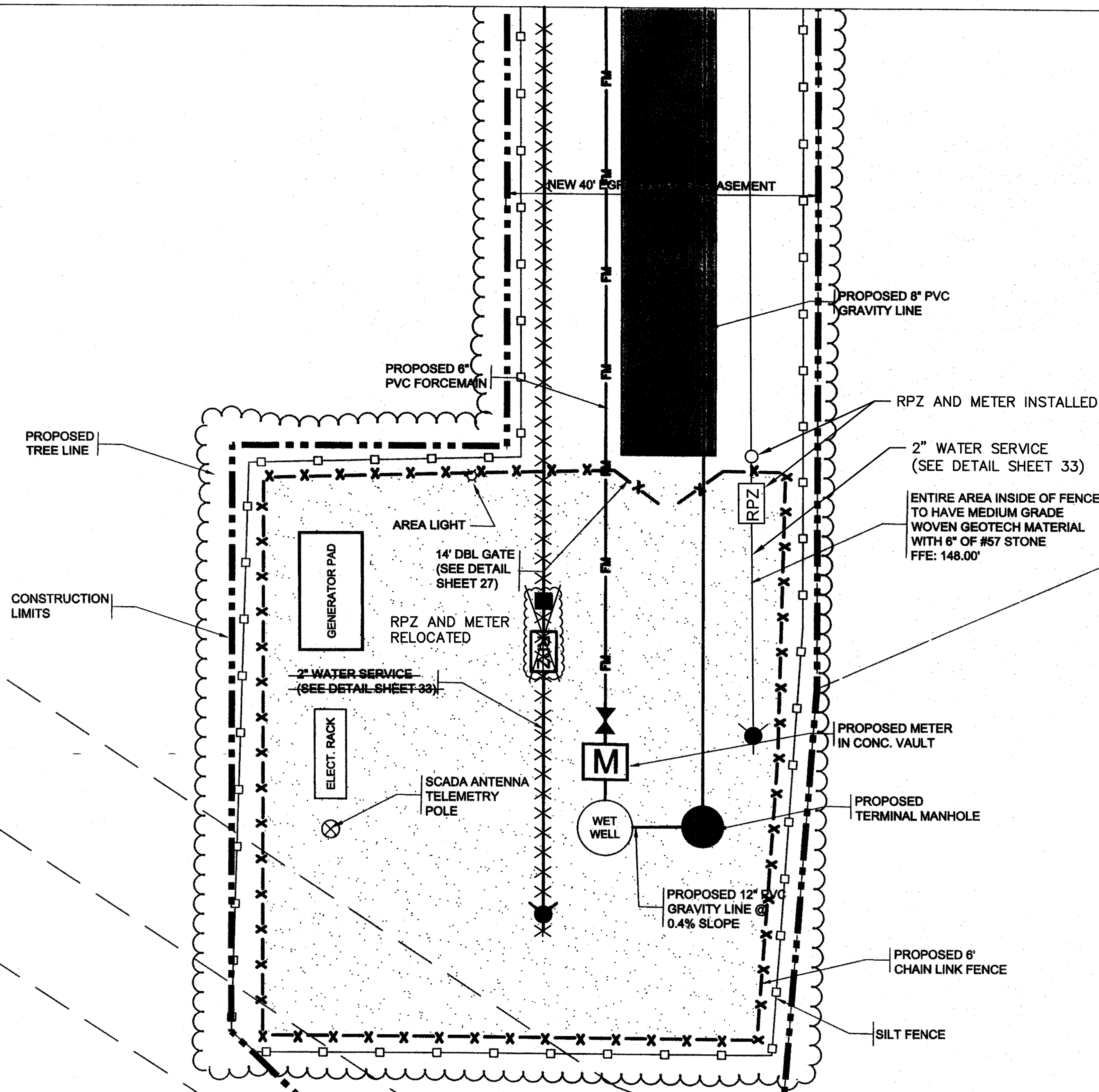
## **Appendix D**

### **Lift Station Record Drawings**





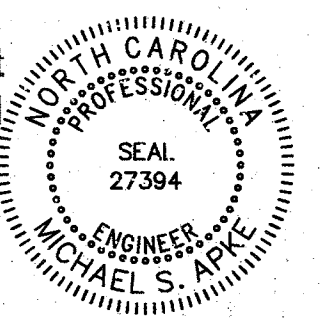
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148.5±



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**RECORD DRAWING**

This Drawing has been modified to reflect changes made during construction based upon information provided by the Contractor and construction observations made by the Owner's Authorized Representative (McGill Associates).



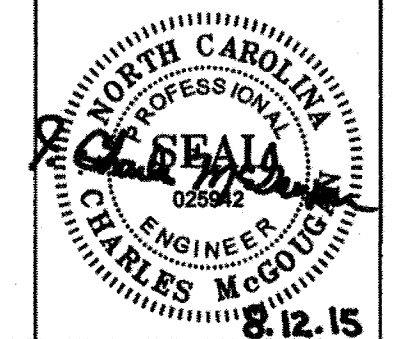
By Michael S. Apple Date 8/2/19

**McGill ASSOCIATES**  
ENGINEERING · PLANNING · FINANCE  
5 REGIONAL CIRCLE, SUITE A PINEHURST, NC 28374 PH. (910) 295-3159 FIRM # C-0459

LEGEND			
	NEW FORCEMAIN		WETLANDS
	NEW GRAVITY LINE		NEW ACCESS ROAD
	EASEMENT LINE		NEW 6" #57 STONE
	PROPERTY LINE		EXIST. ROAD
	WETLANDS BUFFER		NEW MANHOLE
	EXIST. WATER LINE		
	CHAIN LINK FENCE		
	NEW CONTOUR		
	EXIST. CONTOUR		

**PS-1  
BRINKLEY DRIVE PUMP STATION  
SITE PLAN**  
SCALE: 1"=10'

REVISIONS			
BY	DATE	DESCRIPTION	SYM.
JCM	6/15/15	ADDED CONST. LIMITS/CONST. ENTR. NOTES	



**MOBID CONSULTING ENGINEERS, P.A.**  
P.O. BOX 4428  
ASHEBORO, NC 27204  
Phone: (336) 629-3931  
Fax: (336) 629-3932  
NC License No. C-644

**BRINKLEY DRIVE PUMP STATION SITE PLAN**

**OVERHILLS SUBDIVISION WASTEWATER SERVICE**  
Cumberland County, North Carolina

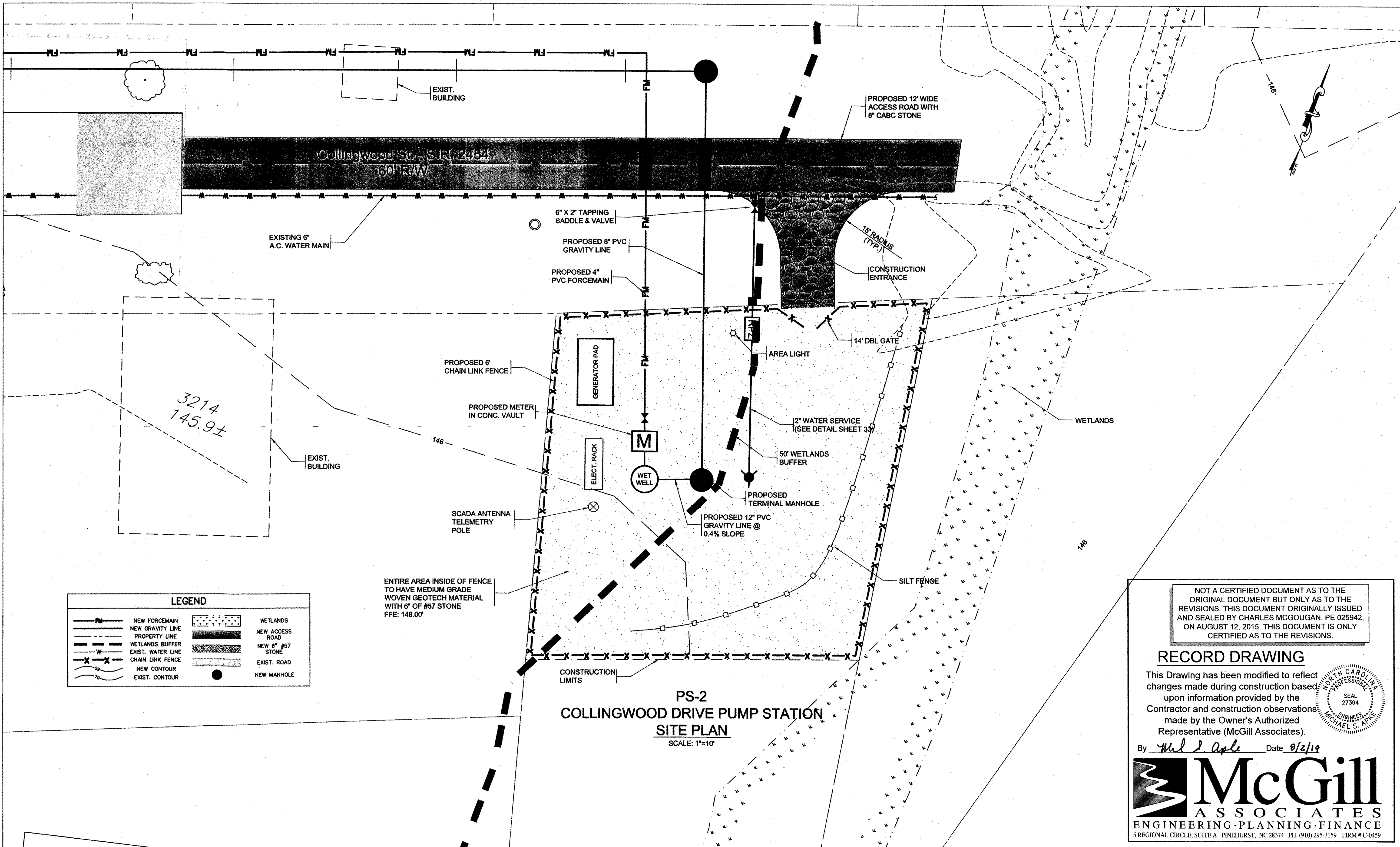
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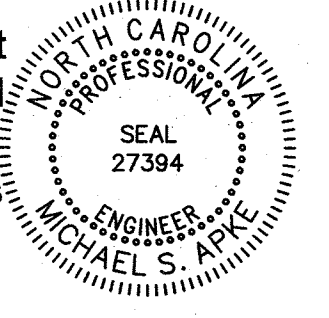
**LEGEND**

	NEW FORCEMAIN		WETLANDS
	NEW GRAVITY LINE		NEW ACCESS ROAD
	PROPERTY LINE		NEW 6\"/>
	WETLANDS BUFFER		EXIST. ROAD
	EXIST. WATER LINE		NEW MANHOLE
	CHAIN LINK FENCE		
	NEW CONTOUR		
	EXIST. CONTOUR		

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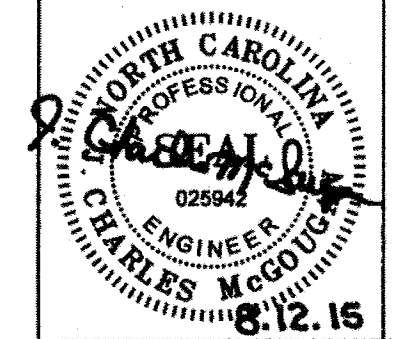


By Michael S. Apple Date 8/2/19

**McGill ASSOCIATES**  
 ENGINEERING · PLANNING · FINANCE  
 5 REGIONAL CIRCLE, SUITE A, PINEHURST, NC 28374 PH. (910) 295-3159 FIRM # C-0459

**REVISIONS**

BY	DATE	DESCRIPTION	SYM.
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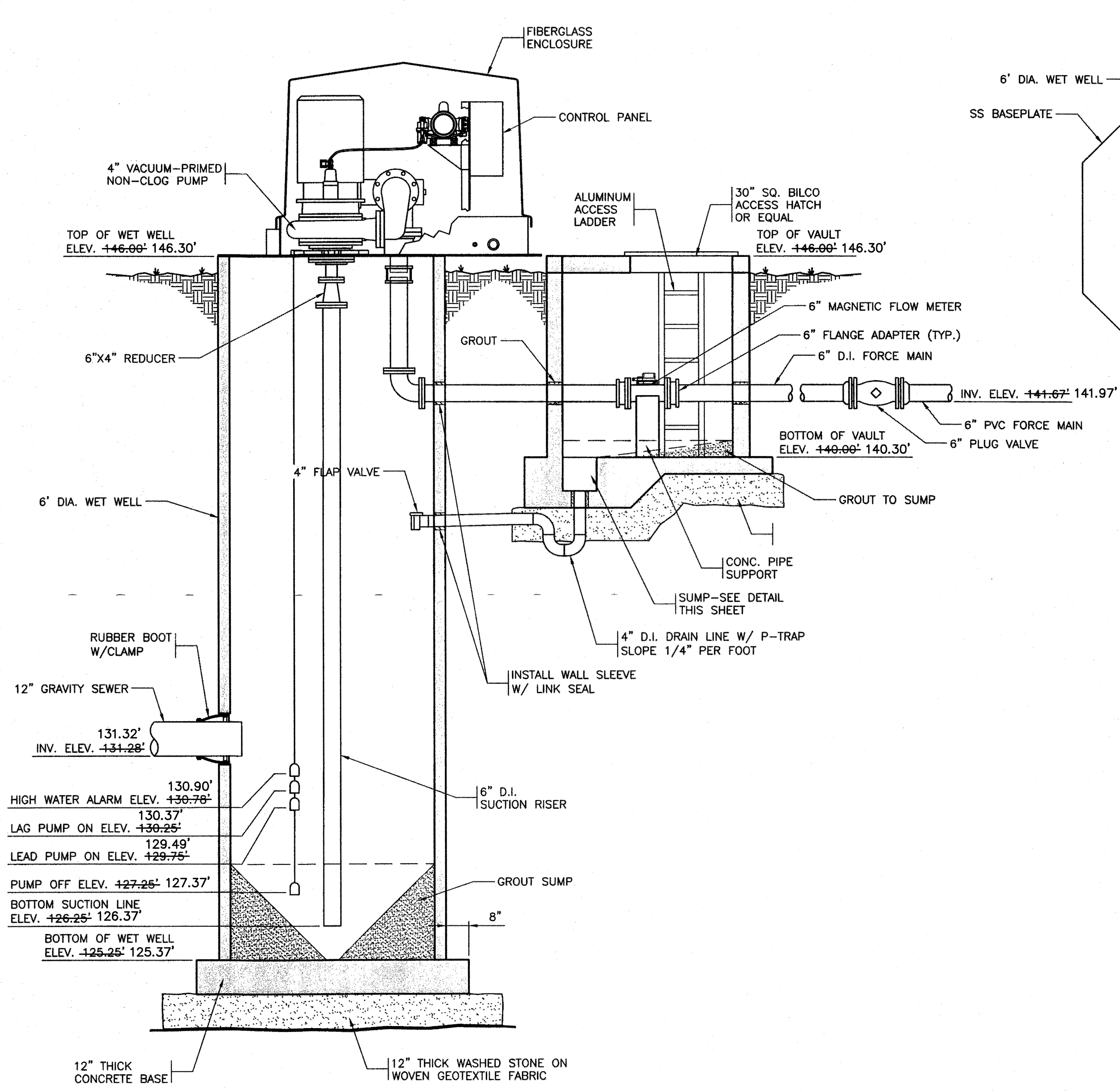


**MOB**  
 CONSULTING ENGINEERS, P.A.  
 P.O. BOX 4428  
 ASHEBORO, NC 27204  
 Phone: (336) 629-3931  
 Fax: (336) 629-3932  
 NC License No. C-644

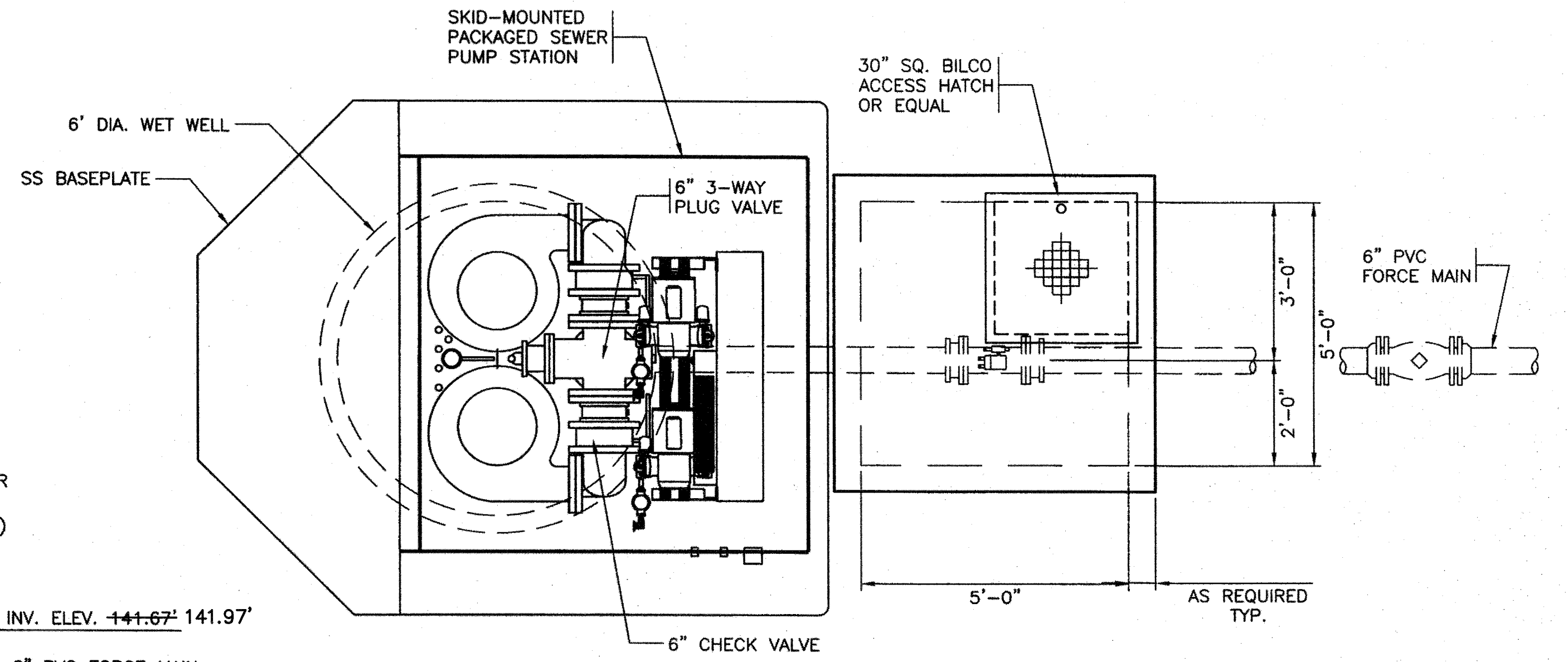
**COLLINGWOOD DRIVE PUMP STATION SITE PLAN**

**OVERHILLS SUBDIVISION WASTEWATER SERVICE**  
 Cumberland County, North Carolina

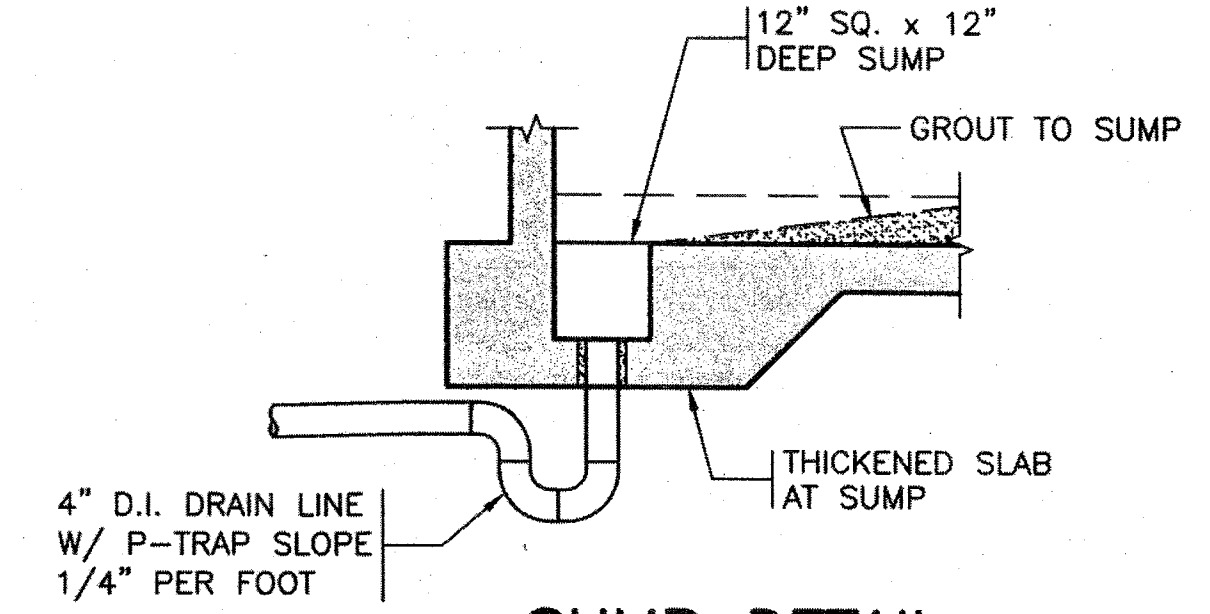
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Job No.: 29001	Of: 33 Version: 1



**COLLINGWOOD DR PUMP STATION  
ELEVATION VIEW**  
SCALE: 1/2"=1'-0"



**COLLINGWOOD DR PUMP STATION  
PLAN VIEW**  
SCALE: 1/2"=1'-0"



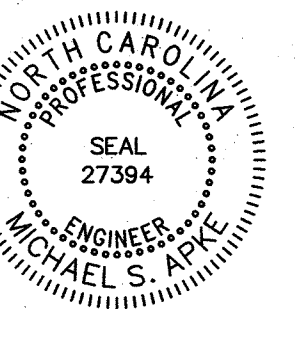
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**RECORD DRAWING**

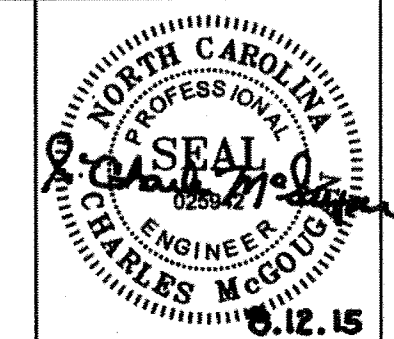
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By *Michael S. Apple* Date *8/2/19*



**McGill ASSOCIATES**  
ENGINEERING · PLANNING · FINANCE  
5 REGIONAL CIRCLE, SUITE A PINEHURST, NC 28374 PH. (910) 295-3159 FIRM # C-0459

REVISIONS			
BY	DATE	DESCRIPTION	SYM.



**MOB**  
CONSULTING ENGINEERS, P.A.

P.O. BOX 4428  
ASHEBORO, NC 27204  
Phone: (336) 629-3931  
Fax: (336) 629-3932  
NC License No. C-644

**COLLINGWOOD DRIVE  
PUMP STATION  
PLAN & DETAILS**

**OVERHILLS SUBDIVISION  
WASTEWATER SERVICE**  
Cumberland County, North Carolina

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Date: MAY 2011	7
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Checked: HJM	
Job No.: 29001	Of: 33 Version: _____







**WATER ASSET MANAGEMENT PLAN**

**SOUTHPOINT SUBDIVISION WATER SYSTEM**  
**GRAYS CREEK WATER AND SEWER DISTRICT**

**CUMBERLAND COUNTY, NC**



PINEHURST, NORTH CAROLINA

**WATER ASSET MANAGEMENT PLAN**

**SOUTHPOINT SUBDIVISION WATER SYSTEM**  
**GRAYS CREEK WATER AND SEWER DISTRICT**

**CUMBERLAND COUNTY, NC**

**MATTHEW JONES, PE**  
matthew.jones@mcgillassociates.com



5 Regional Circle, Suite A  
Pinehurst, North Carolina 28374  
910.295.3159

Firm License No.: C-0459

**AUGUST 2025**

**PROJECT NO. 20.02507**

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## **APPENDICES**

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<b>Appendix A – Excerpt from West Bladen County Water System SWAP</b>
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## EXECUTIVE SUMMARY

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The purpose of this Asset Management Plan (AMP) is to inventory and document the condition of the water infrastructure for Southpoint Subdivision's Water System within the Gray's Creek Water and Sewer District. This will assist the County in becoming more proactive in the management and financing of its water system. The Southpoint Subdivision is a community located in Cumberland County. Cumberland County purchases potable water from the Bladen County Regional Water System and distributes the water to the Southpoint Subdivision and the adjacent community in southern Cumberland County.

The County does not have a previous Asset Management Plan for the water system, therefore this development process has resulted in the assembly of an AMP and 10-year Capital Improvements Plan (CIP) to guide the County with prioritizing capital projects and equipment purchases necessary to rehabilitate and maintain its water system.

This Asset Management Plan seeks to provide a foundation for evaluating the Southpoint Subdivision's distribution system. To address existing system deficiencies and improve overall operations, capital improvement projects are recommended for implementation within a 10-year planning period. An operation and maintenance plan is also provided to ensure long-term system efficiency and reliability. This report was prepared per NCDEQ Division of Water Infrastructure Asset Management Guidance, system operator knowledge, field work conducted by McGill Associates (McGill), Local Water Supply Plan information, and system mapping information prepared by McGill as a result of the field work.

Developing a Capital Improvements Plan (CIP) will allow the County to update its current rate setting model to better estimate future revenue and expenses, capital outlay, indebtedness, and overall health of the water distribution system enterprise fund reserves. A model of this nature would continue to balance revenues and expenditures with a longer-term approach to rate setting and establish a financially sound framework for the County to follow. This plan also includes a budget-level recommendation for staffing associated with system operations and maintenance for all County utility districts.

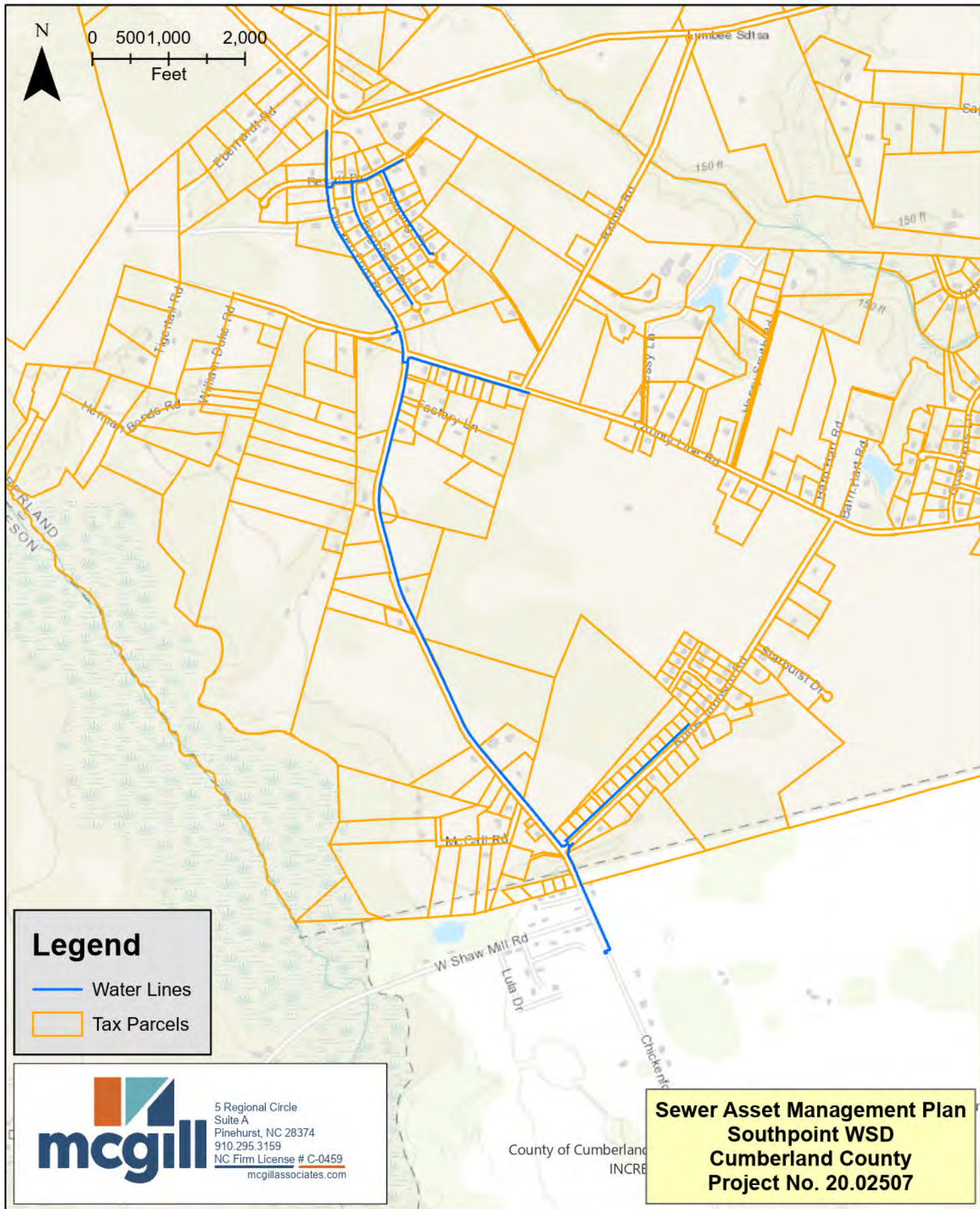
**1.1 BACKGROUND**

The Southpoint Subdivision Water System is in the Gray's Creek Water and Sewer District, located in Cumberland County, North Carolina, and is owned and operated by Cumberland County. The Southpoint Water District includes a water distribution system that currently serves 84 residential connections. Southpoint's Water Distribution System includes approximately 16,900 LF of 6-inch, 8-inch, and 12-inch water main, 12 hydrants, and 84 water meter service connections. The water mains are constructed of PVC pipe and were put into service in 2013. According to the 2022 Local Water Supply Plan (LWSP), the Southpoint community purchased a daily average of 0.0105 MGD of water from Bladen County. Figure 1 shows the current system.

The water source for the Southpoint water system is the Tobemory Well (#9) in the Bladen County Water Distribution-West Bladen water system, PWS ID 0309055. According to the Source Water Assessment Program (SWAP) Report for 2020, the well has a depth of 98 feet and yields water at 300 gallons per minute. Excerpted pages from the SWAP are included in orthophosphate used for corrosion control, Bladen County treats the water at Tobemory Well for iron through pressure sand filtration and for organics through granular activated carbon (GAC).



# Overall System Map Figure 1





## 1.2 EXISTING WATER DISTRIBUTION SYSTEM

The Southpoint water distribution system consists of 84 metered connections and approximately three miles of water distribution pipes, comprised of polyvinyl chloride, and ranging in size from 6-inches to 12-inches in diameter. Based on record drawing review and field work completed by McGill as part of this project, the system includes 12 fire hydrants and six valves. The system was put into service in 2013. The County reports no known issues with the existing system equipment.

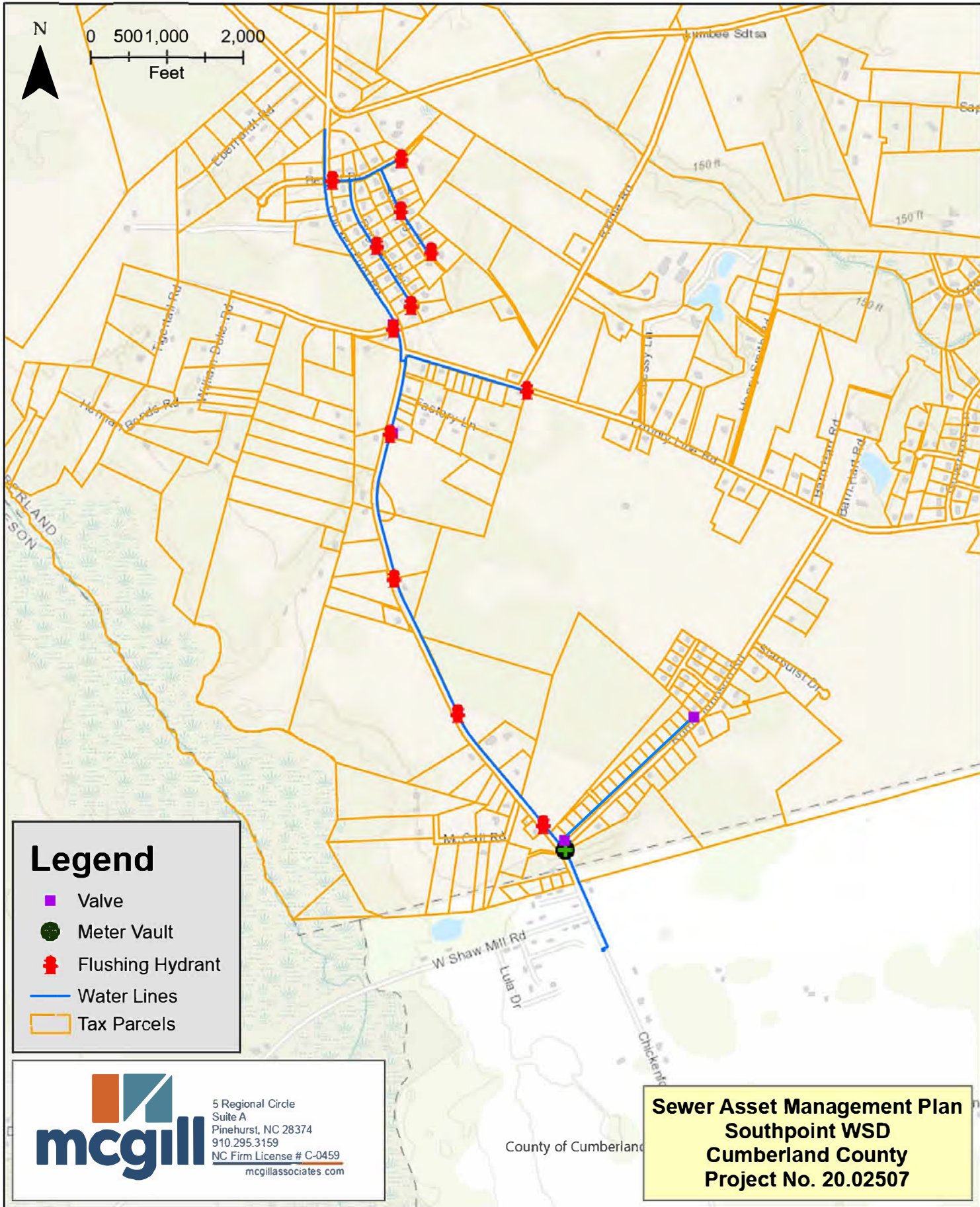
Table 1 summarizes the existing assets within the water distribution system. Figure 2 shows the location of hydrants and valves within the system, and Figure 3 shows the diameter of existing water main.

**Table 1: Water Distribution System Inventory**

<b>Asset</b>	<b>Size Range (in)</b>	<b>Estimated Length (feet)</b>
Polyvinyl Chloride Pipe	6-12	16,900
Valves	6-12	6
Fire Hydrants	N/A	12
Water Meters	N/A	81

# Hydrants and Valves Map

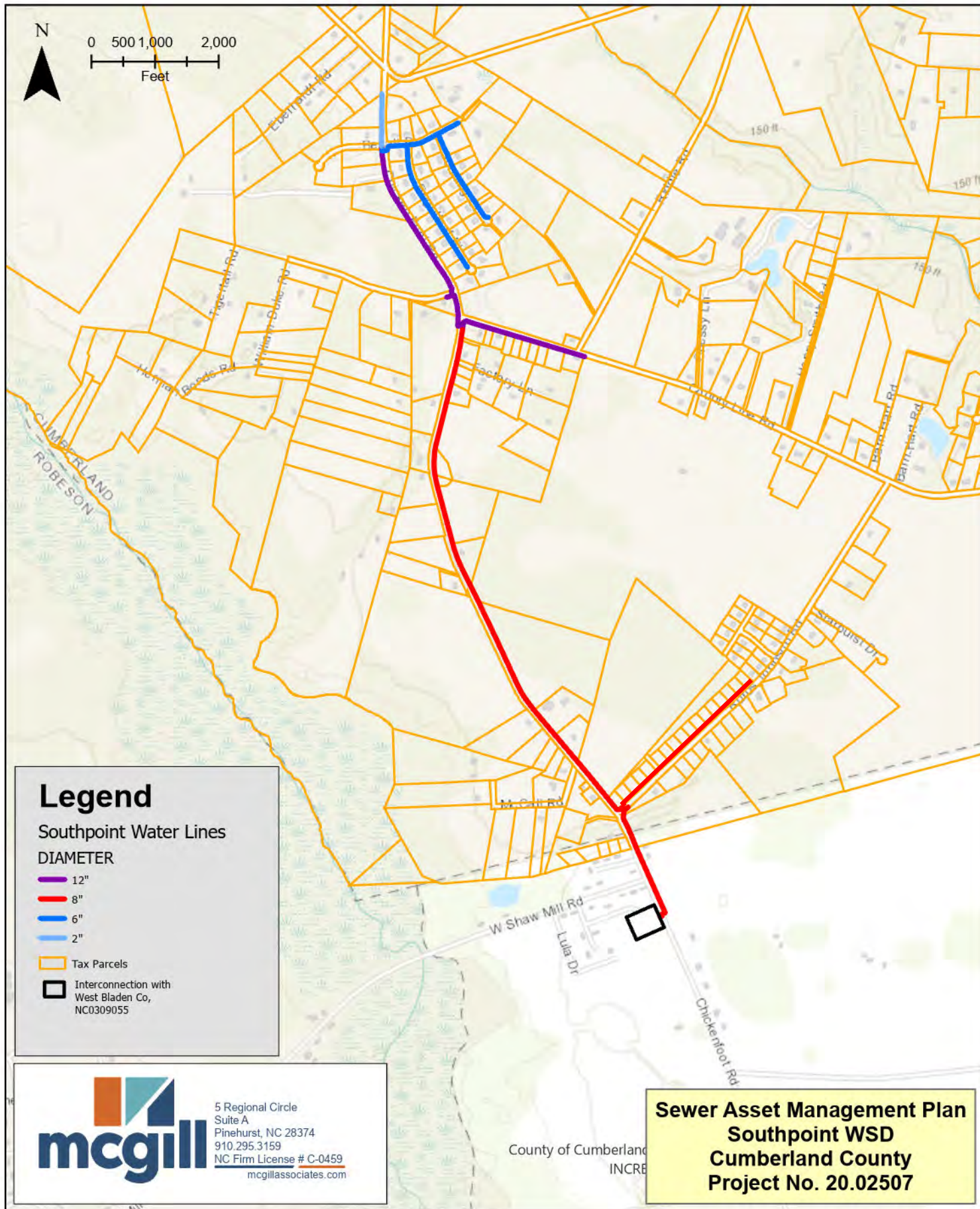
## Figure 2





# Water Line Diameter Map

## Figure 3



## 2.0

## CONDITION ASSESSMENT

### 2.1 WATER DISTRIBUTION SYSTEM

McGill Associates used a combination of water system GIS mapping, visual observations, record drawings, and operator/staff knowledge to assess the condition of the existing distribution system.

The analysis concluded that the general condition of the system is good, based on the low age of the system and primarily residential users connected to the system. The water meter condition is noted as good/fair, based on the age of the meters and the software no longer being supported.

**Table 2: Distribution System Condition Assessment**

Line Type	Size Range (in)	Quantity	% of System	Condition
PVC Pipe	6-12	16,900 LF	100%	Good
Meters	N/A	84 EA	100%	Good/Fair

**Table 3: Hydrant Condition Assessment**

Fire Hydrant Manufacturer	Average Age	Excellent	Good	Fair	Poor	Unknown	Total
American	20 years	-	12	-	-	-	12

**Table 4: Valve Condition Assessment**

Excellent	Good	Fair	Poor	Total
-	6	-	-	6

## **2.2 WATER SYSTEM HYDRAULICS AND CAPACITY**

The water system has an average pressure of 55 psi based on hydrant testing conducted by the McGill and County staff. The lowest static pressure noted during any test was 51 psi, which is still well above the minimum pressure of 30 psi for a public water system under peak flow conditions. Ground elevations within the area are relatively consistent from 160 to 165-ft above sea level.

The water system is not designed to provide fire protection. For the purposes of this report, fire hydrant flow tests were performed in the field to understand the characteristics of the system.

The Southpoint water system has 45,000 GPD of total capacity under the County's current operating agreement with Bladen County. As of March 2024, the County has approximately 10,900 GPD of remaining capacity that is currently unobligated. The County has seen a recent increase in requests from residential developers for properties that would be served by the water system. As a result, the County is interested in in-ground storage to increase its available capacities. Based on existing treatment at the source well in the Bladen County system, Cumberland County may choose to implement additional filtration ahead of proposed water storage.

The County has worked for several years to provide public water to citizens in the Gray's Creek Area, of which the Southpoint S/D water system is a part. As a part of this investigation, the County contracted with HDR to pursue funding for construction of deep wells, treatment, and distribution lines. This project would provide benefit to both the existing customers in the Southpoint S/D water system with increased hydraulic reliability and fire protection, as well as making public water available to the broader Gray's Creek area. This project with cost estimate prepared by HDR is included in the CIP for this report.

## 2.2 CONCLUSION

The existing distribution system is relatively young, and therefore the County does not face the challenge of replacing aging infrastructure at this point. Recommendations for operations and maintenance are included in this report that will serve to extend the life of the existing equipment and infrastructure in the system. Therefore, the focus of the County's needs in this system relate to other operational needs that stem from having only one full-time staff person who oversees the management of the County's three existing sewer systems and this Southpoint water system. The recommended improvements to the system are targeted at improving operational capabilities and developing resiliency within the system:

- Replacing AMR water meters with new AMI water meters and updated meter reading system
- Procure new billing software
- Construct ground-level storage tank with water filtration.

These items have been addressed in the Capital Improvements Plan.

## **3.0**

## **CAPITAL IMPROVEMENTS PLAN**

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The fieldwork, asset inventory, review of existing documentation, and consideration of staff input provided evidence for various water system improvements including specific and general recommendations. Specific recommendations determined the imminent projects in the next few years, and general recommendations are primarily maintenance and further investigation and can be implemented at minimal cost.

### **3.1 GENERAL RECOMMENDATIONS**

#### **3.1.1 Valve Turning**

EPA recommends exercising all mainline valves in the system once per year to ensure valves can be located and opened/closed properly during emergency shut-down periods. Recording the number and direction of turns to open/close will help identify problems and need for maintenance. During valve exercising, a complete evaluation of the asset should be made including difficulty accessing the valve, excessive force needed to operate and leaking during operation. Also, when exercising, complete inventory should be taken of each valve including size, type, valve box/manhole condition, depth of cover, operating condition, and evidence of other potential problems.

#### **3.1.2 Hydrant Testing**

It is recommended to continue testing hydrants throughout the year to verify that the pressures at each hydrant in the system can meet the current fire flow requirements. Hydrant tests can also give valuable information in order to find existing or additional deficiencies in the system.



### **3.1.3 Mapping**

The mapping completed as part of the AIA has been provided to the County on ArcGIS online such that the County staff can maintain and update as needed in the future. It is recommended that the County update materials for water lines where known and as maintenance and replacements are completed. Any age information should be inserted as well as keeping the system map up-to-date and providing information for future work.

## 3.2 PRIORITY PROJECTS

### 3.2.1 Water Meter Replacement Project

This project includes replacement of existing AMR meters with AMI based water meters, as well as new meter reading equipment, installation, startup and training for the associated water meter reading software and data logging software.

**Table 5: Preliminary Opinion of Probable Cost for Water Meter Replacement Project**

Item	Description	Units	Quantity	Unit Price	Total Cost
1	AMI Residential Water Meter	EA	84	\$ 500	\$ 42,000
2	Water Meter Reading System and Startup	LS	1	\$ 20,000	\$ 20,000
<b>Construction Subtotal</b>					<b>\$ 62,000</b>
Contingency (15%)					\$ 9,300
<b>Total Base Project Cost</b>					<b>\$ 71,300</b>

*\*Cost estimates are based on the knowledge of a professional engineer based on 2024 construction costs and are subject to change due to bidding environment and other factors.*

### 3.2.2 Water Storage Tank and Filtration Project

This project includes the construction of a ground storage tank to provide additional capacity for the water system, as well as additional filtration equipment.

**Table 6: Preliminary Opinion of Probable Cost for Water Storage Tank Project**

Item	Description	Units	Quantity	Unit Price	Total Cost
1	22,500 Gallon Ground Storage Tank	LS	1	\$ 55,000	\$ 55,000
2	Greensand Iron Manganese Filter	LS	1	\$ 175,000	\$ 175,000
<b>Construction Subtotal</b>					<b>\$ 230,000</b>
Contingency (15%)					\$ 43,500
Engineering Assistance (If Needed)					\$ 30,000
<b>Total Base Project Cost</b>					<b>\$ 303,500</b>

*\*Cost estimates are based on the knowledge of a professional engineer based on 2024 construction costs and are subject to change due to bidding environment and other factors.*

### 3.2.3 Construct New Wells and Water Main

This project includes approximately 25,550 linear feet of 12-inch distribution pipeline to help reduce the contamination in private drinking water wells. This project will provide well pumps and wellheads, the transmission of raw water from production wells to a treatment unit for a variety of cleaning processes, and then to distribute the water to a maximum of 100 connections throughout Gray’s Creek.

Item	Description	Units	Quantity	Unit Price	Total Cost
1	Source (pumps and wellheads for 2 existing wells, 3,660 LF raw water main)	LS	1	\$ 2,861,732	\$ 2,861,732
2	Treatment (pre-filtration, IX, GAC, disinfection, ground storage, booster pumps)	LS	1	\$ 3,447,158	\$ 3,447,158
3	Distribution Lines (25,500 LF, 12” distribution line)	LS	1	\$ 8,203,417	\$ 8,203,417
<b>Construction Subtotal</b>					<b>\$ 14,512,307</b>
Contingency (10%)					\$ 1,451,231
Engineering Assistance (If Needed)					\$ 1,915,625
Administration Cost					\$ 1,734,974
<b>Total Base Project Cost</b>					<b>\$ 19,614,136</b>

### **3.3 CIP PROJECTS SUMMARY**

Cumberland County's goal is to provide clean, safe and economical water service to current and future customers. The customers include primarily residential households and businesses within the County. The County intends to provide and maintain a reliable and safe water supply and water distribution system in the Southpoint water system, which exceeds the standards imposed to protect the public health and the quality of the receiving waters.

Throughout the AIA process, the Southpoint water system was evaluated through visual inspections, hydrant testing, and water modeling. The highest priorities were collected and put into a 10-year capital improvements plan. In this plan, projects were prioritized based on existing conditions and providing operational benefit to the County.

A Capital Improvements Plan (CIP) is a plan and schedule of anticipated and required capital expenditures for public utility facilities with descriptions of project needs, estimated project costs, and timing of work over a planning period. Thus, a CIP is an important planning tool that allows a public utility to prepare for upcoming projects and to proactively determine how and when to fund them.

**Table 7: CIP Cost Summary**

Year	Water Meter Replacement	Ground Storage Tank and Filter	Construct New Wells and Water Main	TOTAL COST
1	\$ -	\$ -	\$ -	\$ -
2	\$ 71,300	\$ -	\$ -	\$ 71,300
3	\$ -	\$ -	\$ 19,614,136	\$ 19,614,136
4	\$ -	\$ -	\$ -	\$ -
5	\$ -	\$ 303,500	\$ -	\$ 303,500
6	\$ -	\$ -	\$ -	\$ -
7	\$ -	\$ -	\$ -	\$ -
8	\$ -	\$ -	\$ -	\$ -
9	\$ -	\$ -	\$ -	\$ -
10	\$ -	\$ -	\$ -	\$ -
<b>TOTAL ESTIMATED CIP COST</b>				<b>\$ 19,988,936</b>

**4.1 GENERAL RECOMMENDATIONS**

The purpose of an Operations and Maintenance (O&M) Program is to provide an organized and cost-effective approach to ongoing maintenance, repair and replacement activities that will maintain the water distribution system, so it performs as intended and adheres to applicable sections of the of the Water System Management Plan, set forth under North Carolina Office of Administrative Hearings, Subchapter 18c of Title 15A.

This section provides a general description of proactive O&M, that can be defined as scheduled maintenance activities (preventive maintenance), performed on a regular basis in order to achieve the highest level of system performance using available resources and minimizing failures that can result in low pressure, degraded quality, service interruptions and possible contamination.

Developing an O&M Program begins with accurate records of infrastructure inventory, asset locations and physical condition. Coupled with work records and system performance history, preventive maintenance schedules can be developed to efficiently address general system needs, from regular flushing of stagnate water to site-specific maintenance work such as leak repairs.

The following elements provide the foundation for an effective O&M program:

- Maintain up-to-date water distribution system maps and related work history and operational data.
- Develop a routine preventive O&M program and activities for staff and contractors maintaining the water distribution system and a system to document scheduled activities.
- Develop a rehabilitation and replacement plan identifying and prioritizing system deficiencies and implement short- and long-term actions to address the deficiencies.
- Develop and implement training programs to build technical competence and emergency preparedness.



- Develop and provide equipment and replacement part inventories, including critical replacement parts.

The County has an Operations and Maintenance Plan for the water system that was developed by Koonce, Noble and Associates in 2013. The plan focuses on six areas, including: Frost Prevention, Leak Detection and Repair, Meter Calibration, Flushing, Valve Exercise, and Control of Authorized Use. A copy of this plan is included in Appendix B of this report. In addition to and as an elaboration on that plan, McGill suggests the following as critical elements to proactive O&M.

### **Water System Mapping**

Water system maps and related databases are typically managed using a Geographic Information System (GIS). These maps and datasets can be viewed through a GIS desktop program (i.e. ArcGIS), or by creating digital (typically pdf format) maps and tables to be viewed on screen, exported to other software (excel) for analysis, or printed for manual markup, editing, etc. GIS mapping is supported by a database that records water main size, material types, locations of valves, meters, service connections and other attributes of system appurtenances. It can also attach images and records such as field inspections to specific asset(s) or location(s) and attach performance data such as operating pressure or fire flow to sections of the distribution system. GIS provides a powerful tool to build, organize and display the physical and operational attributes of the water distribution system.

The GIS database should be updated on a regular basis. Software applications such as work order systems are available to allow field staff to update GIS data as inspection and maintenance activities are completed. Other applications can also allow staff to update and edit maps.

GIS can organize work history along with operational data, inspection records and images to provide managers, operations staff and engineers with powerful data sets to track current resource allocations and forecast short and long-term operational and capital needs. Outcomes of detailed analysis such as recommended water main rehabilitation work versus water main break history can be mapped to present the relationship visually for ease of communicating and understanding.

### **Preventive Operation and Maintenance (O&M)**

Preventive maintenance is performing routine and scheduled maintenance activities before equipment or buried infrastructure fails, for the purpose of extending useful life, reducing overall operating costs, and increasing system reliability. This proactive approach to maintenance work is more efficient and cost effective than reactive and curative operations.

Preventive maintenance activities will also help operations staff to better understand the distribution system and how it works under various conditions. This knowledge is essential to setting maintenance priorities and developing the scope and timing of long-term rehabilitation and replacement projects.

### **Scheduled Flushing/Cleaning of Water Mains**

A regular flushing schedule for maintaining or improving water quality, primarily by raising chlorine residual, in key locations is typically developed based on the history of regular sampling and/or customer complaints. Care must be taken to flow sufficient volume to remove stagnant water at a rate of flow capable of removing sediments that contribute to degraded water quality. Monitoring chlorine residuals will provide a good indicator that water quality has reached the desired level to complete the task. Automatic flushing valves may be installed to reduce labor costs and ensure regular flushing at appropriate intervals and duration to accomplish the desired results.

More frequent flushing may be necessary during summer months when temperature will speed up degradation and possible formations of disinfectant byproducts. Unidirectional flushing should also be considered on a periodic basis to enhance sediment removal as needed. Mechanical cleaning, forcing a “pig” through the pipe network may be considered where extensive sedimentation and tuberculation occurs.

As part of the O&M Program, a master list of flushing/cleaning operations, priority locations and scheduling can be incorporated into GIS. Maps can be produced to define work areas, schedule resources, including contracted services, track progress and task completion. Updating GIS maintenance operations data (water quality monitoring, sediment quantity, etc.) will help managers adjust cleaning frequency and area boundaries as needed to increase program efficiency, maintain water quality and reduce customer complaints.

### **Routine Visual Inspections**

Routine inspections are used to assess the condition of valve structures, hydrants and other surface facilities, recording general conditions and evidence of water leaks, possible structural problems or failures (offset structures, etc.), corrosion and other damage. Work orders are generated based on inspection records to effect operational adjustments, scheduling more detailed inspections and/or making necessary repairs.

### **Valve Exercising Program**

EPA recommends exercising all mainline valves in the system once per year to ensure valves can be located and opened/closed properly during emergency shut-down periods. Recording the number and direction of turns to open/close will help identify problems and need for maintenance. During valve exercising, a complete evaluation of the asset is made including difficulty accessing the valve, excessive force needed to operate and leaking during operation.

During valve exercising complete inventory is taken of each valve including size, type, valve box/manhole condition, depth of cover, operating condition, and evidence of other potential problems.

Develop a standard form for recording information to ensure consistency of work and accuracy of records. These records are used to prioritize maintenance and repair scheduling and provide a history of condition assessments that will help develop the scope of rehabilitation and replacement work.

### **Leak Detection and Water Loss Reduction**

Proactively identifying and repairing system leaks will reduce the amount of finished water that does not reach the customer and would also increase the overall cost of water delivered to the customer. Reducing water system loss will help to contain utility costs, reduce the need and frequency of rate increases, and preserve a valuable natural resource.

Developing a water loss control program is essential to meeting these goals. Two options are the small system water audit, which was developed from the N.C. Division of Water Resources' Local Water Supply Plan (LWSP), and the American Water Works Association (AWWA) water loss control committee's free water audit. While the AWWA water audit applies to all systems, smaller systems (less than 10,000 people) with more limited resources may elect to complete a slightly less comprehensive audit. DWR has developed an alternative water audit that is available on the division's website.

## **Maintenance Activity Records**

Detailed records and daily logs of O&M work provide valuable information to help managers evaluate the effectiveness of maintenance activities and make adjustments to optimize the use of limited resources. Equipment, manpower and other resources are tracked along with detailed descriptions of defects and other repair needs encountered. Maintenance work resulting in system modifications or extensions should be incorporated into record drawings and system maps. Scheduled testing of emergency and standby equipment is also recommended.

These records should be reviewed periodically to identify problems that cannot be resolved in a short period of time in order to develop a plan to address the problem(s). Maintaining these records for an extended period of time (5 years or more) will also provide accurate reference points of maintenance investments made over time that will track the effectiveness of operation and maintenance activities.

In the event of pressure loss or boil water notice, maintenance records will need to provide sufficient detail to satisfy reporting requirements for the event, including location(s), corrective actions, testing and monitoring, etc. This data may also be integrated into GIS to allow mapping of these events over time in order to identify patterns and/or trends that will assist with scheduling maintenance and planning rehabilitation and other capital improvements.

## **Resolution of Customer Complaints**

Customer complaints are primarily for low pressure, tastes and odors. These conditions require an immediate response to diagnose and resolve the problem. These calls can occur outside normal business hours, significantly escalating costs. Detailed records of the problems found, and the resources needed to address the conditions provide valuable feedback for making adjustments to the preventive maintenance program that can reduce these types of calls and help lower overall maintenance costs.

## **Capital Improvements Plan**

A Capital Improvements Plan (CIP) identifies rehabilitation, replacement and expansion needs of the system. The CIP should address the short and long-term needs of the system, covering at least a 5 to 10-year planning period, and includes the estimated cost of each capital project.

CIP development incorporates maintenance activity, cleaning and inspection records, and system performance data that may include flow monitoring and hydraulic modeling to evaluate the existing system and to recommend improvements needed to correct existing deficiencies, and ensure adequate capacity is maintained throughout the system.

Capital planning includes consideration of on-going funding for rehabilitation and replacement of the collection system as it wears out, and potential upgrades for expansion as needed.

## **Training Program**

Training programs provide a mechanism for educating employees and establishing their technical competence to perform operations, maintenance, and emergency responses safely and effectively. A combination of in-house skill training and specialized training purchased or provided through state and national associations, conferences and vendor training programs are typically used to build and enhance skills for performing daily work duties. Periodic training reinforces previous efforts, as people often overlook things that are used infrequently. It also provides an opportunity to train new staff and learn about new problems, new techniques, and changes in equipment.

Emergency training educates system personnel about emergency situations and resulting effects on the wastewater system, public health and environmental impacts. It also provides an opportunity to practice responses. Good record keeping ensures personnel are properly trained and prepared to effectively operate and maintain the collection system under any given circumstance. Regular review of training records is essential for keeping content up-to-date and maintaining proper employee awareness.

## **Equipment and Replacement Parts**

A reasonable supply of equipment and replacement parts should be maintained to fully support all operations and maintenance activities. A detailed inventory is essential to ensure availability under normal operations and emergency conditions. Specialized equipment or parts may be too costly to keep in stock, so arrangements with vendors, contractors and other utilities (under mutual aid agreements) may be necessary to ensure availability during non-business hours or during emergencies.



## 4.2 STAFFING RECOMMENDATIONS

Cumberland County is responsible for three wastewater collection systems and one water system: NORCRESS, Overhills, Kelly Hills, and Southpoint Water System. While each of these districts maintains its own operating budget, the Board leadership and operational management is performed solely by Cumberland County. Therefore, in consideration of the typical utility system management and operations and maintenance that is necessary for maintaining each of the systems, McGill has considered all of the four utility systems cumulatively. While each system could be analyzed separately, considering the systems together is more consistent with actual management of the systems.

Typical metrics for analyzing full-time equivalent (FTE, representing quantity full-time workers) are based on either the population served by the system or by miles of utility piping (water main or sewer line) within each system. For reference, Table 6 below summarizes the customers and piping in each of the County's utility systems.

**Table 6: Utility System Comparison**

DISTRICT	Number of Connections		Paying Avail. Fee	Pipe in System (mi.)
	Water	Sewer		
<b>Southpoint</b>	84		129	2.8
<b>Kelly Hills</b>		102	166	4.5
<b>Overhills</b>		107	318	4.0
<b>NORCRESS</b>		452	666	41.1
<b>TOTALS</b>	<b>84</b>	<b>661</b>	<b>1279</b>	<b>52.4</b>

**Table 7: Typical Population vs. Pipe Length**

<b>Population</b>	<b>Pipe in System (mi.)</b>
0-100	5
101-500	5
501-3300	21
3301-10000	62

The typical sizes of utility systems from a community system EPA study<sup>1</sup> are shown in Table 7, and are generally consistent when compared to the County’s systems. This study was selected as a basis for comparison due to its comprehensive nature, having included water systems nationwide in its breadth. NORCRESS is the exception when compared to Table 7. This is mostly likely indicative of the system serving a more rural population where the connection density is less, and resulting from the length of force main piping in the system that increases the overall length but does not contribute to population density. Overall, these metrics were found to be reasonably consistent with the County’s systems. Similarly, the data is consistent regardless of whether the utility system is a water systems or wastewater collection system.

The objective is to make budget-level staffing recommendations for the County’s utility systems based on what is typical across the industry and other utility systems of comparable size. The EPA study utilized provides typical FTE for the roles of manager, plant operator, distribution (and collection, for our purposes), and administrative functions. All of these were considered applicable to management and operation of the County’s utility systems. Note: while the County is not responsible for plant operation in any system, the lift stations in the NORCRESS and Overhills systems are the County’s responsibility, therefore this metric was used, albeit in a smaller percentage, to account for the management of those resources.

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<sup>1</sup> Analysis conducted using excerpts from US EPA document, “National Characteristics of Drinking Water Systems Serving 10,000 or Fewer People,” published July 2011.

Table 8 shows Further utilizing the EPA statistics as base for typical FTE for each of the positions, based on the system size in terms of miles of pipe main.

**Table 8: Average Community System Statistics**

Employee Category	System Size (miles of Main)		Mean	Cumberland County
	Pop. 500-3300	Pop. 3300-10000		
	21	62	41.5	51.7
<b>Manager FTE</b>	0.6	1.1	0.85	1.06
per mile	0.029	0.018	0.020	0.020
<b>Plant Operator FTE</b>	0.6	1.3	0.95	1.03
per mile	0.029	0.021	0.023	0.023
<b>Distribution FTE</b>	0.8	2.5	1.65	2.06
per mile	0.038	0.040	0.040	0.040
<b>Administrative FTE</b>	0.6	1.5	1.05	1.31
per mile	0.029	0.024	0.025	0.025

The green highlighted cells are the calculated FTEs that were applied to estimate staffing size based on the quantity of pipe across the County’s four utility systems. Those calculated FTEs are based on the size of systems managed by the County and reasonable estimate of staffing needed for these systems.

Each of the FTEs is applied to each respective employee category. McGill utilized wage information from Zip Recruiter and a benefits multiplier of 1.38 from the U.S. Bureau of Labor Statistics to develop the summary shown in Table 9.

**Table 9: Overall Salary Estimates**

Employee Category	Hourly Rate	Annual Salary	Ben. Mult.	Total	Applied FTE	Applied Budget Cost
Manager	\$38.50	\$80,080.00	1.38	\$110,510.40	1.06	\$117,000
Operator	\$24.52	\$51,001.60	1.38	\$70,382.21	1.03	\$72,700
Distribution	\$23.57	\$49,025.60	1.38	\$67,655.33	2.06	\$139,100
Administrative	\$21.33	\$44,366.40	1.38	\$61,225.63	1.31	\$80,100
<b>Total Applied Budget Cost Based FTEs</b>						<b>\$408,900</b>

Utilizing industry metrics and comparing to systems of comparable size, McGill offers the proceeding section as a general staffing recommendation. This section and these budget values are provided for preliminary planning purposes only.

Staffing levels appear to be reasonable based on the District's ability to operate and maintain the system while providing a reliable level service to its customers.

While this budget number is higher than the current budget staffing, consideration should also be given to the cumulative effect cost to the County for contracted operation and distribution support in the NORCRESS and Kelly Hills district.

# **APPENDICES**



## **Appendix A**

**Excerpt from West Bladen County Water System SWAP**





**Source Water Assessment Program Report for  
BLADEN CO WTR DIST-WEST BLADEN**  
*Community Water System*

**Introduction: What is a Source Water Assessment?**

The North Carolina Division of Water Resources, Public Water Supply (PWS) Section is responsible for implementing the Source Water Assessment Program (SWAP) and completing assessments for all public drinking water supplies in the state. The 1996 amendments to the Safe Drinking Water Act provided federal support and required states to conduct assessments of all public water systems. A source water assessment is a qualitative evaluation of the potential of a drinking water source to become contaminated by the identified potential contaminant sources (PCS) within the delineated area. In North Carolina there are approximately 8,000 public water supply sources that were assessed by the state. The PWS Section has gathered information for each water supply and developed a process for completing the assessments. This process is summarized in the next few pages and detailed in Section 6 of this report.

This report provides a summary of the results for the **Source Water Assessment** for your drinking water source(s).

**What is the Source of Your Drinking Water?**

Everyone wants clean, safe drinking water and we assume this natural resource will always be available to us. However, drinking water sources can be threatened by many potential contaminant sources, including underground storage tanks for gasoline, permitted wastewater discharges and other waste disposal sites, improper handling of hazardous materials, urban storm water runoff, or other types of non-point source contamination such as runoff produced by agricultural activities and land clearing for development. Your drinking water source(s) is listed in Table 1. Protecting your drinking water from becoming contaminated is a wise investment in public health and your community's future.

**Table 1. Public Water Supply System Information**

System Name	BLADEN CO WTR DIST-WEST BLADEN
City	ELIZABETHTOWN
PWS ID	NC0309055
Source Name	WELL #10 MT HOREB WELL
Source Name	WELL #11
Source Name	WELL #13
Source Name	WELL #4/ABBOTTSBURG
Source Name	WELL #5/WHITE'S XRD
Source Name	WELL #8
Source Name	WELL #9 TOBEMORY

In addition to the sources listed in Table 1 above, this water supply system has interconnections to allow for the purchase of water from the following water system(s) or "Seller" system(s):

**BLADENBORO, TOWN OF  
CLARKTON, TOWN OF  
EAST ARCADIA, TOWN OF  
ELIZABETHTOWN, TOWN OF**

## **TAR HEEL WATER CORP**

Please refer to the Source Water Assessment Program Report for the "Seller" system(s) to review the assessment results for the purchased water supply sources that provide drinking water for this water system.

### **Assessment Report Contents**

This assessment report includes the following sections:

- Section 1: Assessment Area Delineation
- Section 2: Potential Contaminant Source Inventory and Map
- Section 3: What is a Susceptibility Rating?
- Section 4: Reviewing Your SWAP Results
- Section 5: Maps, Tables and Figures for your Drinking Water Source(s)
- Section 6: North Carolina's SWAP Approach

### **Section 1: Assessment Area Delineation**

The area delineated for your well(s) for the purpose of this assessment is the contributing area for the well(s). When a well is pumped, it begins to influence groundwater that is flowing through the subsurface and towards the well. The pumping of the well creates a contributing area around the well that supplies water to the well. This is the area through which contaminants, if released to the environment, can be reasonably expected to move through the ground and reach the well.

### **Section 2: Potential Contaminant Source Inventory and Map**

The potential contaminant source inventory map shows the delineated area for your drinking water source(s). This is the area where potential contaminant sources, if released to the environment, could reasonably be expected to be a risk or a potential for contamination of your drinking water supply. A PCS in this assessment report is a facility or site regulated under a state or federal regulatory program. These facilities are identified in electronic databases that contain location information for each facility. Only databases that include statewide information were used for this source water assessment. Included in this report are:

- 1) A table of any PCS identified within the delineated assessment area; and
- 2) A map of the delineated assessment area showing PCSs, roads, jurisdictional boundaries and other pertinent information.

It is important to note that the PCSs identified in this report are only potential sources of contamination to your drinking water source. Environmental contamination is not likely to occur if harmful contaminants are managed properly.

### **Section 3: What is a Susceptibility Rating?**

In North Carolina the susceptibility of any drinking water source is based on two components, a contaminant rating and an inherent vulnerability rating. Your drinking water source(s) was assigned a qualitative susceptibility rating of higher, moderate or lower based on the results of the contaminant rating and inherent vulnerability rating process as described in the following paragraphs.

## **Susceptibility Rating**

The final susceptibility rating for your drinking water source(s) is determined by combining the contaminant rating and the inherent vulnerability rating. More detailed information on the susceptibility rating process can be found in Section 6 of this report.

### **Contaminant Rating**

The contaminant rating for your drinking water source(s) was determined based on the number and location of PCSs within the delineated area. Each PCS identified within the delineated area was assigned a risk rating of higher, moderate or lower. The number of PCSs that occur within the delineated area was determined and a contaminant rating of higher, moderate, or lower was assigned to your drinking water source(s).

### **Inherent Vulnerability Rating**

The inherent vulnerability rating of your well(s) refers to the geologic characteristics or existing conditions of the well and its delineated assessment area. These characteristics include aquifer rating, unsaturated zone rating and well integrity/well construction rating. The aquifer rating is an assessment of the water transmitting characteristics of the aquifer. The unsaturated zone rating is an assessment of the likelihood that contaminants from surface and shallow sources will follow the path of aquifer recharge and reach the water table. The well integrity/construction rating is an assessment of the quality of the construction of the well. An inherent vulnerability rating of higher, moderate or lower was assigned to your well(s).

**Table 2. SWAP Results Summary**

<b>Source Name</b>	<b>Inherent Vulnerability Rating</b>	<b>Contaminant Rating</b>	<b>Susceptibility Rating</b>
WELL #10 MT HOREB WELL	Lower	Lower	Lower
WELL #11	Lower	Lower	Lower
WELL #13	Lower	Lower	Lower
WELL #4/ABBOTTSBURG	Lower	Lower	Lower
WELL #5/WHITE'S XRD	Moderate	Lower	Moderate
WELL #8	Lower	Lower	Lower
WELL #9 TOBEMORY	Moderate	Lower	Moderate

It is important to understand that a susceptibility rating of higher does not imply poor water quality. Susceptibility is an indication of a water supply's potential to become contaminated by the identified PCSs within the assessment area.

**Table 3. Well Information**

<b>Source Name</b>	<b>Well Yield (Gallons/Min)</b>	<b>Well Depth (Feet)</b>
WELL #10 MT HOREB WELL	300	293
WELL #11	320	283
WELL #13	250	205
WELL #4/ABBOTTSBURG	500	127
WELL #5/WHITE'S XRD	390	144
WELL #8	300	188
WELL #9 TOBEMORY	300	98

#### **Section 4: Reviewing Your SWAP Results**

Please review the information on your drinking water source(s) provided in this report. If you believe any of this information is incorrect please contact the Public Water Supply Section by e-mail at the following address: **SWAP@ncdenr.gov** or you may submit comments to us at:

SWAP  
Public Water Supply Section  
1634 Mail Service Center  
Raleigh, NC 27699-1634

Or you may contact the Source Water Assessment staff by phone at 919-707-9098.

#### **Section 5: Maps, Tables and Figures for Your Drinking Water Source(s)**

Maps, tables and figures specific to your drinking water source(s) are included in this report in the following pages and are listed below.

Map 1. Location Map

Map 2. Delineated Area and PCS Map

Table 4. Potential Contaminant Source Attributes

Table 5. Inherent Vulnerability Rating

Table 6. Unsaturated Zone Rating Calculation or Watershed Characteristics Rating Calculation

Figure 1. Land Use / Land Cover Categories

Figure 2. Unsaturated Zone Rating or Watershed Characteristics Rating

Figure 3. Vertical Hydraulic Conductance Rating or Average Annual Precipitation Rating

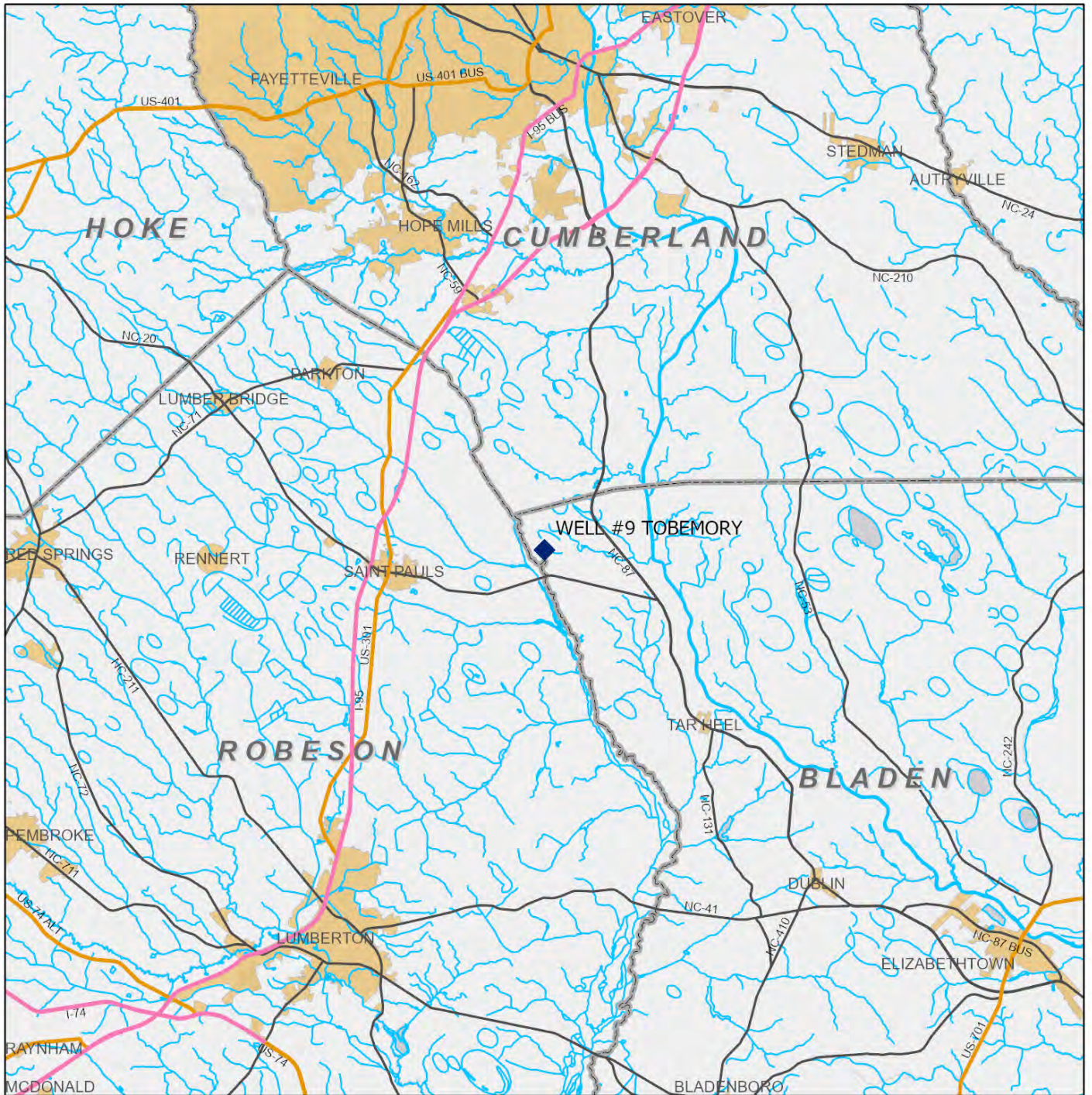
Figure 4. Land Surface Slope Rating

Figure 5. Land Use Rating

Figure 6. Land Cover Rating

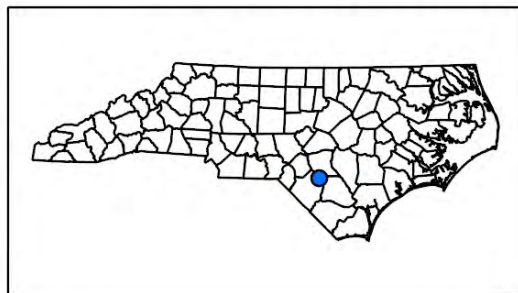
Figure 7. Ground Water Contribution Rating (only applicable to surface water sources)



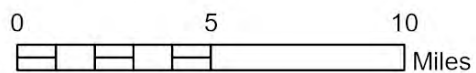


MAP 1. LOCATION MAP

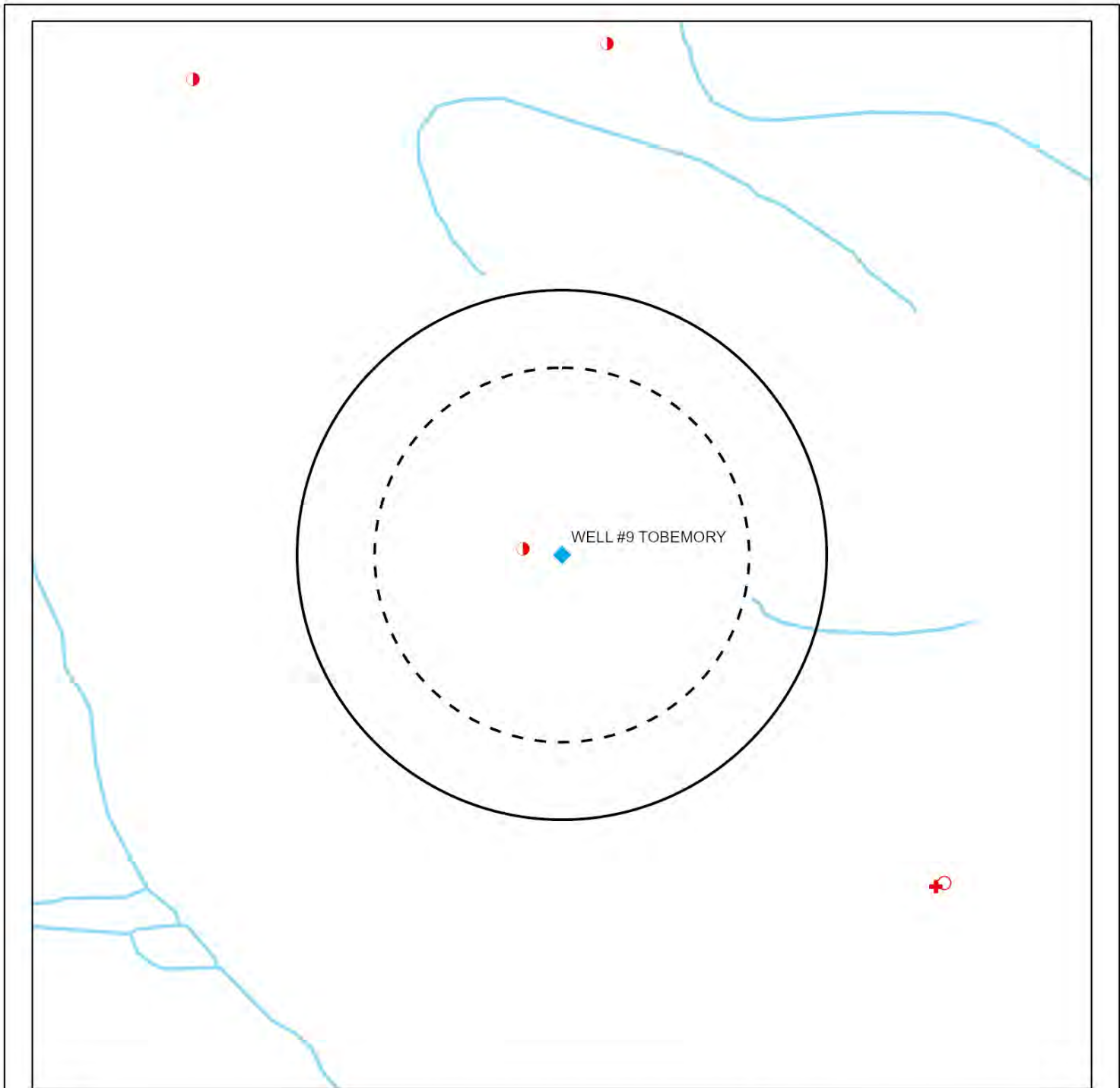
BLADEN CO WTR DIST-WEST BLADEN, PWS ID: 0309055, WELL #9 TOBEMORY



- |             |                      |
|-------------|----------------------|
| Major Roads | Major Hydrology      |
| Interstate  | Municipal Boundaries |
| US Route    | County Boundaries    |
| NC Route    | Rivers and Streams   |







### MAP 2. DELINEATED AREA AND PCS MAP

BLADEN CO WTR DIST-WEST BLADEN, PWS ID: 0309055, WELL #9 TOBEMORY



**PCS Types**

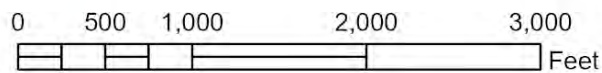
- Animal Operations
- CERCLA-Fed. Remediation
- Hazardous Waste Sites
- Inactive Hazardous Waste Sites
- Non Discharge Permits
- NPDES Permits
- PCB Sites
- Pollution Incidents

- Septage Disposal Sites
- Soil Remediation Sites
- Solid Waste Facilities
- Tier II Sites
- Old Landfill Sites
- UIC Permits
- UST Permits

**Major Roads**

- Interstate
- US Route
- NC Route
- Rivers and Streams
- Major Hydrology
- Municipal Boundaries

- Ground Water Assessment Area - Delineated Area
- Ground Water Assessment Area - Zone A





**Table 4. Potential Contaminant Source Attributes  
BLADEN CO WTR DIST-WEST BLADEN  
PWS ID: NC0309055, WELL #9 TOBEMORY**

PCS Name	PCS ID	PCS Type	PCS Risk Rating	Street Address	City	Zip	County
Tobermory Well	WQ0033325	Non-Discharge Permits	Moderate				Bladen

**Table 5. Inherent Vulnerability Rating  
BLADEN CO WTR DIST-WEST BLADEN  
PWS ID: NC0309055, WELL #9 TOBEMORY**

Ground Water Source Characteristics	Vulnerability
Aquifer Rating	Moderate
Unsaturated Zone Rating	Moderate
Well Integrity/Construction Rating	Higher

**Inherent Vulnerability Rating: Moderate**

**Table 6. Unsaturated Zone Rating Calculation  
BLADEN CO WTR DIST-WEST BLADEN  
PWS ID: NC0309055, WELL #9 TOBEMORY**

<b>Unsaturated Zone Score</b>	<b>59.7</b>
-------------------------------	-------------

**Notes:**

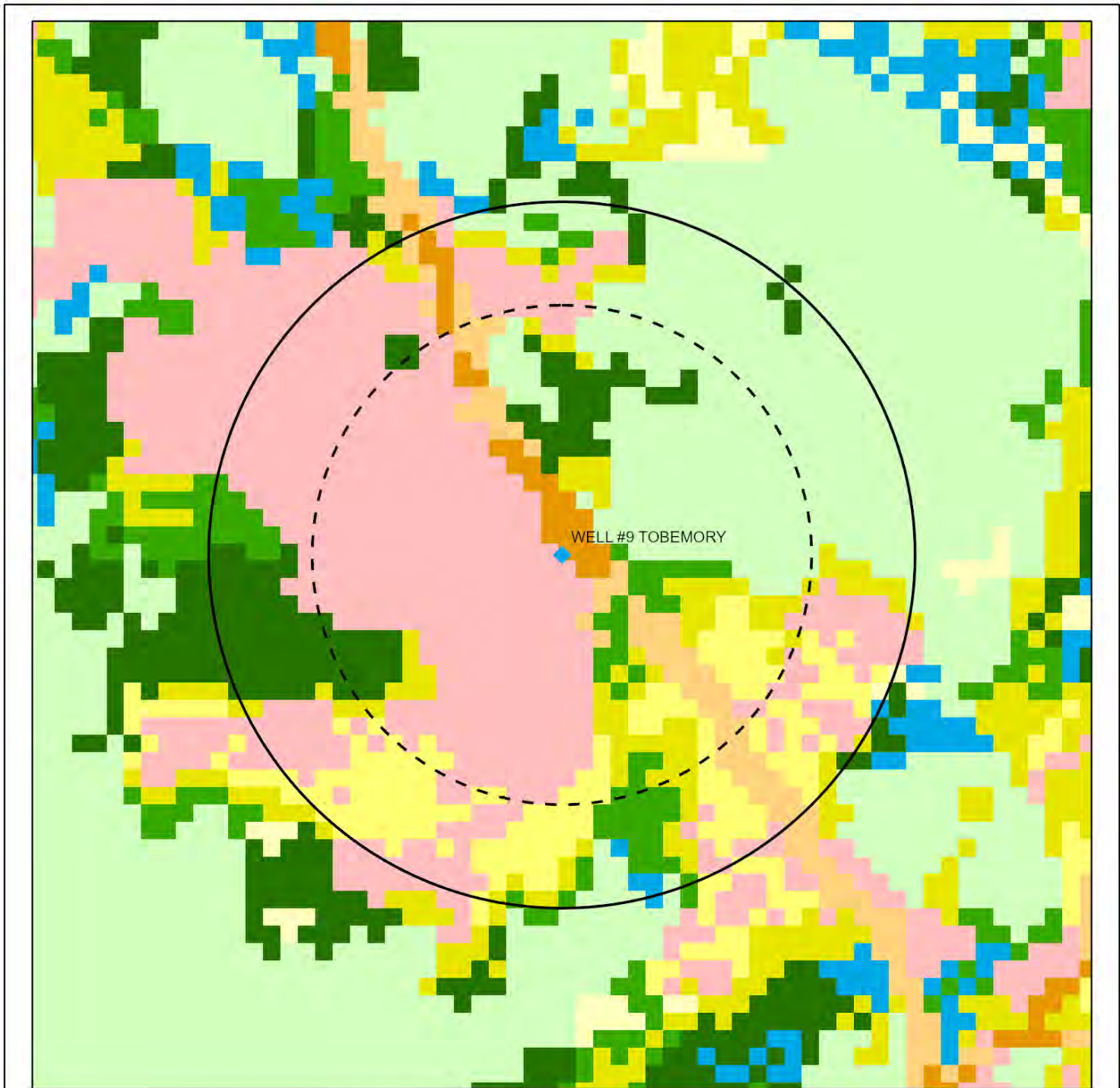
1. Unsaturated Zone Score for each cell (CS):

$$CS = [3 \times (\text{vertical hydraulic conductance score})] + [2 \times (\text{land surface slope score})] + [3 \times (\text{land use score})] + [2 \times (\text{land cover score})]$$

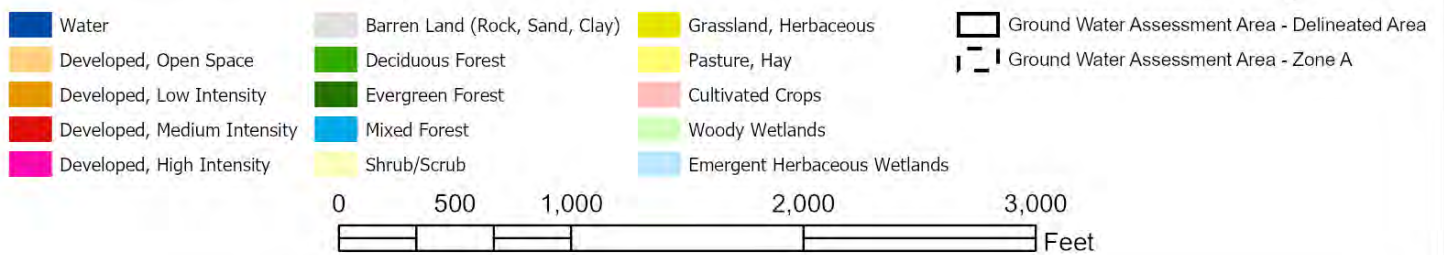
2. Unsaturated Zone Score (S) for the entire assessment area is the mean of the cell scores (CS) calculated as:

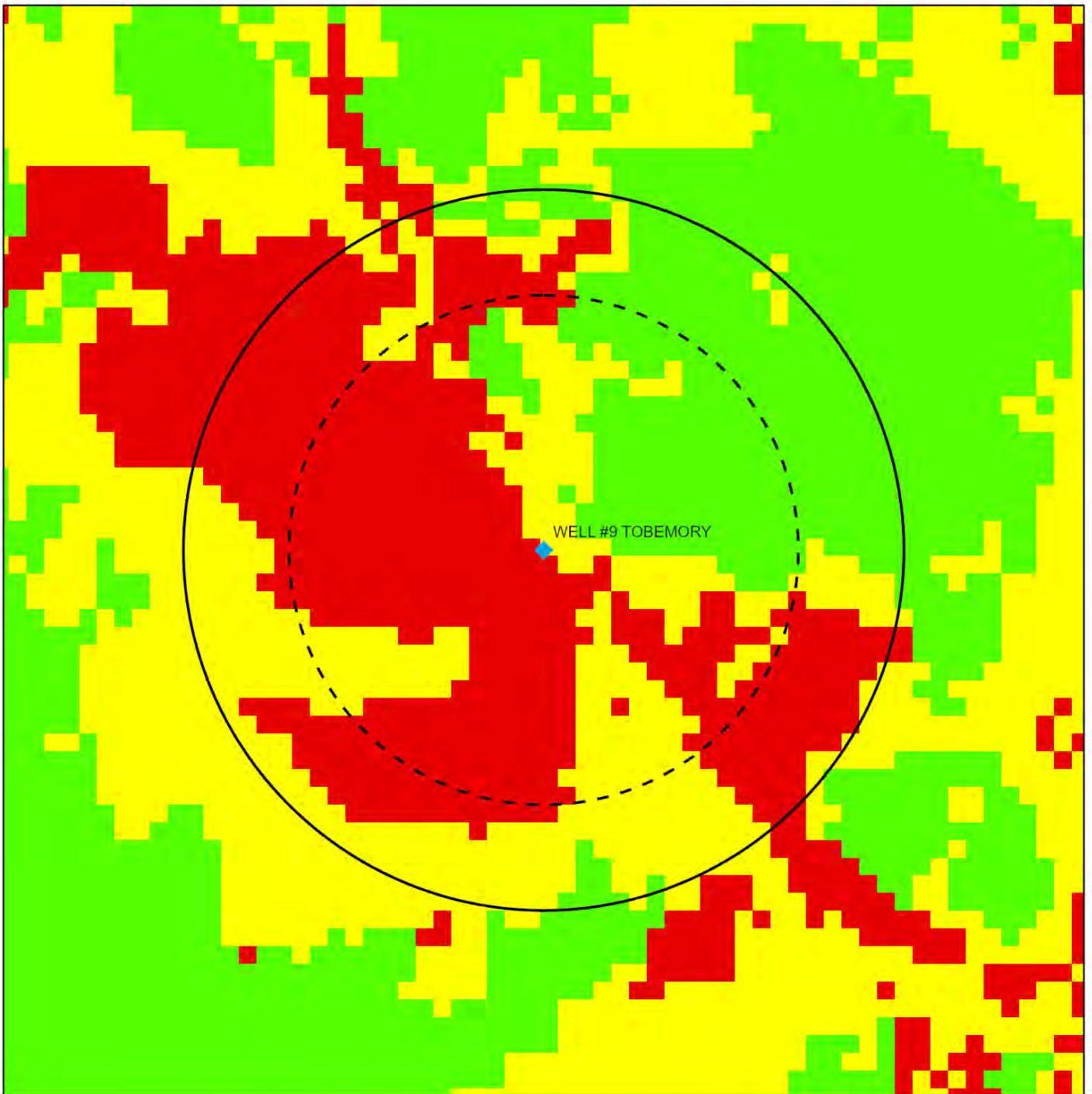
The sum of all cell unsaturated zone scores (CS) divided by the number of cells (N) within the assessment area:  $S = (\sum CS) / N$

3. The USGS publication "Methods of ranking unsaturated zone and watershed characteristics of public water supplies in North Carolina", by J. L. Eimers, J. C. Weaver, S. Terziotti, and R. W. Midgette, 1999, provides a detailed discussion of the methods used to determine unsaturated zone ratings.



**FIGURE 1. LAND USE/LAND COVER CATEGORIES**  
 BLADEN CO WTR DIST-WEST BLADEN, PWS ID: 0309055, WELL #9 TOBEMORY

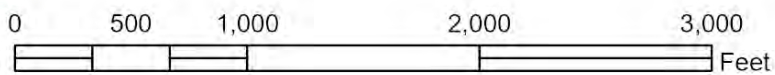




**FIGURE 2. UNSATURATED ZONE RATING**  
 BLADEN CO WTR DIST-WEST BLADEN, PWS ID: 0309055, WELL #9 TOBEMORY



- Lower  $\leq 50$
- Moderate  $> 50$  to  $65$
- Higher  $> 65$
- Ground Water Assessment Area - Delineated Area
- Ground Water Assessment Area - Zone A





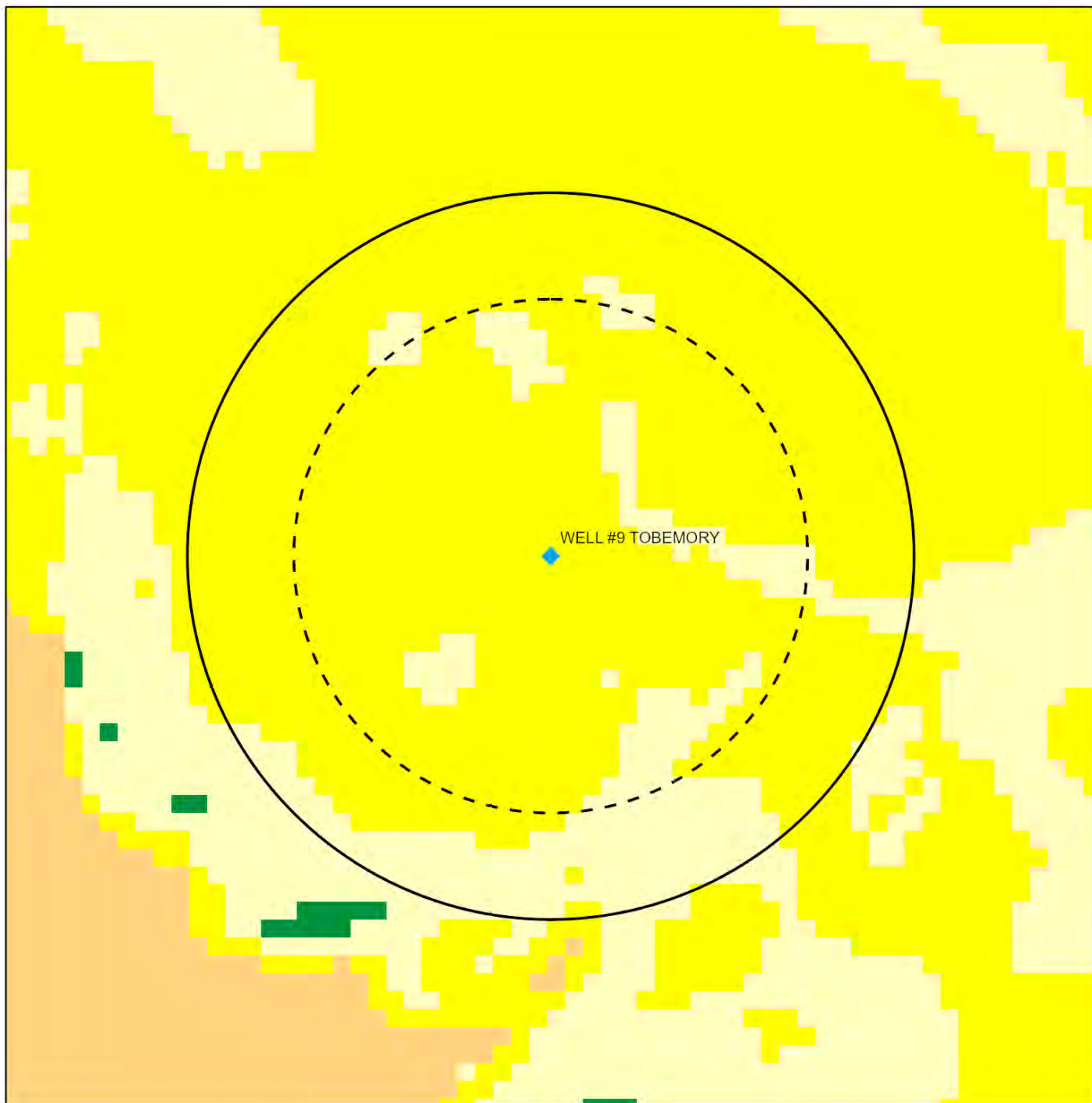
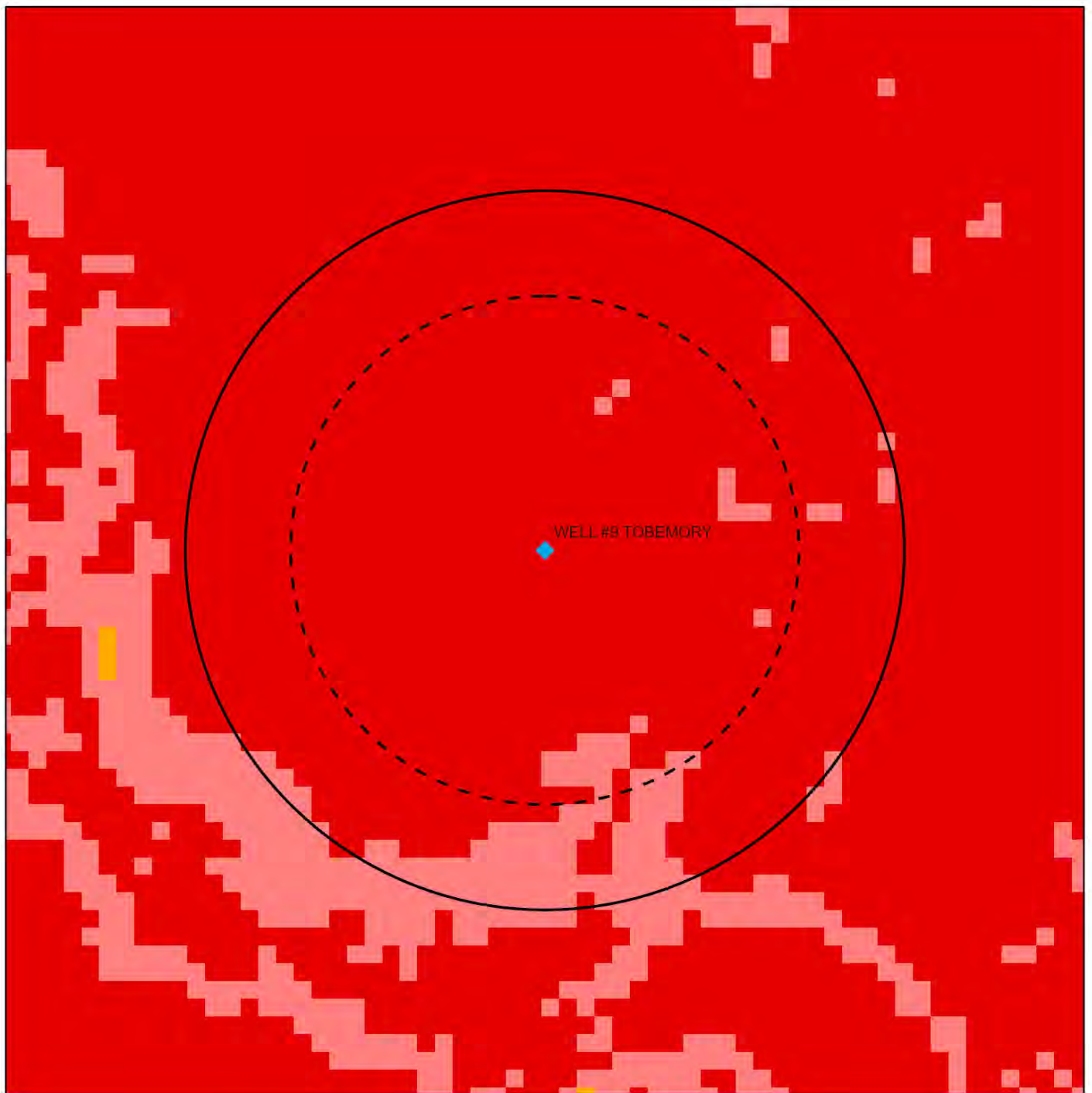


FIGURE 3. VERTICAL HYDRAULIC CONDUCTANCE RATING  
 BLADEN CO WTR DIST-WEST BLADEN, PWS ID: 0309055, WELL #9 TOBEMORY





**FIGURE 4. LAND SURFACE SLOPE RATING**  
 BLADEN CO WTR DIST-WEST BLADEN, PWS ID: 0309055, WELL #9 TOBEMORY



- |                        |                       |  |
|------------------------|-----------------------|--|
| 1 (> 50 percent)       | 7 (> 5 to 10 percent) | Ground Water Assessment Area - Delineated Area |
| 3 (> 20 to 50 percent) | 9 (> 2 to 5 percent)  | Ground Water Assessment Area - Zone A          |
| 5 (> 10 to 20 percent) | 10 (<= 2 percent)     |  |





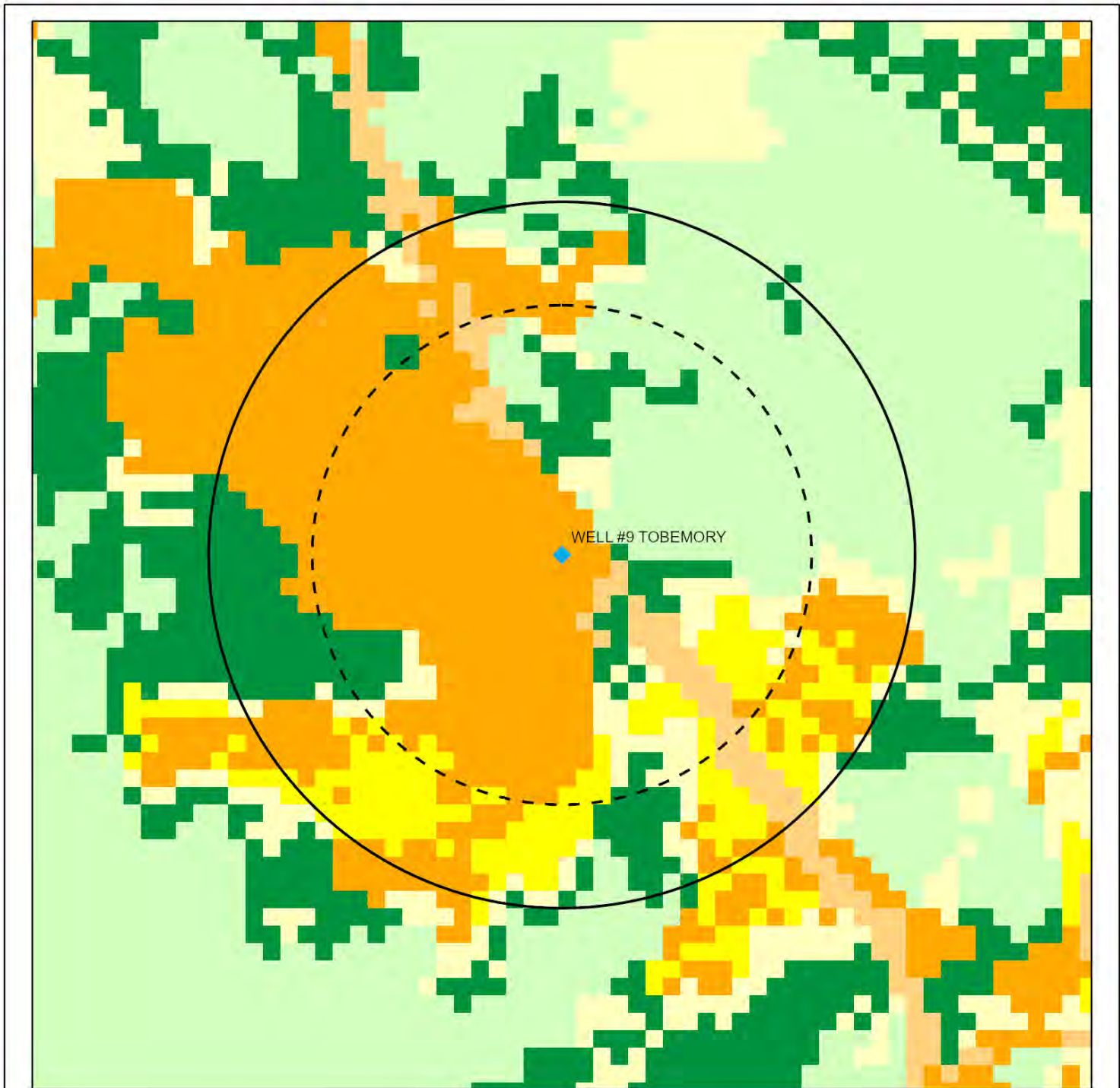
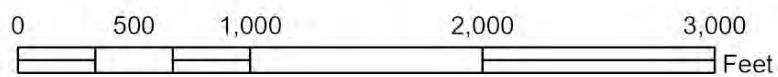


FIGURE 5. LAND USE RATING

BLADEN CO WTR DIST-WEST BLADEN, PWS ID: 0309055, WELL #9 TOBEMORY



- |   |   |   |
|---|---|---|
| <span style="color: #90EE90;">■</span> 1 Water, Wetlands (Woody and Herbaceous) | <span style="color: #FFFF00;">■</span> 5 Pasture/Hay                                | <span style="color: #FF0000;">■</span> 10 Developed, High Intensity   |
| <span style="color: #66CDAA;">■</span> 2 Barren Land (Rock/Sand/Clay)           | <span style="color: #FFDAB9;">■</span> 6 Developed, Open Space                      | <span style="border: 1px solid black; display: inline-block; width: 10px; height: 10px;"></span> Ground Water Assessment Area - Delineated Area |
| <span style="color: #008000;">■</span> 3 Forest (Deciduous, Evergreen, Mixed)   | <span style="color: #FF8C00;">■</span> 7 Developed, Low Intensity; Cultivated Crops | <span style="border: 1px dashed black; display: inline-block; width: 10px; height: 10px;"></span> Ground Water Assessment Area - Zone A         |
| <span style="color: #FFFF00;">■</span> 4 Grassland/Herbaceous; Shrub/Scrub      | <span style="color: #FFB6C1;">■</span> 8 Developed, Medium Intensity                |   |



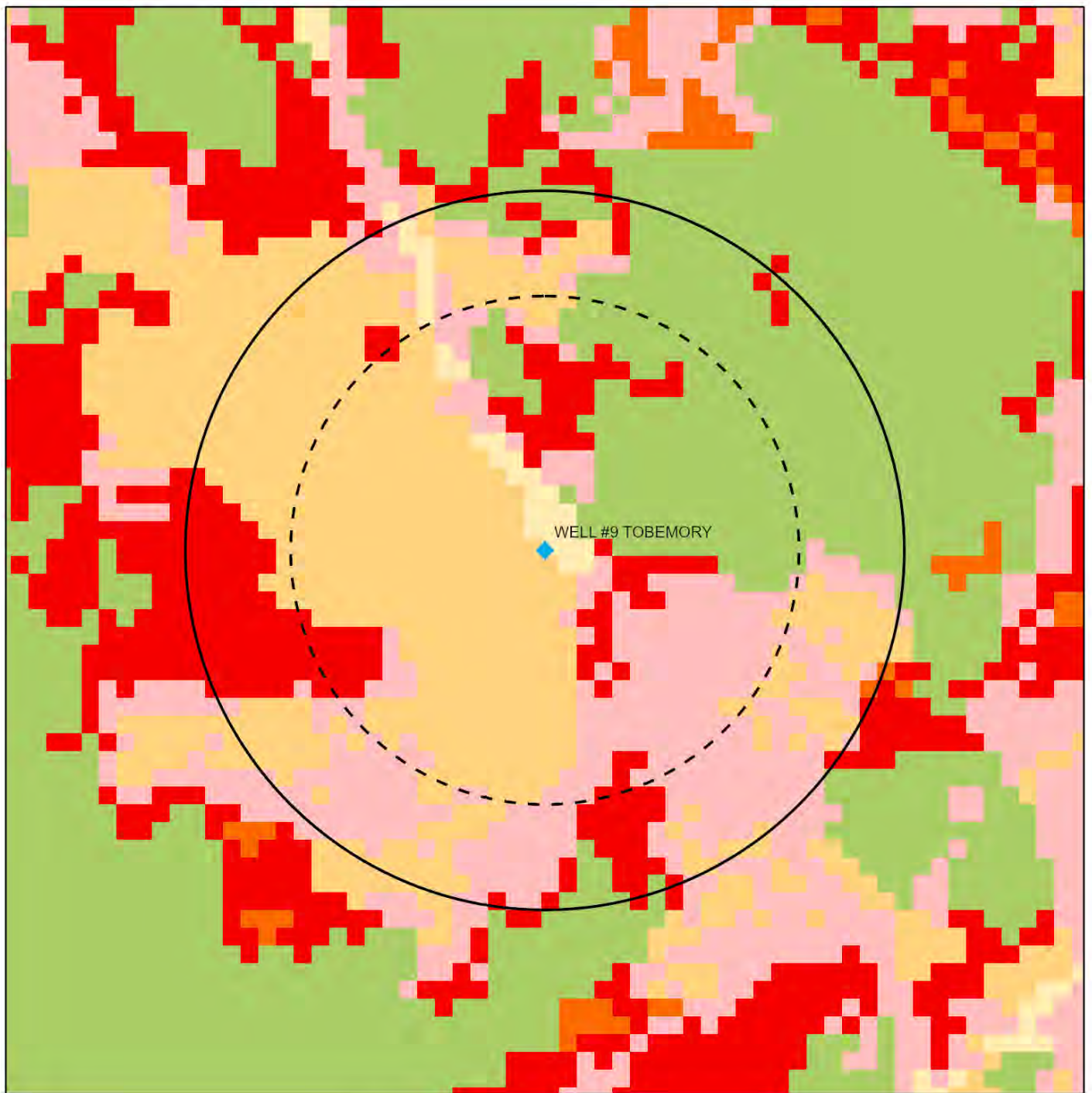


FIGURE 6. LAND COVER RATING

BLADEN CO WTR DIST-WEST BLADEN, PWS ID: 0309055, WELL #9 TOBEMORY



- |   |   |
|---|---|
| <span style="color: #90EE90;">■</span> 1 Developed, High Intensity                                | <span style="color: #FF8C00;">■</span> 9 Shrub/Scrub  |
| <span style="color: #3CB371;">■</span> 2 Water; Wetlands; Developed, Medium Intensity             | <span style="color: #FF0000;">■</span> 10 Deciduous, Evergreen and Mixed Forest   |
| <span style="color: #FFD700;">■</span> 4 Developed, Low Intensity                                 | <span style="border: 1px solid black; display: inline-block; width: 10px; height: 10px;"></span> Ground Water Assessment Area - Delineated Area |
| <span style="color: #FFA500;">■</span> 6 Barren Land (Rock, Sand, Clay); Cultivated Crops         | <span style="border: 1px dashed black; display: inline-block; width: 10px; height: 10px;"></span> Ground Water Assessment Area - Zone A         |
| <span style="color: #FFB6C1;">■</span> 8 Grassland/Herbaceous; Pasture/Hay; Developed, Open Space |   |







## **Appendix B**

### **2013 O&M Plan for Cumberland County Water System**



**OPERATION AND MAINTENANCE PLAN  
CUMBERLAND COUNTY WATER SYSTEM/  
WEST BLADEN PURCHASE SYSTEM**

**PWS I.D. NO.: 50-26-026**

**County Of Cumberland North Carolina  
130 Gillespie Street, Room 215  
Fayetteville, NC 28301**

**Cumberland County**

**Phone: 910-678-7637**

**Email: [ahall@co.cumberland.nc.us](mailto:ahall@co.cumberland.nc.us)**

**PREPARED BY:  
KOONCE, NOBLE AND ASSOCIATES, INC.  
CONSULTING ENGINEERS  
LUMBERTON, NORTH CAROLINA**

**MARCH, 2013**

**F-0103**



## CUMBERLAND COUNTY WATER SYSTEM

### Operation and Maintenance

Some problems associated with water supply systems can be alleviated if not corrected by observing proper procedures for operating and maintaining the system. Proper maintenance practices should be adhered to according to a pre-established schedule (Walski 1987b, AWWA 1987).

#### A. Frost Prevention

Severe winter conditions may warrant actions to prevent water from freezing and bursting pipes or other structures. The easiest short-term action is to keep water moving in problem pipes either by requesting that consumers run water or by bleeding water from pipes at crucial points in the system. Dead-end sections are most susceptible to freezing. Storage tanks, pump stations and meter vaults are susceptible to freezing and, therefore, are possible candidates for supplemental heating.

#### B. Leak Detection and Repair

Unless specific measures are taken to detect and repair leaks, a considerable amount of water can be lost through poor joints or cracked pipes. Leak detection techniques can uncover previously undetected leaks or pinpoint suspected ones. Most leak detection surveys use sonic equipment that allows operators to listen for the source of the leak. Experienced operators can accurately locate the leak and, in some instances, estimate the leakage rate. Leak detection surveys are often conducted by private firms that contract with the water utility, which often follows up on the survey and repairs the leaks. The cost of leak detection and repair usually is less than the value of water that would have been lost through unrepaired leaks over some reasonably short period of time (Moyer et al. 1983, Moyer 1985). Leak detection surveys can be one-time affairs or can be scheduled periodically. The value of leak detection is not realized unless the identified leaks are repaired. It is possible that extremely high leakage in one pipe segment might warrant replacement of the entire pipe segment instead of repair. Leak detection and repair will also help determine which geographic areas and types of pipe are more likely to leak. The degree to which this approach will alleviate water loss depends on the condition of the system. Leak repair might also contribute to a longer-lasting system. First, leaking water tends to erode soil surrounding and supporting a pipe. Continued leaking, therefore, might lead to a more costly break. Second, the increased soil moisture resulting from the leak can promote corrosion if stray direct current is present (because of its higher electric conductivity in wet soil). Repair may not eliminate the cause of leaks and future leakage may result. Poor joint material and corrosion (caused by direct current, bimetallic connections, poor soil, or corrosive water in unlined pipe) are possible causes

that need to be addressed to prevent recurrence of the leaks. Some leaks do not require repair but merely tightening or replacing fittings (Male, Noss and Moore 1985; Moyer et al. 1983; Brown and Caldwell 1984; Walski 1984b).

C. Meter Calibration

Master meters (connection to Bladen County) can over-register, thereby creating the appearance that more water is being used in the system than actually is. Calibration of the meter(s) will not save any water, but will contribute to better accounting practices, which in turn will lead to better operation of the existing system and better design of improvements. Master meter calibration should be a routine part of preventive maintenance. Consumer meters should also be tested and calibrated on a periodic basis. Consumer meters often tend to under-register as they age. This under-registration results in lost revenue (in cases where consumers are being billed) and an elevated assessment of unaccounted-for water. Meters can be checked on a periodic basis, and, in addition, failed meters can be identified by surveillance of billing records (Male, Noss and Moore 1985; AWWA 1986d).

D. Flushing

In some systems with turbidity problems, periodic flushing of the system will improve water quality by removing any settled material. This sediment can occasionally be resuspended and cause dirty water. Flushing assures that when the material is resuspended, it is removed from the lines. Periodic flushing is particularly useful where velocities are slow, such as in dead ends. Flushing eliminates symptoms but does not eliminate the underlying problem. When flushing in a complex grid, it is helpful to isolate individual lines to maximize velocities and hence the effectiveness of the flushing (California-Nevada AWWA 1981).

E. Valve Exercise

Regular exercising of valves is important for several reasons. First, it helps to ensure that the valves can be found and that they will operate when necessary. Second, valves may have been incorrectly left closed or partially closed, and periodic exercise will allow correct positioning. Third, valve exercise also serves as training, allowing personnel to find valves more quickly in an emergency. Records of valve exercising should be kept to determine the effectiveness of the program (e.g., number of valves found stuck), and to ensure that each valve is exercised within a reasonable time period. Valves do not need to be exercised every week but do need to be exercised every few years.

F. Control of Unauthorized Use

Utility personnel need to be on the alert for apparent theft of water. Meter readers, valve crews and construction inspectors all need to be on the alert for water theft.





## **Appendix C**

### **NC0309055 Well Treatment Process Summary**



<a href="#">County Map of NC</a>	<a href="#">Water System Search</a>	<a href="#">Public Water Supply Section Home Page</a>	
<b><a href="#">Water System Detail Information</a></b>			
Water System No.:	NC0309055	Federal Type:	C
Water System Name:	BLADEN CO WTR DIST-WEST BLADEN	Federal Source:	GW
Principal County Served:	BLADEN	System Status:	A
Principal City Served:	ELIZABETHTOWN	Activity Date:	11-01-1989

<b>Water System Facility</b>			
Facility ID No.	P09	Type:	TP - Treatment Plant
Facility Name	TREATMENT_PLT_WELL #9	Status/Reason	A
Water Type	GW	ACTIVITY_DATE	07-01-2007

<b>Sample Points</b>		
<b>Sample Point ID</b>	<b>Location Description</b>	<b>Type</b>
E09	WELL #9	EP

<b>Water System Facility Contacts</b>		
<b>Type</b>	<b>Contact</b>	<b>Communication</b>

<b>Facility Annual Operating Period(s)</b>			
<b>Effective Begin Date</b>	<b>Effective End Date</b>	<b>Start Month/Day</b>	<b>End Month/Day</b>

<b>Treatment Plant</b>	
<b>Treatment Plant Filter Type</b>	

<b>Treatment Plant Contact Time</b>				
<b>Status</b>	<b>Status Date</b>	<b>Contact Time (Minutes)</b>	<b>Disinfection Concentration (mg/L)</b>	<b>CT Value (mg.min/L)</b>

<b>Treatment Plant Disinfection Profiling Benchmark</b>							
<b>Giardia Status</b>	<b>Giardia Inact. Log</b>	<b>Giardia Inact.</b>	<b>Giardia Status Date</b>	<b>Virus Status</b>	<b>Virus Inact Log</b>	<b>Virus Inact</b>	<b>Virus Status Date</b>

Treatment Plant Analyte Removal					
Code	Analyte Name	Removal Credited	Removal Achieved	Removal/Inact. Required	Inactivation Needed

Treatment Plant BIN Determination		
Status	BIN	Status Date

Treatment Plant Filter Backwash Recycling Rule						
Schem Stat	Schem Rec	Schem Rev	Alt Ret Loc Req Stat	Alt Ret Loc Req Stat Dt	Corr Act Req Stat	Corr Act Req Stat Dt

Treatment Units								
Type	Name	Subtype	Cont. Dis.	Aerator Type	Sludge Rem. Type	Filter Media Type	Basin Count	Subunit Count
<u>GU - Generic Unit</u>	GENERIC UNIT						0	0
<b>Treatment Objective Process Associations</b>								
	<b>Primary</b>	<b>Obj. Code</b>	<b>Objective Name</b>		<b>Proc. Code</b>	<b>Process Name</b>		
		C	CORROSION CONTROL		741	PH ADJUSTMENT, POST		
		C	CORROSION CONTROL		445	INHIBITOR, ORTHOPHOSPHATE		
		D	DISINFECTION		423	HYPOCHLORINATION, PRE		
		D	DISINFECTION		421	HYPOCHLORINATION, POST		
		F	IRON REMOVAL		742	PH ADJUSTMENT, PRE		
		F	IRON REMOVAL		344	FILTRATION, PRESSURE SAND		
		O	ORGANICS REMOVAL		121	ACTIVATED CARBON, GRANULAR		

Treatment Plant Unit Process Flows				
Train ID	Sequence ID	Supply	Receive	Connection Type

WSF Indicators		
Type	Value	Date

## **Appendix D**

### **Hydrant Flow Test Reports**









PROJECT: Cumberland County Public Utilities  
Asset Management Plan

McGill Associates, P.A.  
5 Regional Circle, Suite A  
Pinehurst, North Carolina 28374  
Phone (910-295-3159) / Fax (910-295-3647)

## Hydrant Flow Test Report

Location Southpoint Neighborhood, Cumberland County, NC Date 4/10/2024  
Test made by Demi Watkins, Dean Byrd, Amy Hall Time 3:40 PM

Conditions	Sunny, 85 degrees		
Flow Hydrant		Residual Hydrant	
No.	<u>8634 Brightleaf</u>	No.	<u>8480 Brightleaf</u>
Location	<u>Place</u>	Location	<u>Place</u>
Size nozzle	<u>2 1/2 Steamer</u>	Static	<u>54</u> psi
Inlet type	<u></u>	Residual	<u>1</u> psi
Discharge coefficient	<u></u>	Elev. (Autocad)	<u>161</u>
Pitot Pressure	<u>1</u> psi	Residual Hydrant 2 (if applicable)	
GPM	<u>168</u>	No.	<u></u>
		Location	<u></u>
		Static	<u></u> psi
		Residual	<u></u> psi

Remarks Amy was at the Residual hydrant, Dean and Demi were at the Flow hydrant.

*Disclaimer: Hydrant test results indicated are for the single point in time that the test was conducted, and are subject to variation. A number of factors may affect test results which are specific to conditions during testing. These conditions include water system demand, water tank levels, booster pump station status, valve positions, etc.*



# Cumberland County Water and Sewer Asset Inventory and Assessment





# Asset Inventory & Assessment

## **History:**

- In 2021, Cumberland County was designated as “distressed” by the Local Government Commission and the State Water Infrastructure Authority.
- County staff began working to address required steps to be removed from distressed list
- In 2023, Cumberland County contracted with McGill to develop Asset Management Plans (AMP) for each of the existing utility districts.
- Cumberland County intended to adopt CIP’s for each of the utility districts in order to perform and adopt a System Development Fee study.
- McGill utilized NCDEQ AIA guidance and industry standards to **inventory** and **assess** the County’s one water distribution system and three wastewater collection systems.





# What is an Asset Management Plan?

It is a **WORKING** plan and includes 4 key components:

- An **Inventory** of system assets:  
WATER: water main, water valves, fire hydrants, interconnections  
SEWER: sewer line, manholes, lift stations
- A summary of **Asset Conditions**
- A **Capital Improvements Plan**
- An **Operations and Maintenance and Staffing Recommendations Plan**





# Summary of NORCRESS System Assets

- Year put into service: 2005
- Active Service Connections : 452 (394 residential, 87%)
- Performed smoke testing, manhole inspections, flow monitoring

## Sewer Mains – 138,200 feet (26.2 mi)

- PVC (97%) and Ductile Iron Pipe

## Sewer Manholes – 424

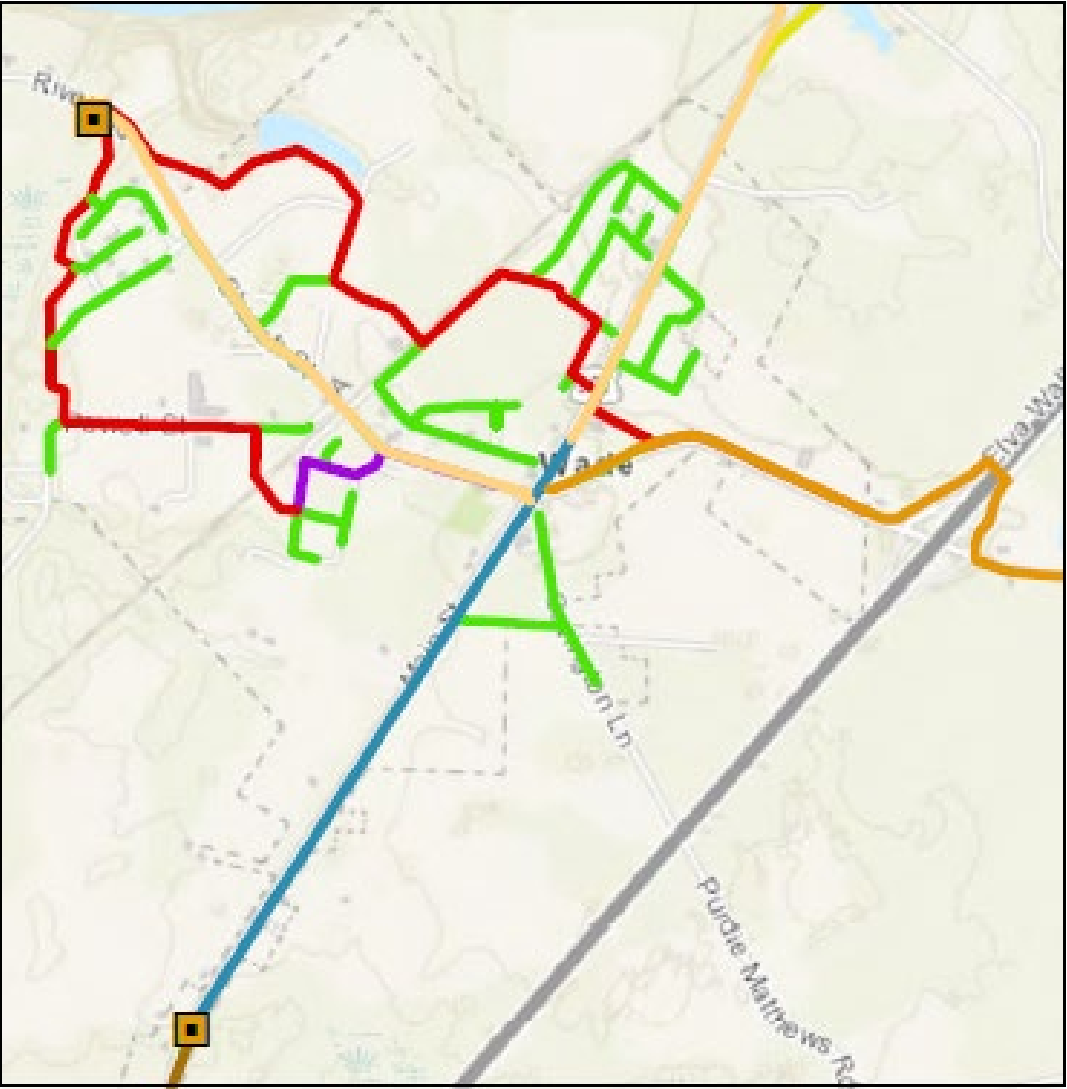
- All Precast Concrete Material
- Beginning to show some corrosion
- Generally good condition

## Lift Stations - 4

- Godwin LS, Falcon LS, Wade #1 LS, Wade #2 LS



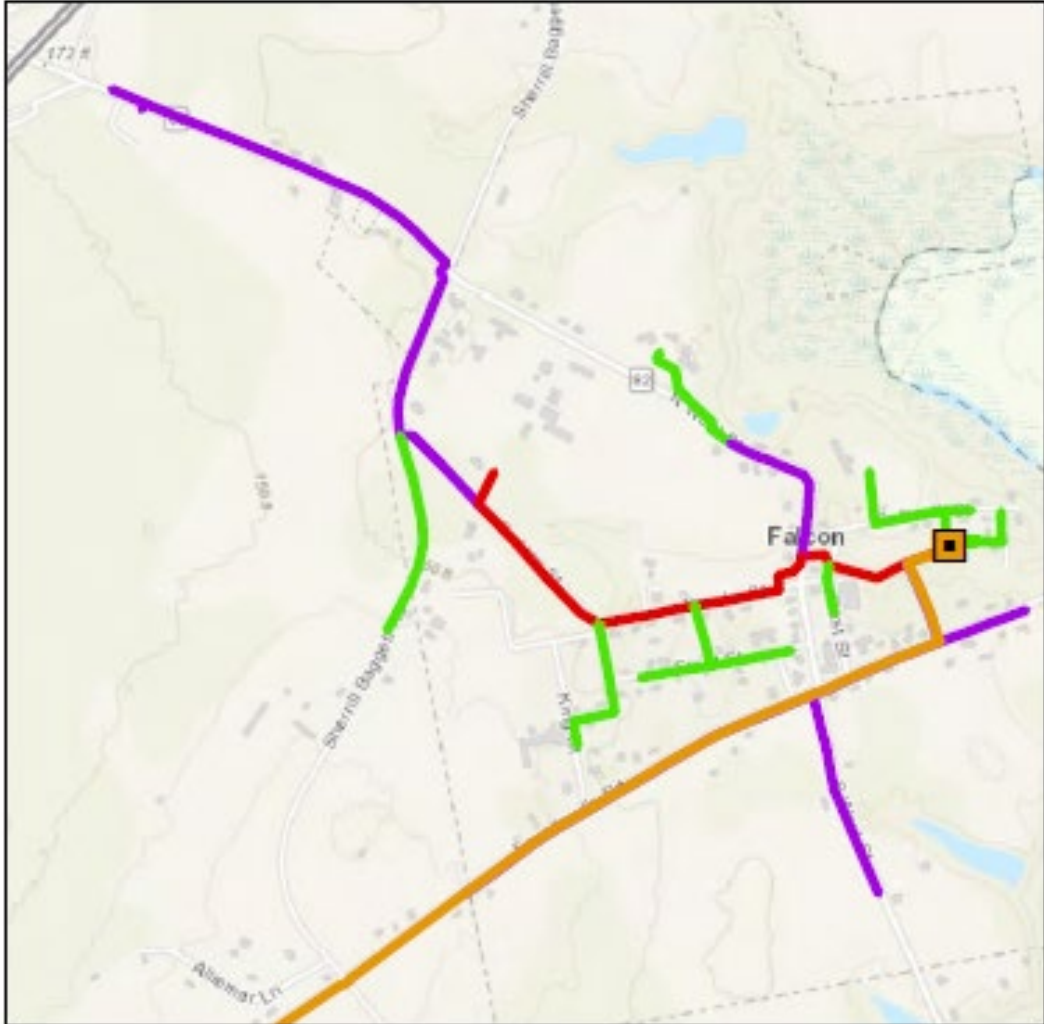
# Wade



# Godwin



# Falcon



**Legend**

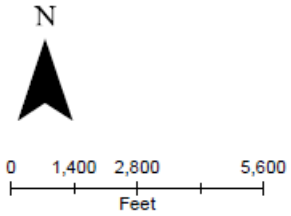
GRAVITY SEWER DIAMETER

- 8" (Green line)
- 10" (Purple line)
- 12" (Red line)
- 15" (Blue line)

FORCE MAIN DIAMETER

- 3" (Yellow line)
- 6" (Orange line)
- 8" (Dark Orange line)
- 10" (Brown line)

☐ Lift Station





# NORCRESS Sewer Capital Improvement Projects

No.	Project Name	Cost
1	New Generators – All Lift Stations	\$640,000.00
2	Upgrade SCADA	\$240,000
3	Flow Meter Project	\$203,900.00
4	Flow Monitoring Study	\$25,440.00
5	Falcon Force Main and ARV Project	\$80,000.00
6	Manhole Rehabilitation Project 1	\$118,600.00
7	Manhole Rehabilitation Project 2	\$118,600.00
8	Manhole Rehabilitation Project 3	\$118,600.00
9	Manhole Rehabilitation Project 4	\$118,600.00
	<b>10-Year CIP Total Project Cost</b>	<b>\$1,714,620.00</b>





# Summary of Kelly Hills System Assets

- Year put into service: 2005
- Active Service Connections: 102 (all residential)
- Performed Smoke testing, manhole inspections

## Sewer Mains – 23,540 feet (4.4 mi)

- PVC (84%) and Ductile Iron Pipe

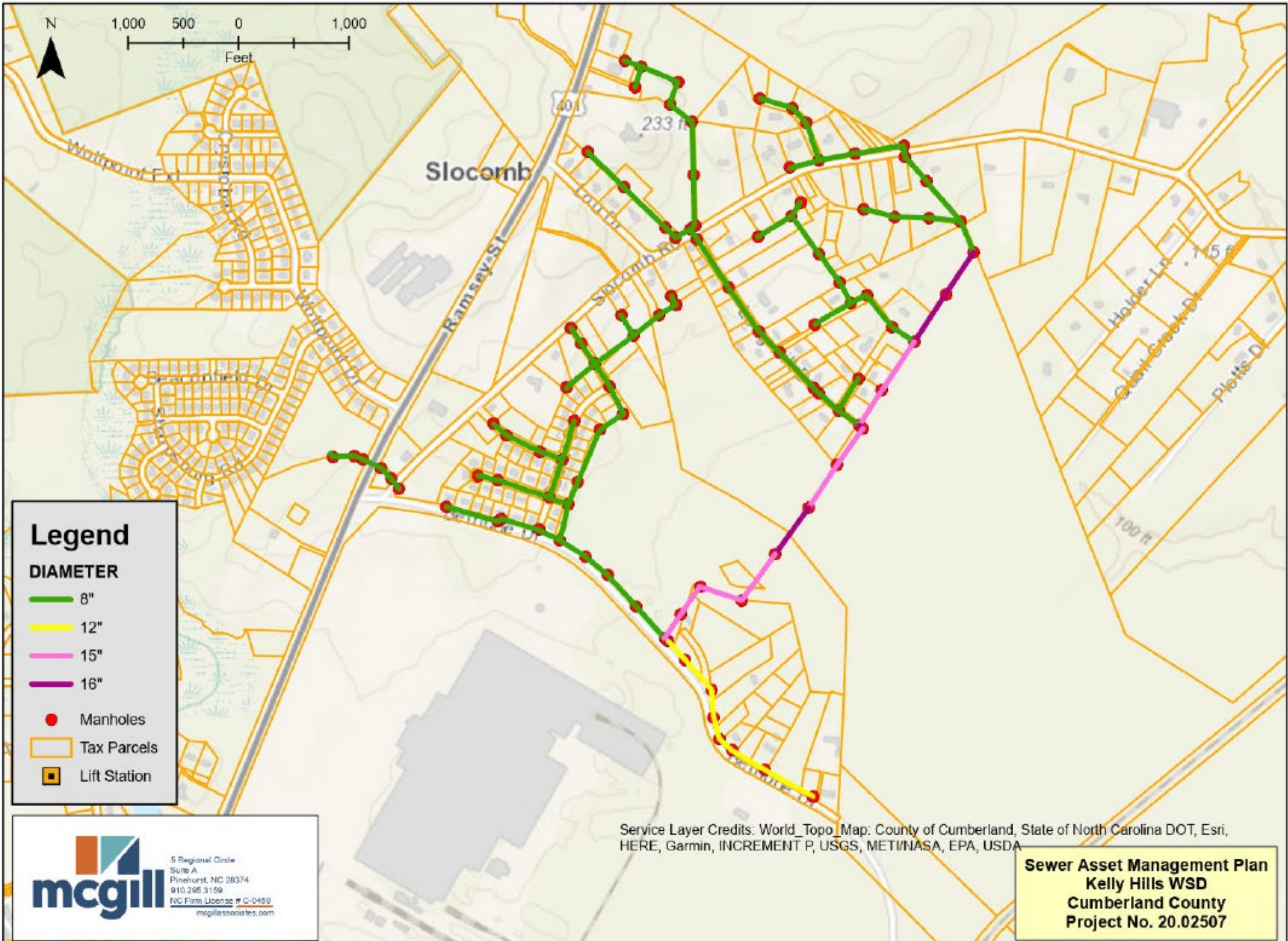
## Sewer Manholes – 100

- All Precast Concrete Material
- Beginning to show some corrosion
- Generally good condition

## Lift Station - 1

- Unobligated Capacity: 53,580 GPD (~230 res. conn.)









# Kelly Hills Sewer Capital Improvement Projects

No.	Project Name	Cost
1	Manhole Rehabilitation Project 1	\$81,000.00
2	Flow Monitoring Improvements	\$103,900.00
3	Manhole Rehabilitation Project 2	\$81,000.00
4	Manhole Rehabilitation Project 3	\$81,000.00
5	Manhole Rehabilitation Project 4	\$81,000.00
	<b>10-Year CIP Total Project Cost</b>	<b>\$427,900.00</b>



# Summary of Overhills System Assets

- Year put into service: 2019
- Active Service Connections: 107 (all residential)
- Performed Smoke testing, manhole inspections

## Sewer Mains – 17,420 feet

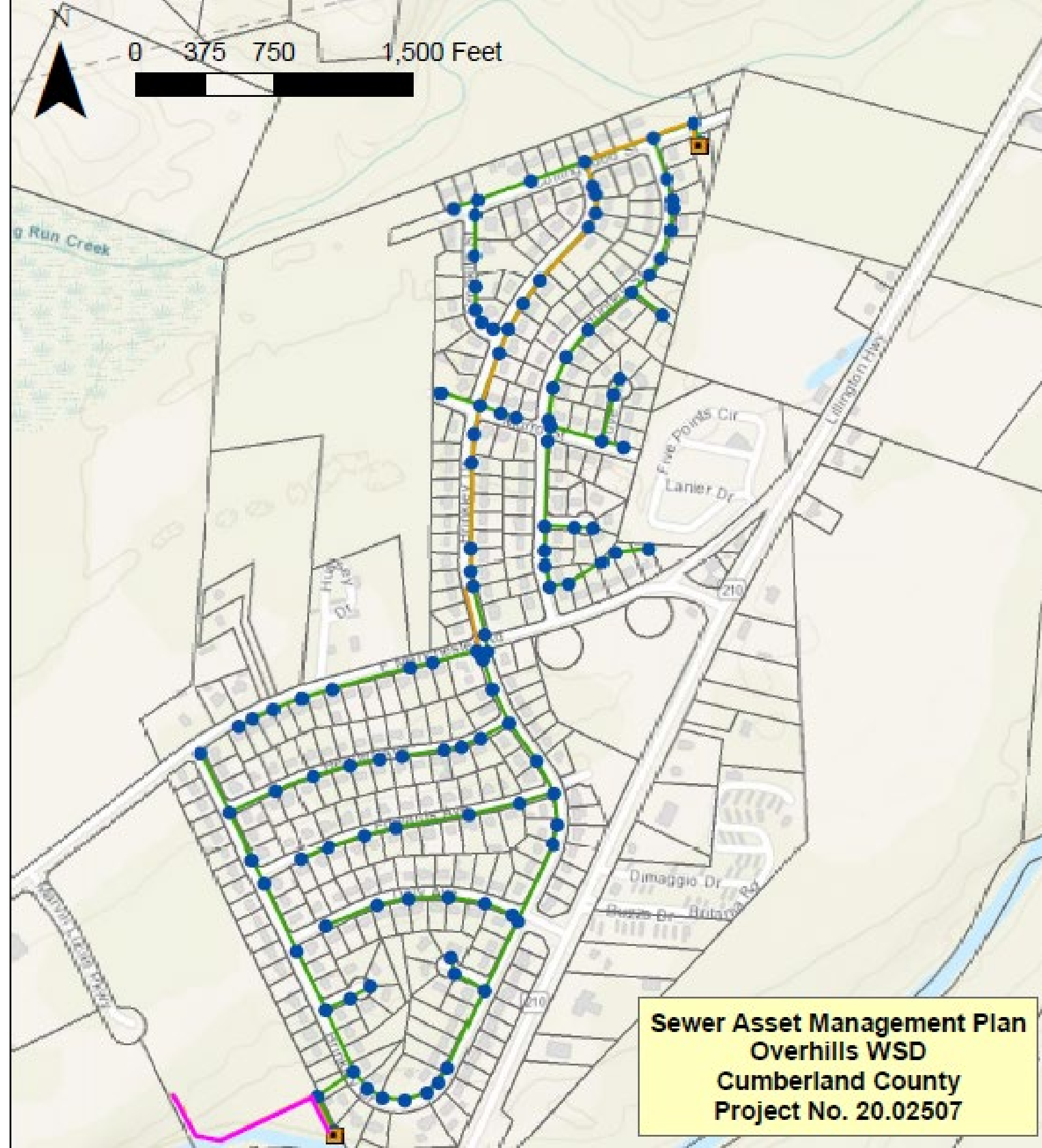
- All 8" PVC Pipe

## Sewer Manholes – 119

- All Precast Concrete Material

## Lift Stations - 2

- Collinswood LS, Brinkley LS
- FY 2025 Daily Flow Per Connection: 84 – 276 GPD



**Legend**

- Lift Station
- 6" PVC Forcemain
- Manhole
- 4" PVC Forcemain
- 8" PVC Gravity Sewer

**Sewer Asset Management Plan  
Overhills WSD  
Cumberland County  
Project No. 20.02507**



# Overhills Sewer Capital Improvement Projects

No.	Project Name	Cost
1	Brinkley Lift Station Improvements	\$33,100.00
2	Manhole Rehabilitation Project 1	\$84,100.00
3	Manhole Rehabilitation Project 2	\$84,100.00
4	Manhole Rehabilitation Project 3	\$84,100.00
	<b>10-Year CIP Total Project Cost</b>	<b>\$285,400.00</b>



# Summary of Southpoint Water Assets

- Year Put into service: 2013
- Active Service Connections: 84 (all residential)
- Flow testing performed, 55 psi average pressure

## Water Main – 16,900 feet

- Diameters: 12-inch, 8-inch, 6-inch, 2-inch

## Valves – 6

- Condition generally good

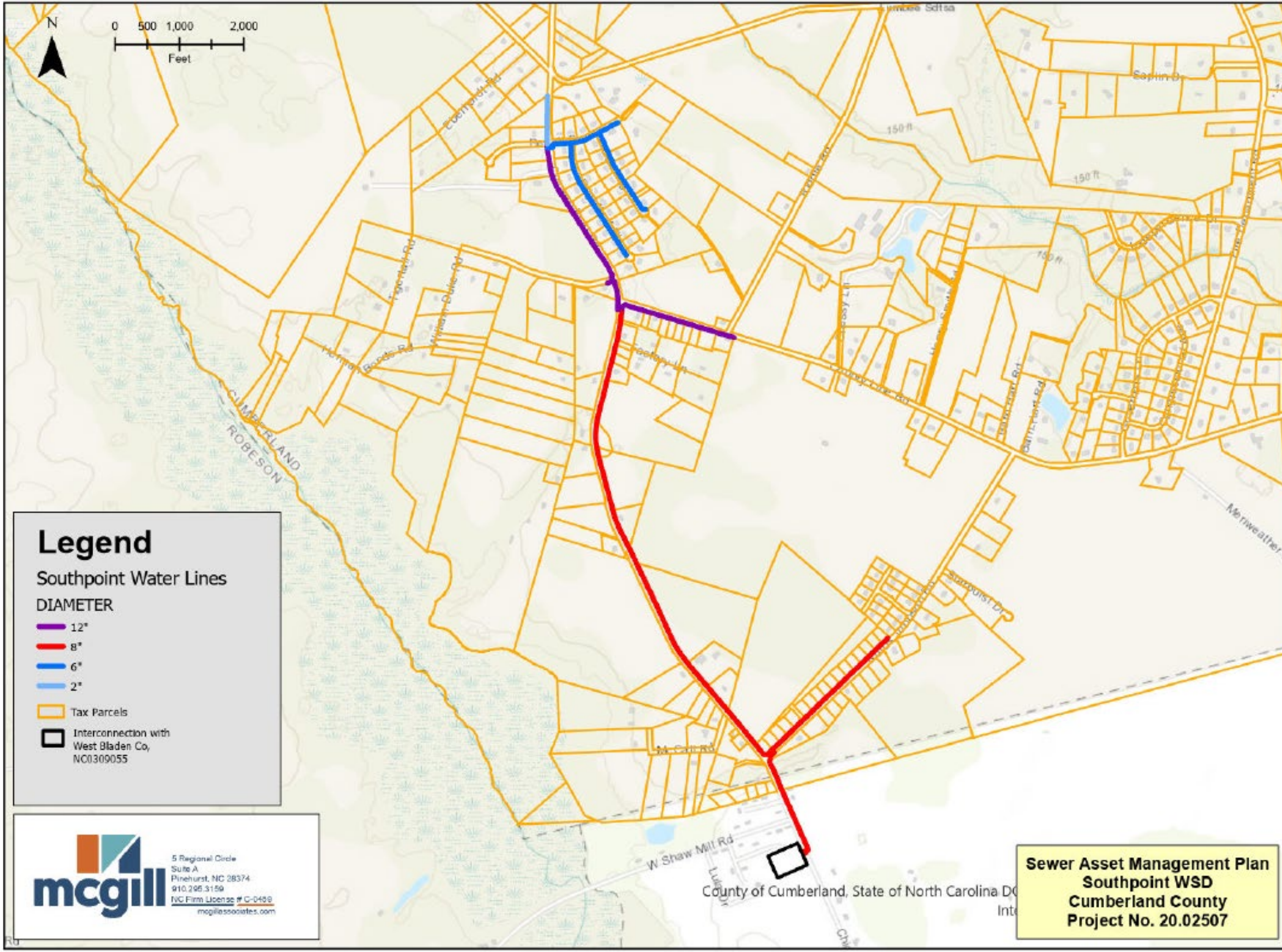
## Fire Hydrants– 12

- Condition generally good

## System Interconnection – Bladen County Water

- 45,000 GPD capacity
- 10,500 GPD average usage





### Legend

Southpoint Water Lines

DIAMETER

- 12"
- 8"
- 6"
- 2"

- Tax Parcels
- Interconnection with West Bladen Co, NC0309055

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I/C Firm License # C-0428  
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**Sewer Asset Management Plan  
Southpoint WSD  
Cumberland County  
Project No. 20.02507**

County of Cumberland, State of North Carolina





# Southpoint Water Capital Improvement Projects

No.	Project Name	Cost
1	Water Meter Replacement	\$71,300.00
2	Construction New Wells and Water Main	\$19,614,136.00
3	Ground Storage Tank and Filter	\$303,500.00
	<b>10-Year CIP Total Project Cost</b>	<b>\$19,988,936.00</b>



# Staffing Recommendations

- County is responsible for management of 3 Sewer Systems and 1 Water System
- Staffing analysis was performed based on typical staffing from EPA study
- EPA study utilizes population and pipe length to estimate staffing
- Table 19 shows calculated Full Time Equivalent (FTE) based on position type

**Table 19: Average Community System Statistics**

Employee Category	System Size (miles of Main)		Mean	Cumberland County
	Pop. 500-3300	Pop. 3300-10000		
	21	62	41.5	51.7
Manager FTE	0.6	1.1	0.85	1.06
per mile	0.029	0.018	0.020	0.020
Plant Operator FTE	0.6	1.3	0.95	1.03
per mile	0.029	0.021	0.023	0.023
Distribution FTE	0.8	2.5	1.65	2.06
per mile	0.038	0.040	0.040	0.040
Administrative FTE	0.6	1.5	1.05	1.31
per mile	0.029	0.024	0.025	0.025



# Staffing Recommendations

- Calculated FTE's were applied based on employee categories
- Wage information based on Zip Recruiter statistics and Benefits Multiplier from U.S. Bureau of Labor Statistics
- Provided for preliminary planning purposes only

**Table 20: Overall Salary Estimates**

Employee Category	Hourly Rate	Annual Salary	Ben. Mult.	Total	Applied FTE	Applied Budget Cost
Manager	\$38.50	\$80,080.00	1.38	\$110,510.40	1.06	\$117,000
Operator	\$24.52	\$51,001.60	1.38	\$70,382.21	1.03	\$72,700
Distribution	\$23.57	\$49,025.60	1.38	\$67,655.33	2.06	\$139,100
Administrative	\$21.33	\$44,366.40	1.38	\$61,225.63	1.31	\$80,100
<b>Total Applied Budget Cost Based FTEs</b>						<b>\$408,900</b>

Any questions?

Thank you!





Additional Information  
as needed



# System Development Fees

- Enacted in the North Carolina Public Water and Sewer System Development Fee Act approved in 2017 (House Bill 436)
- Enables public water and sewer utilities in North Carolina to assess system development fees for utility service to new development
- The SDF Act defines new development as:
  1. Subdivision of land
  2. Construction or structural change that increases service needs, or
  3. Any use of land which increases service needs
- SDFs serve as the mechanism by which “growth pays for growth”





# System Development Fees

- Fee calculation in a written analysis prepared by a financial professional or licensed engineer employing generally accepted accounting, engineering and planning methodologies
- The analysis must be posted on the County's website and provide a means by which public comments are received for 45 days
- Comments received must be considered by the preparer of the analysis for possible adjustments to the analysis
- A public hearing must be held prior to considering adoption



## **SOLID WASTE MANAGEMENT**

### **MEMORANDUM FOR BOARD OF COMMISSIONERS AGENDA OF SEPTEMBER 15, 2025**

**TO: BOARD OF COUNTY COMMISSIONERS**

**FROM: AMANDA LEE, PE, GENERAL MANAGER FOR NATURAL RESOURCES**

**DATE: 9/10/2025**

**SUBJECT: APPROVAL OF ASSET MANAGEMENT PLANS FOR THE WATER AND SEWER DISTRICTS**

#### **BACKGROUND**

The Public Utilities Department has been working with McGill Associates, PA, on Asset Management Plans (AMP) for the water and sewer districts owned by Cumberland County. These plans are needed to effectively manage the systems and budget for projects that support the utility needs of customers within each district. As part of the AMP studies a 10-year Capital Improvements Plan (CIP) is being included for each district in accordance with NC Department of Environmental Quality Division of Water Infrastructure Guidance. Projects will include focusing on operational and maintenance challenges and consideration to potential growth.

The suggested CIP was incorporated into the FY26 budget. The CIP for the Water and Sewer Enterprise funds can be found on page 77 of the Recommended Annual Budget for FY26. It should be noted that in the CIP Cost Summary for each AMP has a year one of FY26, and continues for ten years, whereas FY30+ is combined in the CIP Recommended Budget document. All amounts remain the same.

Matthew Jones, PE, with McGill Associates, presented an overview of the studies to the Infrastructure Committee on September 8, 2025. The Infrastructure Committee approved moving this item to the Consent Agenda of the September 15, 2025, Board of Commissioners' meeting, as well as to the Consent Agendas of the Kelly Hills Water and Sewer District Governing Board, the NORCRESS Water and Sewer District Governing Board, the Overhills Park Water and Sewer District Governing Board, and the Gray's Creek Water and Sewer District Governing Board.

#### **RECOMMENDATION / PROPOSED ACTION**

The Public Utilities Project Manager, General Manager for Natural Resources and Management recommend

the following proposed actions for the Board of Commissioners and the Kelly Hills Water and Sewer District Governing Board, the NORCRESS Water and Sewer District Governing Board, the Overhills Park Water and Sewer District Governing Board, and the Gray's Creek Water and Sewer District Governing Board:

Approve the Asset Management Plans (AMP), including the 10-year Capital Improvements Plans (CIP), for the Kelly Hills, NORCRESS, Overhills Park, and Gray's Creek Water and Sewer Districts.

**ATTACHMENTS:**

Description	Type
Kelly Hills Asset Management Plan	Backup Material
NORCRESS Asset Management Plan	Backup Material
Overhills Asset Management Plan	Backup Material
Southpoint Asset Management Plan	Backup Material
McGill Associates AMP Presentation	Backup Material

**SEWER ASSET MANAGEMENT PLAN**

**KELLY HILLS / SLOCOMB ROAD  
WATER AND SEWER DISTRICT**

**CUMBERLAND COUNTY, NC**



PINEHURST, NORTH CAROLINA

**SEWER ASSET MANAGEMENT PLAN**

**KELLY HILLS / SLOCOMB ROAD  
WATER AND SEWER DISTRICT**

**CUMBERLAND COUNTY, NC**

**MATTHEW JONES, PE**  
matthew.jones@mcgillassociates.com



5 Regional Circle, Suite A  
Pinehurst, NC 28374  
910.295.3159

**AUGUST 2025**

**PROJECT NO. 20.02507**

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- Appendix A – Manhole Inspection List**
- Appendix B – Smoke Testing Results List**
- Appendix C – Wastewater Collection System Permit**
- Appendix D – PWC Agreement**



## EXECUTIVE SUMMARY

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The purpose of this Asset Management Plan (AMP) is to document the condition of the Kelly Hills/Slocomb Road (Kelly Hills) Sewer District's infrastructure to assist the County with becoming more proactive in the management, operation and financing of its sewer collection system. The Kelly Hills Sewer District serves approximately 102 residential connections in the northern area of Cumberland County. There are 166 properties within the Kelly Hills District are not currently connected and are paying the sewer availability fee. The District's sewer collection system consists of approximately four and a half miles of gravity sewer and approximately 100 manholes. Collected wastewater is pumped from the Kelly Hills Lift Station, which is owned and operated by Fayetteville PWC, to the PWC collection system. Wastewater generated from the district is ultimately treated at the Cross Creek Water Reclamation Facility (NC0023957), which is also owned and operated by Fayetteville PWC.

This asset inventory and assessment consisted of assembling data on sewer pipe, manholes, and other appurtenances in the collection system. This assessment included performing inspections of selected manholes, performing smoke testing throughout the system, and reviewing existing data with County Staff. This information was evaluated and is summarized in this document which includes the asset management plan and capital improvements plan. This process resulted in the development of a 10-year Capital Improvements Plan (CIP) to guide the County with scheduling and financing the capital projects and equipment purchases necessary to maintain and improve its wastewater collection system. Through the AMP process, approximately 20% of the manholes and 25% of the cleanouts in the sewer collection system are in need of rehabilitation due to deterioration and fair condition.

The CIP includes a focused improvement to components within the sewer system that need rehabilitation or replacement based on existing condition, and on improvements that could improve management of the sewer system for staff. These planned projects will bring the County into a better position to serve its customers by improving the reliability

of the collection system. The County should look to its CIP to guide its next projects, and the CIP should be updated regularly as priorities change and as projects are completed. It is noted that many factors may impact the priorities including failures, and funding availability both local and through grant and loan programs. This assessment project provides evidence for the prioritization of manhole rehabilitation and improvement projects in the CIP.

### ***System Evaluation***

All of the pipe material in the Kelly Hills sewer system is PVC pipe. The collection system was first put into service in 2005, therefore the relative age of the system is low. PVC pipe is the most common material used for sewer systems today. The typical useful life for PVC pipe is anywhere from 40 to 60 years.

As part of the AMP, McGill Associates, PA (McGill) assisted the County with evaluating the condition of its sewer infrastructure to identify projects in line with these goals. The following items were included in the AMP scope:

- Identify areas to conduct smoke testing to identify potential sources of I/I into the sewer system;
- Analyze the Kelly Hills lift station, based on County-provided data
- Inspect selected sewer manholes within the system to establish overall system condition;
- Identify and evaluate potential sewer system improvements;
- Prioritize sewer system improvements;
- Prepare opinions of probable costs for sewer system improvements; and
- Create a Capital Improvements Plan.

### **Manhole Inspections**

All manholes in the Kelly Hills sewer system are precast concrete based on information provided by County staff. The results of the selected manhole inspections performed as a part of this inventory were used to develop an assessment of manhole conditions in the

system. Based on the inspections performed, manholes that were inspected were assigned a condition rating – excellent, good, fair, or poor. Of the ten manholes they were all in good to fair condition. The remaining 90 are noted as unknown condition, but the manholes inspected are believed to be representative of the system based on input from County staff. These results are recorded in Figure 5 and included in Appendix A.

### Lift Station Inspection

The Lift Station serving the Kelly Hills District is owned and operated by Fayetteville PWC, therefore inspection of the station was not included as a part of this assessment. The Lift Station is located at 355 Bethune Drive. Analysis of flow data and customer usage was performed and is included in this report.

### Findings and Recommendations

The system evaluation allowed McGill to assemble a list of general recommendations and high priority projects to guide the County in the next 10 years. General recommendations to the District included establishing its own flow monitoring and smoke testing programs in high priority areas to determine sewer rehabilitation needs and inspecting sewer lines and manholes with CCTV equipment during routine cleanings to track the condition of these items. McGill also recommended the County begin rehabilitation and/or replacement of existing manholes within the collection system in order to reduce the risk of I/I.

Data and field investigation reporting were utilized to identify the priority projects within the collection system, focusing on manhole rehabilitation.

Table 1 summarizes projects identified during this assessment, centering around manhole rehabilitation projects. A project to install flow monitors is included to give greater control and understanding of flows from the collection system.

**Table 1: Summary of Capital Improvements Projects**

No.	Project Name	Cost
1	Manhole Rehabilitation Project 1	\$81,000.00
2	Flow Monitoring Improvements	\$103,900.00
3	Manhole Rehabilitation Project 2	\$81,000.00
4	Manhole Rehabilitation Project 3	\$81,000.00
5	Manhole Rehabilitation Project 4	\$81,000.00
<b>10-Year CIP Total Project Cost</b>		<b>\$427,900.00</b>

***Capital Improvements Plan***

The purpose of this asset inventory and assessment was to document the condition of the District’s inventoried infrastructure to assist the County with becoming proactive in the management of its wastewater system, to include capital project planning. The County does not currently have a Capital Improvements Plan (CIP) for its wastewater system. The CIP being developed from this current assessment will guide the County through its planning for projects within the 10-year window. The CIP will remain a living document and be updated in the future so that it remains current to the Districts’ highest priorities and provides accurate cost estimates. The CIP included in this assessment includes projects focused on rehabilitation of existing manholes, which have been identified to be potential sources for I/I into the system. Through discussion with County staff, field investigation and review of existing system data, the specific defects and general problematic areas within the wastewater system have been summarized. These results were used to develop the CIP and formulate a 10-year plan.

The complete asset inventory and assessment task consisted of multiple field work and analysis components, culminating in the development of the Kelly Hills/Slocomb Road Water and Sewer District’s CIP. McGill developed cost estimates for all projects based on current 2024 materials and construction costs. The updated CIP is intended to be adopted by the County to guide its selection of sewer system improvement projects over the next decade. This plan also includes a budget-level recommendation for staffing associated with system operations and maintenance for all County utility districts.

### 1.1 BACKGROUND

The Kelly Hills/Slocomb Road Water and Sewer District is located in Cumberland County, North Carolina, and is owned and operated by Cumberland County. The District includes a wastewater collection system that currently serves 102 residential customers as of August 2025. The collection system consists of approximately four and a half miles of gravity sewer mains that are 8-inch, 12-inch, 15-inch, and 16-inch in diameter. These gravity sewer mains are constructed of PVC and Ductile Iron pipe. The system was put into service in 2005. Figure 1 shows the existing sewer collection system.

Developing a Capital Improvements Plan (CIP) will allow the District to update its current rate setting model to better estimate future revenue and expenses, capital outlay, indebtedness, and overall health of the sewer system enterprise fund reserves. A model of this nature would continue to balance revenues and expenditures with a longer-term approach to rate setting and establish a financially sound framework for the District to follow.

The District has experienced the degradation of manholes within its sewer collection system due to the age of the system and resulting from wear over time.

Even with the relatively young age of the Kelly Hills system, County staff remains cognizant that infiltration and inflow (I/I) is always a concern, particularly in a scenario where the County's operation costs are based on the gallons of flow that enter into the existing lift station. Therefore, the top challenges for the Kelly Hills sewer system are mitigating I/I that results from deteriorated infrastructure and collecting reliable data on existing sewer flows for operations and maintenance planning. The information collected through this assessment project will help identify system deficiencies and develop improvement projects to reach these goals.

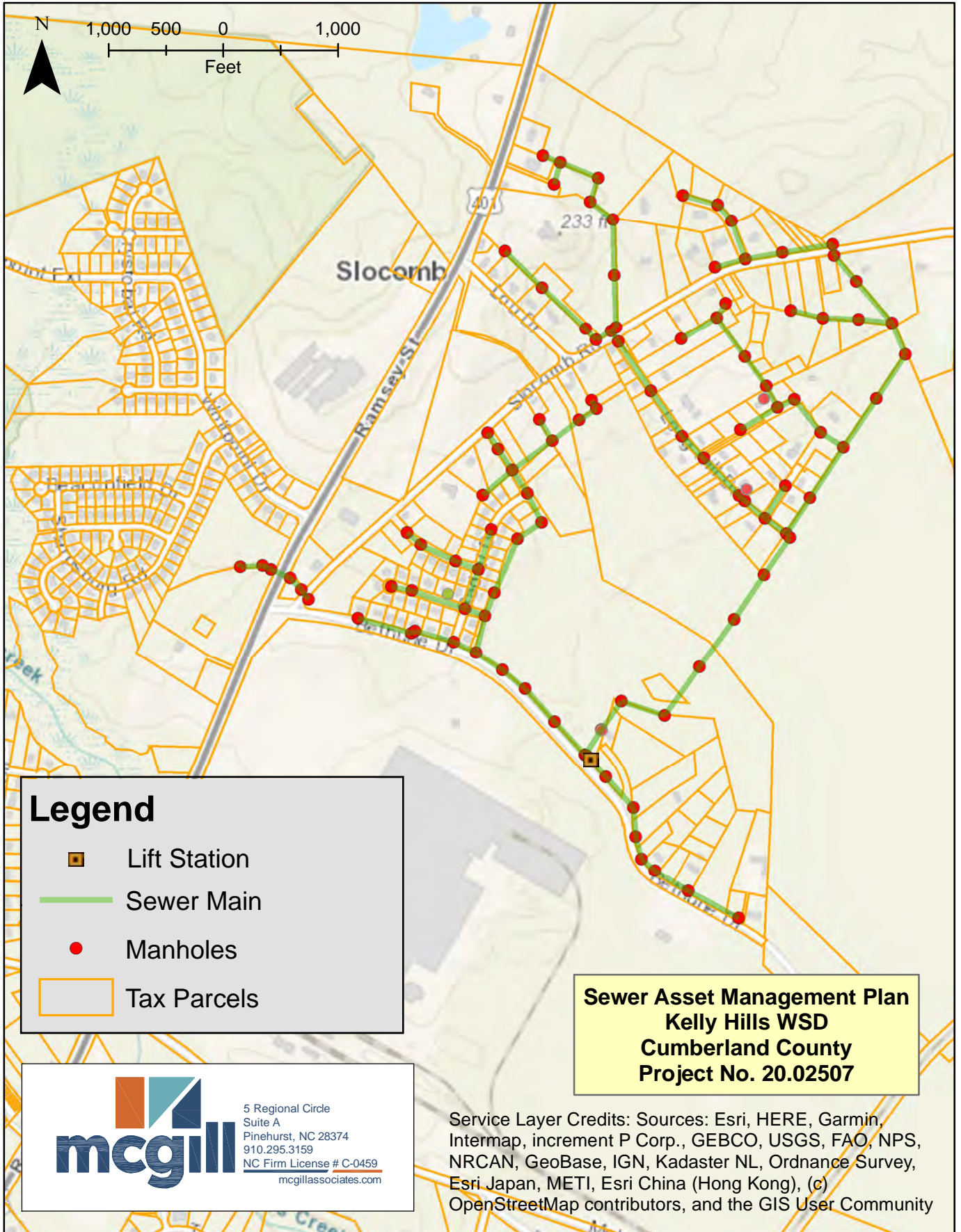
This process resulted in the development of a 10-year Capital Improvements Plan (CIP) to guide the District with scheduling and financing the capital projects and equipment purchases necessary to restore its wastewater collection system. Through the AMP process, the McGill and County staff have identified approximately multiple that require rehabilitation or replacement due to their poor condition.

The purpose of this Asset Management Plan (AMP) is to document the condition of the Districts' inventoried infrastructure to assist the District with becoming more viable and proactive in the management and financing of its wastewater system. The District continues to look to its CIP to guide its next projects; therefore, it is vital that the CIP remains current to the Districts' highest priorities and provides accurate cost estimates. This assessment project was utilized for the prioritization of replacement of lines and improvement projects in the CIP.



# Kelly Hills Overall System Map

## Figure 1





**2.1 SMOKE TESTING****2.1.1 Overview**

Smoke testing is one of the most cost-effective ways to locate defects in sewer mains and laterals. In this process, artificially produced non-harmful smoke is injected into the sewer line via a blower placed over a selected manhole. The pressurized smoke travels up and down the sewer line and connections and emerges at openings in the system. This visual aide allows test crews to easily identify, record, and mark locations where defects are present. If the sewer is in good condition, one should only see smoke rising from manhole lids and house roof vents. If the line has defects, such as breaks or illegal connections, the smoke will emerge at these points.

**2.1.2 Investigation**

McGill met with County staff to identify areas that would benefit most from smoke testing. Based on the size of the Kelly Hills District, it was determined that the entire system could be smoke tested. McGill prepared a detailed map of the area based on the County's GIS database. The Fire Department and customers along the route were alerted to the upcoming testing.

### **2.1.3 Methodology**

McGill and County staff smoke tested all four and a half miles of gravity sewer lines over a period of two days to determine locations where I/I enter the wastewater collection system. For each line to be tested, County staff recommended a centrally located manhole on which to place the blower based on the manhole's accessibility and avoidance of traffic. The manhole nomenclature used by the County was utilized and the location, configuration and condition of each one was recorded.

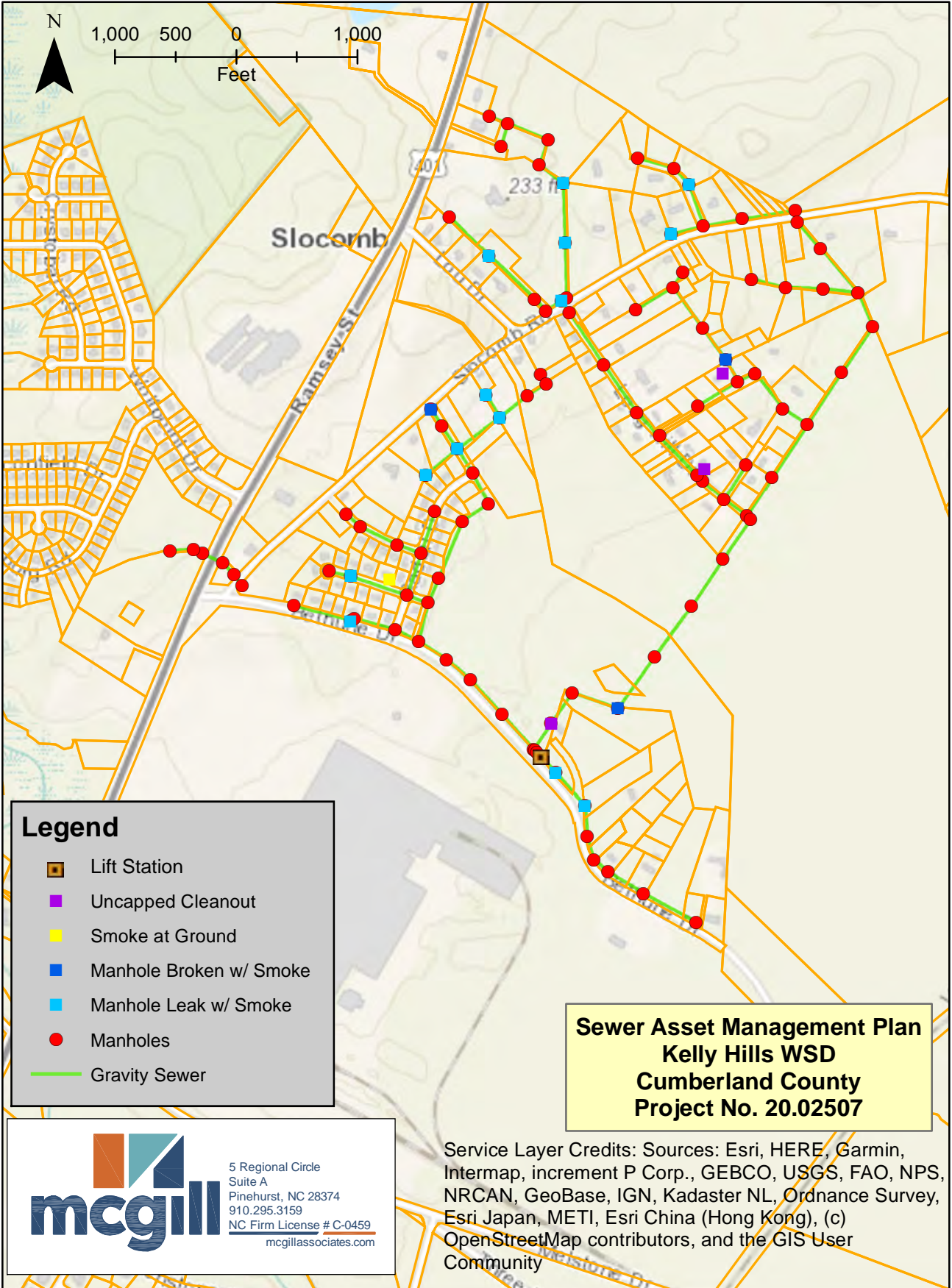
At each location, the following procedure was executed.


1. Place the blower on the manhole (with the rubber seal, if necessary).
2. Fill smoke pump up to  $\frac{3}{4}$  with liquid smoke.
3. Close all smoke pump valves.
4. Start blower and allow to warm up.
5. Open smoke pump valves.
6. Pressurize smoke pump by pumping the canister manually.
7. Once smoke begins emerging from roof vents, begin surveying for smoke emergencies indicating defects or problem areas in the pipeline.
8. For each defect, record the opening type, address, manhole identifier, and notes.
9. Additionally, mark each defect with paint.

This process continued until all visible defects were marked and recorded. Figure 2 shows some problematic system openings.

# Kelly Hills Smoke Testing Map

## Figure 2



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Pinehurst, NC 28374  
910.295.3159  
NC Firm License # C-0459  
mcgillassociates.com

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

## **2.2.4 Results**

The crew recorded 54 abnormal smoke outlets, which divided generally into four categories.

1. **Uncapped cleanouts:** Several cleanout caps were missing or broken. The cumulative number of broken cleanouts in the District can contribute significant I/I. County staff had repair caps on hand during the testing and were able to install new caps where needed.
2. **Broken Cleanouts:** Ground smoke was detected adjacent to the cleanout, which appeared to be damaged or below grade. Replacement of the cleanout assembly will be needed.
3. **Ground Smoke:** Ground smoke can be the result of broken lines, joint separation, etc. Any of these problems can cause significant I/I.
4. **Unsealed manholes:** Some manholes emitted excess smoke indicating cracked concrete or offset rings. Manholes located in ditches are most likely to contribute I/I.

A spreadsheet describing all smoke occurrences can be found in Appendix A and all locations were documented in the mapping information in ArcGIS for the County staff's use.

## **2.2 SEWER MAINS**

### **2.2.1 Overview**

Kelly Hills/Slocomb road sewer mains consist of polyvinyl chloride (PVC) pipe. The District's existing sewer lines range from 8-16-inches in diameter. The age of the system and system materials were confirmed by the County based records from construction of the system in 2005. Condition was determined based on visual inspection of select manholes and smoke testing of the system.

### **2.2.2 Investigation**

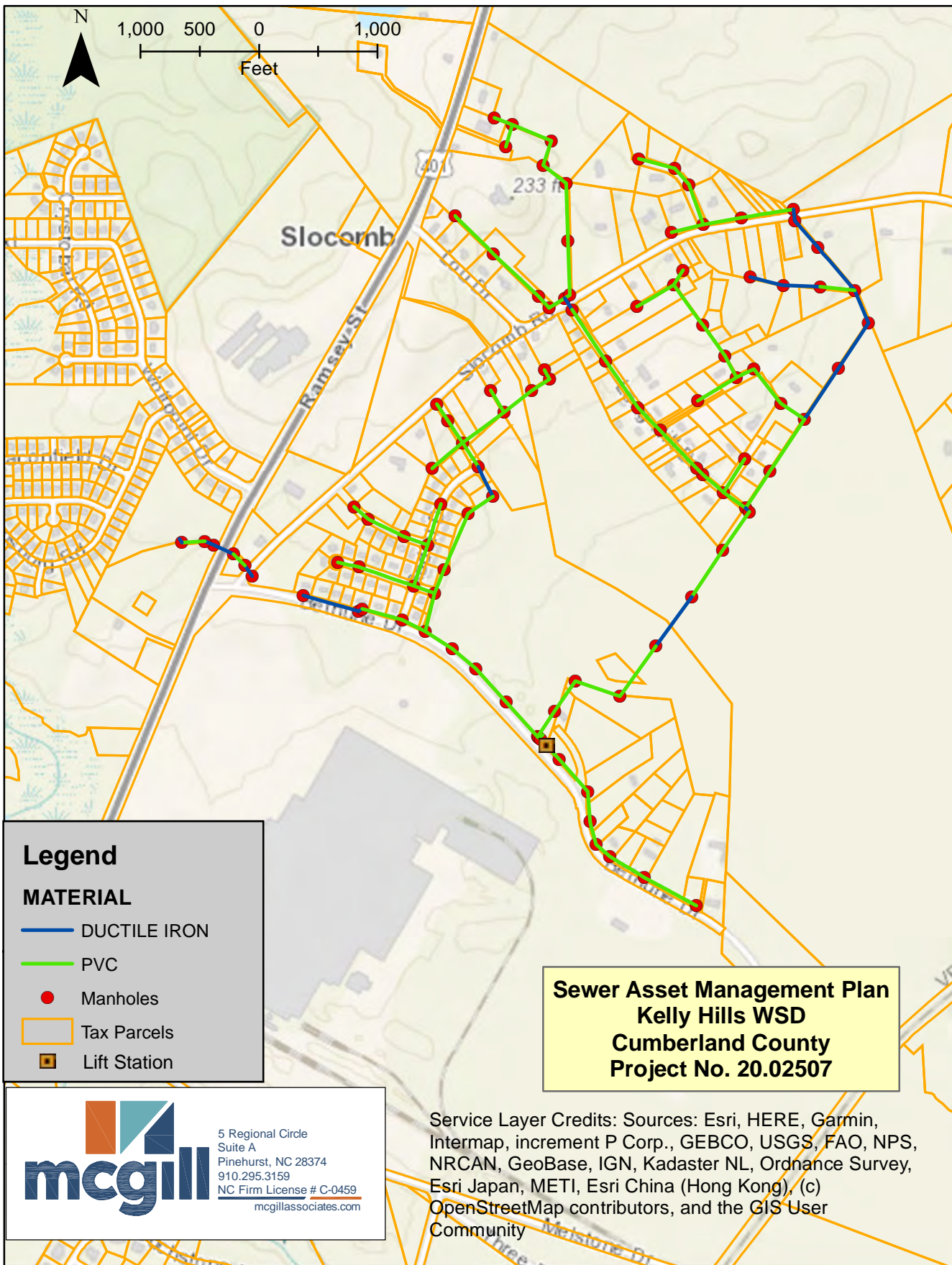
With District input from County staff, McGill has reviewed the district's data on the sewer mains throughout the District's collection system. The sewer main material and diameters were verified by the County and updated according to GIS records. Figure 3 shows the sewer line materials in the system, and Figure 4 shows the sewer line diameter throughout the system.

The purpose of this portion of the assessment was to create a working system inventory and then review which areas of Kelly Hills District have system components in need of replacement or rehabilitation.



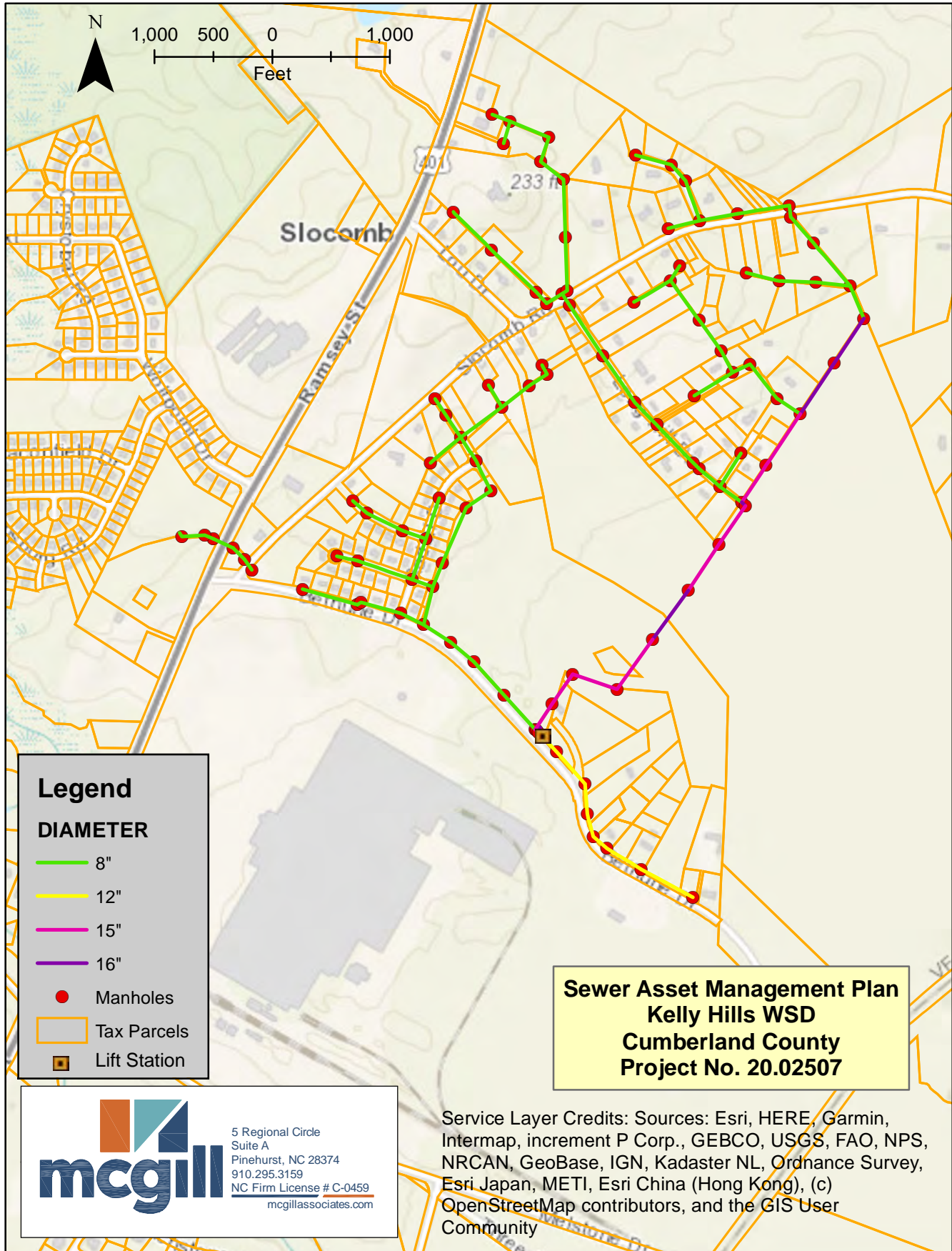
# Kelly Hills Sewer Line Material Map

## Figure 3



# Kelly Hills Sewer Line Diameter Map

## Figure 4





### 2.2.3 Methodology

McGill reviewed the District's GIS data for the sewer collection system. County staff provided information on manholes where deterioration was suspected. Smoke testing was performed throughout the system. The County's GIS mapping was utilized to create maps that document the collection system by material and by diameter.

### 2.2.4 Results

The existing gravity sewer pipe in the sewer system ranges from 8-inch to 16-inch in diameter based on County records. All pipe diameters therefore do meet current NCDEQ minimum design standards. Based on the age of the system, the PVC and ductile iron pipe installed in 2005 has not exceeded its useful life, and therefore replacement is not recommended outright. Recommendations will include planned CCTV inspections by the County of the existing piping in order to verify existing condition and provide future updates to this AMP/CIP. Based on the age of the pipes and no documented issues from County staff, pipe in the system has been noted to be in good/excellent condition. Tables 2 and 3 show the assessment based on material and then broken out by diameter.

**Table 2: Summary of Gravity Sewer Main by Material**

<b>Material</b>	<b>Diameters (in)</b>	<b>Total LF</b>	<b>% of System</b>
<b>Polyvinyl Chloride</b>	<i>8, 12, 15</i>	<b>19,750</b>	<b>83.9%</b>
<b>Ductile Iron</b>	<i>8, 16</i>	<b>3,790</b>	<b>16.1%</b>
<b>Total LF</b>		<b>23,540</b>	<b>100%</b>

**Table 3: Summary of Gravity Sewer Main by Diameter**

<b>Diameter</b>	<b>Total LF</b>	<b>% of System</b>
<b>8"</b>	<b>17,900</b>	<b>76.0%</b>
<b>12"</b>	<b>1,670</b>	<b>7.1%</b>
<b>15"</b>	<b>2,690</b>	<b>11.4%</b>
<b>16"</b>	<b>1,280</b>	<b>5.5%</b>
<b>Total LF</b>	<b>23,540</b>	<b>100%</b>

**Table 4: Summary of Gravity Sewer Main Conditions by Age**

<b>Year Put Into Service</b>	<b>Total LF</b>	<b>% of System</b>
<b>2005</b>	<b>23,544</b>	<b>100%</b>
<b>Total LF</b>	<b>23,544</b>	<b>100%</b>

## **2.3 MANHOLE INSPECTIONS**

### **2.3.1 Overview**

Manholes are the primary access points to the sanitary sewer system and are essential for its operation and maintenance. As they allow personnel access to the sewer system, manholes are also likely culprits for allowing I/I to enter the sewer system. Manholes in low-lying areas with improperly sealed lids, manhole joints, and poor connection practices can all be sources of I/I. Storm drains or the presence of manholes in ditches and low-lying areas in Kelly Hills/Slocomb road frequently allow standing water to remain for hours or days after a storm event which can exacerbate inflow through manhole lids.

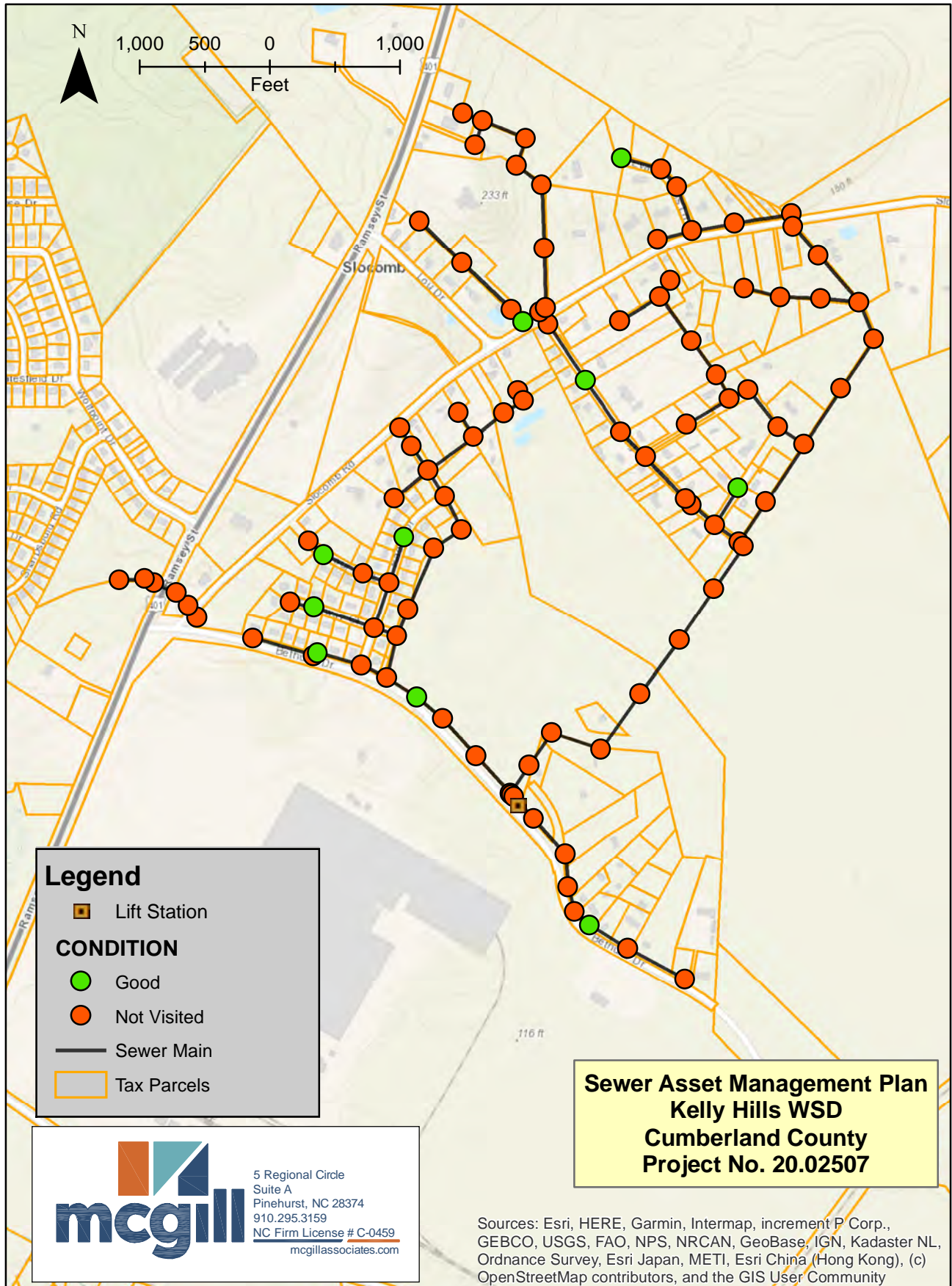
One of the most cost-effective practices for managing this intrusion is visual manhole inspections, where the various components of the manhole are rated according to their condition. Some examples of noticeable deficiencies are benches which have deteriorated from abrasion and corrosion and rings which can be moved by traffic, soil, and the freeze/thaw cycle. Defects in any aspect of the manhole can lead to I/I, structural instability, and manhole failure.

### **2.3.2 Investigation**

After the Kelly Hills system was put into service, the GIS record was created in 2006. The purpose of this portion of the assessment was to perform selected field inspections to determine an overall system assessment. A total of 100 manholes are currently inventoried by the District. Approximately ten manholes were inspected as a part of this inventory and assessment. The map of the diameter of all manholes that were accessible (not paved over or otherwise not located) are shown in Figure 3.

# Kelly Hills Manhole Condition Map

## Figure 5



### **2.3.3 Methodology**

The District of Kelly Hills/Slocomb Road sewer collection system contains 100 sewer manholes. Working with County staff, McGill inspected selected manholes within the sewer system to obtain a representative condition sampling. County staff determined which manholes to inspect in each area based on manhole location and orientation. Manholes prioritized for inspection include those located in existing ditches or low-lying areas where the manhole would be susceptible to degradation and inflow from surface water. At each manhole, the inspector recorded the manhole's location, dimensions, material, and condition of its various components. All information including photographs of the interior of the manhole and top area were uploaded into the GIS mapping.

Some typical distresses include:

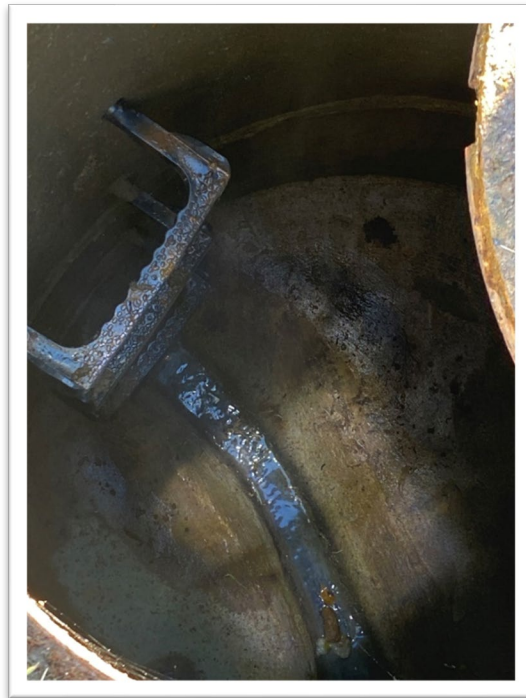
- Wear and asphalt paving on the cover;
- Corrosion and mud seepage on the ring and frame;
- Gas residue, corrosion, seepage, and deteriorating concrete on the cone and riser;
- Wetness, silt, root intrusion, and deteriorating concrete on the barrel;
- Dirt and corrosion on the rungs;
- Silt accumulation on the bench; and
- Misaligned pipes, obstructions, trough deteriorating, standing water, and no flow in the channel.

Based on the recorded comments, each component was assigned a condition score, and these scores were combined into an overall condition rating for each manhole- excellent, good, fair, or poor. The images below depict the interiors of various condition manholes.





*SMH-027203, Treadway Court. Precast manhole shows signs of corrosion and wear over time. Invert is well-formed.*



*SMH-027197, Bethune Drive. Precast manhole in good condition, invert well formed.*

### 2.3.4 Results

All of the ten inspected manholes are precast manholes. Due to the relative low age of the system, County staff confirmed that all of the existing manholes in Kelly Hills are precast sewer manholes. Of the manholes observed, all were noted as good to fair condition. Still, the presence of I/I and deterioration was observed in several instances. Based on the condition of those observed, it is suspected that the remaining manholes not inspected would have similar condition to those observed. Tables 5 and 6 summarize the manhole materials and condition.

**Table 5: Summary of Manholes by Material**

<b>Material</b>	<b>Total</b>
<b>Precast Concrete</b>	<b>100</b>
	<b>100</b>

**Table 6: Summary of Manholes by Condition**

<b>Condition</b>	<b>Total</b>
<b>Good-Fair</b>	<b>10</b>
<b>Unknown</b>	<b>90</b>
	<b>100</b>

The County maintains its collection system using the ESRI platform and includes the attribute data for each manhole. A spreadsheet including condition comments for each manhole can be found in Appendix A.



## 2.4 LIFT STATION

### 2.4.1 Overview

The Kelly Hills Lift Station is owned and operated by Fayetteville PWC. The station includes a flow meter that is used for recording flow generated by the Kelly Hills Sewer Collection System. The monthly records from that station were provided by the County and have used to develop an average use per user for the District. The results of the analysis are below.

Lift Station Design Capacity	100,000 GPD
Metered Average Daily Use	16,900 GPD
Permitted, Not Yet Tributary Flow	29,520 GPD
<i>Pending Development Usage</i>	<i>41,400 GPD</i>
Lift Station Available Capacity*	<b>53,580 GPD</b>

\*Does not include pending development usage. Available capacity including pending amount is 12,150 GPD.

Recommendations for various sewer system improvements to include the gravity sewer pipe and manholes in the collection system include general recommendations, high priority projects (within 10-years) and future projects (past the 10-year planning window). General recommendations are typically less costly and can be implemented more quickly, whereas high priority projects may require financial assistance and be undertaken in phases.

### **3.1 GENERAL RECOMMENDATIONS**

#### **3.1.1 *Smoke Testing***

Smoke testing is a valuable tool that can be used to locate broken pipe, cleanouts, or manholes that need repair. Any of these issues can be a source for the inflow and infiltration (I&I) of surface water into the sewer collection system. It is recommended that the District utilize smoke testing on an “as needed” basis to troubleshoot possible problem areas. The most common repairs that would result from smoke testing include replacing missing or broken cleanout caps and removing buildup from manholes. Other repairs that can be performed at this time are patching the exterior concrete or replacing the rings/lids of manholes identified to be leaking during smoke testing. These may be contributing to significant I/I into the wastewater collection system. Similarly, line breaks in flooded areas should also be addressed promptly. It is also recommended that the District continue to conduct regular smoke testing to monitor the system’s ongoing wear and identify specific areas for improvement.

#### **3.1.2 *Video Evaluations***

Based on information provided by the County, video evaluations were not performed as part of the system inventory. County staff reports that no video evaluations have been performed on the collection system to date. It is recommended that the County plan to perform video evaluation of the system as a part of O&M in order to stay vigilant concerning potential issues within the collection system.

### **3.1.3 Manhole Inspections**

Manhole inspections uncovered some infrastructure deficiencies which can be repaired immediately to improve the condition and function of the wastewater collection system. The full list of manholes and their field assessment is included in Appendix A. Manhole rehabilitation and replacement is the priority work that is targeted by the CIP. The proposed projects are divided out on an annual basis in order to include the improvements as a reasonable component of annual budgeting.

### **3.1.4 Flow Monitoring**

The District and McGill have discussed that flow monitoring is not needed at this time. Should the County begin to suspect the presence of I&I, they will engage in flow monitoring to verify as needed. The PWC Lift Station does provide for metering of flow received within the district. It is recommended within the CIP that the County install an in-line flow meter within the collection system just upstream of the lift station, in order to assist with recording of data and calibration with the PWC maintained lift station.

## 3.2 PRIORITY PROJECTS

### 3.2.1 *Manhole Rehabilitation Projects*

In these projects, manholes will be repaired and lined. The projects are scoped to be undertaken every 3 years. Each project is priority targeting any manhole deficiencies or evidence of I/I observed during manhole inspections or leaks based on the results of the smoke testing. There are a range of issues from broken risers to cracks in the frame of the manhole that warrant various repairs. To reduce the amount of I/I that enters the system it is imperative to repair these manholes. The project will be ongoing to spread out the cost for the County over a 10-year period. There are 100 manholes in the system, and for planning purposes it is assumed that 50% of the manholes would benefit from rehabilitation and lining. In order to fit a reasonable budgeting target, the rehabilitation of those 50 manholes is broken into four projects, which are included in the CIP separately, but can be combined or modified as needed given annual budgetary considerations. The projects also include replacement of existing cleanout assemblies for select residences. The results of the smoke testing identified that some cleanouts were damaged below grade, therefore replacement of the assembly would be necessary.

This project is recommended to be pursued with a manhole rehabilitation specialty company with scopes large enough to get competitive pricing for each mobilization. The manholes proposed for rehabilitation or replacement range in depth; therefore an average depth of seven vertical feet (VF) was used per manhole for estimating purposes. The capital improvements plan breaks this project into four phases with a budget of approximately \$81,000 every three years over a 10-year span with the exception of year four, if the County elects to perform the flow monitoring improvement project, as outlined in Table 7. The total cost of the manhole rehabilitation projects is estimated to be \$324,000.

**Table 7: Preliminary Opinion of Probable Cost for Manhole Rehabilitation Projects**

Item	Description	Units	Quantity	Unit Price	Total Cost
1	Mobilization	LS	3%	N/A	\$ 1,900
2	Rehabilitate Existing Manhole	VF	84	\$ 500	\$ 42,000
3	Additional Manhole Repairs	LS	1	\$ 10,000	\$ 10,000
4	Asphalt Surface Restoration	LS	1	\$ 8,500	\$ 8,500
5	Replace Cleanout Assembly on Existing Service	EA	3	\$ 1,100	\$ 3,300
<b>Construction Subtotal</b>					<b>\$ 65,700</b>
Contingency (15%)					\$ 9,800
Engineering Coordination					\$ 5,500
<b>Total Base Project Cost</b>					<b>\$ 81,000</b>

*\*Cost estimates are based on the knowledge of a professional engineer based on 2024 construction costs and are subject to change due to bidding environment and other factors.*

### 3.2.2 Flow Monitoring Improvement Project

This project includes installing two in-line flow monitoring devices on the two downstream collection lines within the sewer system. These devices will allow the County to monitor its own sewer flow. This data can be utilized by staff for planning and budgeting purposes.

The project includes two 8-inch electromagnetic flow meters in a precast underground bypass vault with associated piping and appurtenances. The meters will be installed on the County’s 12-inch and 15-inch lines outside of the existing lift station. The preliminary cost estimate for this project is \$103,900 as outlined in Table 8 below.

**Table 8: Preliminary Opinion of Probable Cost for Flow Monitoring Improvements Project**

Item	Description	Units	Quantity	Unit Price	Total Cost
1	Mobilization	LS	3%	N/A	\$ 2,400
2	8-inch Mag Meter	EA	2	\$ 25,000	\$ 50,000
3	Precast Concrete Valve Vault	EA	2	\$ 8,000	\$ 16,000
4	Piping, Valves, Fittings	LS	1	\$ 15,000	\$ 15,000
<b>Construction Subtotal</b>					<b>\$ 83,400</b>
Construction Contingency (15%)					\$ 12,500
Engineering Coordination					\$ 8,000
<b>Total Base Project Cost</b>					<b>\$ 103,900</b>

*\*Cost estimates are based on the knowledge of a professional engineer based on 2024 construction costs and are subject to change due to bidding environment and other factors.*

### **3.3 CIP PROJECTS SUMMARY**

The purpose of this asset management plan was to document the condition of the Kelly Hills sewer infrastructure to assist the County with becoming more viable and proactive in the management and financing of its wastewater system. The County intends to look to its CIP to guide its next project; therefore, it is vital that the CIP be established as an accurate depiction of current conditions and reflect the Districts' highest priorities with accurate cost estimates. The development of this AMP will serve as a positive step towards ensuring that the District can maintain its level of service agreement.

Sewer manhole rehabilitation and cleanout replacement was evaluated based on current staff input and the results of the field inspections. The existing manholes and cleanouts were divided into projects recommended for the next 10-years.

McGill prepared cost estimates for all projects based on current materials and construction costs. The 10-year CIP is intended to be adopted by the District to guide its selection of sewer system improvement projects over the next two decades. The cost summary for the 10-year CIP is shown below in Table 9.



**Table 7: CIP Cost Summary**

Year <sup>1</sup>	Manhole Rehabilitation Project 1	Flow Monitoring Improvements	Manhole Rehabilitation Project 2	Manhole Rehabilitation Project 3	Manhole Rehabilitation Project 4	TOTAL COST
1	\$ 81,000.00	\$ -	\$ -	\$ -	\$ -	\$ 81,000.00
2	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3	\$ -	\$ 103,900.00	\$ -	\$ -	\$ -	\$ 103,900.00
4	\$ -	\$ -	\$ 81,000.00	\$ -	\$ -	\$ 81,000.00
5	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
7	\$ -	\$ -	\$ -	\$ 81,000.00	\$ -	\$ 81,000.00
8	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
9	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
10	\$ -	\$ -	\$ -	\$ -	\$ 81,000.00	\$ 81,000.00
<b>TOTAL ESTIMATED CIP COST</b>						<b>\$ 427,900.00</b>

Notes:

1: Considering timeline for adoption of this plan and County budget planning cycle, Year 1 is anticipated to be FY 2026

## 4.0

## OPERATIONS AND MAINTENANCE PLAN

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### 4.1 GENERAL RECOMMENDATIONS

The purpose of an Operations and Maintenance (O&M) Program is to provide an organized and cost-effective approach to ongoing maintenance, repair and replacement activities that will maintain the sewer collection system, so it performs as intended and meets the requirements of the sewer utility's System-Wide Collection System Permit, issued under North Carolina General Statutes Article 21 of Chapter 143.

This section provides a general description of proactive O&M, which can be defined as scheduled maintenance activities (preventive maintenance), performed on a regular basis in order to achieve the highest level of system performance using available resources and minimizing failures that can result in Sewer System Overflows (SSOs)

Developing an O&M Program begins with accurate records of infrastructure inventory, asset locations and physical condition. Coupled with work records and system performance history, preventive maintenance schedules can be developed to efficiently address general system needs, from cleaning and debris removal to site-specific maintenance work such as cutting and repair work.

The following elements provide the foundation for an effective O&M program:

- Maintain up-to-date wastewater treatment plant equipment documentation, sewer collection system maps and related work history and operational data.
- Develop a routine preventive O&M program and activities for staff and contractors maintaining the sewer collection system and a system to document scheduled activities.
- Develop a rehabilitation and replacement plan identifying and prioritizing system deficiencies and implement short- and long-term actions to address the deficiencies.
- Develop and implement training programs to build technical competence and emergency preparedness.
- Develop and provide equipment and replacement part inventories, including critical replacement parts.

## **Sewer System Mapping**

Sewer system maps and related databases are typically managed using a Geographic Information System (GIS). The District of Kelly Hills/ Slocomb Road currently utilizes ESRI as the GIS platform from which to manage the utility systems. This GIS mapping is supported by a database that records sewer main size, material types, and locations of manholes and clean-out connections. The platform has the ability to store more information that is currently being utilized by the County, including invert and rim elevations and other attributes of system appurtenances. If County intends to utilize the GIS platform for managing and recording maintenance performed and planned, it is recommended that the County investigate alternative software to ensure that they are utilizing a software that meets their needs with respect to budget.

The GIS database should be updated on a regular basis. Software applications such as work order systems are available to allow field staff to update GIS data as inspection and maintenance activities are completed. Other applications can also allow staff to update and edit maps. Field information that was gathered by McGill and County staff as a part of this assessment is now included in the County's GIS system database for future reference.

GIS can organize work history along with operational data, inspection records and images to provide managers, operations staff and engineers with powerful data sets to track current resource allocations and forecast short and long-term operational and capital needs. Outcomes of detailed analysis such as recommended sewer main rehabilitation work versus sewer overflows can be mapped to present the relationship visually for ease of understanding.

## **Preventive Operation and Maintenance (O&M)**

Preventive maintenance is performing routine and scheduled maintenance activities before wastewater treatment plant and lift station equipment or buried infrastructure fails, for the purpose of extending useful life, reducing overall operating costs, and increasing system reliability. This proactive approach to maintenance work is more efficient and cost effective than reactive and curative operations. Preventive maintenance activities will also help operations staff to better understand the wastewater treatment plant equipment, lift station equipment, and collection system components and how they work under various conditions. This knowledge is essential to setting maintenance priorities and developing the scope and timing of long-term rehabilitation and replacement projects.

## **Scheduled Cleaning of Sewers**

EPA recommends, at a minimum, that 100% of sewer mains should be cleaned every five (5) years, or 20% of the system annually. The sewer utility's Collection System Operating Permit requires 10% of the gravity sewers to be cleaned annually. High pressure jetting is the most common approach using various spray nozzles for general cleaning and debris removal. Mechanical cutters are used to address root intrusion and cleaning agents can be added to help remove fats, oils, and grease (FOG).

More frequent cleaning is scheduled for areas with a history of heavy debris, grease buildup and roots. CCTV inspections are also used to identify areas to clean more often, such as sections with minor defects such as offset joints and service taps protruding into the main line. Sewer sections near siphons are cleaned more frequently to ensure continuous and uninterrupted operation.

As part of the O&M Program, a master list of cleaning operations, priority locations and scheduling can be incorporated into GIS. Maps can be produced to define work areas, schedule resources, including contracted services, track progress and task completion. Updating GIS maintenance operations data (partial blockages found, debris quantity, etc.)

will help managers adjust cleaning frequency and area boundaries as needed to increase program efficiency, reduce sewer blockages, and avoid SSOs.

## **Routine Visual Inspections**

Routine inspections are used to assess the condition of lift stations, manholes and surface facilities, recording general conditions and evidence of possible structural problems or failures (offset structures, etc.), corrosion, surcharging, overflows and excessive Inflow and Infiltration (I&I). Work orders are generated based on inspection records to effect operational adjustments, scheduling more detailed inspections and/or making necessary repairs.

## **Manhole Inspection Program**

Manhole inspections keep the asset inventory up-to-date and are used not only to update collection system maps, but to determine structural condition. During manhole inspections, a complete inventory is taken of each manhole including construction materials, ring size, depth to invert, flow conditions and evidence of problems. The National Association of Sewer Service Companies (NASSCO) Manhole Assessment and Certification Program (MACP) may be adopted or used as a guide to ensure consistency and reliability of evaluation and ranking methodology.

The results from routine manhole inspections and monitoring are used to prioritize areas needing CCTV inspections to assess pipe condition such as manholes with evidence of slow flow or surcharging. Information is recorded and used to schedule maintenance and repairs.

## **CCTV Inspection Program**

While routine cleaning and visual inspection are used to assess the condition of surface facilities and manholes, CCTV video inspections are the primary method used to assess the condition of the sewer pipes. Using conventional defect criteria is highly recommended to provide standardization and consistency in sewer pipe condition

assessment and ranking. The NASSCO Pipeline Assessment and Certification Program (PACP) may be adopted or used as a guide to ensure consistency and reliability of evaluation and ranking methodology.

## **Maintenance Activity Records**

Detailed records and daily logs of O&M work provide valuable information to help managers evaluate the effectiveness of maintenance activities and make adjustments to optimize the use of limited resources. Equipment, manpower and other resources are tracked along with detailed descriptions of defects and/or obstructions encountered including debris, FOG, structural failures, etc. Maintenance work resulting in system modifications or extensions is required to be incorporated into record drawings and system maps. Scheduled testing of emergency and standby equipment is also a requirement of the collection system permit.

These records are required to be reviewed periodically to identify problems that cannot be resolved in a short period of time in order to develop a plan to address the problem(s). Maintaining these records for an extended period of time (5-years or more) will also provide accurate reference points of maintenance investments made over time that will track the effectiveness of operation and maintenance activities.

In the event of a sewer spill or system overflow, maintenance records will need to provide sufficient detail to satisfy reporting requirements for the event, including location(s), volume of wastewater, corrective actions, etc. This data may also be integrated into GIS to allow mapping of these events over time in order to identify patterns and/or trends that will assist with scheduling maintenance and planning rehabilitation and other capital improvements.

## **Resolution of Customer Complaints**

Customer complaints are primarily for sewer backups and odors. Sewer backups require an immediate response to diagnose and resolve the problem. These complaints can occur outside normal business hours, significantly escalating costs. Detailed records of the problems found, and the resources needed to address the failed condition, provide valuable feedback for making adjustments to the preventive maintenance program that can reduce these types of calls and help lower overall maintenance costs.

These records can also identify areas where private service laterals frequently fail. Notifying customers in these areas will allow them the opportunity to address deficiencies proactively, which will also help reduce customer “emergency” calls.

## **Capital Improvements Plan**

A Capital Improvements Plan (CIP) is required by the collection system permit to identify rehabilitation, replacement and expansion needs of the system. The CIP is required to address the short and long-term needs of the system, covering at least a 3 to 5-year planning period, and must include the estimated cost of each capital project.

CIP development incorporates maintenance activity, cleaning and inspection records, and system performance data that may include flow monitoring and hydraulic modeling to evaluate the existing system and to recommend improvements needed to correct existing deficiencies, and ensure adequate capacity is maintained throughout the system.

Capital planning includes consideration of on-going funding for rehabilitation and replacement of the collection system as it wears out, and potential upgrades for expansion as needed.



## **Training Program**

Training programs provide a mechanism for educating employees and establishing their technical competence to perform operations, maintenance, and emergency responses safely and effectively. A combination of in-house skill training and specialized training purchased or provided through state and national associations, conferences and vendor training programs are typically used to build and enhance skills for performing daily work duties. Periodic training reinforces previous efforts, as people often overlook things that are used infrequently. It also provides an opportunity to train new staff and learn about new problems, new techniques, and changes in equipment.

Emergency training educates system personnel about emergency situations and resulting effects on the wastewater system, public health, and environmental impacts. It also provides an opportunity to practice responses. Good record keeping ensures personnel are properly trained and prepared to effectively operate and maintain the collection system under any given circumstance. Regular review of training records is essential for keeping content up-to-date and maintaining proper employee awareness.

## **Equipment and Replacement Parts**

A reasonable supply of equipment and replacement parts should be maintained to fully support all operations and maintenance activities. A detailed inventory is essential to ensure availability under normal operations and emergency conditions. Specialized equipment or parts may be too costly to keep in stock, so arrangements with vendors and/or contractors may be necessary to ensure availability during non-business hours or during emergencies.

## 4.2 STAFFING RECOMMENDATIONS

Cumberland County is responsible for three wastewater collection systems and one water system: NORCRESS, Overhills, Kelly Hills, and Southpoint Water System. While each of these districts maintains its own operating budget, the Board leadership and operational management is performed solely by Cumberland County. Therefore, in consideration of the typical utility system management and operations and maintenance that is necessary for maintaining each of the systems, McGill has considered all of the four utility systems cumulatively. While each system could be analyzed separately, considering the systems together is more consistent with actual management of the systems.

Typical metrics for analyzing full-time equivalent (FTE, representing quantity full-time workers) are based on either the population served by the system or by miles of utility piping (water main or sewer line) within each system. For reference, Table 8 below summarizes the customers and piping in each of the County’s utility systems.

**Table 8: Utility System Comparison**

DISTRICT	Number of Connections		Paying Avail. Fee	Pipe in System (mi.)
	Water	Sewer		
<b>Southpoint</b>	84		129	2.8
<b>Kelly Hills</b>		102	166	4.5
<b>Overhills</b>		107	318	4.0
<b>NORCRESS</b>		452	666	41.1
<b>TOTALS</b>	<b>84</b>	<b>661</b>	<b>1279</b>	<b>52.4</b>

**Table 9: Typical Population vs. Pipe Length**

<b>Population</b>	<b>Pipe in System (mi.)</b>
0-100	5
101-500	5
501-3300	21
3301-10000	62

The typical sizes of utility systems from a community system EPA study<sup>1</sup> are shown in Table 9, and are generally consistent when compared to the County’s systems. This study was selected as a basis for comparison due to its comprehensive nature, having included water systems nationwide in its breadth. NORCRESS is the exception when compared to Table 9. This is mostly likely indicative of the system serving a more rural population where the connection density is less, and resulting from the length of force main piping in the system that increases the overall length but does not contribute to population density. Overall, these metrics were found to be reasonably consistent with the County’s systems. Similarly, the data is consistent regardless of whether the utility system is a water systems or wastewater collection system.

The objective is to make budget-level staffing recommendations for the County’s utility systems based on what is typical across the industry and other utility systems of comparable size. The EPA study utilized provides typical FTE for the roles of manager, plant operator, distribution (and collection, for our purposes), and administrative functions. All of these were considered applicable to management and operation of the County’s utility systems. Note: while the County is not responsible for plant operation in any system, the lift stations in the NORCRESS and Overhills systems are the County’s responsibility, therefore this metric was used, albeit in a smaller percentage, to account for the management of those resources.

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<sup>1</sup> Analysis conducted using excerpts from US EPA document, “National Characteristics of Drinking Water Systems Serving 10,000 or Fewer People,” published July 2011.

Table 10 shows Further utilizing the EPA statistics as base for typical FTE for each of the positions, based on the system size in terms of miles of pipe main.

**Table 10: Average Community System Statistics**

Employee Category	System Size (miles of Main)		Mean	Cumberland County
	Pop. 500-3300	Pop. 3300-10000		
	21	62	41.5	51.7
<b>Manager FTE</b> per mile	0.6	1.1	0.85	1.06
	0.029	0.018	0.020	0.020
<b>Plant Operator FTE</b> per mile	0.6	1.3	0.95	1.03
	0.029	0.021	0.023	0.023
<b>Distribution FTE</b> per mile	0.8	2.5	1.65	2.06
	0.038	0.040	0.040	0.040
<b>Administrative FTE</b> per mile	0.6	1.5	1.05	1.31
	0.029	0.024	0.025	0.025

The green highlighted cells are the calculated FTEs that were applied to estimate staffing size based on the quantity of pipe across the County’s four utility systems. Those calculated FTEs are based on the size of systems managed by the County and reasonable estimate of staffing needed for these systems.

Each of the FTEs is applied to each respective employee category. McGill utilized wage information from Zip Recruiter and a benefits multiplier of 1.38 from the U.S. Bureau of Labor Statistics to develop the summary shown in Table 11.

**Table 11: Overall Salary Estimates**

Employee Category	Hourly Rate	Annual Salary	Ben. Mult.	Total	Applied FTE	Applied Budget Cost
Manager	\$38.50	\$80,080.00	1.38	\$110,510.40	1.06	\$117,000
Operator	\$24.52	\$51,001.60	1.38	\$70,382.21	1.03	\$72,700
Distribution	\$23.57	\$49,025.60	1.38	\$67,655.33	2.06	\$139,100
Administrative	\$21.33	\$44,366.40	1.38	\$61,225.63	1.31	\$80,100
<b>Total Applied Budget Cost Based FTEs</b>						<b>\$408,900</b>

Utilizing industry metrics and comparing to systems of comparable size, McGill offers the proceeding section as a general staffing recommendation. This section and these budget values are provided for preliminary planning purposes only.

Staffing levels appear to be reasonable based on the District's ability to operate and maintain the system while providing a reliable level service to its customers.

While this budget number is higher than the current budget staffing, consideration should also be given to the cumulative effect cost to the County for contracted operation and distribution support in the NORCRESS and Kelly Hills district.

# **APPENDICES**





## **Appendix A**

### **Manhole Inspection List**

# Kelly Hills Manhole Inspection

DATE: January 17th, 2024

FACILITYID	MH ID NO.	CONDITION
115136	SMH027236	Good
115167	SMH027267	Good
115168	SMH027268	Good
115098	SMH027198	Good
115101	SMH027201	Good
115103	SMH027203	Good
115109	SMH027209	Good
115113	SMH027213	Good
115125	SMH027225	Good
115188	SMH027287	Good

## **Appendix B**

### **Smoke Testing Results List**

## Kelly Hills Smoke Testing Manholes

Date: September 21, 28, 2023		
Manhole ID	Status	Notes
SMH027233	Leak	Smoke around lid
SMH027234	Leak	Smoke around lid
SMH027246	Broken	
SMH027248	Seal	Smoke from lid
SMH027258	Seal	Smoke from collar
SMH027259	Seal	Smoke around lid
SMH027264	Leak	From around bottom of mh
SMH027265	Leak	
SMH027197	Leak	Leak around the lid
SMH027198	Seal	Smoke around lid
SMH027203	Leak	Smoke around rim
SMH027209	Seal	Smoke around lid
SMH027214	Leak	Smoking from top
SMH027215	Leak	
SMH027218	Broken	Cracked ring
SMH027219	Leak	
SMH027220	Leak	
SMH027223	Leak	
SMH027226	Leak	
SMH027277	Broken	
SMH027279	Seal	Smoke around concrete collar
SMH027283	Leak	
SMH027284	Leak	
SMH027288	Seal	Smoke around lid

<b>Kelly Hills Smoke Testing Cleanouts</b>		
<b>Date: September 21, 28, 2023</b>		
<b>Facility ID</b>	<b>Status</b>	<b>Notes</b>
33904	Broken	Broken cap
33991	Broken	Broken no cap
34012	Broken	Needs cap 9/28/2023 no cap
33889	Broken	
33908	Broken	
33961	Broken	Both valves broken
33895	Broken	
33990	Broken	cleanout cap repaired
33927	Broken	smoking from sides,burnt
33945	Broken	
34014	Broken	
33972	Broken	Missing lid covers
34029	Broken	
33913	Broken	
33916	Broken	
33985	Broken	broken cap
34033	Broken	Replace whole top
33926	Broken	Broken cap unable to open
33937	Broken	CO broken from bush hogging
34031	Broken	Around lid cracked
33966	Broken	
33976	Broken	CO in yard house
33906	Broken	Repaired
33964	Broken	Vacant lot
33955	Broken	Possible I&I issue.
33901	Broken	No cap repaired
33910	Broken	Broken cap in yard, cap replaced



## **Appendix C**

### **Wastewater Collection System Permit**





Michael F. Easley, Governor  
William G. Ross Jr., Secretary  
North Carolina Department of Environment and Natural Resources  
Alan W. Klimek, P.E. Director  
Division of Water Quality

October 27, 2003

Mr. Joseph Glass  
City of Fayetteville,  
Public Works Commission  
PO Drawer 1089  
Fayetteville, NC 28302

**SUBJECT: Permit No. WQ0023202  
Kelly Hills/Slocomb Road Water & Sewer District  
Wastewater Collection System Extension  
Cumberland County**

Dear Mr. Glass:

In accordance with your application received October 23, 2003, we are forwarding herewith Permit No. WQ0023202, dated October 27, 2003, to the City of Fayetteville, Public Works Commission for the construction and operation of the subject wastewater collection system extension. This permit shall be effective from the date of issuance until rescinded and shall be subject to the conditions and limitations as specified therein. This cover letter shall be considered a part of this permit and is therefore incorporated therein by reference.

Please pay particular attention to Permit Condition 3 which requires that the wastewater collection facilities be properly operated and maintained in accordance with 15A NCAC 2H .0227 or any individual system-wide collection system permit issued to the Permittee.

Permitting of this project does not constitute an acceptance of any part of the project that does not meet 15A NCAC 2H .0200; the Division of Water Quality's (Division) Gravity Sewer Minimum Design Criteria adopted February 12, 1996 as applicable; and the Division's Minimum Design Criteria for the Fast-Track Permitting of Pump Stations and Force Mains adopted June 1, 2000 as applicable, unless specifically mentioned therein. Division approval is based on acceptance of the certification provided by the North Carolina-licensed Professional Engineer named in the application. It shall be the Permittee's responsibility to ensure that the as-constructed project meets the appropriate design criteria and rules. Failure to comply may result in penalties in accordance with North Carolina General Statute § 143-215.6A through § 143-215.6C, construction of additional or replacement wastewater collection facilities, and/or referral of the North Carolina-licensed Professional Engineer to the licensing board.

In accordance with provisions of Article 21 of Chapter 143, General Statutes of North Carolina as amended, and other applicable Laws, Rules, and Regulations, permission is hereby granted to the City of Fayetteville, Public Works Commission for the construction and operation of



Mr. Joseph Glass  
Page 2  
October 27, 2003

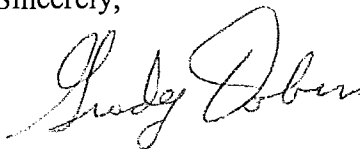
approximately 18,811 linear feet of 8-inch gravity sewer; as well as approximately 1,699 linear feet of 12-inch gravity sewer; as well as approximately 2,664 linear feet of 15-inch gravity sewer; as well as approximately 1,258 linear feet gravity sewer; a 0.1416 mgd, 225 gpm @ 74' TDH pump station with permanent generator; as well as approximately 2,388 linear feet of 6-inch force main to serve 144 three-bedroom residences, 10 three-bedroom mobile homes and 2 two-hundred seat churches as part of the Kelly Hills/Slocumb Road Water & Sewer District project, and the discharge of 56,640 gallons per day of collected domestic wastewater into the City of Fayetteville, Public Works Commission Cross Creek Wastewater Treatment Facility's existing sewerage system, pursuant to the application received October 23, 2003 and in conformity with 15A NCAC 2H .0200; the Division's Gravity Sewer Minimum Design Criteria adopted February 12, 1996 as applicable; the Division's Minimum Design Criteria for the Fast-Track Permitting of Pump Stations and Force Mains adopted June 1, 2000 as applicable; and other supporting data subsequently filed and approved by the Department of Environment and Natural Resources and considered as part of this permit.

The sewage and wastewater collected by this system shall be treated in the City of Fayetteville, Public Works Commission Cross Creek Wastewater Treatment Facility (Permit No. NC0023957) prior to being discharged into the receiving stream.

If any parts, requirements, or limitations contained in this permit are unacceptable, you have the right to request an adjudicatory hearing upon written request within 30 days following receipt of this permit. This request must be in the form of a written petition, conforming to Chapter 150B of North Carolina General Statutes, and filed with the Office of Administrative Hearings, 6714 Mail Service Center, Raleigh, NC 27699-6714. Unless such demands are made, this permit shall be final and binding.

If you need additional information concerning this matter, please contact Grady Dobson at (910) 486-1541 extension 729.

Sincerely,



for Alan W. Klimek, P.E.

cc: Cumberland County Health Department  
Fayetteville Regional Office, Water Quality Section (WWTF Permit No. NC0023957)  
Mr. James M. Kizer, Jr., Moorman, Kizer & Reitzel, Inc.  
Water Quality Central Files  
NDPU

**NORTH CAROLINA**  
**ENVIRONMENTAL MANAGEMENT COMMISSION**  
**DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES**  
**RALEIGH**  
**WASTEWATER COLLECTION SYSTEM EXTENSION PERMIT**

---

This permit shall be effective from the date of issuance until rescinded and shall be subject to the following specified conditions and limitations:

1. This permit shall become voidable unless the wastewater collection facilities are constructed in accordance with the conditions of this permit; 15A NCAC 2H .0200; the Division of Water Quality's (Division) Gravity Sewer Minimum Design Criteria adopted February 12, 1996 as applicable; the Division's Minimum Design Criteria for the Fast-Track Permitting of Pump Stations and Force Mains adopted June 1, 2000 as applicable; and other supporting materials unless specifically mentioned herein.
2. This permit shall be effective only with respect to the nature and volume of wastes described in the application and other supporting data.
3. The wastewater collection facilities shall be properly maintained and operated at all times. The Permittee shall maintain compliance with an individual system-wide collection system permit for the operation and maintenance of these facilities as required by 15A NCAC 2H .0227. If an individual permit is not required, the following performance criteria shall be met as provided in 15A NCAC 2H .0227:
  - a. The sewer system shall be effectively maintained and operated at all times to prevent discharge to land or surface waters, and any contravention of the groundwater standards in 15A NCAC 2L .0200 or the surface water standards in 15A NCAC 2B .0200.
  - b. A map of the sewer system shall be developed prior to January 1, 2004 and shall be actively maintained.
  - c. An operation and maintenance plan shall be developed and implemented.
  - d. Pump stations that are not connected to a telemetry system shall be inspected every day (i.e. 365 days per year). Pump stations that are connected to a telemetry system shall be inspected at least once per week.
  - e. High-priority sewer lines shall be inspected at least once per every six-month period of time.
  - f. A general observation of the entire sewer system shall be conducted at least once per year.
  - g. Inspection and maintenance records shall be maintained for a period of at least three years.
  - h. Overflows and bypasses shall be reported to the appropriate Division regional office in accordance with 15A NCAC 2B .0506(a), and public notice shall be provided as required by North Carolina General Statute §143-215.1C.

4. **This permit shall not be transferable.** In the event there is a desire for the wastewater collection facilities to change ownership, or there is a name change of the Permittee, a formal permit request shall be submitted to the Division accompanied by documentation from the parties involved, and other supporting materials as may be appropriate. The approval of this request shall be considered on its merits and may or may not be approved.
5. Construction of the gravity sewers, pump stations, and force mains shall be scheduled so as not to interrupt service by the existing utilities nor result in an overflow or bypass discharge of wastewater to the surface waters of the State.
6. Upon completion of construction and prior to operation of these permitted facilities, a certification, a copy of the construction record drawings, as well as supporting design calculations for any pump stations permitted as part of this project shall be received from a North Carolina-licensed Professional Engineer certifying that the facilities have been installed in accordance with this permit; 15A NCAC 2H .0200; the Division's Gravity Sewer Design Criteria adopted February 12, 1996 as applicable; the Division's Minimum Design Criteria for the Fast-Track Permitting of Pump Station and Force Main adopted June 1, 2000 as applicable; and other supporting materials. If this project is to be completed in phases and partially certified, you shall retain the responsibility to track further construction approved under the same permit, and shall provide a final certificate of completion once the entire project has been completed. A copy of the construction record drawings, indicating the facilities constructed in the phase being certified, shall be submitted with each partial certification. Mail the Engineer's Certification, one copy of the "Construction Record Drawings," and one copy of the supporting design calculations to the Non-Discharge Permitting Unit, 1617 Mail Service Center, Raleigh, NC 27699-1617.
7. A copy of the construction record drawings shall be maintained on file by the Permittee for the life of the wastewater collection facilities.
8. Failure to abide by the conditions and limitations contained in this permit; 15A NCAC 2H .0200; the Division's Gravity Sewer Design Criteria adopted February 12, 1996 as applicable; the Division's Minimum Design Criteria for the Fast-Track Permitting of Pump Station and Force Mains adopted June 1, 2000 as applicable; and other supporting materials may subject the Permittee to an enforcement action by the Division, in accordance with North Carolina General Statutes §143-215.6A through §143-215.6C.
9. In the event that the wastewater collection facilities fail to perform satisfactorily, including the creation of nuisance conditions, the Permittee shall take immediate corrective action, including those as may be required by this Division, such as the construction of additional or replacement facilities.
10. The issuance of this permit shall not exempt the Permittee from complying with any and all statutes, rules, regulations, or ordinances that may be imposed by other government agencies (local, state and federal) which have jurisdiction, including but not limited to applicable river buffer rules in 15A NCAC 2B .0200, erosion and sedimentation control requirements in 15A NCAC Ch. 4 and under the Division's General Permit NCG010000, and any requirements pertaining to wetlands under 15A NCAC 2B .0200 and 15A NCAC 2H .0500.

**11. Noncompliance Notification:**

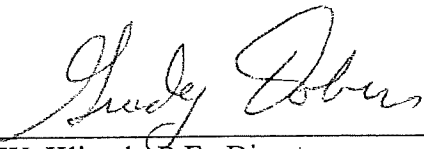
The Permittee shall report by telephone to the Fayetteville Regional Office, telephone number (910) 486-1541, as soon as possible, but in no case more than 24 hours or on the next working day, following the occurrence or first knowledge of the occurrence of either of the following:

- a. Any process unit failure, due to known or unknown reasons, that renders the facility incapable of adequate wastewater transport, such as mechanical or electrical failures of pumps, line blockage or breakage, etc.; or
- b. Any failure of a pumping station or sewer line resulting in a by-pass directly to receiving waters without treatment of all or any portion of the influent to such station or facility.

Persons reporting such occurrences by telephone shall also file a written report in letter form within five days following first knowledge of the occurrence. This report must outline the actions taken or proposed to be taken to ensure that the problem does not recur.

Permit issued this the twenty-seventh day of October 2003

NORTH CAROLINA ENVIRONMENTAL MANAGEMENT COMMISSION



for Alan W. Klimek, P.E., Director  
Division of Water Quality

By Authority of the Environmental Management Commission

**Permit Number WQ0023202**

**Fast Track Engineering Certification**

Permit No. WQ0023202  
October 27, 2003

Complete and submit this form to the permit issuing regional office with the following:

- One copy of the project record drawings (plan & profile views of sewer lines) of the wastewater collection system extension
- supporting design calculations (selected pumps, system curve, operating point, available storage if portable generator(s) or storage greater than longest past three year outage reliability option selected) for any pump stations permitted as part of this project
- Changes to the project should be clearly identified on the record drawings or in written summary form. Permit modifications are required for any changes resulting in non-compliance with this permit, regulations or minimum design criteria.

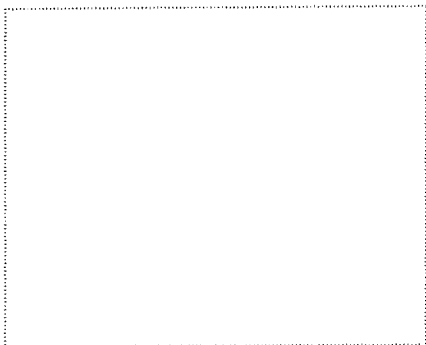
This project shall not be considered complete nor allowed to operate until this Engineer's Certification and all required supporting documentation have been received by the Division. **Therefore, it is highly recommended that this certification be sent in a manner that provides proof of receipt by the Division.**

**ENGINEER'S CERTIFICATION**

Partial                       Final

I, \_\_\_\_\_, as a duly registered Professional Engineer in the State of North Carolina, having been authorized to observe ( periodically,  weekly,  full time) the construction of the Kelly Hills/Slocomb Road Water & Sewer District, Cumberland County project for the Permittee hereby state that, to the best of my abilities, due care and diligence was used in the observation of the construction such that the construction was observed to be built within substantial compliance of this permit; 15A NCAC 2H .0200; the Division of Water Quality's (Division) Gravity Sewer Minimum Design Criteria adopted February 12, 1996 as applicable; the Division's Minimum Design Criteria for the Fast-Track Permitting of Pump Stations and Force Mains adopted June 1, 2000 as applicable; and other supporting materials.

North Carolina Professional Engineer's  
seal, signature, and date:



**SEND THIS FORM & SUPPORTING DOCUMENTATION  
WITH REQUIRED ATTACHMENTS TO THE FOLLOWING ADDRESS**

**FAYETTEVILLE REGIONAL OFFICE  
225 GREEN STREET, SUITE 714  
FAYETTEVILLE NC 28301**

The Permittee is responsible for tracking all partial certifications up until a final certification is received. Any wastewater flow made tributary to the wastewater collection system extension prior to completion of this Engineer's Certification shall be considered a violation of the permit and shall subject the Permittee to appropriate enforcement actions.





## **Appendix D**

### **PWC Agreement**

**STATE OF NORTH CAROLINA  
COUNTY OF CUMBERLAND  
SANITARY SEWER WHOLESALE AGREEMENT**

**THIS AGREEMENT** made and entered into this 24<sup>th</sup> day of September 2014 by and between the City of Fayetteville acting by and through its Public Works Commission of the City of Fayetteville (hereinafter referred to as "Commission" or "PWC") and the County of Cumberland, a North Carolina body politic acting by and through its Kelly Hills/Slocomb Road Water & Sewer District, (hereinafter referred to as "Kelly Hills").

**WITNESSETH**

**THAT, WHEREAS,** Kelly Hills owns and operates a wastewater collection system, as described in Exhibit B, that currently serves approximately 115 customers in the Kelly Hills/Slocomb Road area; and,

**WHEREAS,** Commission owns and operates wastewater treatment facilities (the "Municipal Wastewater System") and provides wholesale wastewater treatment services; and,

**WHEREAS,** Kelly Hills wishes to contract with Commission for PWC to furnish wholesale wastewater treatment service to Kelly Hills for the treatment of Kelly Hills wastewater; and ,

**WHEREAS,** Commission agrees to furnish wastewater treatment service pursuant to the terms of this agreement; and,

**WHEREAS,** Kelly Hills wishes to contract with Commission for PWC to provide operation and maintenance services to Kelly Hills for the Kelly Hills Sanitary Sewer system; and,

**WHEREAS,** Commission agrees to furnish operation and maintenance services to Kelly Hills for the Kelly Hills Sanitary Sewer system pursuant to the terms of this agreement; and,

**WHEREAS,** both parties recognize the Commission must implement and enforce a pretreatment program to control wastewater discharges from Significant Industrial Users ("SIUs") under 40 CFR Part 403 or other dischargers who require issuance of SIU or local permits.

**NOW THEREFORE,** Commission and Kelly Hills agree to the following terms and conditions:

1. Discharge Points:  
As of the Effective Date, wastewater from Kelly Hills existing sanitary sewer collection system will be discharged into the Commission's Municipal Wastewater System at the

existing entry point listed in this Section 1 and thence treated at Commission's plants as deemed appropriate. Existing entry point is PWC Lift station at 355 Bethune Drive. Kelly Hills shall not discharge into Commission's Municipal Wastewater System at any other entry point without prior written approval from the Commission. Exhibit A shows the approved discharge points.

2. Flow Measurement:

Within one hundred and twenty (120) business days from the Effective Date of this agreement, Commission shall install at Kelly Hills' expense a flow measurement device at the Kelly Hills approach main where Kelly Hills discharges wastewater into the Commission's Municipal Wastewater System. Commission at its expense, shall be responsible for maintenance and calibration of the flow measurement device and calibration shall be done annually and shall operate within the accuracy tolerances as specified by the manufacturer. Commission shall provide Kelly Hills a copy of the calibration records of the flow measurement device.

3. Basic Operations and Maintenance

A. The cost of basic operation and maintenance of the sanitary sewer collection system is built into the sanitary sewer rate being charged to Kelly Hills. Basic operation and maintenance includes:

1. Rights-of-way and/or easement maintenance to allow for accessibility to the sanitary sewer collection system.
2. Cleaning of at least 10% of the sanitary sewer collection system each year.
3. A general observation of the entire sanitary sewer collection system throughout the course of every year.
4. Semiannual inspections of all high priority lines (i.e. aerial, sub-waterway crossing, line contacting surface waters, siphon, line positioned parallel to stream banks subject to eroding, or line designated as high priority in a permit if applicable).
5. Point repair to a damaged or broken sanitary sewer main pipe, not to include replacement of multiple pipe joints.
6. Point repair to a damaged or broken sanitary sewer lateral or cleanout, not to include outright renewal of entire lateral.
7. Cleaning and rodding of clogged sanitary sewer mains and laterals.
8. Repair of manholes to include resetting of manhole ring and cover, not to include adjustments to or replacement of manhole or ring and cover; not to include repairs warranted to address I&I or corrosion issues.

- B. Other extraordinary work required or requested by Kelly Hills will be NU billed at the appropriate rate to include applicable overtime and overhead for labor, equipment and materials ( to include an amount for all direct and indirect charges) plus 10%. Examples of extraordinary work are: SSO remediation and post cleaning and inspection, work consider as a capital improvement under Financial Accounting Standards Board (FASB) standards, replacement of multiple joints of sanitary sewer pipe, renewal of a sanitary sewer lateral, installation of a new sanitary sewer lateral, elder valve installation, smokedye testing and CCTV inspection. Kelly Hills shall have the right to install themselves or to hire a contractor(s) to perform this work to PWC standards.
- C. The Commission shall at its discretion exercise the right to decline or subcontract any work required or requested by Kelly Hills that would conflict with the Commission's responsibilities and requirements for the operation and maintenance of the Commissions' sanitary sewer collection system.
- D. Commission will provide other services, upon request, but which will be billed separately and not included in the Wholesale Sewer Rate. A partial list of the other services that may be available to Kelly Hills include the following:
1. Promote participation agreements with other benefitted parties;
  2. Participation and administration of utility extension contracts;
  3. Right-of-way acquisition for land and easement requirements to be secured in the name of Kelly Hills within the limits permitted by law but not to include actions in eminent domain;
  4. Inspection services during construction;
  5. Miscellaneous services such as GIS mapping as requested.
- E. Other services requested by Kelly Hills will be NU billed at the appropriate rate to include applicable overtime and overhead for labor, equipment and materials ( to include an amount for all direct and indirect charges) plus 10%.

4. Upsizing Mains

Commission will be responsible for the cost associated with upsizing mains within the delineated Kelly Hills service as may be deemed necessary in order to meet

Commission's existing and future sanitary sewer needs which would not be otherwise required for the sanitary sewer collection system being installed by Kelly Hills pursuant to this Agreement.

5. Ownership of Sewer Lines

A. All sanitary sewer lines installed within the boundaries of the Kelly Hills Sanitary Sewer District shall be owned and operated by Kelly Hills subject to Commission's right to upsize such mains at its expense and to transmit sanitary sewer through such mains to areas beyond the Kelly Hills area.

B. Commission shall own and operate the lift station located at 355 Bethune Drive, Fayetteville, NC and the associated force main.

6. Rights-of-way and encroachments

Kelly Hills will acquire all rights-of-way and/or encroachments as may be needed for construction and maintenance of the sanitary sewer collection system as referenced herein.

7. Extension of Mains Outside Kelly Hills Service Area

Commission reserves the right to extend or continue sanitary sewer mains from such mains as initially constructed by Kelly Hills to points outside of the delineated Kelly Hills service area. Future connections or main extensions that occur outside of the delineated Kelly Hills area are not subject to this Agreement and shall be the property of Commission unless the Kelly Hills boundary is expanded by law to serve development of contiguous properties. If such extensions occur, then the Commission shall install a flow measurement device at its expense to measure all flow being generated by customers outside of the Kelly Hills Service Area. A map of showing the boundaries of the Kelly Hills service is show as Exhibit B.

8. Extension of Mains Within Kelly Hills Service Area

The further extension of or connection to mains within the delineated Kelly Hills service area will be pursuant to applicable extension and connection policies and procedures of Kelly Hills in effect at the time a request for service is made.

9. Compliance with Commission Policies and Procedures

Kelly Hills may by resolution adopt a policy whereby future customers and/or extenders of sanitary sewer infrastructure in the Kelly Hills service area will be subject to the then current applicable Commission Policies and Procedures to simplify the application process for customers with the understanding that such customers remain responsible to Kelly Hills for compliance with such policies and procedures.



10. Notification of Excessive Inflow/Infiltration

Upon notification by Commission that volumes of Kelly Hills wastewater entering Commission's lines, based on flow measuring data, exceed one hundred twenty-five percent (125%) of the average volume of sewer measured at the Discharge Point during any consecutive three-month billing period, Kelly Hills shall initiate an infiltration/inflow study to be conducted or supervised by a professional consulting engineer. Such study will provide Kelly Hills with recommendations designed to reduce infiltration/inflow to acceptable levels as delineated by the United States Environmental Protection Agency. Said study shall be made during the fiscal year immediately following notification. Corrective measures shall be taken by Kelly Hills upon receipt of and based on said infiltration/inflow study. Kelly Hills shall be responsible for all costs associated with any required infiltration/inflow study and corrective measures. Results of any infiltration/inflow study and proposed corrective measures shall be sent to Commission for review and approval.

11. New Laterals

- A. At Kelly Hills request, Commission will install new laterals in the Kelly Hills Sanitary Sewer District at Kelly Hills expense. Commission will NU bill Kelly Hills for such laterals at the appropriate rate to include applicable overtime and overhead for labor, equipment and materials (to include an amount for all direct and indirect charges) plus 10%.
- B. Kelly Hills, at its sole discretion, may install or contract for the installation of new laterals in the Kelly Hills Sanitary Sewer District.
- C. All new laterals will be designed and built to the PWC standards in effect at the time of the design and construction.

12. Monthly Billing:

- A. As of the Effective Date, the flow measuring device at the Kelly Hills connective main will be read, as nearly as practical, at regular monthly intervals. The period of time between device readings shall not be less than twenty-seven (27) days and not more than thirty-three (33) days. If Commission is unable to read the flow measuring device, for any reason, the wastewater flow shall be estimated by Commission on the basis of Kelly Hills wastewater flow for the preceding three billing periods for which readings were obtained. Bills rendered on the basis of such estimates shall be as valid as if made from actual device readings and appropriate adjustment of Kelly Hills bill shall be made at first actual reading of the flow measuring device subsequent to such estimate.
- B. The term "month" or "monthly" refers to the interval(s) transpiring between the previous meter reading date and the current meter reading date, and bills shall be rendered accordingly.

- C. The Commission will submit bills to Kelly Hills on a monthly basis for the prior month's sewer treatment service.
- D. If at the time of this Agreement's Effective Date, the flow measurement device at Kelly Hills approach main is not installed, the parties agree that billing shall continue under the existing arrangement, as specified in the Kelly Hills/Slocomb Road Water & Sewer District Sanitary Sewer Service Agreement as amended October 24, 2005 until such time that the flow measurement device is installed and calibrated.
- E. The Commission will, annually, or such time as shall be determined by Commission, perform a rate analysis to determine the rates which are applicable to serving Commission's various classes of water and sanitary sewer service. Among those classes of service will be wholesale sanitary sewer service classes, a class which includes Kelly Hills.
- F. Commission will use audited balance sheets, income statements, comparable wholesale market rate data, and return on investment financial information as the basis for determining the rates applicable to this Agreement. Commission may at its option, adjust audited financial data for changes to such financial data known or reasonably expected to occur during the period in which the billing rate will be in effect.
- G. Commission will provide at least 30 days' notice to Kelly Hills of any rate changes.
- H. The initial Wholesale Sewer Rate to be charged to Kelly Hills, including the cost of O&M, is \$ 4.1267 per 1,000 gallons, or \$ .0041267 per gallon, the rate effective January 1, 2014. This cost includes the cost of basic operation and maintenance of the sanitary sewer collection system as described in paragraph 3.

13. Capacity Charges

- A. Commission shall receive and treat up to 100,000 gallons per day of Kelly Hills wastewater, representing the projected average daily usage generated from sources within the Kelly Hills Sanitary Sewer District. Kelly Hills has purchased 32,430 gallons per day sanitary sewer treatment capacity using \$ 92,640 of FIF credits. Upon execution of this agreement Kelly Hills will purchase an additional 67,570 gallons per day of sanitary sewer treatment capacity using \$ 201,358.60 of their existing FIF credits that expire in October 2015.

Kelly Hills has the option, in the future, to purchase any or all of the remaining 50,000 gallons per day force main capacity at the then current FIF charge. Such purchases will be made in increments of at least 5% of the then current contract capacity.



- B. Kelly Hills shall, advise Commission of any anticipated growth in number of connections to its sanitary sewer system, population served and anticipated volume of wastewater as Kelly Hills becomes aware of such growth.. Commission does not anticipate any restriction on annual increase in flow from Kelly Hills, if within limits of the contract demand of 100,000 gallons per day. However, flow limits may be imposed if a regulatory agency having jurisdiction over Commission's treatment facilities requires restriction on flow increases on Commission's system.
  - C. Commission shall notify Kelly Hills if the measured average daily usage in gallons per day of wastewater reaches 80% of the contract demand.
  - D. If the measured average daily usage in gallons per day of wastewater from Kelly Hills exceeds 90% of the contract demand, Kelly Hills shall purchase additional contract demand at the current Commission capacity rate in increments of at least 5% of the existing contract demand.
14. Surcharges for Carbonaceous Biochemical Oxygen Demand (CBOD) and Suspended Solids (SS) and Total Kjeldhal Nitrogen (TKN):
- A. A surcharge for CBOD, Suspended Solids or NH<sub>3</sub> will be applied to those customers of Kelly Hills who are issued SIU or local permits ("Industrial Users"). These surcharges will be determined in accordance with the Commission Rate Schedule "Sanitary Sewer Surcharges" currently indexed as 620.05. Such surcharge billing will be determined by testing samples of wastewater from each Industrial Users' discharge at Commission's laboratories pursuant to standard test requirements and procedures of the State and Federal governments. Commission shall bill surcharges directly to the Industrial Users. The additional costs to treat wastewater in excess of limits stated above are determined by the Commission and published annually. The Commission will, from time-to-time, review and revise the surcharge applicable to Industrial Users based on testing.
  - B. Kelly Hills shall terminate sewer service to any Industrial User upon notice from the Commission that said Industrial User has failed to pay surcharges pursuant to Sections 5 or 7 or any additional fees or penalties under the City of Fayetteville's Sewer Use Ordinance.
15. Sewer Use Ordinance Requirement:
- A. The Sanitary Sewer Ordinance of the City of Fayetteville, as amended from time-to-time, shall be applicable to all Kelly Hills customers whose wastewater is discharged to Commission's Municipal Wastewater System.

- B. Kelly Hills shall be responsible for regulation of all customers who discharge wastewater through Kelly Hills system to the Commission's Municipal Wastewater System. Kelly Hills shall be responsible for enforcement of the requirements of the City of Fayetteville's Sanitary Sewer Ordinance.

16. Sewer Use Ordinance, and Pretreatment Requirements and Costs:

- A. The Sanitary Sewer Use Ordinance of the City of Fayetteville and subsequent revisions of such Ordinance to include pretreatment requirements and cost, both incorporated herein by reference, shall be applicable to the effluent of Kelly Hills' sanitary sewer being discharged into the Commission's sanitary sewer system.
- B. Kelly Hills hereby designates Commission as the agent of Kelly Hills for the purposes of implementation and enforcement of the pretreatment requirements of Kelly Hills for industrial users located in Kelly Hills' jurisdiction. Commission hereby accepts the designation of agent of Kelly Hills' jurisdiction for purposes of implementation and enforcement of the pretreatment requirements. If Commission determines the pretreatment requirements are not enforceable by Commission, then Kelly Hills shall provide timely enforcement. Kelly Hills shall continue to enforce all other provisions of the City's Sanitary Sewer Use Ordinance.
- C. Commission, on behalf of and as an agent for Kelly Hills', agrees to perform technical and administrative duties necessary to implement and enforce the pretreatment requirements, including but not limited to the following:
  - 1. Updating industrial waste survey no less than once every five (5) years;
  - 2. Providing technical services such as sampling and analysis;
  - 3. Permitting of Significant Industrial Users (SIU's);
  - 4. Conducting inspection and compliance monitoring at permitted SIU's and certain commercial users; and
  - 5. Performing enforcement activities.

In addition, Kelly Hills authorizes the Commission, as its agent, to take emergency action to stop or prevent any discharge which presents or may present an imminent danger to the health or welfare of humans, reasonably appears to threaten the environment, threatens to interfere with the operation of Commission's sanitary sewer treatment system (including the collection system and its workers' safety), or which could pass through the treatment plant and threaten the integrity of the publicly owned treatment works receiving stream.

- D. Kelly Hills, as with other Commission customers, shall be responsible for additional cost associated with treatment of sanitary sewer in excess of published limits as determined by Commission. Such pretreatment surcharge billing will be determined by testing of samples of sanitary sewer from the Kelly Hills sanitary sewer collection system at Commission's laboratories pursuant to standard test requirements and procedures of the State and Federal governments. The pretreatment surcharge procedure as it applies to commercial industrial customers is described in Commission's Rates and Policies Manual and is incorporated herein by reference.
- E. Kelly Hills shall pay Commission for actual costs incurred by Commission, including all reasonably allocated overhead costs, implementing and enforcing pretreatment requirements on behalf of Kelly Hills'. Commission shall bill Kelly Hills monthly for pretreatment costs incurred by Commission in implementing and enforcing Kelly Hills' pretreatment requirements, which shall be payable within 30 days of date of invoice.

17. Corrosion Control:

Kelly Hills shall be responsible for ensuring compliance with hydrogen sulfide discharge limits at the point(s) of discharge to the Commission's Municipal Wastewater System. The discharge of dissolved sulfide by Kelly Hills to Commission's Municipal Wastewater System at the discharge point(s) identified in Section 1 of this Agreement, are limited to the following: a daily average of 5mg/l in solution and/or 10 ppm in atmosphere and a maximum of 10 mg/l in solution and/or 30 ppm in atmosphere per day. PWC, at its own expense, shall perform all testing and as needed shall coordinate with Kelly Hills. Kelly Hills, at its own expense, shall be responsible for the addition of any chemicals or additional treatment necessary to comply with the hydrogen sulfide limit. Any addition of chemicals to control hydrogen sulfide shall be coordinated with Commission prior to introduction into the system.

18. Indemnity and Responsibilities:

Kelly Hills assumes responsibility for and shall indemnify (or defend at Commission's sole option) Commission, its successors and assigns, and hold it harmless against all injuries, liabilities, claims, damages, losses, costs and expenses, including reasonable attorney's fees and costs, personal injury or property damage, arising out of or related to 1) the construction, maintenance and operation of Kelly Hills sanitary sewer system, 2) Kelly Hill's discharge into the Commission's Municipal Wastewater System, 3) this Agreement, or 4) fines or penalties by any Federal, State or local agency or body.. Kelly Hills will not indemnify PWC for intentional or negligent acts solely attributable to PWC, its employees, agents, or contractors.

19. Suspension or Termination of Sanitary Wastewater Treatment Service:

Commission, in addition to all other legal remedies, may either terminate this Agreement or suspend sanitary sewer treatment service to Kelly Hills for:

- a) Any material default or breach of this Agreement by Kelly Hills; Fraudulent or unauthorized use of the sanitary sewer treatment service or discharge of sanitary sewer in such manner as to circumvent Commission's meter(s) serving Kelly Hills; or,
- b) Failure to pay monthly sanitary sewer bills when due and payable.
- c) No such termination or suspension, however, will be made by Commission without thirty (30) days written notice delivered to Kelly Hills personally or by mail, within which time Kelly Hills may cure any such alleged default or breach or commence in good faith to cure any such default or breach which cannot reasonably be cured within thirty (30) days, except that only seven (7) days' notice need be given under subsection (b) above.
- d) Commission's suspension of sanitary sewer service or termination of this Agreement upon any authorized grounds shall not relieve Kelly Hills of:
  - 1) Liability for the payment of sanitary sewer treatment service to the date of suspension or termination of this Agreement; nor
  - 2) Liability for any actual damages sustained by Commission.

20. Payment:

Monthly bills are payable within thirty (30) days from date thereof at P.O. Box 1089, Fayetteville, North Carolina, 28302, or its successors. A late payment charge in accordance with PWC's Schedule of Deposits, Fees, and Charges shall be applicable to all bills rendered pursuant to this Agreement except when notified within fifteen (15) days by Kelly Hills in writing of an invoice dispute, but Kelly Hills shall pay the undisputed amount pursuant to this contract.

21. Term of Agreement:

The term of this Agreement is for twenty (20) years from September 24, 2014 until September 24, 2034 (the "Initial Term"). This Agreement shall automatically renew at the end of the Initial Term for a period of one (1) year, and shall automatically renew each year thereafter for a period of one year, unless terminated pursuant to the terms of Paragraph 10, or by either party by giving not less than one (1) year written notice to the other party, or upon mutual consent of both parties. Either party may terminate this Agreement during the Initial Term by giving the other party one (1) year written notice.



22. Prior Agreements: This Sanitary Sewer Wholesale Agreement shall replace the Sanitary Sewer Service Agreement by and between the City of Fayetteville acting by and through its Public Works Commission of the City of Fayetteville and the Kelly Hills /Slocomb Road Sanitary Sewer District dated April 19, 2004 and amended October 24, 2005.

23. Continuity of Service:

Commission does not guarantee continuous utility service, but shall use reasonable diligence in providing uninterrupted services. Having used such reasonable diligence, Commission shall not be liable to Kelly Hills or its customers for failure to provide continuous services. The performance of Commission's obligations under this Agreement shall be excused during such times and to the extent such performance is prevented by reason of any event beyond the control of Commission, including without limitation, flood, earthquake, storm, lightning, fire, explosion, war, riot, civil disturbances, terrorist act, strikes, sabotage, or act of God.

24. Dispute Resolution:

Commission and Kelly Hills will attempt in good faith to resolve any dispute or claim arising out of or in relation to this Agreement through direct negotiations between Commission and Kelly Hills' staff. If the dispute is not settled through such negotiations, then Commission and Kelly Hills agree to attend voluntary mediation prior to initiating formal legal proceedings. Said voluntary mediation shall be initiated by either party giving notice of the same, and shall be concluded within 30 days of such notice. Said voluntary mediation shall be conducted pursuant to the North Carolina Rules Implementing Statewide Mediated Settlement Conferences in Superior Court Civil Actions in effect at the time said notice is given. The requirements of this Section 25 shall not apply to emergency situations where the dispute involves potential harm to the Commission's Municipal Wastewater System.

25. Amendment Proceedings:

This Agreement may be amended, changed, modified, altered, or assigned only by written consent of Commission and Kelly Hills.

26. Notices:

All notices hereunder, other than monthly invoices and payment of the same, shall be sent to the following addresses using regular mail unless otherwise specified in writing:

Commission:            General Manager  
                              Public Works Commission  
                              P.O. Box 1089  
                              Fayetteville, NC 28302

Kelly Hills: Chairman, Governing Board  
Kelly Hills/Slocomb Road Water and Sewer District  
P. O. Box 1829  
Fayetteville, NC 28302-1829

27. Binding Effect:

This Agreement shall be binding upon and inure to the benefit of the parties hereto, their heirs, successors and assigns.

28. Entire Agreement:

This Agreement contains the entire Agreement of the parties and there are no representations, inducements, or other provisions other than those expressed in writing.

29. Kelly Hills acknowledges that, in carrying out the terms of this agreement, PWC will disclose certain confidential customer information to Kelly Hills (the "Confidential Information"). Kelly Hills agrees not to disclose the Confidential Information to third parties, except as may be reasonably necessary to carry out the terms of this Agreement. Kelly Hills will advise PWC of any such disclosure prior to disclosure and obtain PWC's consent. In the event Kelly Hills inadvertently discloses Confidential Information, Kelly Hills will immediately notify PWC of such inadvertent disclosure and will take all appropriate actions to prevent further dissemination or disclosure of the Confidential Information.

29. Governing Law:

This Agreement shall be governed by the laws of the State of North Carolina.

30. Severability:


It is hereby declared to be the intention of Commission and Kelly Hills that the paragraphs, sentences, clauses, and phrases of this Agreement are severable. If one or more paragraphs, sections, sentences, clauses, or phrases shall be declared void, invalid, or otherwise unenforceable for any reason by valid and final judgment or decree of any court of competent jurisdiction, such judgment or decree shall not affect the remaining provisions of this Agreement and the same shall continue to be fully effective and enforceable on the basis that said remaining provisions would have been agreed to by Commission and Kelly Hills without the incorporation of such void, invalid, or otherwise unenforceable paragraph, section, sentence, clause, or phrase.

31. Effective Date:

The Effective Date, as that term is used in this Agreement, shall be the date that the Agreement is fully executed by both parties.

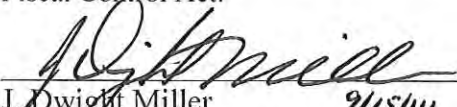
IN WITNESS WHEREOF, the parties hereto, through their duly authorized officers, have executed this contract as to the date and year first above written.

PUBLIC WORKS COMMISSION  
OF THE CITY OF FAYETTEVILLE

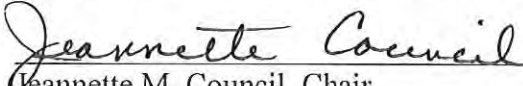
By:   
Michael G. Lallier, Chairman

ATTEST:  
  
Lynne Greene, Secretary

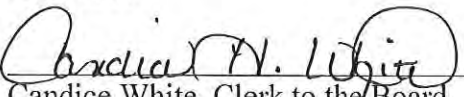
This instrument has been preaudited in the manner required by the Local Government Budget and Fiscal Control Act.

  
J. Dwight Miller 9/15/14  
PWC Chief Financial Officer

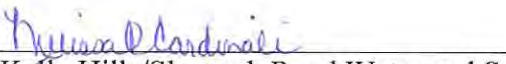
KELLY HILLS/SLOCOMB ROAD WATER AND SEWER DISTRICT

By:   
Jeannette M. Council, Chair



ATTEST:  
  
Candice White, Clerk to the Board

This instrument has been preaudited in the manner required by the Local Government Budget and Fiscal Control Act.

  
Kelly Hills/Slocomb Road Water and Sewer District  
Finance Officer



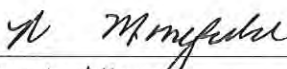
**Legal Review of the Contract between the City of Fayetteville, Acting through its Public Works Commission, and Cumberland County, Acting through its Kelly Hills/Slocumb Road Water & Sewer District, Approved by the Board of Commissioners August 18, 2014**

Section 18 of this agreement is subject to N.C.G.S. § 22B-1. Construction indemnity agreements invalid. That statute states:

Any promise or agreement in, or in connection with, a contract or agreement relative to the design, planning, construction, alteration, repair or maintenance of a building, structure, highway, road, appurtenance or appliance, including moving, demolition and excavating connected therewith, purporting to indemnify or hold harmless the promisee, the promisee's independent contractors, agents, employees, or indemnitees against liability for damages arising out of bodily injury to persons or damage to property proximately caused by or resulting from the negligence, in whole or in part, of the promisee, its independent contractors, agents, employees, or indemnitees, is against public policy and is void and unenforceable.

To the extent that any portion of this indemnity agreement is enforceable, there is no limit on the amount of the obligation that may be incurred.

Subject to proper execution by both parties and the effective dates of the term being inserted into Section 21, this agreement is approved for legal sufficiency for the reason that the Public Works Commission is the sole provider of sewer service for the Kelly Hills Water & Sewer District and the agreement terms were not negotiable.

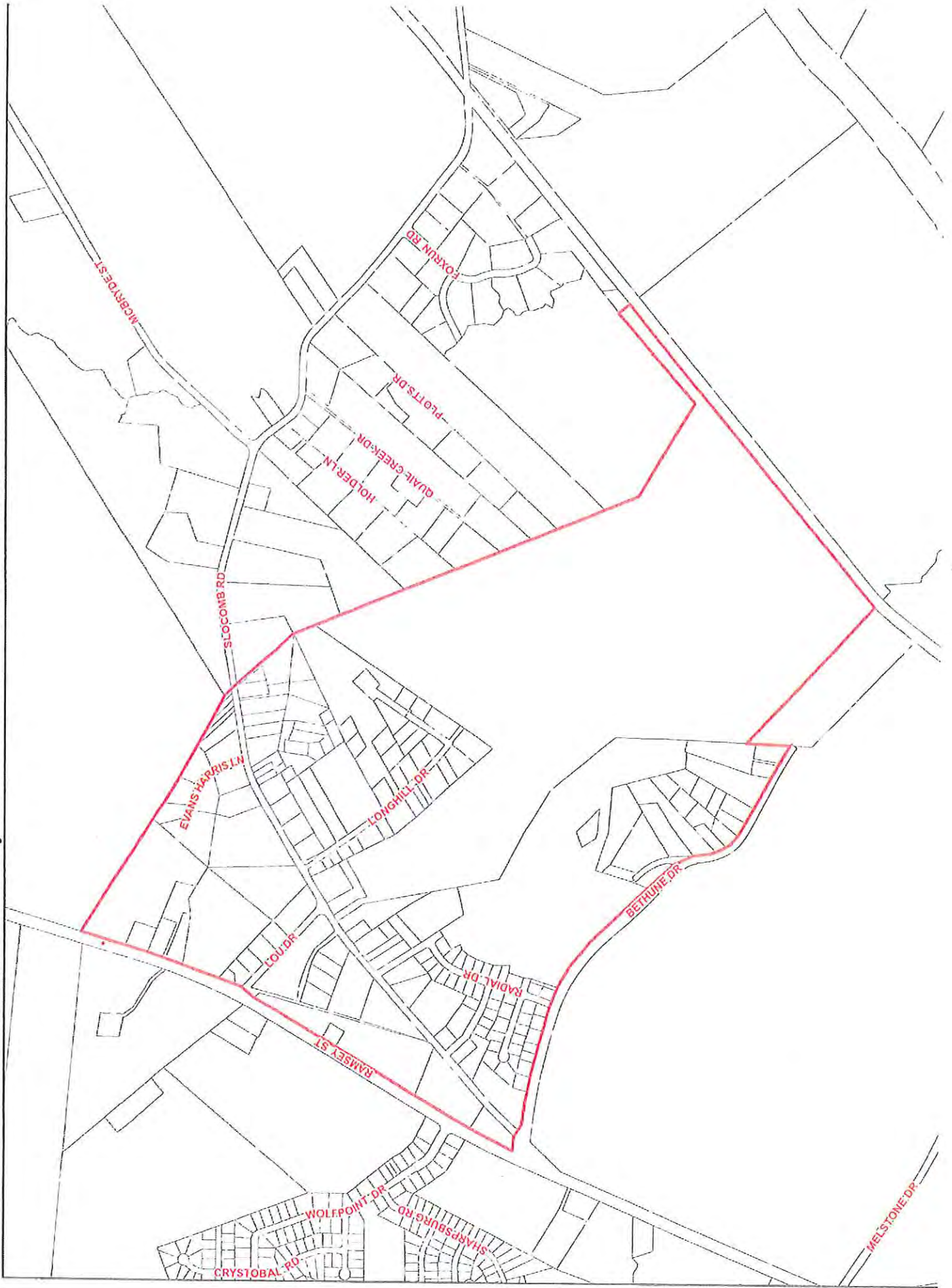
  
County Attorney 8-19-14

## **Exhibit A – Kelly Hills Discharge Points**

The approved discharge point(s) for Kelly Hills are:

1. The flow measurement device at the Kelly Hills force main.

EXHIBIT-B: Kelly Hills Water and Sewer District



**SEWER ASSET MANAGEMENT PLAN**

**NORTHERN CUMBERLAND REGIONAL  
SEWER SYSTEM (NORCRESS) DISTRICT**

**CUMBERLAND COUNTY, NC**



PINEHURST, NORTH CAROLINA

**SEWER ASSET MANAGEMENT PLAN**

**NORTHERN CUMBERLAND REGIONAL  
SEWER SYSTEM (NORCRESS) DISTRICT**

**CUMBERLAND COUNTY, NC**

**MATTHEW JONES, PE**  
matthew.jones@mcgillassociates.com



5 Regional Circle, Suite A  
Pinehurst, NC 28374  
910.295.3159

**AUGUST 2025**

**PROJECT NO. 20.02507**

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**Appendix A – Manhole Inventory List**

**Appendix B – Smoke Testing Results List**

**Appendix C – Rainfall Data**

**Appendix D – Flow Monitoring Data, Hourly Graphs**

**Appendix E – Capital Improvement Project Product Data**

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## **EXECUTIVE SUMMARY**

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The purpose of this Asset Management Plan (AMP) is to document the condition of the Northern Cumberland Regional Sewer System (NORCRESS) District's infrastructure to assist the County with becoming more proactive in the management, operation, and financing of its wastewater collection system. The NORCRESS District serves approximately 452 connections in the northeastern area of Cumberland County. Approximately 666 properties within the district are not currently connected and are paying the sewer availability fee. The District's wastewater collection system consists of approximately 26 miles of gravity sewer, four sewer lift stations, 15 miles of force main, and 424 manholes. Collected wastewater is pumped from the Wade 2 Lift Station to Eastover Central Lift Station and then sent to Fayetteville PWC. Flow generated from the district is ultimately treated at the Cross Creek Water Reclamation Facility (NC0023957), which is owned and operated by Fayetteville PWC. A copy of the agreement is included in Appendix F.

This asset inventory and assessment consisted of assembling data on gravity sewer pipe, manholes, and other appurtenances in the collection system. This assessment included performing inspections of selected manholes, performing smoke testing throughout the system, performing flow monitoring at select locations within the system, and reviewing existing data with County Staff. The information was evaluated and is summarized in this document which includes the asset management plan and capital improvements plan. This process resulted in the development of a 10-year Capital Improvements Plan (CIP) to guide the District with scheduling and financing the capital projects and equipment purchases necessary to maintain and improve its wastewater collection system. Through the AMP process, it is estimated that approximately 40% of the manholes in the sewer collection system are in need of rehabilitation due to deterioration.

The CIP includes a focused improvement to components within the sewer system that need rehabilitation or replacement based on existing condition, and on improvements that could improve management of the sewer system for staff. These planned projects will

bring the system into a better position to serve its customers by improving reliability of the collection system. The District should look to its CIP to guide its next projects, and the CIP should be updated regularly as priorities change and as projects are completed. It is noted that many factors may impact the priorities including failures, and funding availability both local and through grant and loan programs. This assessment project provides evidence for the prioritization of manhole rehabilitation and improvement projects in the CIP.

### ***System Evaluation***

The pipe material in the NORCRESS system is primarily PVC pipe. The collection system was first put into service in 2005, therefore the relative age of the system is low. PVC pipe is the most common material used for sewer systems today. The typical useful life for PVC pipe is anywhere from 40 to 60 years. There is some ductile iron pipe (DIP) used at culvert crossings and HDPE used for directional drill of the Falcon and Wade force mains.

As part of the AMP, McGill Associates, PA (McGill) assisted the District with evaluating the condition of its sewer infrastructure to identify projects in line with these goals. The following items were included in the AMP scope:

- Identify areas to conduct smoke testing to locate potential sources of I/I into the sewer system;
- Flow monitoring in select areas (6 sewershed areas within the Towns of Godwin and Falcon)
- Inspect selected sewer manholes within the system to establish overall system condition;
- Identify and evaluate potential sewer system improvements;
- Prioritize sewer system improvements;
- Prepare opinions of probable costs for sewer system improvements; and
- Create a Capital Improvements Plan.

### Flow Monitoring

McGill met with County staff to identify areas of concern within the sewer system and select locations to place flow meters. From these discussions, the NORCRESS wastewater collection system was divided into six total sewersheds between the Towns of Godwin and Falcon, according to the GIS mapping as depicted in Figure 2. These sites were selected to favor areas where County staff suspected I/I and the sewershed was easily able to be isolated within the total system. Overall, flow monitoring revealed that while all sites had sufficient capacity to handle dry weather flow, there was additional flow during dry weather conditions that raises some concern. Falcon Site 2 had peak flows which used around 40% of the estimated capacity during dry weather conditions, and Falcon Site 1 had peak flows over 60% existing capacity. There was only one significant rainfall event during the flow monitoring period, and I/I did seem to be an issue for the system. All six flow monitoring locations logged higher flows immediately following the event.

### Smoke Testing

McGill and the Cumberland County staff smoke tested segments of gravity sewer lines connected to multiple manholes across the system, enabling the full smoke testing of the entire 26 miles of the sewer system. This testing occurred over a period of several days to determine locations where I/I could enter the wastewater collection system. For each segment, McGill and County staff selected a centrally located manhole on which to place the blower based on the manhole's accessibility. The crew recorded smoke emerging from 240 abnormal locations, which divided generally into four categories- broken or uncapped cleanouts, broken lines, unsealed manholes, and unknown defects. All smoke occurrences are recorded in Appendix A and shown in Figure 3.

### Manhole Inspections

All manholes in the NORCRESS system are precast concrete based on information provided by County staff. The results of the selected manhole inspections performed as a part of this inventory were used to develop an assessment of manhole conditions in the

system. Based on the inspections performed, manholes that were inspected were assigned a condition score, and these scores were combined into an overall condition rating for each manhole- excellent, good, fair, or poor. Of the 37 manholes inspected, approximately 34 were in good condition and four were in fair condition. These results are recorded in Figure 7 and included in Appendix A.

### Lift Station Inspections

The NORCRESS System is served by four lift stations: one in Godwin, one in Falcon, and two in Wade. The County previously contracted with Freese and Nichols to perform an analysis and report on the lift stations. Lift station inspection was not included in the scope of this assessment. Analysis of the lift stations was included the NORCRESS Comprehensive Sewer Evaluation study completed by Freese and Nichols in June 2021. For reference, record drawings for the lift stations are included in Appendix G of this report.

### Findings and Recommendations

The system evaluation allowed McGill to assemble a list of general recommendations and high priority projects to guide the County in the next 10 years. General recommendations to the District included establishing its own flow monitoring and smoke testing programs in high priority areas to determine sewer rehabilitation needs and inspecting sewer lines and manholes with CCTV equipment during routine cleanings to track the condition of these items. McGill also recommended the County begin rehabilitation and/or replacement of existing manholes within the collection system in order to reduce the risk of I/I.

Data and field investigation reporting were utilized to identify the priority projects within the collection system, focusing on manhole rehabilitation.

Table 1 summarizes projects identified during this assessment, centering around additional flow monitoring, flow meters, and manhole rehabilitation projects. A project to

install flow monitors is included to give greater control and understanding of flows from the collection system.

**Table 1: Summary of Capital Improvements Projects**

<b>No.</b>	<b>Project Name</b>	<b>Cost</b>
1	Flow Monitoring Study	\$25,440.00
2	Manhole Rehabilitation Project 1	\$118,600.00
3	Flow Monitoring Improvements	\$203,900.00
4	Manhole Rehabilitation Project 2	\$118,600.00
5	Manhole Rehabilitation Project 3	\$118,600.00
6	Manhole Rehabilitation Project 4	\$118,600.00
7	New Generators All Lift Stations	\$640,000.00
8	Upgrade SCADA	\$240,000.00
9	Falcon Force Main-Inspect, Clean, and Replace ARVs	\$80,000.00
<b>10-Year CIP Total Project Cost</b>		<b>\$1,714,620.00</b>

***Capital Improvements Plan***

The purpose of this asset inventory and assessment was to document the condition of the District’s inventoried infrastructure to assist the County with becoming proactive in the management of its wastewater system, to include capital project planning. The County does not currently have a Capital Improvements Plan (CIP) for its wastewater system. The CIP being developed from this current assessment will guide the County through its planning for projects within the 10-year window. The CIP will remain a living document and be updated in the future so that it remains current to the Districts’ highest priorities and provides accurate cost estimates. The CIP included in this assessment includes projects focused on rehabilitation of existing manholes, which have been identified to be potential sources for I/I into the system. Through discussion with County staff, field investigation and review of existing system data, the specific defects and general problematic areas within the wastewater system have been summarized. These results were used to update the CIP and formulate a ten-year plan.

The complete asset inventory and assessment task consisted of five parts culminating in the development of the NORCRESS Water and Sewer District’s CIP. McGill developed



cost estimates for all projects based on current 2024 materials and construction costs. The updated CIP is intended to be adopted by the County to guide its selection of sewer system improvement projects over the next decade. This plan also includes a budget-level recommendation for staffing associated with system operations and maintenance for all County utility districts.

**1.1 BACKGROUND**

The NORCRESS District is located in Cumberland County, North Carolina, and is owned and operated by Cumberland County. The District includes a wastewater collection system that currently serves 452 customers. A summary of customer type based on use is provided in Table 2. The collection system consists of approximately four and a half miles of gravity sewer mains that are 8-inch, 12-inch, 15-inch, and 16-inch in diameter. These gravity sewer mains are constructed of PVC and Ductile Iron pipe and are all 15 years old. Figure 1 shows the existing sewer collection system.

Developing a Capital Improvements Plan (CIP) will allow the District to update its current rate setting model to better estimate future revenue and expenses, capital outlay, indebtedness, and overall health of the sewer system enterprise fund reserves. A model of this nature would continue to balance revenues and expenditures with a longer-term approach to rate setting and establish a financially sound framework for the District to follow.

The District has experienced the degradation of manholes within its sewer collection system due to the age of the system and resulting from wear over time.

Even with the relatively young age of the NORCRESS system, County staff remains cognizant that infiltration and inflow (I/I) is always a concern, particularly in a scenario where the County's operation costs are based on the gallons of flow that enter into the existing lift station. The County is also aware that during dry weather there tend to be excessive flows in Godwin and Falcon (and therefore Wade, where flows are pumped from both Towns). Therefore, the top challenges for the NORCRESS system are mitigating I/I that results from deteriorated infrastructure and identifying the source of any additional flows into the collection system that do not first enter via water connection and are therefore billable. This additional information will help the County anticipate typical flows and assist with operations and maintenance planning. The information collected

throughout this assessment project will help identify system deficiencies and develop improvement projects to reach these goals.

This process resulted in the development of a 10-year Capital Improvements Plan (CIP) to guide the District with scheduling and financing the capital projects and equipment purchases necessary to restore its wastewater collection system. Through the AMP process, the McGill and County staff have estimated that approximately eighty-four (84) manholes would benefit from rehabilitation due to their poor condition.

The purpose of this Asset Management Plan (AMP) is to document the condition of the Districts' inventoried infrastructure to assist the District with becoming more viable and proactive in the management and financing of its wastewater system. The District continues to look to its CIP to guide its next projects; therefore, it is vital that the CIP remains current to the Districts' highest priorities and provides accurate cost estimates. This assessment project was utilized for the prioritization of replacement lines and improvements projects in the CIP.

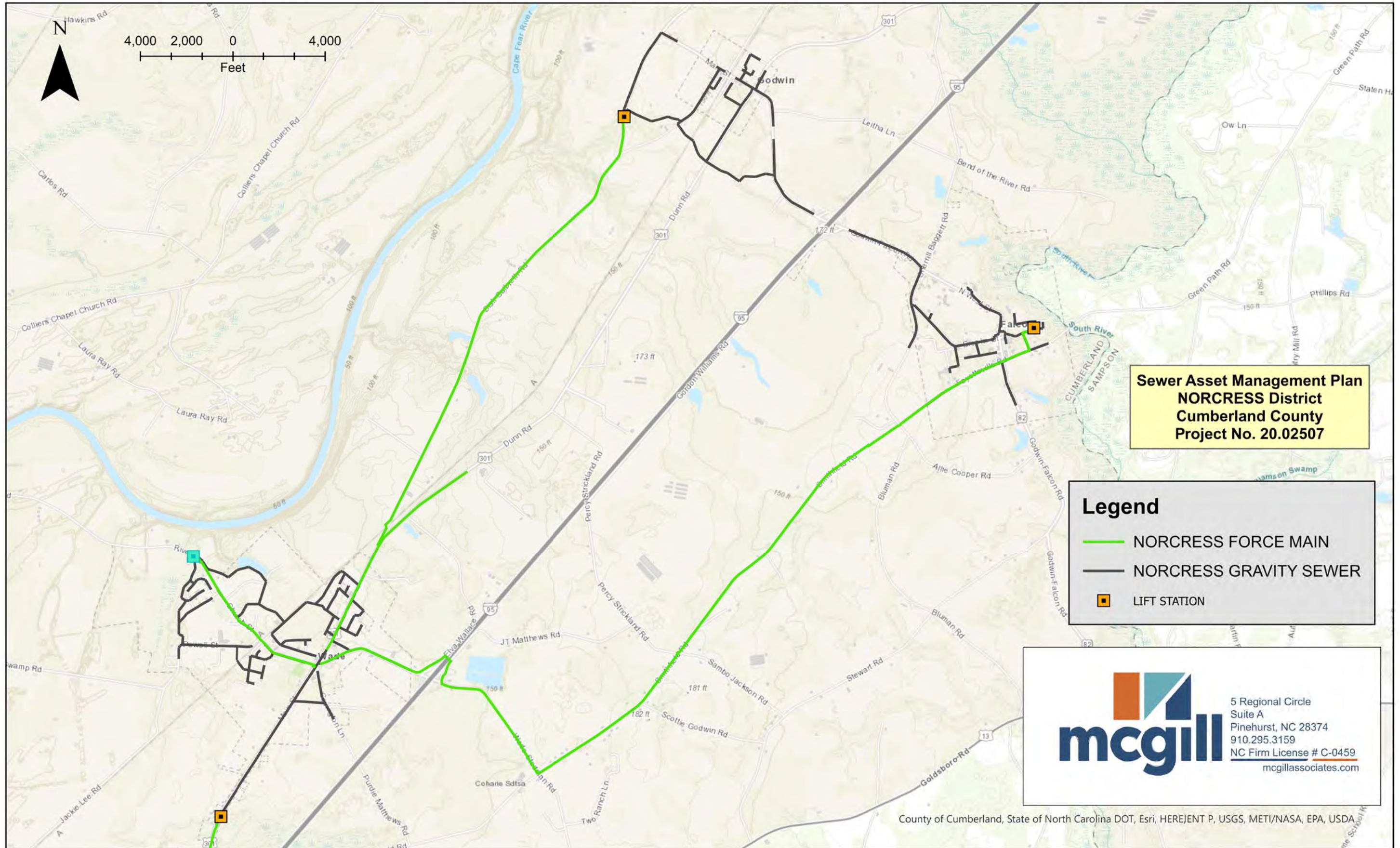
**Table 2: Summary of Customers by Use**

<b>Diameter</b>	<b>Total</b>	<b>% of System</b>
<b>Residential</b>	<b>394</b>	<b>87.1%</b>
<b>Commercial</b>	<b>50</b>	<b>11.1%</b>
<b>Industrial</b>	<b>3</b>	<b>0.7%</b>
<b>Flat Rate</b>	<b>5</b>	<b>1.1%</b>
<b>Total LF</b>	<b>452</b>	<b>100%</b>



# NORCRESS Overall System Map

## Figure 1



**Sewer Asset Management Plan  
NORCRESS District  
Cumberland County  
Project No. 20.02507**

**Legend**

- NORCRESS FORCE MAIN
- NORCRESS GRAVITY SEWER
- LIFT STATION



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County of Cumberland, State of North Carolina DOT, Esri, HERE/JENT P, USGS, METI/NASA, EPA, USDA



## 2.1 FLOW MONITORING

### 2.1.1 Overview

The purpose of flow monitoring was to determine the capacity, average daily flow, and wet-weather flows within areas of the NORCRESS system. This information reveals locations where significant Infiltration and Inflow (I/I) enters the system causing a reduction in available capacity and potential for overflows and sewer backups in the system. Infiltration and Inflow have similar impacts but are contributed to by different sources and can be located and/or resolved using different methods.

Infiltration is water, besides wastewater, that seeps into the sewer system through the ground. Typical infiltration sources include broken pipes, defective pipe joints, damaged manhole walls, and broken service connections. Infiltration typically enters a system slowly and may remain evident in the sewer system for several days following a rainfall event. Although infiltration generally does not produce high peak flows, infiltration regularly results in large volumes if I/I.

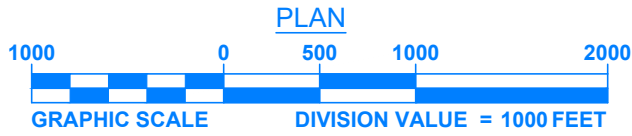
Inflow is water, besides wastewater, that enters the sewer system directly. Typical inflow sources include storm/sewer cross-connections, roof leader connections to sewers, vented manhole covers, and missing cleanout caps. Inflow produces rapid flow increases and often causes sewer system surcharging and overflows during rainfall events. Inflow regularly results in peak I/I flow and high peaking factors.

### 2.1.2 Investigation

Meetings were held with County staff to identify areas of concern within the sewer system and select locations to place flow meters. McGill reviewed the results of the 2021 Freese and Nichols NORCRESS Study, in which the recommendation was to further monitor the flow in Godwin and Falcon. Both of those Towns produced higher than anticipated flow during the period of monitoring during that study. From discussions with County staff, it

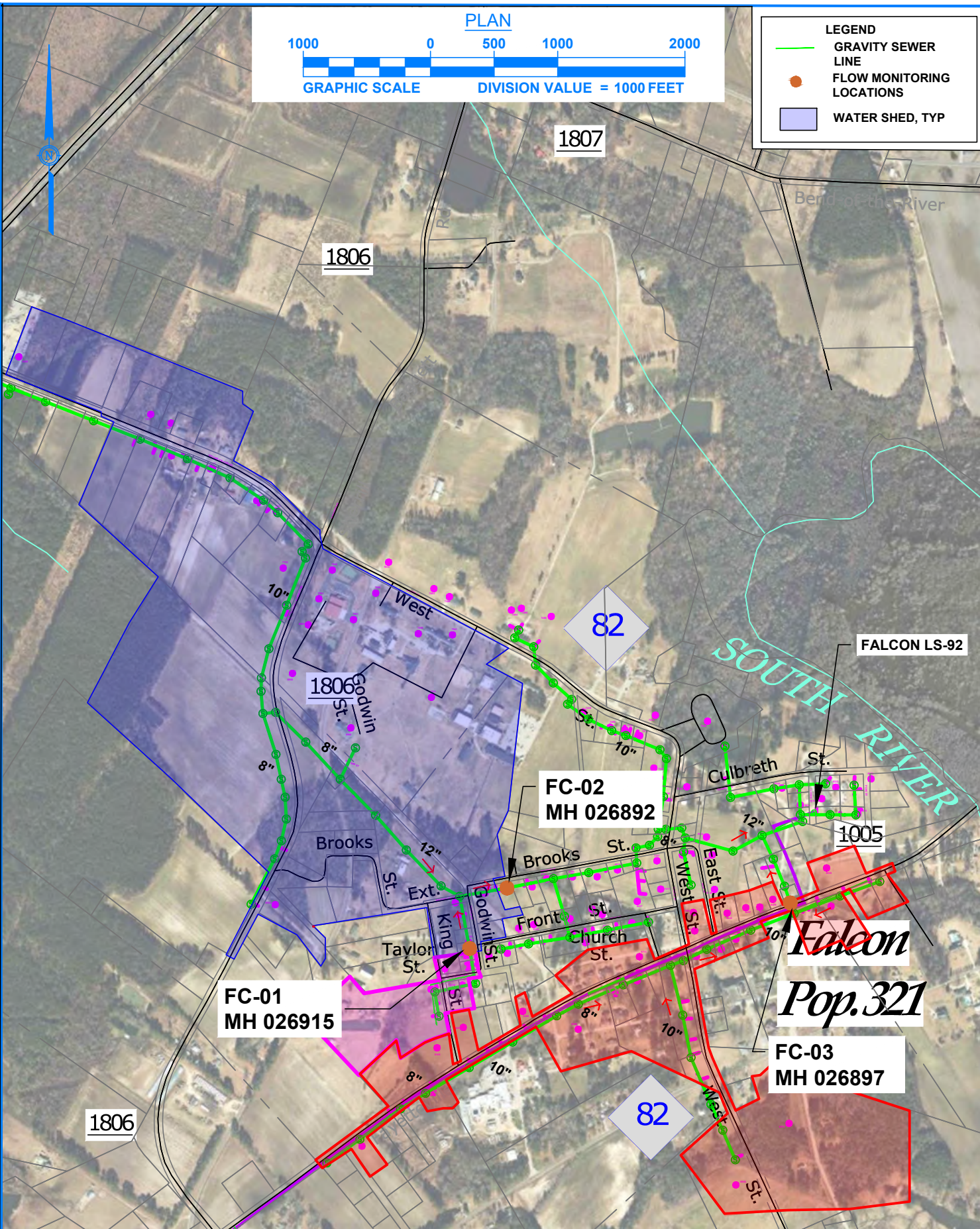
was determined that flow monitors would be placed within the Towns of Godwin and Falcon. Three sewersheds were developed for each Town, resulting in the placement of three flow monitors in each Town. Utilizing staff from KRG Utility, McGill owned flow monitors were installed and flow was monitored from October 18 through November 28, 2023. A map of both Towns and the sewersheds and monitoring locations is shown in Figure 2 and Figure 3. The shaded areas denote the sewersheds for each site.





LEGEND

- GRAVITY SEWER LINE
- FLOW MONITORING LOCATIONS
- WATER SHED, TYP



P:\2020\20.02507-CUMBERLAND-ENGINEERING\DRAWINGS\FIGURES\20.02507 FLOW MONITORING FIGURE.DWG PLOT DATE 3/21/2024 3:52 PM DEMI WATKINS

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DATE  
OCTOBER 2023

PROJECT #  
20.02507

PROJECT MANAGER  
M. JONES

ASSET MANAGEMENT PLAN  
CUMBERLAND COUNTY PUBLIC UTILITIES

CUMBERLAND COUNTY, NORTH CAROLINA

NORCRESS FLOW  
MONITORING IN FALCON

SHEET  
FIG 2







### 2.1.3 Methodology

Average dry-weather flows provide the basis for capacity and wet-weather flow analyses. To develop the average dry-weather flows, McGill averaged the flows for each day with typical flow (no rain events or evidence of silt/debris). Several days that fit this criterion were used in the calculation to acquire the dry-weather flow each respective meter. If present, daily groundwater infiltration into the sewer system is included in the reported average daily flows.

During the flow monitoring period, rain events were recorded on October 21, Nov 11-13, and November 23 based on rainfall data recorded at the Fayetteville Regional Airport (provided in Appendix C). The flows at each of the six flow monitoring devices were recorded during these events. The rainfall event on October 21 was less than 0.5 inches and did not cause I/I based on the monitoring data. The events from November 11-13 and November 22 recorded over 2 inches of rainfall and did contribute I/I into the system. Anticipated flows for each basin were estimated based on the dwellings served. The range represents the estimated value based on usage of 225 gpd/dwelling, which is the updated estimate from 360 gpd/dwelling based on NCAC 02T rules. Dry weather flows were approximated based on the flow seen between rain events at the meter. Actual average daily flow recorded by the meters is also noted.

**Table 3: Summary of Flow Monitoring Drainage Areas**

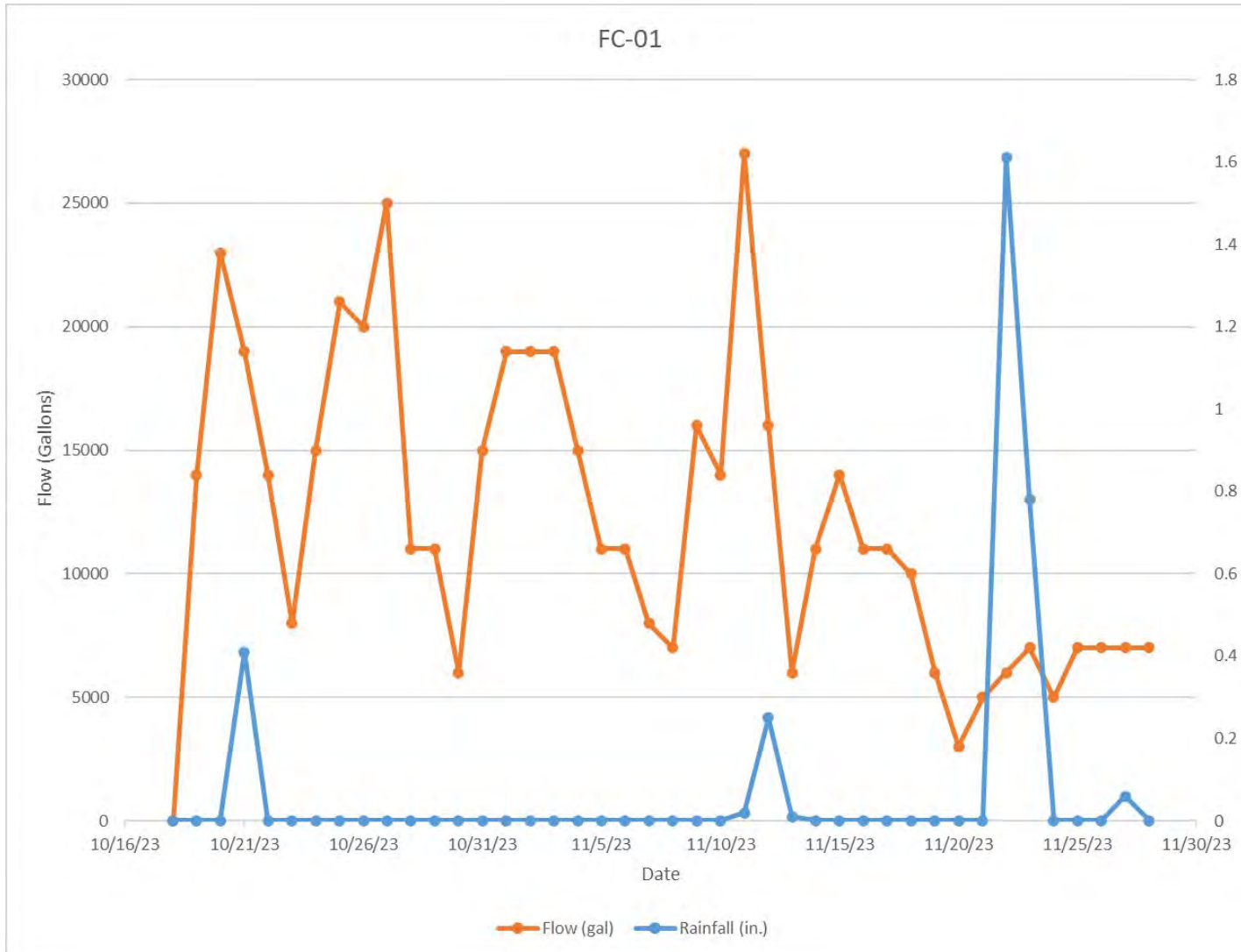
Site	Flow Meter Location	Structures/ Dwellings	Area (acres)	Estimated Flow (gpd)	Dry Average Flow (gpd)	Total Average Flow (gpd)
FC-01	Godwin St	5	14.4	22,925*	11,970	12,070
FC-02	Brooks St	22	224.3	16,050*	23,170	24,970
FC-03	Fayetteville Rd	22	88.9	4,950	1,660	1,625
GW-01	Burnette Rd	17	111.8	6120	7,800	7,930
GW-02	Dunn Rd	21	84.1	7560	7,875	7,290
GW-03	Dunn Rd	13	95.0	4680	4,560	4,340

\*FC-01 and FC-02 Expected Flows include estimated average daily flows for Martins Meats and the Falcon Children’s home. These two entities represent the largest water users in the system.

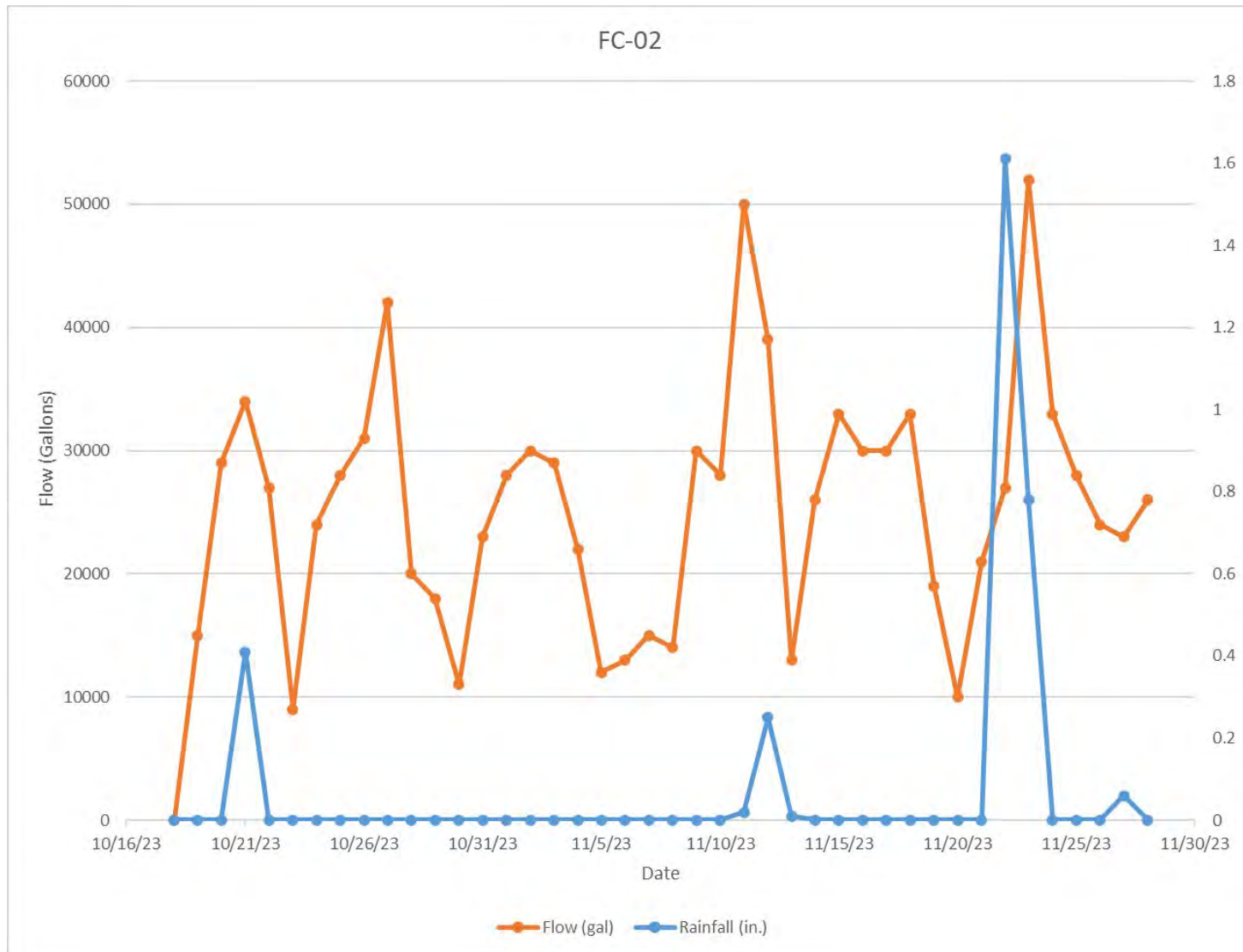
**Table 4: Summary of Large Users In Falcon**

	<b>Total Water Usage (gal)</b>	<b>Total Sewer flow (gal)</b>	<b>Notes</b>
<b>Martins (Accts: 562,665,808)</b>			
October	736,630	202,000	<i>Sewer Flow monitored 10/18-10/31</i>
November	573,810	305,000	<i>Sewer Flow monitored 11/1-11/28</i>
Avg Flow (gpd)	21,840.67		
<b>Falcon Children's Home (Accts: 96,97,98,101,102,103,208,209,210,211,213,328,378,495,585,913,914,915,982,1052)</b>			
October	406,750	109,000	<i>Sewer Flow monitored 10/18-10/31</i>
November	258,500	433,000	<i>Sewer Flow monitored 11/1-11/28</i>
Avg Flow (gpd)	11,087.50		

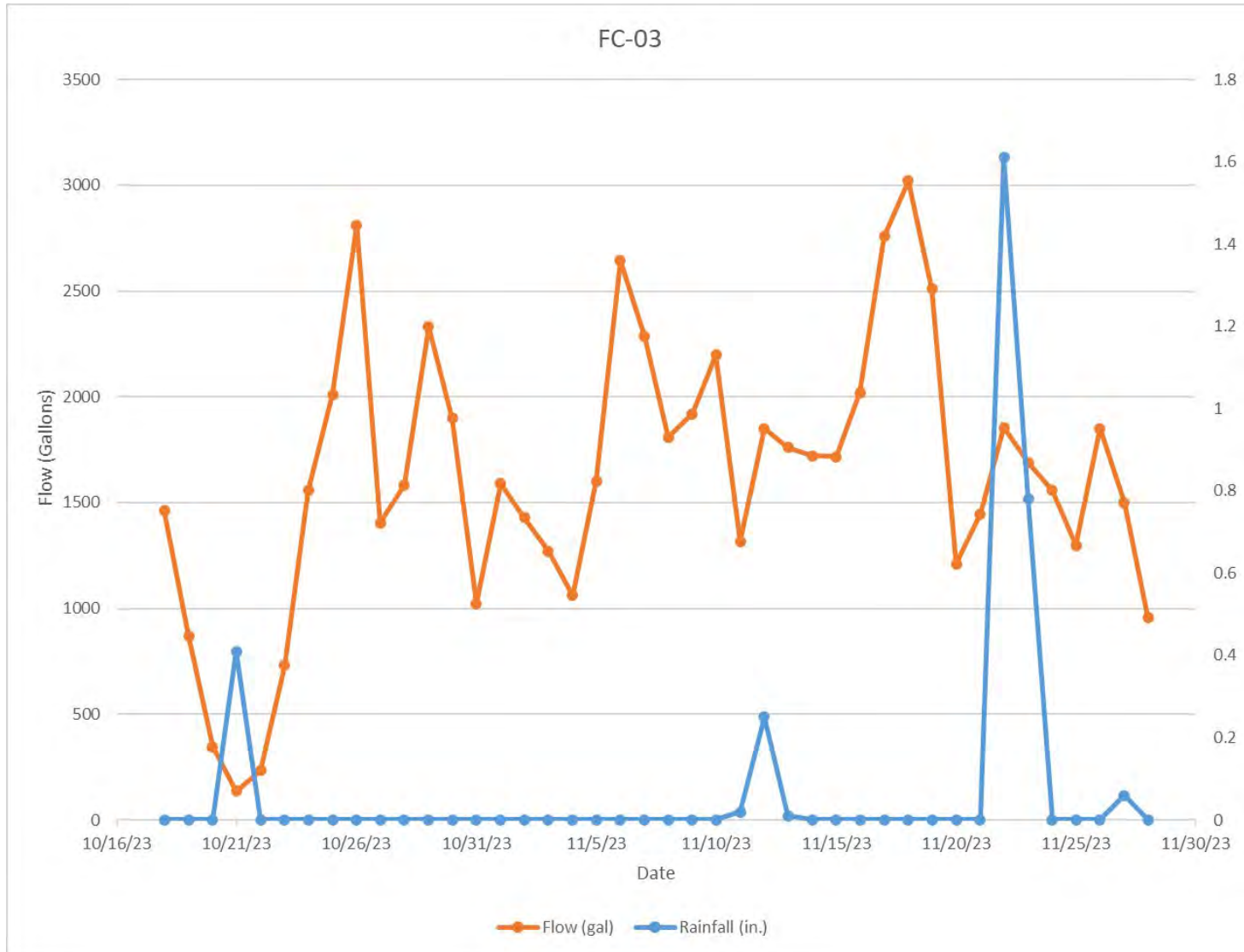
**Graph 1: Falcon Location 01, Daily Flow vs. Rainfall**



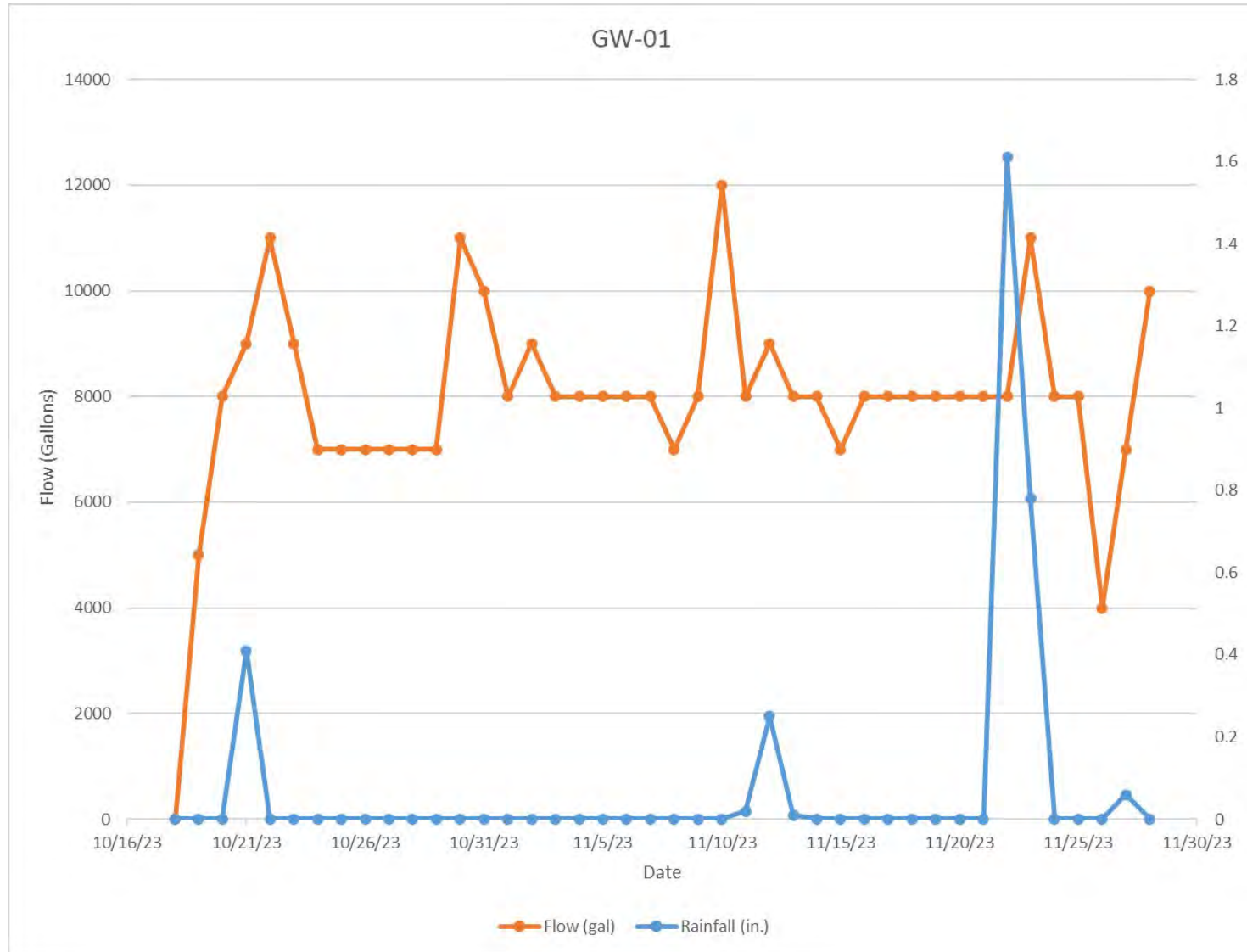
**Graph 2: Falcon Location 02, Daily Flow vs. Rainfall**



**Graph 3: Falcon Location 03, Daily Flow vs. Rainfall**

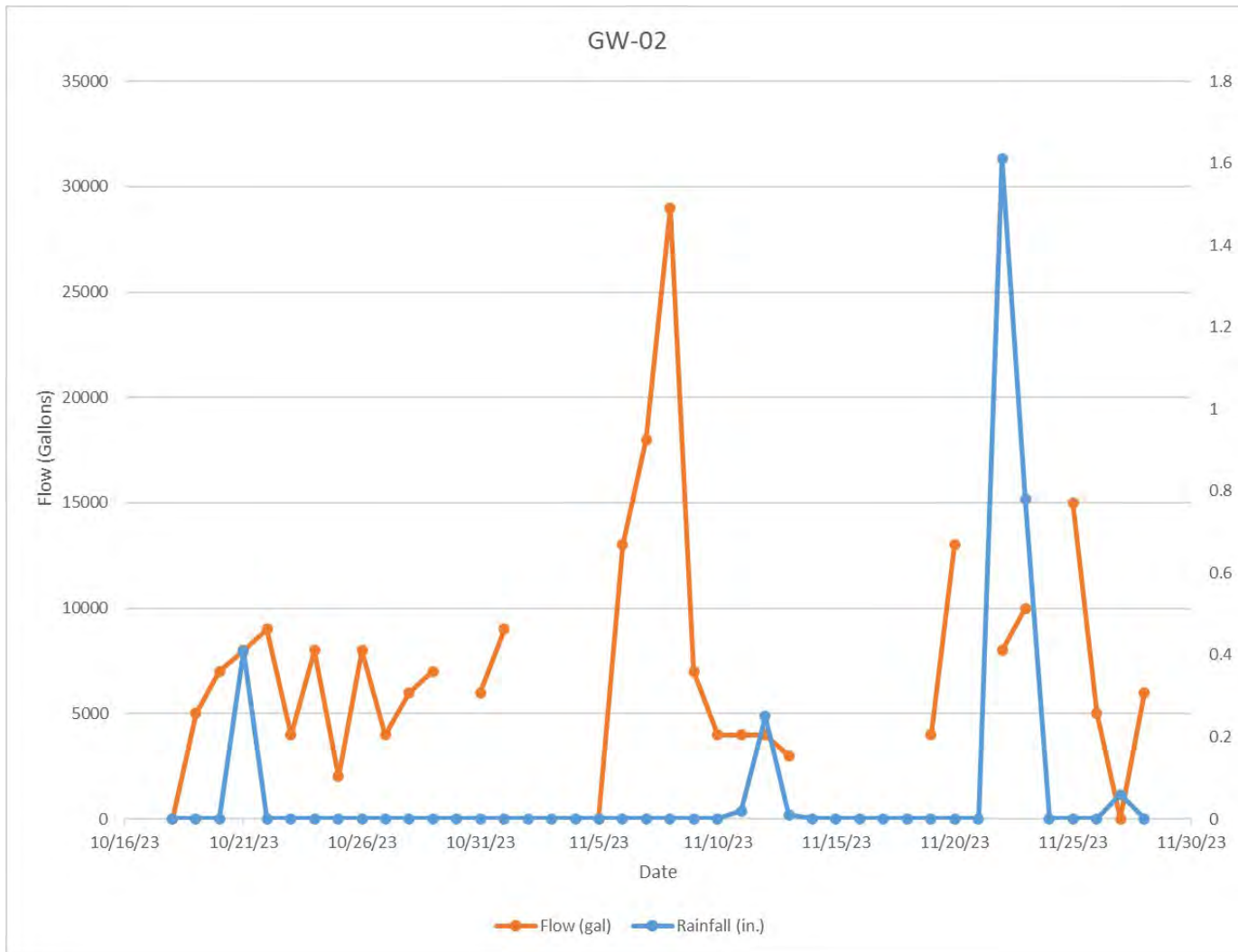


**Graph 4: Godwin Location 01, Daily Flow vs. Rainfall**



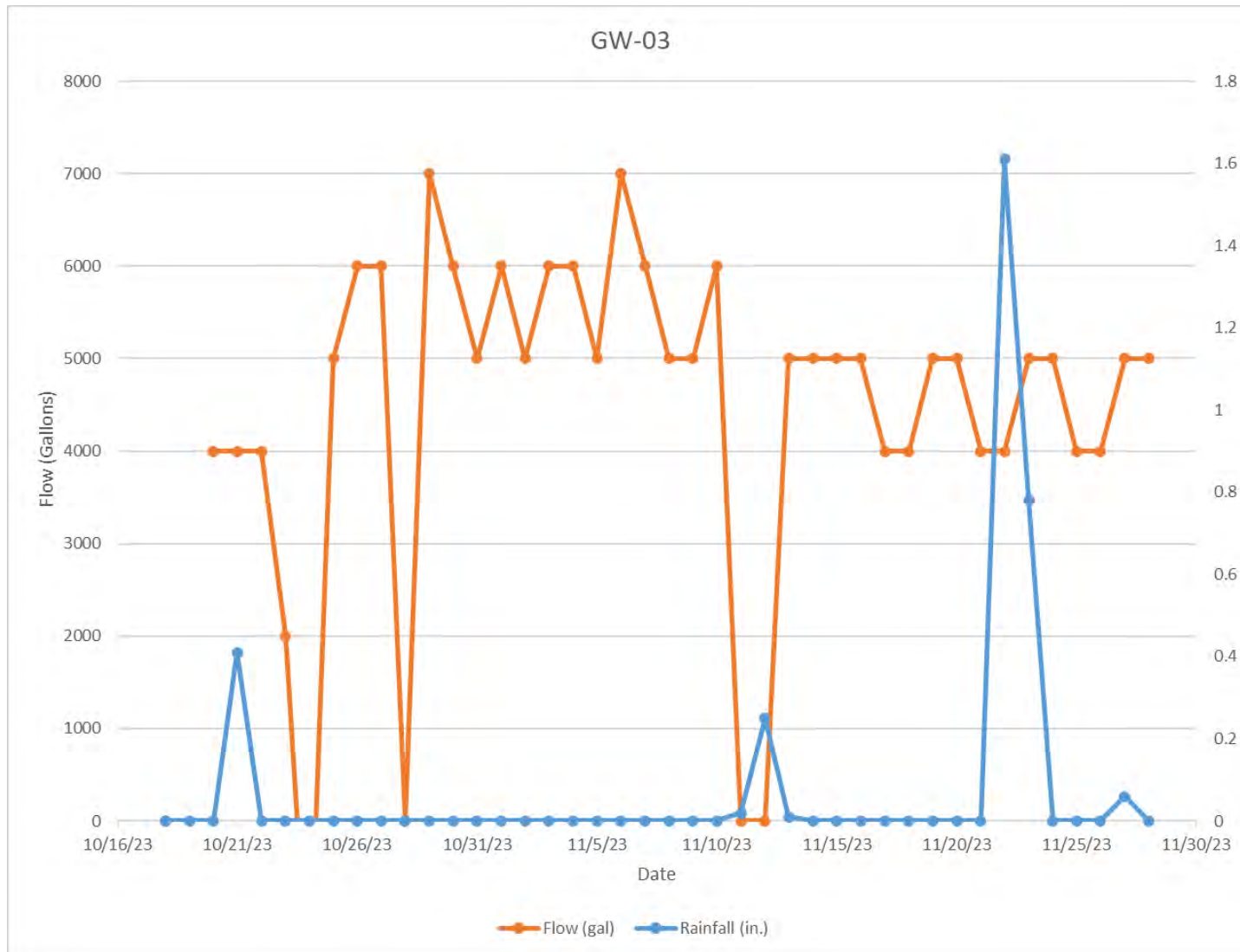


**Graph 5: Godwin Location 02, Daily Flow vs. Rainfall**



Note: Several segments on the graphed flow line show no recorded flow as a result of a negative recorded reading for total flow during the day. There was evidence in the manhole of flow backing up to the mounted meter during this period.

**Graph 6: Godwin Location 03, Daily Flow vs. Rainfall**



#### **2.1.4 Results**

The purpose of the flow monitoring was to determine which locations in the NORCRESS wastewater collection system were the best candidates for further field testing to uncover sources of I/I and other issues. Flow monitoring revealed the following behaviors for the sites/sewersheds depicted in Figure 1:

- All sites had sufficient capacity to handle current dry-weather flow.
- No locations exhibited significant I/I indicators
- Location FC-02 had evidence of inflow as the flow spiked during rain event but then returned quickly.
- Most of the locations monitored showed flows following events that were typical based on dry weather conditions.
- Flow from Martin's Meats do not appear to exceed water usage based on FC-01.
- Flow from Falcon Children's Home does appear to exceed water usage based on FC-02.

The County experiences frequent issues with increased flow from the NORCRESS system that exceeds water usage in the system. Given the results of flow monitoring, it is recommended that additional flow monitoring be performed in Falcon. Additionally, further investigation of possible groundwater or other sources of flow into the system from the Falcon Children's Home property.

In terms of additional monitoring, McGill recommends mid-term flow monitoring of the Falcon area (and any other areas where I/I or unaccounted flow is suspected). Duration would be for a year to begin with, in order to have 12-months of data to review against rainfall and water usage.

## **2.2 SMOKE TESTING**

### **2.2.1 Overview**

Smoke testing is one of the most cost-effective ways to locate defects in sewer mains and laterals. In this process, artificially produced non-harmful smoke is injected into the sewer line via a blower placed over a selected manhole. The pressurized smoke travels up and down the sewer line and connections and emerges at openings in the system. This visual aide allows test crews to easily identify, record, and mark locations where defects are present. If the sewer is in good condition, one should only see smoke rising from manhole lids and house roof vents. If the line has defects, such as breaks or illegal connections, the smoke will emerge at these points.

### **2.2.2 Investigation**

McGill met with County staff to identify areas that would benefit most from smoke testing. Based on the size of the NORCRESS District and having the use of the County's team and equipment in addition to McGill, it was determined that the entire system could be smoke tested. McGill prepared a detailed map of the areas based on the County's GIS database. The Fire Department and customers along the route were alerted to the upcoming testing.

### **2.2.3 Methodology**

McGill and County staff smoke tested all 26 miles of gravity sewer lines over a period of three days to determine locations where I/I enter the wastewater collection system. For each line to be tested, County staff recommended a centrally-located manhole on which to place the blower based on the manhole's accessibility and avoidance of traffic. The manhole nomenclature used by the County was utilized and the location, configuration and condition of each one was recorded.

At each location, the following procedure was executed.

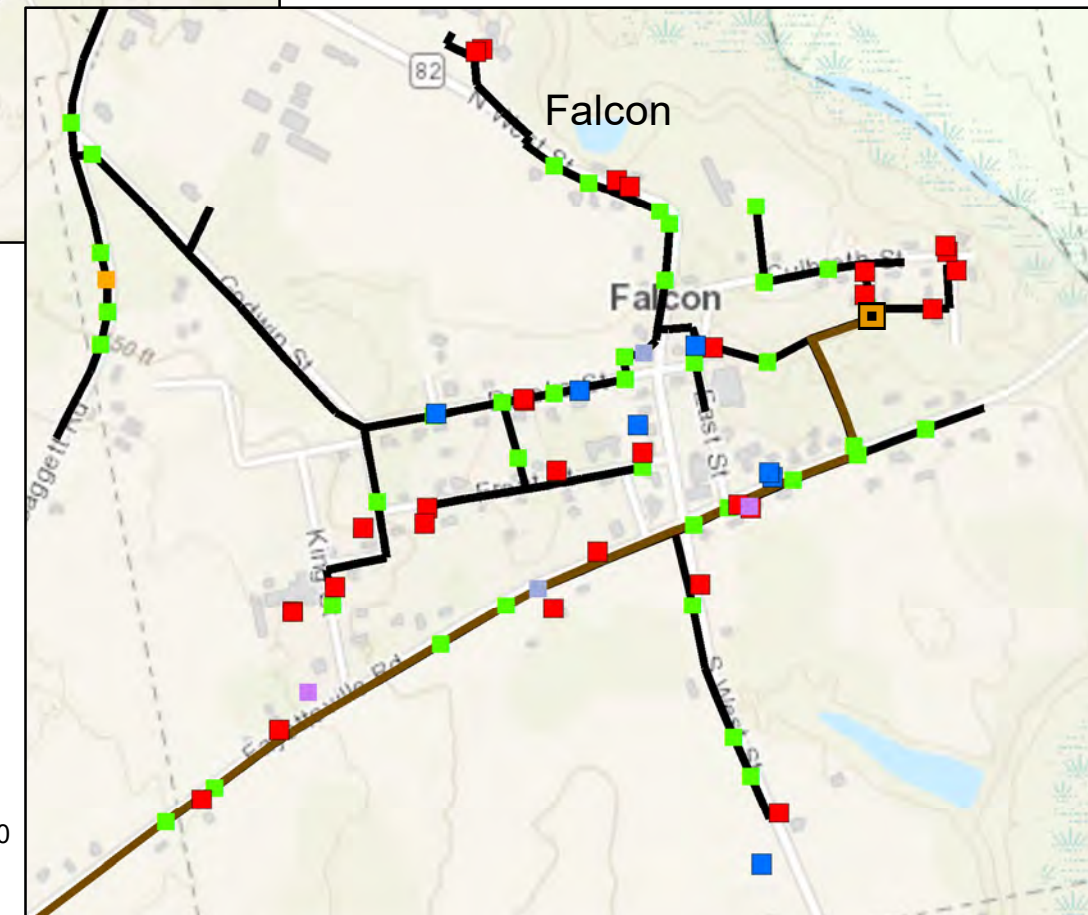
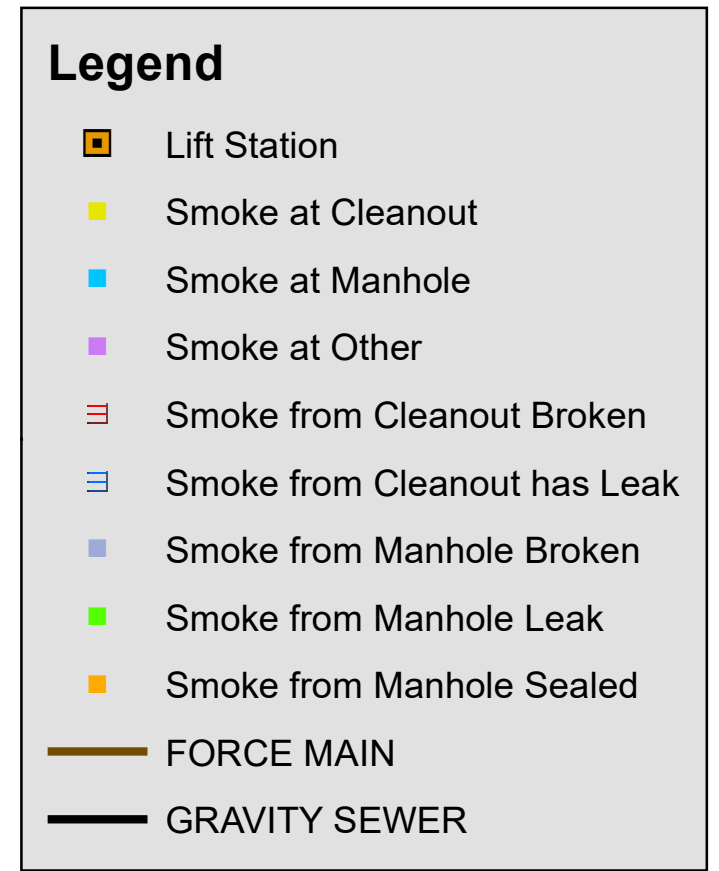
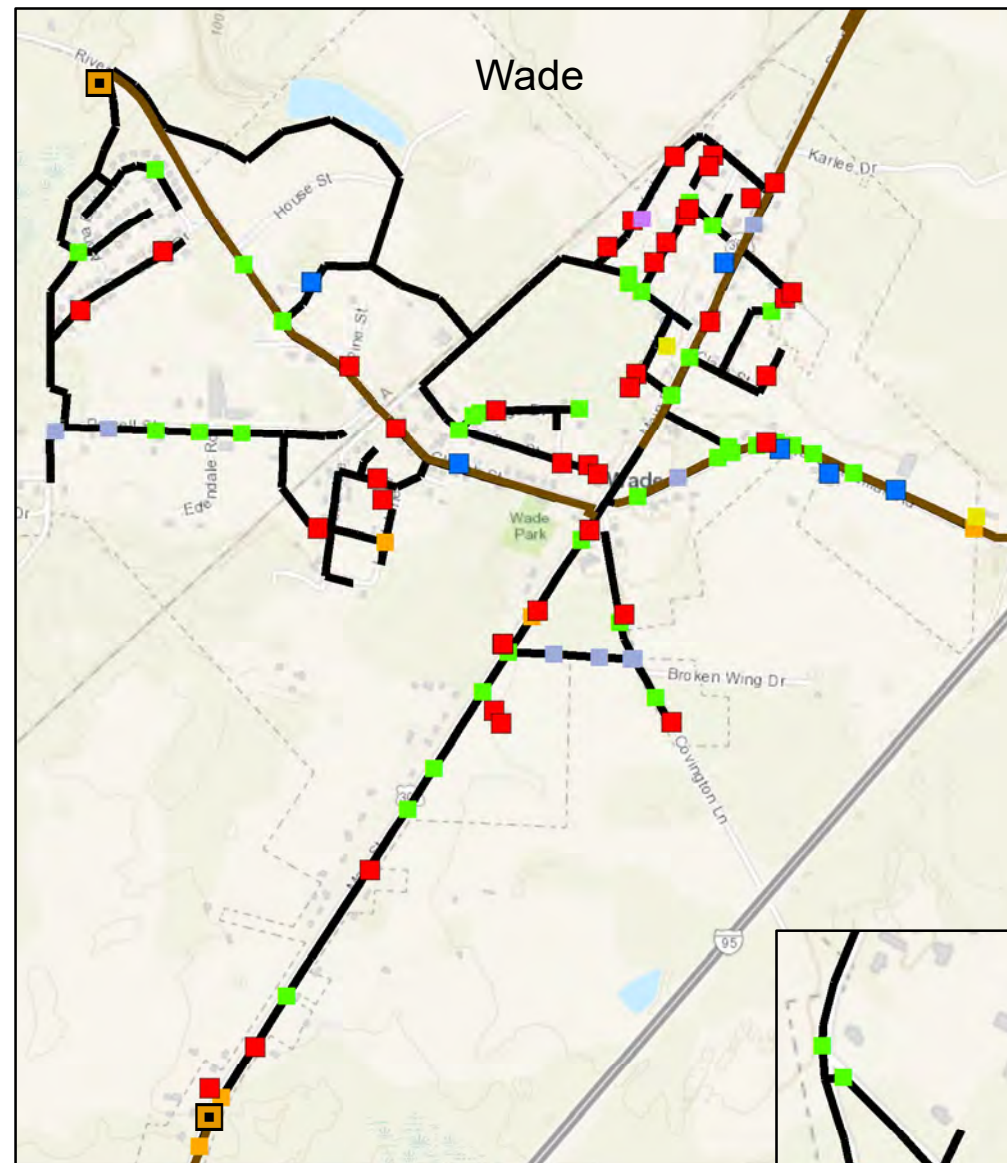
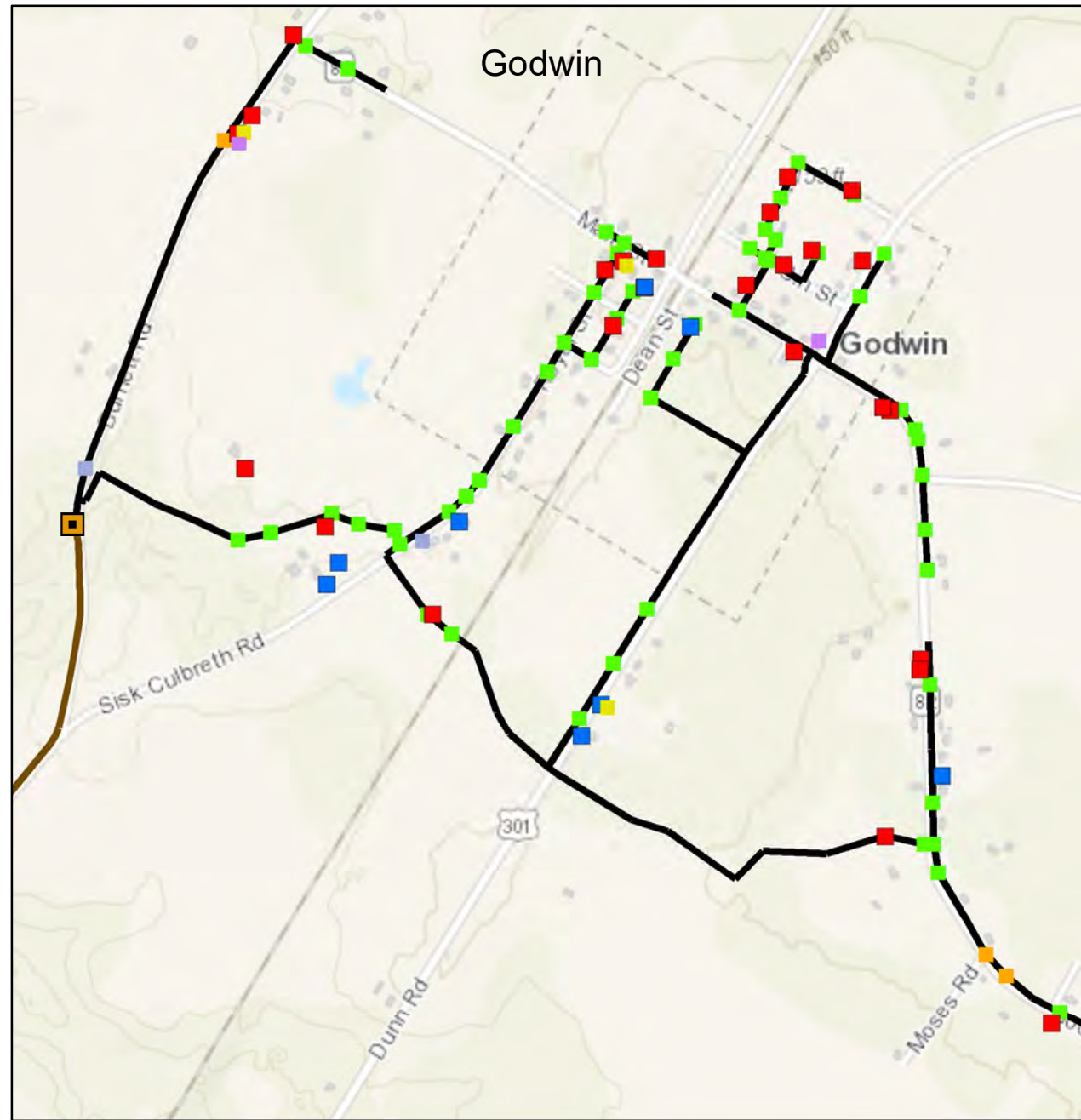
1. Place the blower on the manhole (with the rubber seal, if necessary).
2. Fill smoke pump up to  $\frac{3}{4}$  with liquid smoke.
3. Close all smoke pump valves.
4. Start blower and allow to warm up.
5. Open smoke pump valves.
6. Pressurize smoke pump by pumping the canister manually.
7. Once smoke begins emerging from roof vents, begin surveying for smoke emergencies indicating defects or problem areas in the pipeline.
8. For each defect, record the opening type, address, manhole identifier, and notes.
9. Additionally, mark each defect with paint.

This process continued until all visible defects were marked and recorded. Figure 4 shows some problematic system openings.



# NORCRESS Smoke Testing Map

## Figure 4

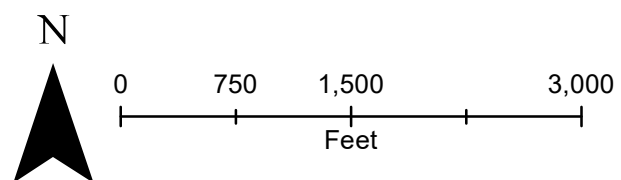


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**Cumberland County**  
**Project No. 20.02507**



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### **2.2.4 Results**

The crew recorded 240 abnormal smoke outlets, which divided generally into five categories.

1. Broken or uncapped cleanouts: Several cleanout caps were missing or broken. The cumulative number of broken cleanouts in the District can contribute to significant I/I. County staff had repair caps on hand during the testing and was able to install new caps where needed.
2. Ground Smoke: Ground smoke can be the result of broken lines, joint separation, etc. Any of these problems can cause significant I/I.
3. Unsealed manholes: Some manholes emitted excess smoke indicating cracked concrete or offset rings. Manholes located in ditches are most likely to contribute I/I.
4. Connected storm drains and culverts: Storm drains and culverts connected to the sanitary sewer systems contribute significant amounts of I/I into the system. These connections are good candidates for video testing.
5. Unknown: Some smoke occurrences require further investigation to determine the type of opening.

A spreadsheet describing all smoke occurrences can be found in Appendix A and all locations were documented in the mapping information in ArcGIS for the County staff to use.



## **2.3 SEWER MAINS**

### **2.3.1 Overview**

NORCESS sewer mains consist of polyvinyl chloride (PVC) and ductile iron pipe. The District's existing sewer lines range from 8-16 inches in diameter. The age of the system and system materials were confirmed by the County based records from construction of the system in 2005. Condition was determined based on visual inspection of select manholes and smoke testing of the system.

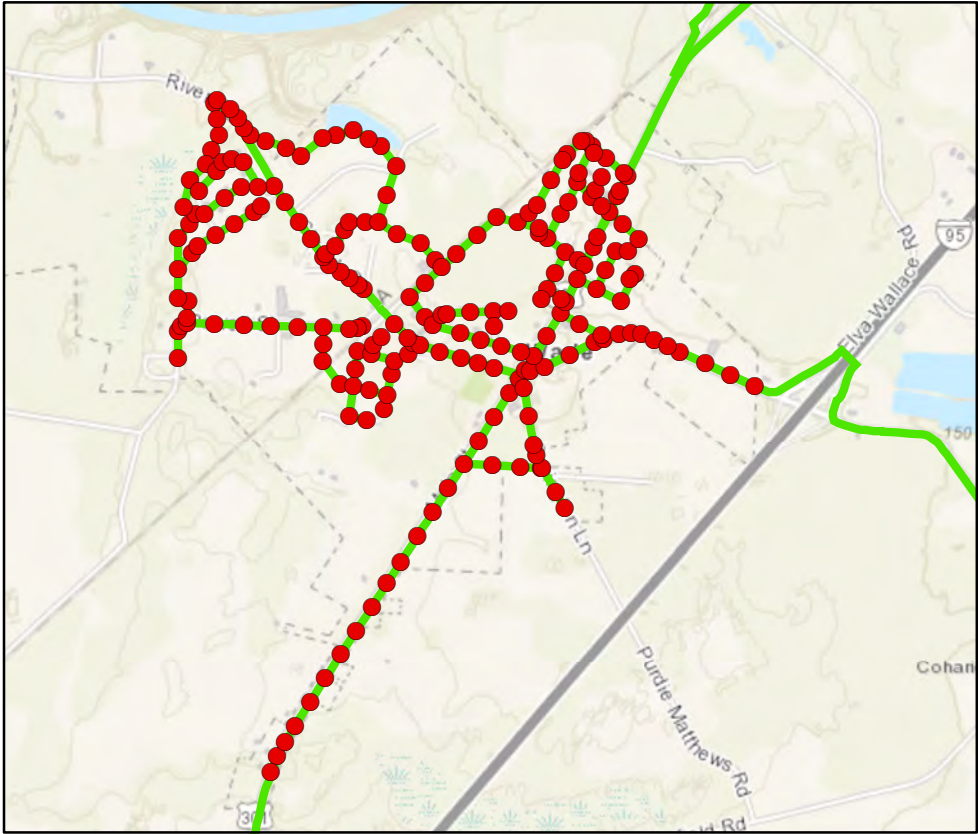
### **2.3.2 Investigation**

With County input, McGill has reviewed the District's data on sewer mains throughout the collection system. The sewer main material and diameters were verified by the County and updated according to GIS records. Figure 5 shows the sewer line materials in the system, and Figure 6 shows the sewer line diameter throughout the system.

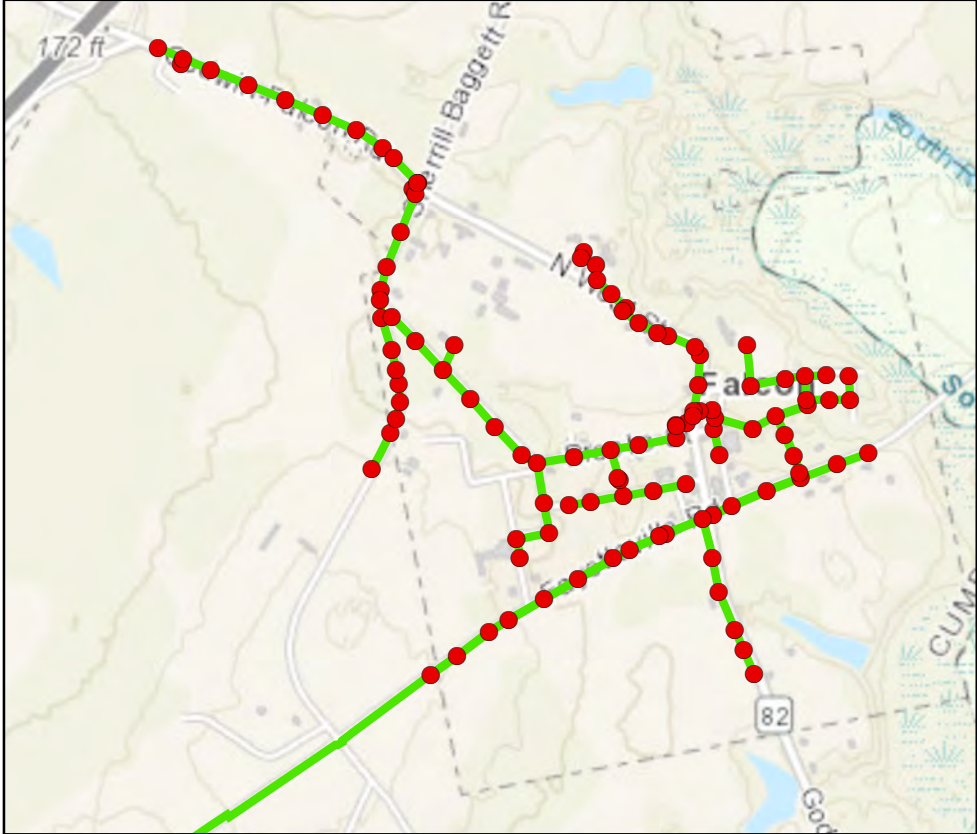
The purpose of this portion of the assessment was to create a working system inventory and then review which areas of the NORCESS District have system components in need of replacement or rehabilitation.

# Norcross Line Material Map Figure 5

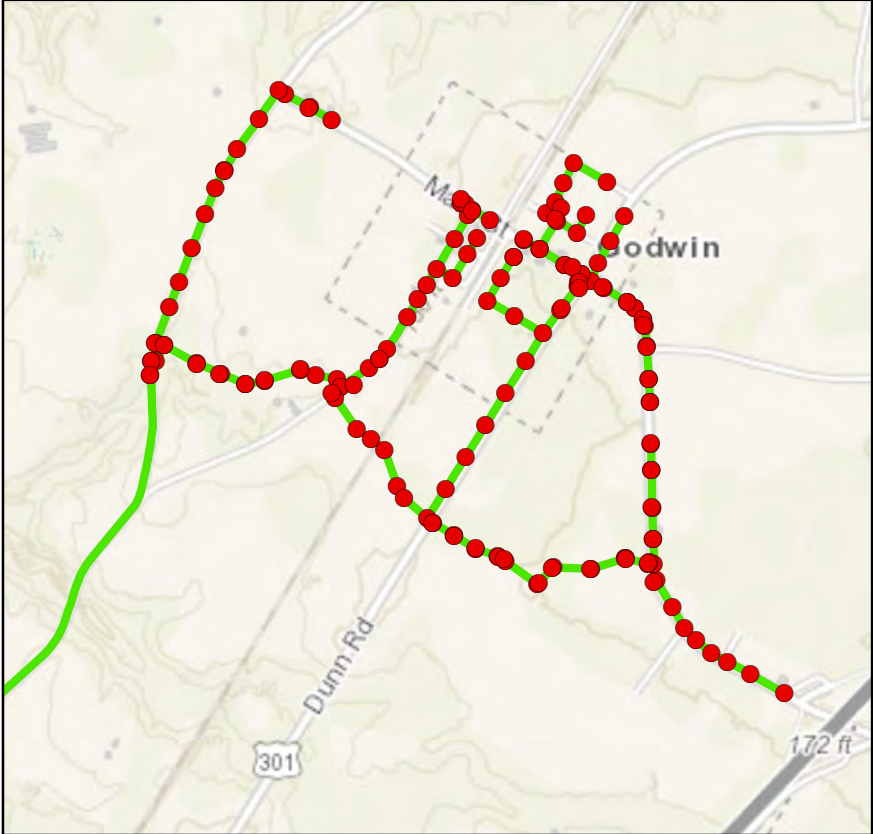
Wade



Falcon



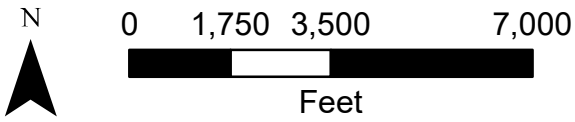
Godwin



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Project No. 20.02507**

**Legend**

- PVC
- Norcross Manholes



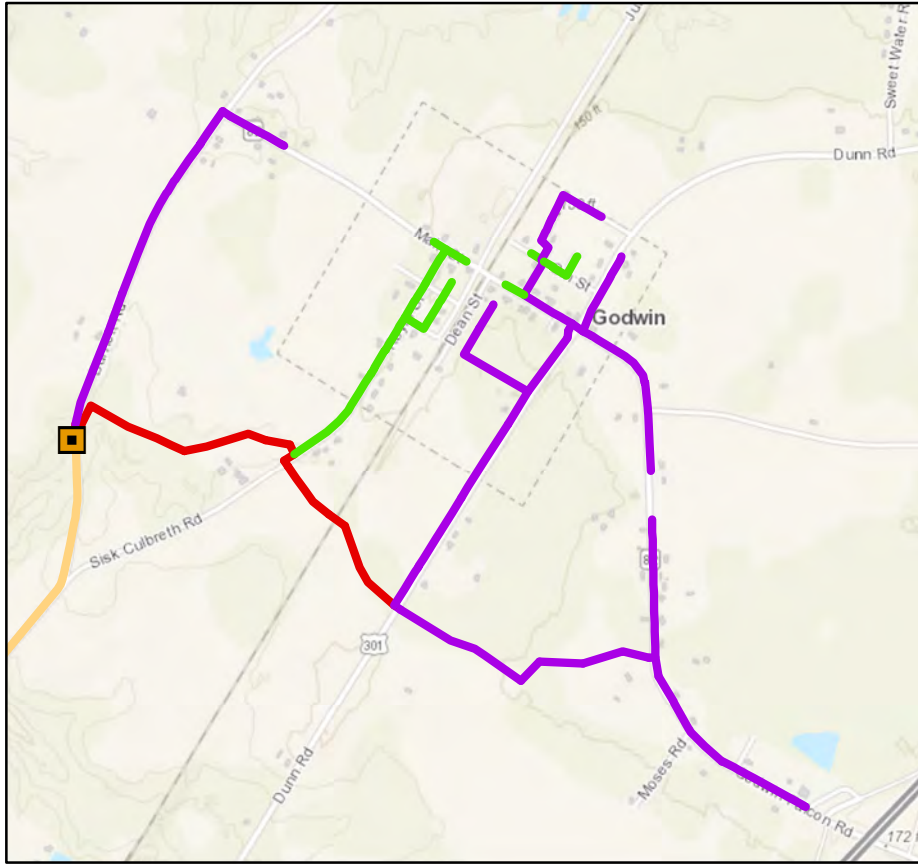

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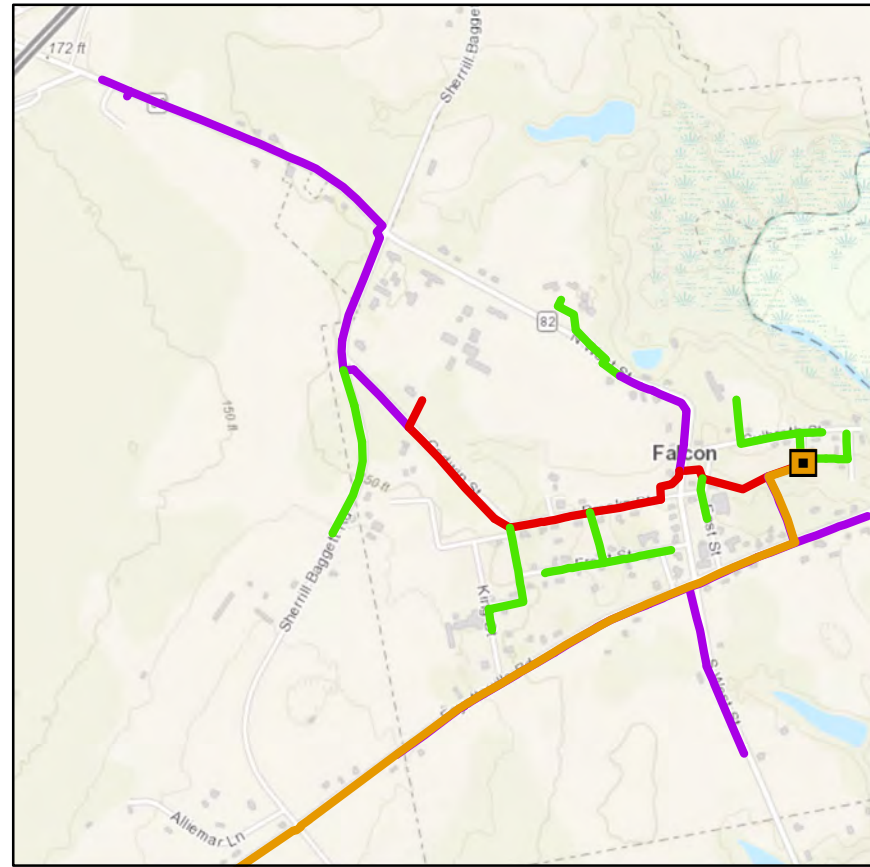
# NORCRESS Sewer Line Diameter Map

## Figure 6

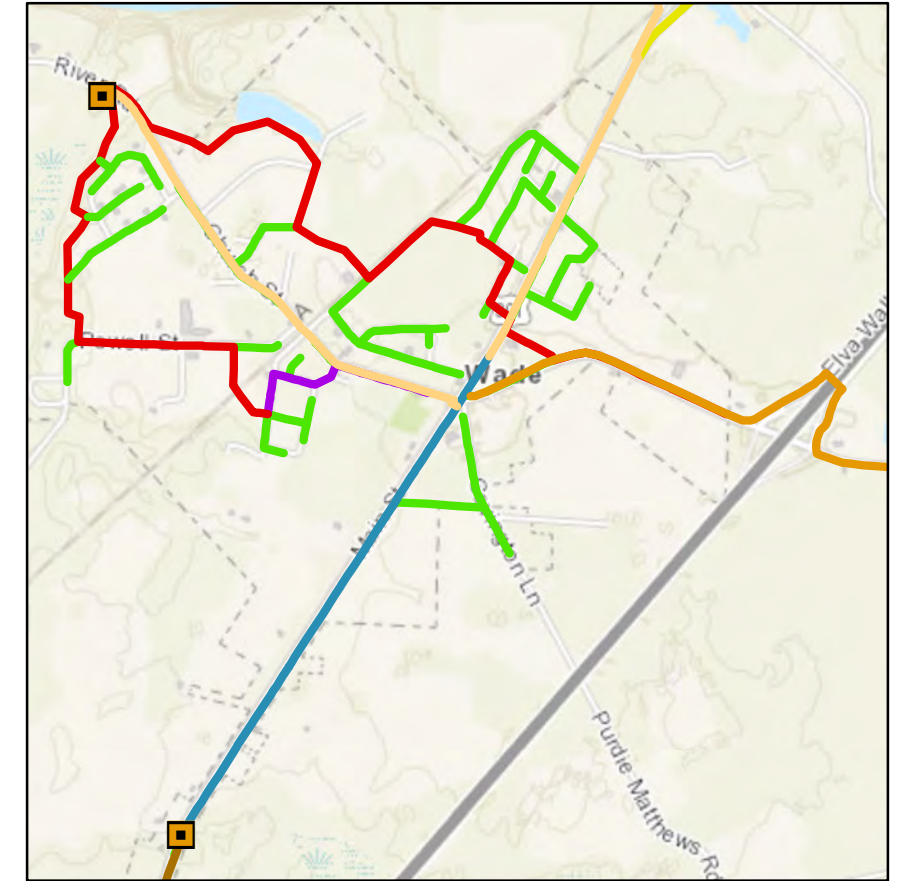
Godwin



Falcon



Wade



**Legend**

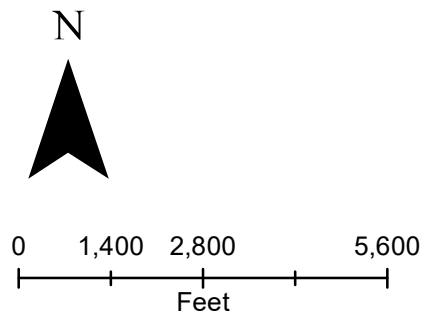
**GRAVITY SEWER DIAMETER**

- 8"
- 10"
- 12"
- 15"

**FORCE MAIN DIAMETER**

- 3"
- 6"
- 8"
- 10"

Lift Station



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**NORCRESS District**  
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\*PVC Material throughout Norcross System



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### 2.3.3 Methodology

McGill reviewed the County's GIS data for the sewer collection system. County staff provided information on manholes where deterioration was suspected. Flow monitoring and smoke testing were performed throughout the system. The County's GIS mapping was utilized to create maps that document the collection system by material and by diameter.

### 2.3.4 Results

The existing gravity sewer pipe in the sewer system ranges from 8-inch to 16-inch in diameter based on County records. All pipe diameters therefore do meet current NCDEQ minimum design standards. Based on the age of the system, the PVC and ductile iron pipe installed in 2005 have not exceeded its useful life, and therefore replacement is not recommended outright. Recommendations will include planned CCTV inspections by the County of the existing piping in order to verify existing condition and provide future updates to this AMP/CIP. Based on the age of the pipes and no documented issues from County staff, pipe in the system has been noted to be in good/excellent condition. Tables 5 through 9 show the assessment based on material and then broken out by diameter and age.

**Table 5: Summary of Gravity Sewer Main by Material**

<b>Material</b>	<b>Diameters (in)</b>	<b>Total LF</b>	<b>% of System</b>
<b>Polyvinyl Chloride</b>	<i>8, 12, 15</i>	<b>134,275</b>	<b>97.2%</b>
<b>Ductile Iron</b>	<i>8, 16</i>	<b>3,907</b>	<b>2.8%</b>
<b>Total LF</b>	<b>N/A</b>	<b>138,182</b>	<b>100%</b>

**Table 6: Summary of Gravity Main Sewer Main by Diameter**

Diameter	Total LF	% of System
8"	85,144	37.71%
10"	23,235	27.29%
12"	22,720	26.68%
15"	7,083	8.32%
<b>Total LF</b>	<b>138,182</b>	<b>100%</b>

**Table 7: Summary of Force Main by Material**

Material	Diameters (in)	Total LF	% of System
Polyvinyl Chloride	8, 12, 15	73,650	93.6%
Ductile Iron	8, 16	4,015	5.1%
HDPE	8	1,013	1.3%
<b>Total LF</b>	<b>N/A</b>	<b>78,678</b>	<b>100%</b>

**Table 8: Summary of Force Main Sewer Main by Diameter**

Diameter	Total LF	% of System
3"	4,082	5.2%
6"	28,123	35.7%
8"	35,364	45.0%
10"	11,109	14.1%
<b>Total LF</b>	<b>78,678</b>	<b>100%</b>

**Table 9: Summary of Pipe Condition by Age**

Year Put Into Service	Type	Total LF	% of System
2005	Gravity	138,182	64%
2005	Force Main	78,678	36%
<b>Total LF</b>		<b>216,860</b>	<b>100%</b>

## **2.4 MANHOLE INSPECTIONS**

### **2.4.1 Overview**

Manholes are the primary access points to the sanitary sewer system and are essential for its operation and maintenance. As they allow personnel access to the sewer system, manholes are also likely culprits for allowing I/I to enter the sewer system. Manholes in low-lying areas with improperly sealed lids, manhole joints, and poor connection practices can all be sources of I/I. Storm drains or the presence of manholes in ditches and low-lying areas in NORCRESS frequently allow standing water to remain for hours or days after a storm event which can exacerbate inflow through manhole lids.

One of the most cost-effective practices for managing this intrusion is visual manhole inspections, where the various components of the manhole are rated according to their condition. Some examples of noticeable deficiencies are benches which have deteriorated from abrasion and corrosion and rings which can be moved by traffic, soil, and the freeze/thaw cycle. Defects in any aspect of the manhole can lead to I/I, structural instability, and manhole failure.

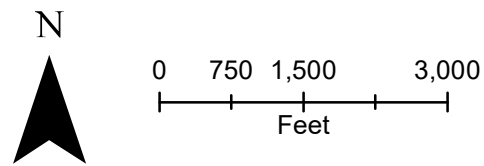
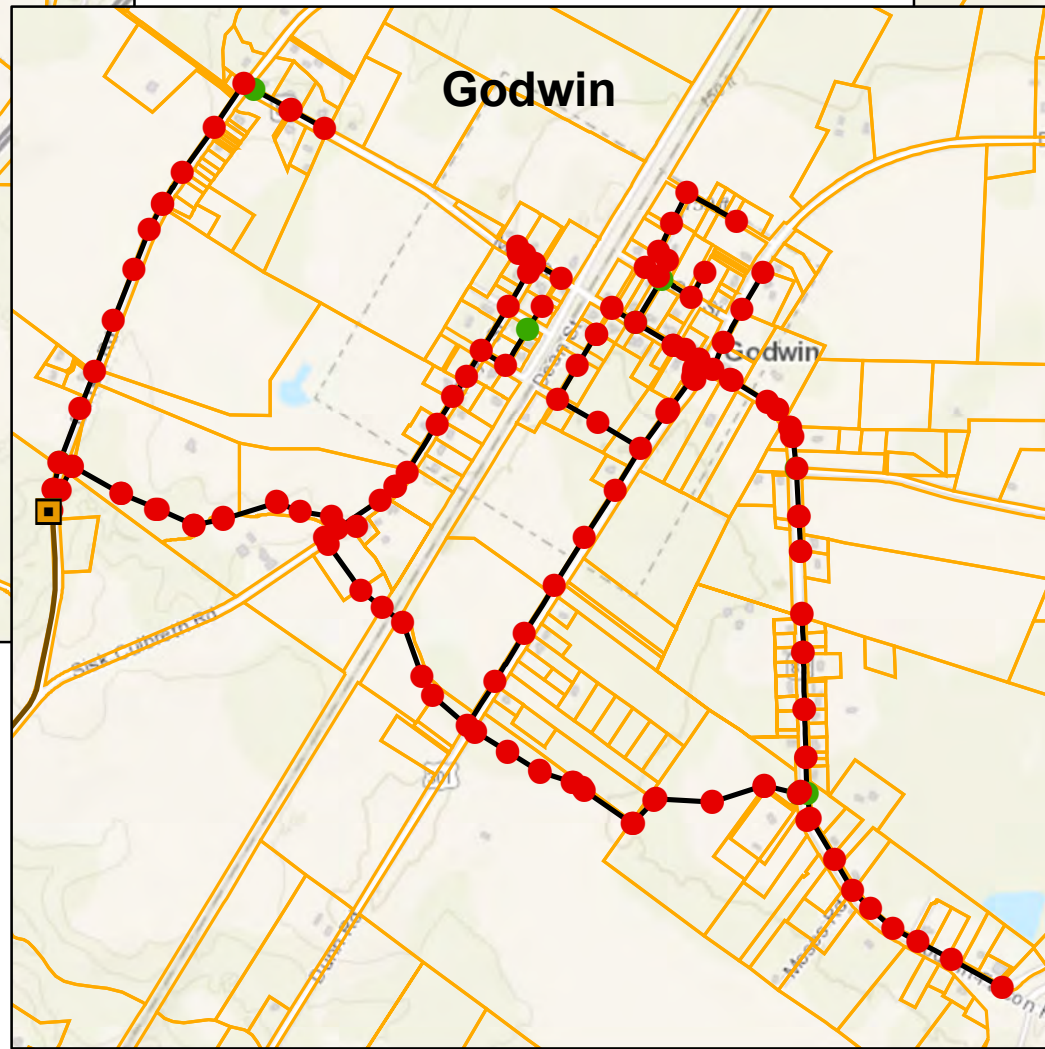
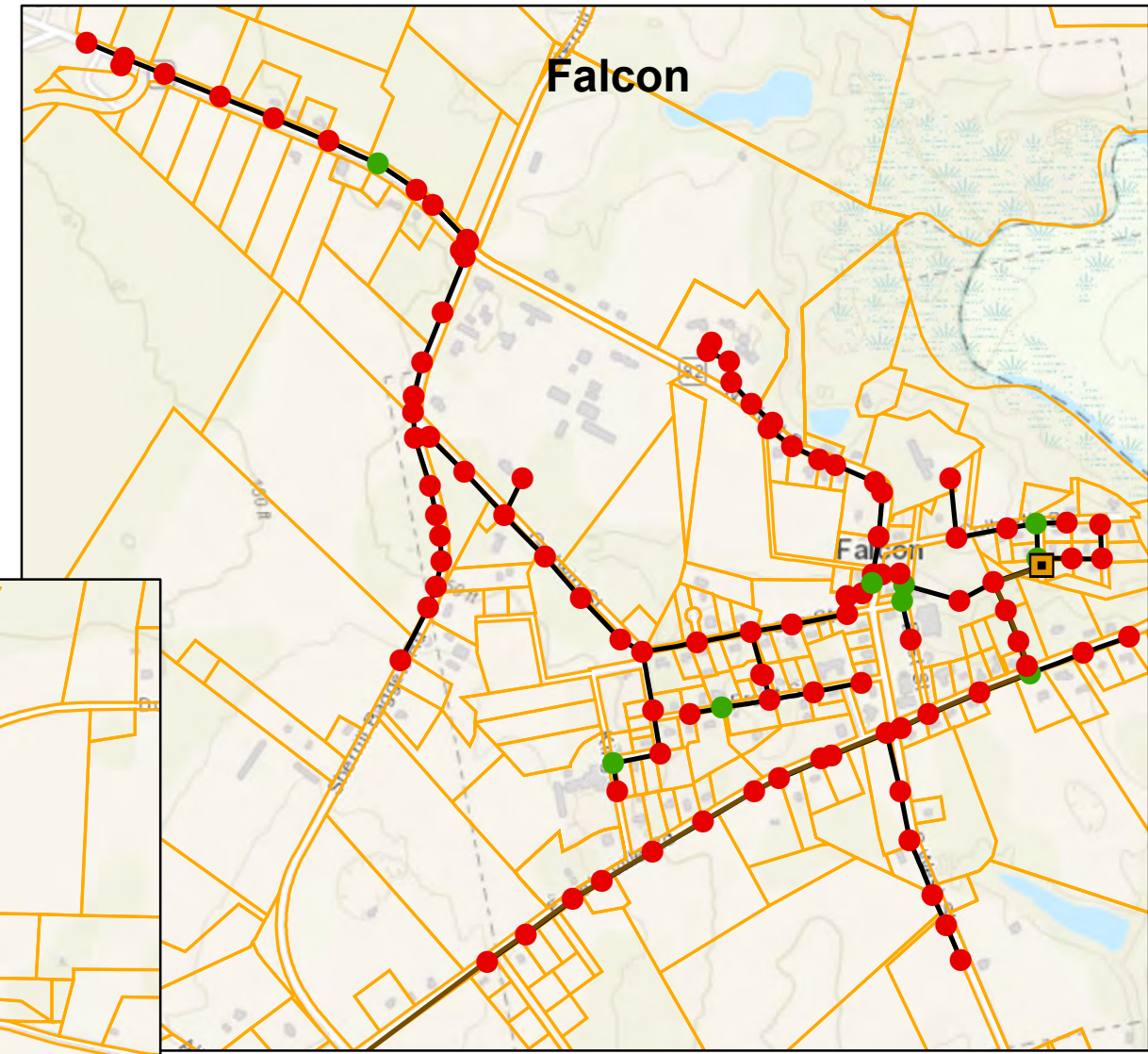
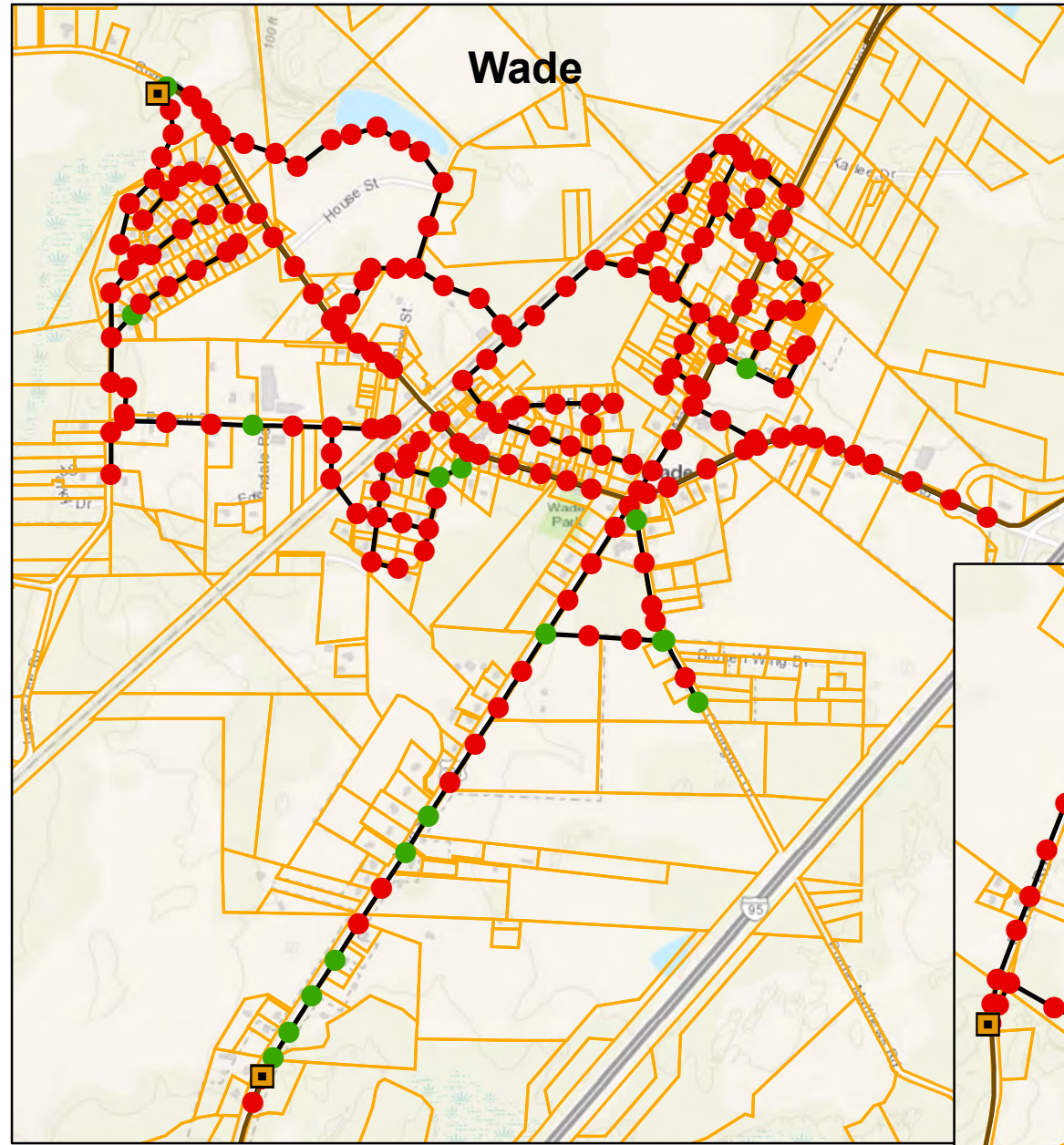
### **2.4.2 Investigation**

After the NORCRESS system was put into service, the GIS record was created in 2006. The purpose of this portion of the assessment was to perform field inspections of select manholes within the system to develop an overall system assessment. A total of 424 manholes are currently inventoried by the District. Approximately 37 manholes were inspected as a part of this inventory and assessment. The map including all manholes that were inspected is shown in Figure 7.



# NORCRESS Manhole Inspection Map

## Figure 7



**Legend**

**Manholes**

**Condition**

- Not Visited
- Good
- NORCRESS FORCE MAIN
- NORCRESS SEWER MAIN
- Lift Station
- Tax Parcels

**Sewer Asset Management Plan**  
**NORCRESS District**  
**Cumberland County**  
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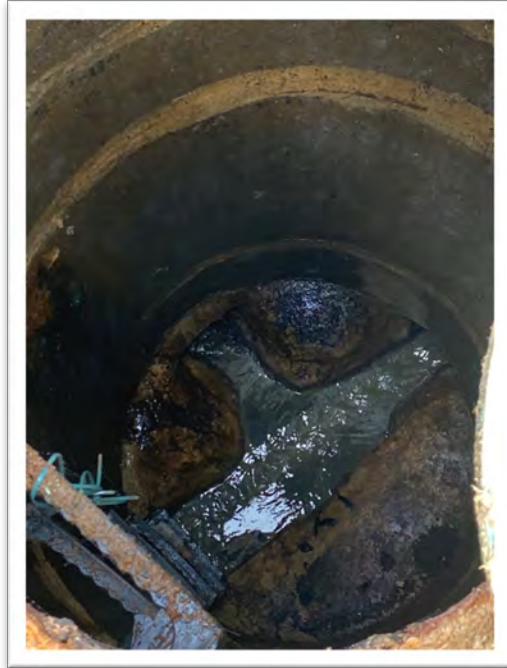
### **2.4.3 Methodology**

The NORCRESS District sewer collection system contains 424 sewer manholes. Working with County staff, McGill inspected selected manholes within the sewer system to obtain a representative condition sampling. County staff determined which manholes to inspect in each area based on manhole location and orientation. Manholes prioritized for inspection include those located in existing ditches or low-lying areas where the manhole would be susceptible to degradation and inflow from surface water. At each manhole, the inspector recorded the manhole's location, dimensions, material, and condition of its various components. All information including photographs of the interior of the manhole and top area were uploaded into the GIS mapping.

Some typical distresses include:

- Wear and asphalt paving on the cover;
- Corrosion and mud seepage on the ring and frame;
- Gas residue, corrosion, seepage, and deteriorating concrete on the cone and riser;
- Wetness, silt, root intrusion, and deteriorating concrete on the barrel;
- Dirt and corrosion on the rungs;
- Silt accumulation on the bench; and
- Misaligned pipes, obstructions, trough deteriorating, standing water, and no flow in the channel.

Based on the recorded comments, each component was assigned a condition score, and these scores were combined into an overall condition rating for each manhole- excellent, good, fair, or poor. The images below depict the interiors of various condition manholes.



*SMH 028208, River Road in Wade. Manhole shows minor corrosion over time.*



*SMH 028044, Main Street in Wade. Rehabilitated manhole with lining, some corrosion on frame.*



*SMH 027930, Main Street in Godwin. Manhole in good condition.*



*SMH 026913, King Street in Falcon. Manhole in good condition.*

#### **2.4.4 Results**

All of the 37 inspected manholes were precast manholes. Due to the relative low age of the system, County staff confirmed that all of the existing manholes in NORCRESS are precast sewer manholes. Of the manholes observed, a majority were noted as good condition, and others observed were described as poor condition. Based on the condition of those observed, it is suspected that the remaining manholes not inspected would have similar condition to those observed. Tables 10 and 11 summarize the manhole materials and condition.

**Table 10: Summary of Manholes by Material**

<b>Material</b>	<b>Total</b>
<b>Precast Concrete</b>	<b>424</b>
	<b>424</b>

**Table 11: Summary of Manholes by Condition**

<b>Material</b>	<b>Total</b>
<b>Excellent-Good</b>	<b>33</b>
<b>Fair-Poor</b>	<b>4</b>
<b>Unknown</b>	<b>387</b>
	<b>424</b>

The County maintains its collection system using the ESRI platform and includes the attribute data for each manhole. A spreadsheet including condition comments for each manhole can be found in Appendix A.

## 2.5 LIFT STATIONS

### 2.5.1 Overview

The NORCRESS Lift Station is owned and operated by Fayetteville PWC. The station includes a flow meter that is used for recording flow generated by the NORCRESS Sewer Collection System. The capacities of each lift station are listed below.

Falcon Lift Station #92:

Lift Station Design Capacity	70,000 GPD
------------------------------	------------

Wade Lift Station #89:

Lift Station Design Capacity	45,000 GPD
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Wade Lift Station #90:

Lift Station Design Capacity	125,000 GPD
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Godwin Lift Station # 91:

Lift Station Design Capacity	10,000 GPD
------------------------------	------------

\*Lift Station Design Capacity information is from the Freese and Nichols report called Northern Cumberland Regional Sewer System Comprehensive Sewer Evaluation.

## 3.0

## CAPITAL IMPROVEMENTS PLAN

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Recommendations for various sewer system improvements to include the gravity sewer pipe and manholes in the collection system include general recommendations, high priority projects (within 10-years) and future projects (past the 10-year planning window). General recommendations are typically less costly and can be implemented more quickly, whereas high priority projects may require financial assistance and be undertaken in phases.

### 3.1 GENERAL RECOMMENDATIONS

#### 3.1.1 *Smoke Testing*

Smoke testing is a valuable tool that can be used to locate broken pipe, cleanouts, or manholes that need repair. Any of these issues can be a source for the inflow and infiltration (I&I) of surface water into the sewer collection system. It is recommended that the District perform comprehensive smoke testing of the entire system at least every other year. Additionally, the District should utilize smoke testing on an “as needed” basis to troubleshoot possible problem areas. The most common repairs that would result from smoke testing include replacing missing or broken cleanout caps and removing buildup from manholes. Other repairs that can be performed at this time are patching the exterior concrete or replacing the rings/lids of manholes identified to be leaking during smoke testing. These may be contributing significant I/I into the wastewater collection system. Similarly, line breaks in flooded areas should also be addressed promptly. It is also recommended that the District continue to perform regular smoke testing to monitor the system’s ongoing wear and identify specific areas for improvement.

#### 3.1.2 *Video Evaluations*

Based on information provided from the County, video evaluations were performed by Hydrostructures. Hydrostructures cleaned and provided CCTV inspections of the gravity lines in 2016 as part of the system inventory. It is recommended that the District plan to

perform video evaluation of the system every 5 years as a part of O&M in order to stay vigilant concerning potential issues within the collection system.

### **3.1.3 Manhole Inspections**

Manhole inspections uncovered some infrastructure deficiencies which can be repaired immediately to improve the condition and function of the wastewater collection system. The full list of manholes and their field assessment is included in Appendix A. Manhole rehabilitation and replacement is the priority work that is targeted by the CIP. The proposed projects are divided out over an annual basis in order to include the improvements as a reasonable component of annual budgeting.

### **3.1.4 Flow Monitoring**

The County and McGill have discussed that additional flow monitoring would be beneficial to the County in this system. It is recommended that the County perform flow monitoring at a frequency of every 3 to 5 years to monitor I/I within the system. Initially, we recommend focusing the monitoring in the Town of Falcon.

Additionally, should the County begin to suspect the presence of I&I at specific locations within the system, they will engage in flow monitoring to verify as needed. The PWC Lift Station does provide for metering of flow received within the district. It is recommended within the CIP that the County install an in-line flow meter within the collection system just upstream of the lift station, in order to assist with recording of data and calibration with the PWC maintained lift station.



## **3.2 PRIORITY PROJECTS**

### **3.2.1 Manhole Rehabilitation Projects**

In these projects, manholes will be repaired and lined where possible, unless replacement is needed. The projects are scoped to be undertaken every three years. Each project is priority targeting any manhole deficiencies or evidence of I/I observed during manhole inspections. There are a range of issues from broken risers to cracks in the frame of the manhole that warrant various repairs. To reduce the amount of I/I that enters the system it is imperative to repair these manholes. The project will be ongoing as to spread out the cost for the County over a 10-year period. There are 424 manholes in the system, and based on inspections and smoke testing, it is estimated that approximately 20% of the manholes would benefit from rehabilitation and lining. In order to fit a reasonable budgeting target, the rehabilitation of 84 manholes is broken into 4 projects, which are included in the CIP separately, but can be combined or modified as needed given annual budgetary considerations.

This project is recommended to be pursued with a manhole rehabilitation specialty company with scopes large enough to get competitive pricing for each mobilization. The manholes proposed for rehabilitation or replacement range in depth, therefore an average depth of seven vertical feet (VF) was used per manhole for estimating purposes. The capital improvements plan breaks this project into 4 phases with a budget of approximately \$118,600 every three years over a 10-year span, as outlined in Table 12. The total cost of the manhole rehabilitation projects is estimated to be \$474,400.

**Table 12: Preliminary Opinion of Probable Cost for Manhole Rehab Projects**

Item	Description	Units	Quantity	Unit Price	Total Cost
1	Mobilization	LS	3%	N/A	\$ 2,800
2	Rehabilitate Existing Manhole	VF	147	\$ 500	\$ 73,500
3	Additional Manhole Repairs	LS	1	\$ 10,000	\$ 10,000
4	Asphalt Surface Restoration	LS	1	\$ 12,500	\$ 12,500
<b>Construction Subtotal</b>					<b>\$ 98,800</b>
Contingency (15%)					\$ 14,800
Engineering Coordination					\$ 5,000
<b>Total Base Project Cost</b>					<b>\$ 118,600</b>

*\*Cost estimates are based on the knowledge of a professional engineer based on 2024 construction costs and are subject to change due to bidding environment and other factors.*

**3.2.2 Flow Meter Project**

This project includes installing four in-line flow meters on the existing gravity lines upstream of the four lift stations the sewer system. These devices will allow the County to monitor its own sewer flow. This data can be utilized by staff for planning and budgeting purposes.

The project includes two 8-inch electromagnetic flow meters in a precast underground bypass vault with associated piping and appurtenances. The meters will be installed on the County’s gravity sewer lines outside of the existing lift stations. The preliminary cost estimate for this project is \$203,900 as outlined in Table 13 below.

**Table 13: Preliminary Opinion of Probable Cost for Flow Meter Project**

Item	Description	Units	Quantity	Unit Price	Total Cost
1	Mobilization	LS	3%	N/A	\$ 4,900
2	8-inch Mag Meter	EA	4	\$ 25,000	\$ 100,000
3	Precast Concrete Valve Vault	EA	4	\$ 8,000	\$ 32,000
4	Piping, Valves, Fittings	LS	1	\$ 30,000	\$ 30,000
<b>Construction Subtotal</b>					<b>\$ 166,900</b>
Construction Contingency (15%)					\$ 25,000
Engineering Coordination					\$ 12,000
<b>Total Base Project Cost</b>					<b>\$ 203,900</b>

*\*Cost estimates are based on the knowledge of a professional engineer based on 2024 construction costs and are subject to change due to bidding environment and other factors.*

**3.2.3 Flow Monitoring Study**

This project includes the rental of four non-contact flow monitors. These devices will give the County the ability to develop a database of real-time sewer flow data in the collection system in order to pinpoint potential sources for I/I and uncaptured flow. Additionally, the budget includes utilizing the Flow Works software, a cloud-based data management program that will put flow monitoring and rainfall data into usable format for tracking and reporting. This data can be utilized by staff for planning and budgeting purposes.

The project includes rental of four Hach Flo-Dar Area/Velocity Flow Meter Sensors with wireless data transmission. The monitors are designed to be installed above the flow, therefore can typically be installed from the surface without the need for confined-space entry permit. The project also includes the purchase of a rain gauge with RTU. The project is quoted for 2-months of monitoring with the FlowWorks Software. Longer duration and the option for flow monitoring equipment purchase can be further explored. The preliminary cost estimate for this project is \$25,440 as outlined in Table 14 below.

**Table 14: Preliminary Opinion of Probable Cost for Flow Monitoring Study**

Item	Description	Units	Quantity	Unit Price	Total Cost
1	Hach Flo-Dar Rental	EA	8	\$ 1,925	\$ 15,400
2	Device Data Hosting	EA	4	\$ 555	\$ 2,220
3	FlowWorks Device Monthly	EA	8	\$ 100	\$ 800
4	FlowWorks Device Setup	EA	4	\$ 180	\$ 720
5	Rain Guage with RTU	EA	1	\$ 3,000	\$ 3,000
<b>Construction Subtotal</b>					<b>\$ 22,140</b>
Construction Contingency (15%)					\$ 3,300
<b>Total Base Project Cost</b>					<b>\$ 25,440</b>

*\*Cost estimates are based on the knowledge of a professional engineer based on 2024 construction costs and are subject to change due to bidding environment and other factors.*

**3.2.4 Air Release Valve Replacement and Ice Pigging**

This project includes replacement of existing air release valves along the 8-inches force main that extends from the Falcon lift station to a sewer manhole in the Town of Wade. These devices will give improvement performance of force main by more adequately allowing for release of built up air within the over seven miles of existing force main.

**Table 155: Preliminary Opinion of Probable Cost for ARV and Ice Pigging**

Item	Description	Units	Quantity	Unit Price	Total Cost
1	Mobilization	LS	3%	N/A	\$ 2,400
2	2" Combination Air Release Valve	EA	8	\$ 10,000	\$ 80,000
3	Install Pigging Stations and Perform Ice Pigging on Force Main	LS	1	\$ 150,000	\$ 150,000
<b>Construction Subtotal</b>					<b>\$ 232,400</b>
Construction Contingency (15%)					\$ 34,900
<b>Total Base Project Cost</b>					<b>\$ 267,300</b>

### **3.3 CIP PROJECTS SUMMARY**

The purpose of this asset management plan was to document the condition of the NORCRESS sewer infrastructure to assist the County with becoming more viable and proactive in the management and financing of its wastewater system. The County intends to look to its CIP to guide its next projects; therefore, it is vital that the CIP be established as an accurate depiction of current conditions and reflect the District's highest priorities with accurate cost estimates. The development of this AMP will serve as a positive step towards ensuring that the District can maintain its level of service agreement.

Sewer manhole rehabilitation was evaluated based on current staff input and the results of the field inspections. The existing manholes were divided into projects recommended for the next 10 years.

McGill prepared cost estimates for all projects based on current materials and construction costs. The 10-year CIP is intended to be adopted by the District to guide its selection of sewer system improvement projects over the next two decades. The cost summary for the 10-year CIP is shown below in Table 16.

**Table 16: CIP Projects Cost Summary**

Year <sup>1</sup>	Flow Monitoring Study	Manhole Rehabilitation Project 1	Flow Meter Project	Manhole Rehabilitation Project 2	Manhole Rehabilitation Project 3	Manhole Rehabilitation Project 4	New Generators- All Lift Stations <sup>2</sup>	Upgrade SCADA <sup>2</sup>	Falcon Force Main- Inspect, Clean, Replace ARVs <sup>2</sup>	TOTAL COST
1	\$ 25,440.00						\$ 640,000.00			\$ 665,440.00
2		\$ 118,600.00						\$ 240,000.00		\$ 358,600.00
3			\$ 203,900.00						\$ 80,000.00	\$ 283,900.00
4				\$ 118,600.00						\$ 118,600.00
5	\$ 25,440.00									\$ 25,440.00
6										\$ -
7					\$ 118,600.00					\$ 118,600.00
8										\$ -
9										\$ -
10	\$ 25,440.00					\$ 118,600.00				\$ 144,040.00
<b>TOTAL ESTIMATED CIP COST</b>										<b>\$ 1,714,620.00</b>

**Notes:**

- 1: Considering the timeline for adoption of this plan and County budget planning cycle, Year 1 is anticipated to be FY 2026
- 2: Project was previously included in a Capital Improvements Plan developed by Freese and Nichols for the NORCRESS District.



**4.1 GENERAL RECOMMENDATIONS**

The purpose of an Operations and Maintenance (O&M) Program is to provide an organized and cost-effective approach to ongoing maintenance, repair and replacement activities that will maintain the sewer collection system, so it performs as intended and meets the requirements of the sewer utility's System-Wide Collection System Permit, issued under North Carolina General Statutes Article 21 of Chapter 143.

This section provides a general description of proactive O&M, that can be defined as scheduled maintenance activities (preventive maintenance), performed on a regular basis in order to achieve the highest level of system performance using available resources and minimizing failures that can result in Sewer System Overflows (SSOs)

Developing an O&M Program begins with accurate records of infrastructure inventory, asset locations and physical condition. Coupled with work records and system performance history, preventive maintenance schedules can be developed to efficiently address general system needs, from cleaning and debris removal to site-specific maintenance work such as cutting and repair work.

The following elements provide the foundation for an effective O&M program:

- Maintain up-to-date wastewater treatment plant equipment documentation, sewer collection system maps and related work history and operational data.
- Develop a routine preventive O&M program and activities for staff and contractors maintaining the sewer collection system and a system to document scheduled activities
- Develop a rehabilitation and replacement plan identifying and prioritizing system deficiencies and implement short- and long-term actions to address the deficiencies
- Develop and implement training programs to build technical competence and emergency preparedness.
- Develop and provide equipment and replacement part inventories, including critical replacement parts

## **Sewer System Mapping**

Sewer system maps and related databases are typically managed using a Geographic Information System (GIS). The NORCRESS District currently utilizes ESRI as the GIS platform from which to manage the utility systems. This GIS mapping is supported by a database that records sewer main size, material types, and locations of manholes and clean-out connections. The platform has the ability to store more information that is currently being utilized by the County, including invert and rim elevations and other attributes of system appurtenances. If the County intends to utilize the GIS platform for managing and recording maintenance performed and planned, it is recommended that the County investigate alternative software to ensure that they are utilizing a software that meets their needs with respect to budget.

The GIS database should be updated on a regular basis. Software applications such as work order systems are available to allow field staff to update GIS data as inspection and maintenance activities are completed. Other applications can also allow staff to update and edit maps. Field information that was gathered by McGill and County staff as a part of this assessment is now included in the County's GIS system database for future reference.

GIS can organize work history along with operational data, inspection records and images to provide managers, operations staff and engineers with powerful data sets to track current resource allocations and forecast short and long-term operational and capital needs. Outcomes of detailed analysis such as recommended sewer main rehabilitation work versus sewer overflows can be mapped to present the relationship visually for ease of understanding.

## **Preventive Operation and Maintenance (O&M)**

Preventive maintenance is performing routine and scheduled maintenance activities before wastewater treatment plant and lift station equipment or buried infrastructure fails, for the purpose of extending useful life, reducing overall operating costs, and increasing system reliability. This proactive approach to maintenance work is more efficient and cost effective than reactive and curative operations. Preventive maintenance activities will also help operations staff to better understand the lift station equipment, and collection system components and how they work under various conditions. This knowledge is essential to setting maintenance priorities and developing the scope and timing of long-term rehabilitation and replacement projects.

## **Scheduled Cleaning of Sewers**

EPA recommends, at a minimum, that 100% of sewer mains should be cleaned every 5-years, or 20% of the system annually. The sewer utility's Collection System Operating Permit requires 10% of the gravity sewers to be cleaned annually. High pressure jetting is the most common approach using various spray nozzles for general cleaning and debris removal. Mechanical cutters are used to address root intrusion and cleaning agents can be added to help remove fats, oils, and grease (FOG).

More frequent cleaning is scheduled for areas with a history of heavy debris, grease buildup and roots. CCTV inspections are also used to identify areas to clean more often, such as sections with minor defects such as offset joints and service taps protruding into the main line. Sewer sections near siphons are cleaned more frequently to ensure continuous and uninterrupted operation.

As part of the O&M Program, a master list of cleaning operations, priority locations and scheduling can be incorporated into GIS. Maps can be produced to define work areas, schedule resources, including contracted services, track progress and task completion. Updating GIS maintenance operations data (partial blockages found, debris quantity, etc.)

will help managers adjust cleaning frequency and area boundaries as needed to increase program efficiency, reduce sewer blockages, and avoid SSOs.

## **Routine Visual Inspections**

Routine inspections are used to assess the condition of lift stations, manholes and surface facilities, recording general conditions and evidence of possible structural problems or failures (offset structures, etc.), corrosion, surcharging, overflows and excessive Inflow and Infiltration (I&I). Work orders are generated based on inspection records to effect operational adjustments, scheduling more detailed inspections and/or making necessary repairs.

## **Manhole Inspection Program**

Manhole inspections keep the asset inventory up-to-date and are used not only to update collection system maps, but to determine structural condition. During manhole inspections, a complete inventory is taken of each manhole including construction materials, ring size, depth to invert, flow conditions and evidence of problems. The National Association of Sewer Service Companies (NASSCO) Manhole Assessment and Certification Program (MACP) may be adopted or used as a guide to ensure consistency and reliability of evaluation and ranking methodology.

The results from routine manhole inspections and monitoring are used to prioritize areas needing CCTV inspections to assess pipe condition such as manholes with evidence of slow flow or surcharging. Information is recorded and used to schedule maintenance and repairs.

## **CCTV Inspection Program**

While routine cleaning and visual inspection are used to assess the condition of surface facilities and manholes, CCTV video inspections are the primary method used to assess the condition of the sewer pipes. Using conventional defect criteria is highly recommended to provide standardization and consistency in sewer pipe condition

assessment and ranking. The NASSCO Pipeline Assessment and Certification Program (PACP) may be adopted or used as a guide to ensure consistency and reliability of evaluation and ranking methodology.

## **Maintenance Activity Records**

Detailed records and daily logs of O&M work provide valuable information to help managers evaluate the effectiveness of maintenance activities and make adjustments to optimize the use of limited resources. Equipment, manpower and other resources are tracked along with detailed descriptions of defects and/or obstructions encountered including debris, FOG, structural failures, etc. Maintenance work resulting in system modifications or extensions is required to be incorporated into record drawings and system maps. Scheduled testing of emergency and standby equipment is also a requirement of the collection system permit.

These records are required to be reviewed periodically to identify problems that cannot be resolved in a short period of time in order to develop a plan to address the problem(s). Maintaining these records for an extended period of time (5-years or more) will also provide accurate reference points of maintenance investments made over time that will track the effectiveness of operation and maintenance activities.

In the event of a sewer spill or system overflow, maintenance records will need to provide sufficient detail to satisfy reporting requirements for the event, including location(s), volume of wastewater, corrective actions, etc. This data may also be integrated into GIS to allow mapping of these events over time in order to identify patterns and/or trends that will assist with scheduling maintenance and planning rehabilitation and other capital improvements.

## **Resolution of Customer Complaints**

Customer complaints are primarily about sewer backups and odors. Sewer backups require an immediate response to diagnose and resolve the problem. These complaints can occur outside normal business hours, significantly escalating costs. Detailed records of the problems found, and the resources needed to address the failed condition, provide valuable feedback for making adjustments to the preventive maintenance program that can reduce these types of calls and help lower overall maintenance costs.

These records can also identify areas where private service laterals frequently fail. Notifying customers in these areas will allow them the opportunity to address deficiencies proactively, which will also help reduce customer “emergency” calls.

## **Capital Improvements Plan**

A Capital Improvements Plan (CIP) is required by the collection system permit to identify rehabilitation, replacement and expansion needs of the system. The CIP is required to address the short and long-term needs of the system, covering at least a 3 to 5-year planning period, and must include the estimated cost of each capital project.

CIP development incorporates maintenance activity, cleaning and inspection records, and system performance data that may include flow monitoring and hydraulic modeling to evaluate the existing system and to recommend improvements needed to correct existing deficiencies, and ensure adequate capacity is maintained throughout the system.

Capital planning includes consideration of on-going funding for rehabilitation and replacement of the collection system as it wears out, and potential upgrades for expansion as needed.

## **Training Program**

Training programs provide a mechanism for educating employees and establishing their technical competence to perform operations, maintenance, and emergency responses safely and effectively. A combination of in-house skill training and specialized training purchased or provided through state and national associations, conferences and vendor training programs are typically used to build and enhance skills for performing daily work duties. Periodic training reinforces previous efforts, as people often overlook things that are used infrequently. It also provides an opportunity to train new staff and learn about new problems, new techniques, and changes in equipment.

Emergency training educates system personnel about emergency situations and resulting effects on the wastewater system, public health, and environmental impacts. It also provides an opportunity to practice responses. Good record keeping ensures personnel are properly trained and prepared to effectively operate and maintain the collection system under any given circumstance. Regular review of training records is essential for keeping content up-to-date and maintaining proper employee awareness.

## **Equipment and Replacement Parts**

A reasonable supply of equipment and replacement parts should be maintained to fully support all operations and maintenance activities. A detailed inventory is essential to ensure availability under normal operations and emergency conditions. Specialized equipment or parts may be too costly to keep in stock, so arrangements with vendors and/or contractors may be necessary to ensure availability during non-business hours or during emergencies.



## 4.2 STAFFING RECOMMENDATIONS

Cumberland County is responsible for three wastewater collection systems and one water system: NORCRESS, Overhills, Kelly Hills, and Southpoint Water System. While each of these districts maintains its own operating budget, the Board leadership and operational management is performed solely by Cumberland County. Therefore, in consideration of the typical utility system management and operations and maintenance that is necessary for maintaining each of the systems, McGill has considered all of the four (4) utility systems cumulatively. While each system could be analyzed separately, considering the systems together is more consistent with actual management of the systems.

Typical metrics for analyzing full-time equivalent (FTE, representing quantity full-time workers) are based on either the population served by the system or by miles of utility piping (water main or sewer line) within each system. For reference, Table 17 below summarizes the customers and piping in each of the County’s utility systems.

**Table 17: Utility System Comparison**

DISTRICT	Number of Connections		Paying Avail. Fee	Pipe in System (mi.)
	Water	Sewer		
<b>Southpoint</b>	84		129	2.8
<b>Kelly Hills</b>		102	166	4.5
<b>Overhills</b>		107	318	4.0
<b>NORCRESS</b>		452	666	41.1
<b>TOTALS</b>	<b>84</b>	<b>661</b>	<b>1279</b>	<b>52.4</b>

**Table 18: Typical Population vs. Pipe Length**

<b>Population</b>	<b>Pipe in System (mi.)</b>
0-100	5
101-500	5
501-3300	21
3301-10000	62

The typical sizes of utility systems from a community system EPA study<sup>1</sup> are shown in Table 18, and are generally consistent when compared to the County's systems. This study was selected as a basis for comparison due to its comprehensive nature, having included water systems nationwide in its breadth. NORCRESS is the exception when compared to Table 18. This is mostly likely indicative of the system serving a more rural population where the connection density is less, and resulting from the length of force main piping in the system that increases the overall length but does not contribute to population density. Overall, these metrics were found to be reasonably consistent with the County's systems. Similarly, the data is consistent regardless of whether the utility system is a water systems or wastewater collection system.

The objective is to make budget-level staffing recommendations for the County's utility systems based on what is typical across the industry and other utility systems of comparable size. The EPA study utilized provides typical FTE for the roles of manager, plant operator, distribution (and collection, for our purposes), and administrative functions. All of these were considered applicable to management and operation of the County's utility systems. Note: while the County is not responsible for plant operation in any system, the lift stations in the NORCRESS and Overhills systems are the County's responsibility, therefore this metric was used, albeit in a smaller percentage, to account for the management of those resources.

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<sup>1</sup> Analysis conducted using excerpts from US EPA document, "National Characteristics of Drinking Water Systems Serving 10,000 or Fewer People," published July 2011.

Table 19 shows Further utilizing the EPA statistics as base for typical FTE for each of the positions, based on the system size in terms of miles of pipe main.

**Table 19: Average Community System Statistics**

Employee Category	System Size (miles of Main)		Mean	Cumberland County
	Pop. 500-3300	Pop. 3300-10000		
	21	62	41.5	51.7
<b>Manager FTE</b> per mile	0.6	1.1	0.85	1.06
	0.029	0.018	0.020	0.020
<b>Plant Operator FTE</b> per mile	0.6	1.3	0.95	1.03
	0.029	0.021	0.023	0.023
<b>Distribution FTE</b> per mile	0.8	2.5	1.65	2.06
	0.038	0.040	0.040	0.040
<b>Administrative FTE</b> per mile	0.6	1.5	1.05	1.31
	0.029	0.024	0.025	0.025

The green highlighted cells are the calculated FTEs that were applied to estimate staffing size based on the quantity of pipe across the County’s four utility systems. Those calculated FTEs are based on the size of systems managed by the County and reasonable estimate of staffing needed for these systems.

Each of the FTEs is applied to each respective employee category. McGill utilized wage information from Zip Recruiter and a benefits multiplier of 1.38 from the U.S. Bureau of Labor Statistics to develop the summary shown in Table 20.

**Table 20: Overall Salary Estimates**

Employee Category	Hourly Rate	Annual Salary	Ben. Mult.	Total	Applied FTE	Applied Budget Cost
Manager	\$38.50	\$80,080.00	1.38	\$110,510.40	1.06	\$117,000
Operator	\$24.52	\$51,001.60	1.38	\$70,382.21	1.03	\$72,700
Distribution	\$23.57	\$49,025.60	1.38	\$67,655.33	2.06	\$139,100
Administrative	\$21.33	\$44,366.40	1.38	\$61,225.63	1.31	\$80,100
<b>Total Applied Budget Cost Based FTEs</b>						<b>\$408,900</b>

Utilizing industry metrics and comparing to systems of comparable size, McGill offers the proceeding section as a general staffing recommendation. This section and these budget values are provided for preliminary planning purposes only.

Staffing levels appear to be reasonable based on the District's ability to operate and maintain the system while providing a reliable level service to its customers.

While this budget number is higher than the current budget staffing, consideration should also be given to the cumulative effect cost to the County for contracted operation and distribution support in the NORCRESS and Kelly Hills district.

# **APPENDICES**



# **Appendix A**

## **Manhole Inspection List**





<b>Norcross Manhole Inspection</b>		
<b>Date:</b>	<b>Nov. 28 and 30, 2023, Feb. 5, 2024</b>	
<b>Manhole ID</b>	<b>Condition</b>	<b>Notes</b>
SMH028220	Poor	Crack on interior from being hit by mower
SMH028209	Poor	
SMH026946	Poor	Black inside manhole and corrosion around collar
SMH028208	Good	
SMH028215	Good	
SMH029390	Good	
SMH028093	Good	
SMH027974	Good	
SMH027985	Good	
SMH028003	Good	
SMH028033	Good	
SMH028025	Good	
SMH028026	Good	
SMH027171	Good	
SMH026913	Good	Outside of Martin's Meats
SMH026927	Good	
SMH026896	Good	
SMH026879	Good	
SMH026880	Good	
SMH026933	Good	
SMH026934	Good	
SMH027941	Good	
SMH027930	Good	
SMH028067	Good	
SMH028038	Good	
SMH028039	Good	
SMH028054	Good	
SMH028053	Good	
SMH028040	Good	
SMH028061	Good	
SMH028045	Good	
SMH028050	Good	
SMH028041	Good	
SMH028044	Good	Ring very rusted
SMH028146	Good	
SMH028145	Good	
SMH026946	Poor	Black inside manhole and corrosion around collar



## **Appendix B**

### **Smoke Testing Results List**

# Norcross Smoke Testing Manholes

Date: October 24-26th 2023		
Manhole ID	Smoke Status	Notes in the field
SMH026878	Leak	
SMH026879	Leak	Smoke around concrete
SMH026880	Leak	Cracked ring
SMH026885	Broken	smoke
SMH026886	Leak	
SMH026887	Leak	Smoking from edges
SMH026887	Leak	Smoking from edges
SMH026892	Leak	Smoking from edges
SMH026895	Leak	Smoking from edges
SMH026896	Leak	Small amount of smoke
SMH026897	Leak	
SMH026900	Leak	Smoking from edges
SMH026901	Leak	Small amount of smoke
SMH026904	Broken	concrete collar broken
SMH026905	Leak	Rim broken
SMH026906	Leak	
SMH026906	Leak	
SMH026911	Leak	
SMH026912	Leak	Buried in front of Martin's
SMH026915	Leak	Smoking
SMH026916	Leak	smoking
SMH026918	Leak	Smoking
SMH026919	Leak	Small amount of smoke
SMH026921	Leak	
SMH026922	Leak	
SMH026923	Leak	
SMH026925	Leak	Smoke around lid
SMH026929	Leak	
SMH026930	Leak	
SMH026931	Leak	
SMH026932	Leak	
SMH026934	Leak	
SMH026941	Leak	Smoking
SMH026942	Leak	Small amount of smoke
SMH026944	Leak	Cracked concrete smoke around lid and collar
SMH026945	Leak	
SMH027168	Leak	
SMH027170	Leak	Smoking from edges
SMH027172	Leak	
SMH027173	Leak	
SMH027174	Leak	
SMH027175	Leak	

SMH027176	Leak	
SMH027179	Leak	smoking
SMH027180	Leak	smoking
SMH027183	Leak	smoke around lid
SMH027184	Leak	smoking
SMH027185	Seal	smoking around sealed lid
SMH027188	Leak	
SMH027441	Leak	
SMH027929	Leak	
SMH027930	Leak	
SMH027933	Broken	Lid removed, possible dumping
SMH027941	Broken	Lid missing, possible dumping
SMH027947	Leak	smoking from lid edges
SMH027948	Leak	
SMH027950	Leak	
SMH027951	Leak	
SMH027952	Leak	smoking from edges
SMH027955	Leak	Smoking from edges
SMH027956	Leak	Smoking from edges
SMH027963	Leak	
SMH027964	Leak	
SMH027965	Leak	
SMH027966	Leak	
SMH027967	Leak	
SMH027968	Leak	Smoking from edges
SMH027969	Leak	Smoking from edges
SMH027970	Leak	
SMH027971	Leak	
SMH027972	Leak	
SMH027973	Leak	Smoking from edges
SMH027974	Leak	Smoking from edges
SMH027975	Leak	
SMH027976	Leak	
SMH027985	Leak	Smoking from edges
SMH027987	Leak	
SMH027988	Leak	
SMH027989	Leak	
SMH027993	Leak	
SMH027994	Leak	
SMH027995	Leak	
SMH027996	Leak	
SMH027997	Leak	
SMH027998	Leak	
SMH027999	Leak	Smoke around lid and ground
SMH028000	Leak	smoke around lid

SMH028002	Leak	
SMH028003	Leak	
SMH028004	Leak	
SMH028006	Leak	
SMH028007	Leak	Smoking from edges
SMH028008	Leak	
SMH028018	Leak	Riser is shifted
SMH028019	Leak	Smoke around lid
SMH028021	Seal	smoking
SMH028022	Seal	smoking
SMH028024	Leak	
SMH028025	Leak	
SMH028026	Leak	
SMH028027	Leak	
SMH028029	Leak	
SMH028031	Leak	smoke around ground and concrete
SMH028032	Leak	
SMH028033	Leak	
SMH028034	Leak	
SMH028035	Leak	
SMH028036	Leak	
SMH028038	Seal	smoke around rim
SMH028041	Leak	
SMH028046	Leak	
SMH028047	Leak	Smoking from edges
SMH028048	Leak	
SMH028049	Leak	
SMH028050	Leak	Smoking from edges
SMH028051	Broken	smoke from collar
SMH028052	Broken	smoke from collar
SMH028053	Broken	smoke from collar
SMH028054	Broken	collar busted
SMH028056	Leak	
SMH028057	Seal	
SMH028059	Leak	Smoking from edges
SMH028073	Broken	Concrete cracked around mh
SMH028074	Leak	
SMH028075	Leak	
SMH028076	Leak	
SMH028077	Leak	
SMH028078	Leak	
SMH028079	Leak	
SMH028080	Leak	
SMH028081	Leak	
SMH028084	Leak	



SMH028092	Leak	Smoking from edges
SMH028099	Leak	Smoking from top sides of mh
SMH028104	Leak	Small amount of smoke from edges of mh. Concrete base is cracked
SMH028105	Leak	Smoking from edges of mh and ground around it
SMH028106	Leak	Small amount of smoke come from edges. Looks like holes in top from missing screw or bolt
SMH028113	Leak	Small amount of smoke coming from sides of mh
SMH028114	Leak	Smoking from mh and ground around it
SMH028117	Broken	
SMH028129	Seal	Smoking from mh
SMH028142	Seal	Broken around concrete
SMH028160	Leak	Small amount of smoke from edges of mh
SMH028164	Leak	Very small amount of smoke coming from mh
SMH028165	Leak	Smoking from edges of mh
SMH028169	Leak	Small amount of smoke coming from edges of mh
SMH028181	Leak	
SMH028189	Leak	Small amount of smoke coming from edges of mh
SMH028214	Leak	
SMH028215	Leak	
SMH028216	Leak	
SMH028217	Broken	Smoke coming up around the ground near manhole
SMH028230	Seal	Smoke around seal
SMH029404	Leak	Small amount of smoke from edges of mh

## Norcross Smoke Testing Cleanouts

Date: October 24-26th 2023

Facility ID	Smoke Status	Notes in the field
32849	Leak	Smoking from c/o and house
32851	Leak	Leaking from broken cap
32853	Broken	
32855	Leak	
32866	Broken	
32867	Broken	
32870	Broken	
32871	Broken	
32874	Broken	
32877	Broken	Busted pipe
32878	Broken	Busted pipe
32900	Broken	Stack
32901	Leak	
32905	Leak	
32907	Broken	
32909	Broken	Smoking
32915	Broken	
32918	Broken	Busted pipe
32930	Broken	
32943	Broken	
32964	Leak	Small amount of smoke
32967	Broken	Missing cap broken sides on c/o
36922	Broken	
36925	Broken	Broken off cap
36926	Broken	
36934	Broken	Pipe busted
36935	Broken	Pipe busted
36946	Broken	Broken stack
36947	Broken	Stack broke no cap
36948	Broken	
36949	Broken	Broken needs cap
36955	Broken	Needs cap
36964	Leak	
36990	Broken	
36991	Broken	
36999	Broken	Pipe busted
37003	Broken	Pipe broken
37005	Broken	
37009	Broken	
37018	Broken	
37019	Broken	
37020	Broken	

37023	Broken	
37023	Broken	
37025	Broken	
37236	Broken	
37238	Broken	
37265	Broken	
37266	Broken	Smoking from house, c/o and ground
37272	Broken	
37058	Broken	
37070	Broken	Broken cap but fixed in field
37078	Broken	Pipe broken
37079	Broken	Pipe broken
37080	Broken	Broken ring and cap
37091	Broken	Cap broken
37138	Leak	Small amount of smoke coming from c/o
37145	Broken	Cap missing
37149	Broken	
37169	Broken	
37172	Broken	Vacant lot near manhole
37181	Leak	
37202	Broken	
37219	Broken	
37222	Broken	
37225	Broken	
37277	Leak	Smoking from cap and ground around c/o
37284	Broken	
37287	Broken	
37291	Broken	Stack cracked
37292	Broken	Broken cap
37307	Broken	
37314	Broken	
41110	Leak	
41695	Broken	
41712	Broken	
43878	Broken	
42156	Leak	
46282	Broken	Smoke coming from holes in cap
54547	Broken	Busted pipe
59583	Broken	
62262	Leak	
32864	Leak	
32865	Broken	
32882	Leak	No cap
32883	Broken	Pipe busted



## **Appendix C**

### **Rainfall Data**



Daily Precipitation from Fayetteville Regional Airport  
Cumberland County 20.02507

<b>Time</b>	<b>Precipitation (in)</b>
Day	Total
18-Oct	0
19-Oct	0
20-Oct	0
21-Oct	0.41
22-Oct	0
23-Oct	0
24-Oct	0
25-Oct	0
26-Oct	0
27-Oct	0
28-Oct	0
29-Oct	0
30-Oct	0
31-Oct	0
1-Nov	0
2-Nov	0
3-Nov	0
4-Nov	0
5-Nov	0
6-Nov	0
7-Nov	0
8-Nov	0
9-Nov	0
10-Nov	0
11-Nov	0.02
12-Nov	0.25
13-Nov	0.01
14-Nov	0
15-Nov	0
16-Nov	0
17-Nov	0
18-Nov	0
19-Nov	0
20-Nov	0
21-Nov	0
22-Nov	1.61
23-Nov	0.78
24-Nov	0
25-Nov	0
26-Nov	0
27-Nov	0.06
28-Nov	0
29-Nov	0
	<b>3.14</b>

Source: <https://www.wunderground.com/history/weekly/us/nc/fayetteville/KFAY/date>



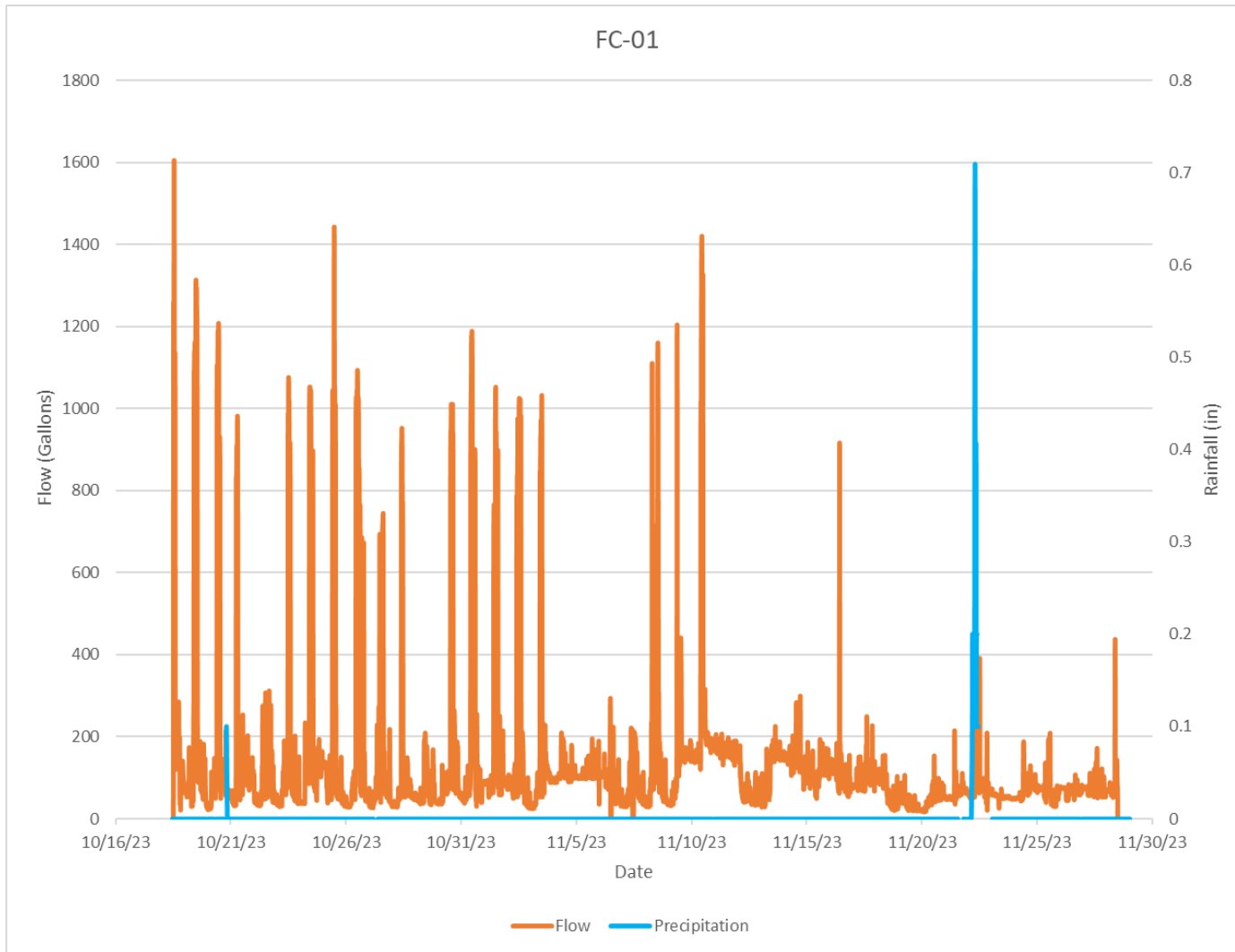


## **Appendix D**

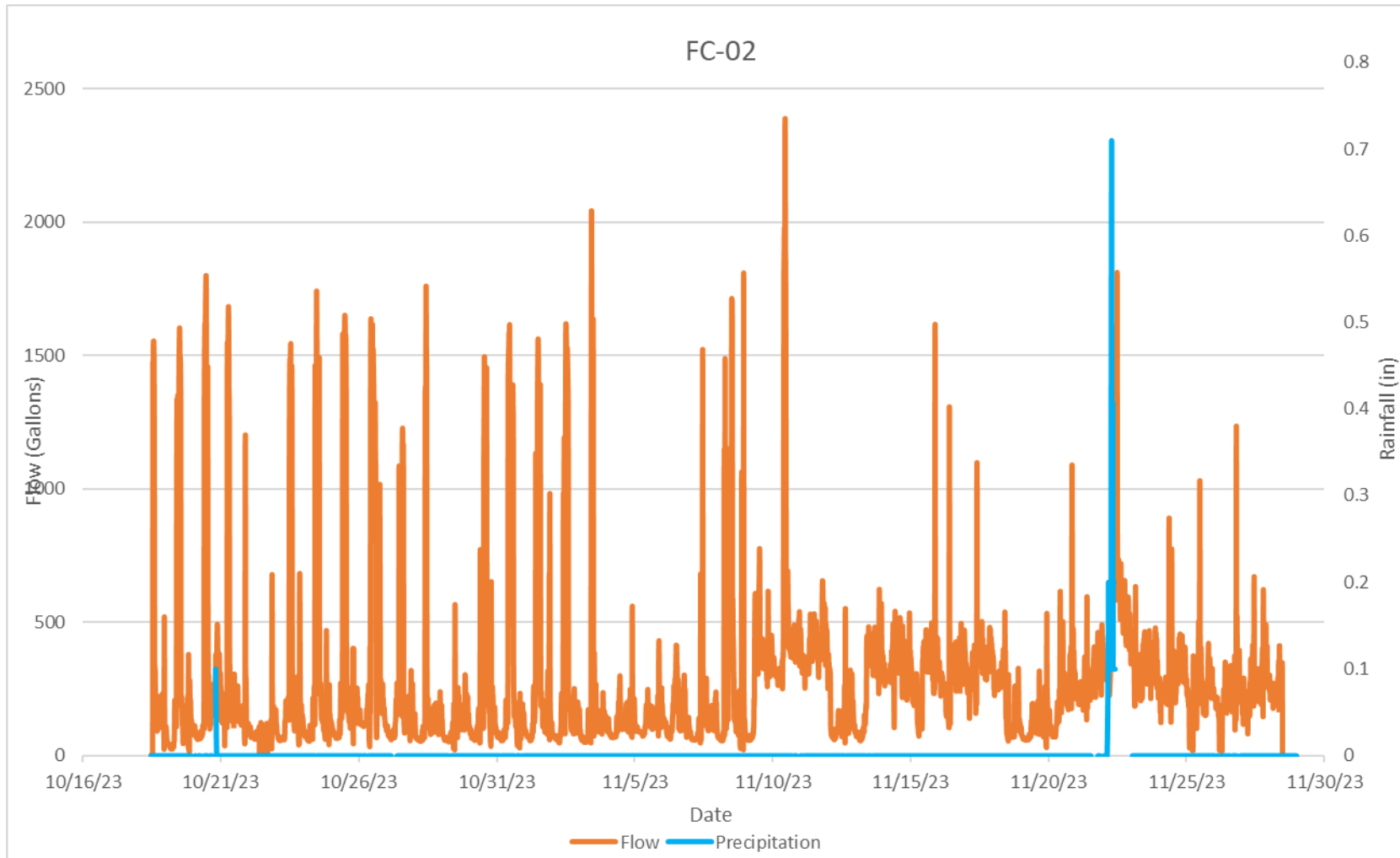
### **Flow Monitoring Data, Hourly Graphs**



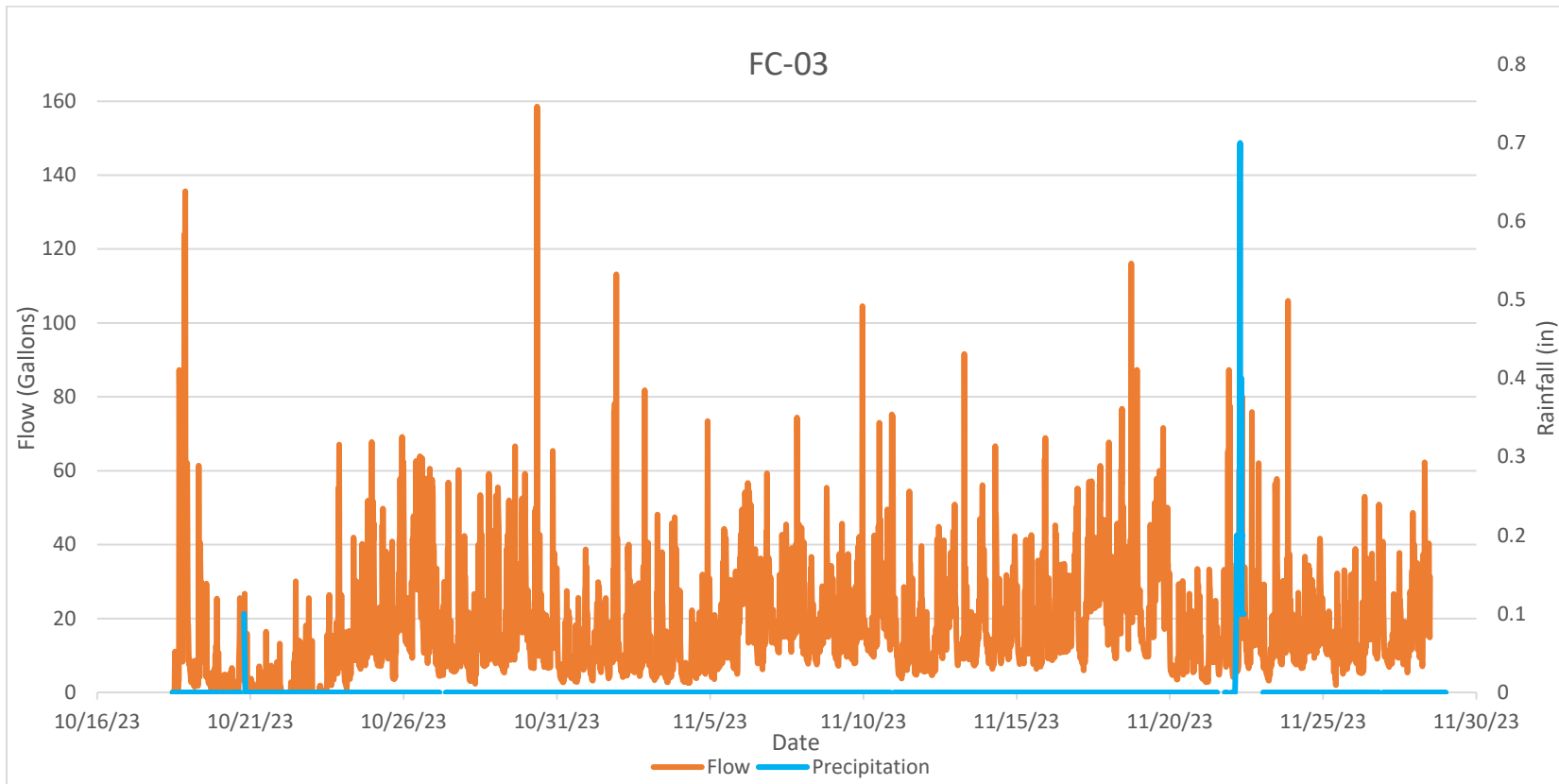
**Graph 1A: Falcon Location 01, Hourly Flow vs. Rainfall**



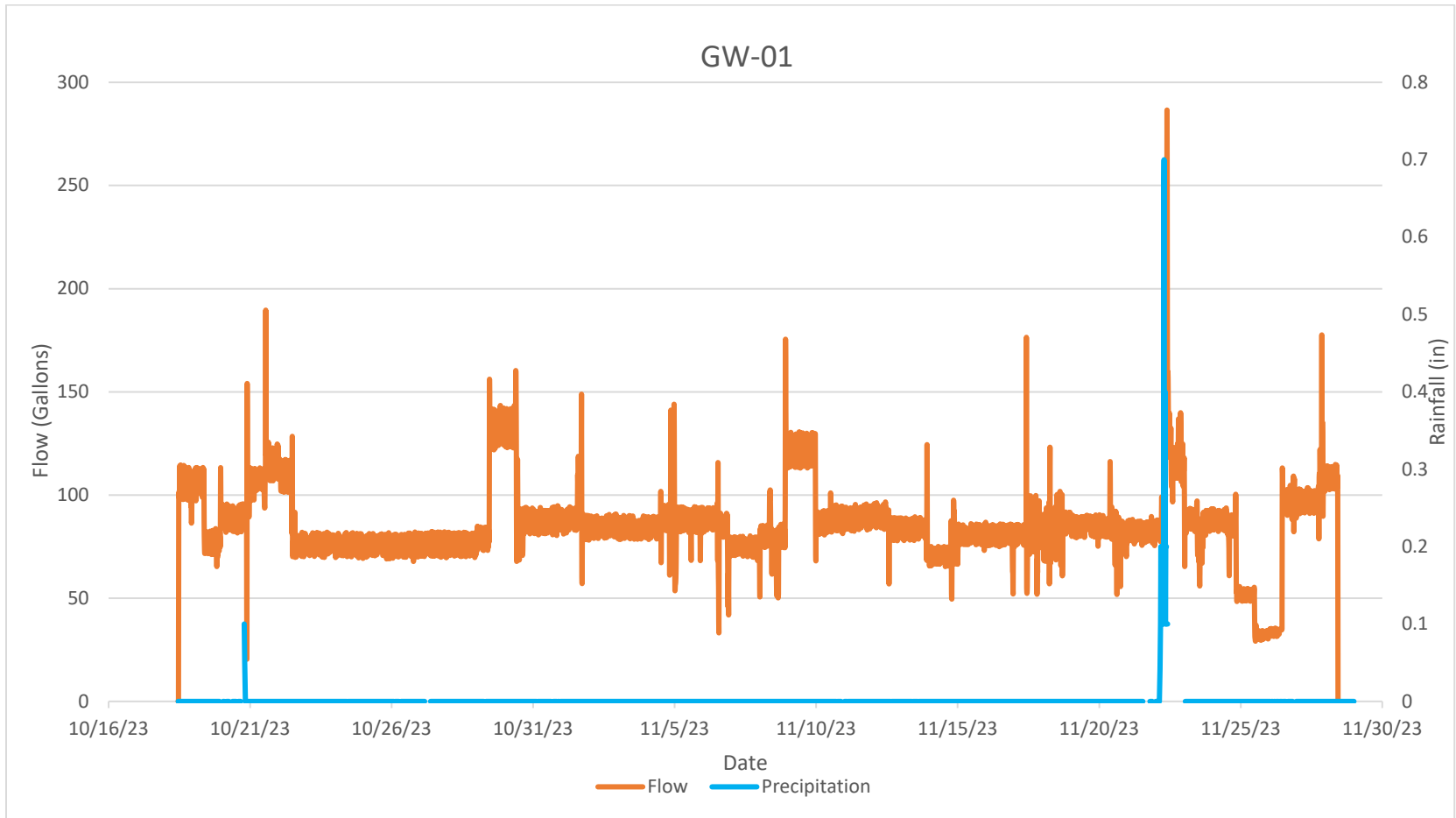
**Graph 2A: Falcon Location 02, Hourly Flow vs. Rainfall**



**Graph 3A: Falcon Location 03, Hourly Flow vs. Rainfall**

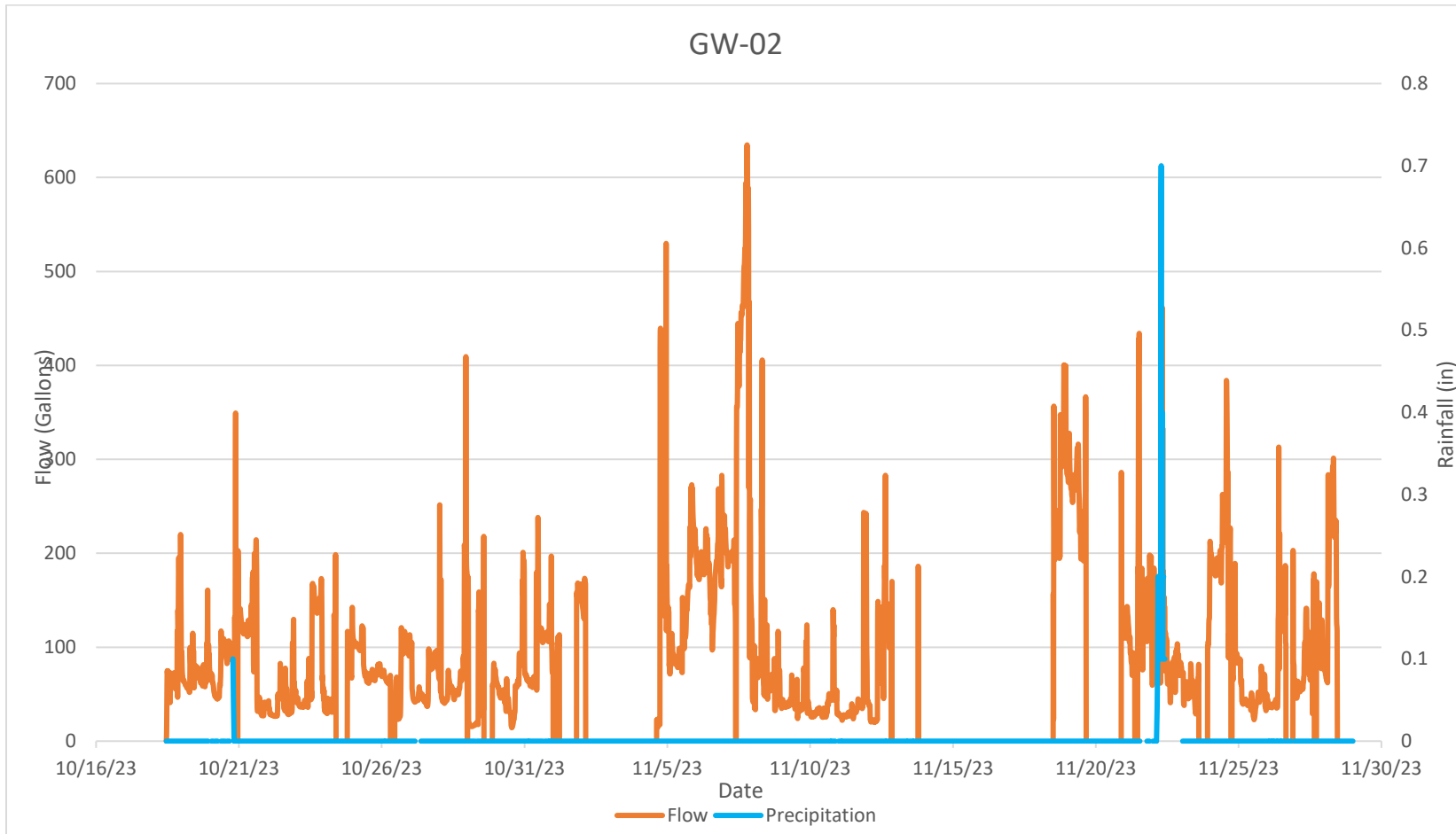


**Graph 4A: Godwin Location 01, Hourly Flow vs. Rainfall**

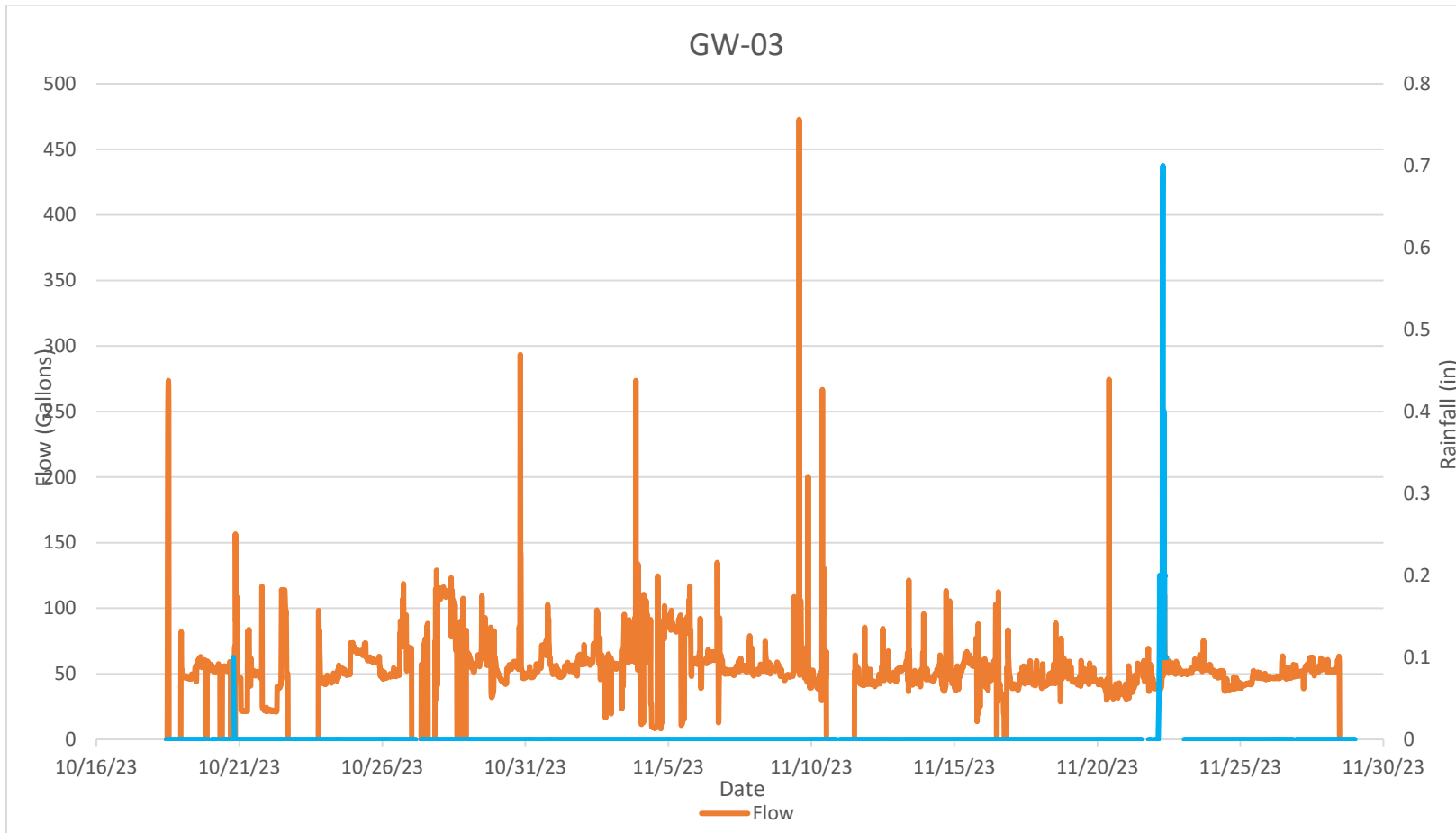




**Graph 5A: Godwin Location 02, Hourly Flow vs. Rainfall**



**Graph 6A: Godwin Location 03, Hourly Flow vs. Rainfall**



## **Appendix E**

### **Capital Improvement Project Product Data**



# HACH FL900 SERIES FLOW LOGGER -WIRELESS

**The wireless Hach FL900 Series Flow Logger revolutionizes open channel flow monitoring by providing reliable, innovative solutions for any sewer flow measurement challenge.**

From wireless communication with free data hosting to longer battery life, the FL900 is designed to reduce monitoring costs, increase efficiency, and provide better data 24/7 with less hassle than you ever thought possible. When combined with any of our full array of smart sensors, the FL900 wireless flow monitoring system will provide reliable flow data for any wastewater flow monitoring application. And with the FL900's included software tool, *fsDATA*® Online Data Manager, site time is reduced dramatically, allowing for increased time for data analysis and proactive actions for solving any flow related issue.

## Plug and Play Sensor Ports

The FL900 is available with 1, 2 or 4 sensor ports. The sensor ports are "plug and play"; the logger auto detects the type of sensor connected to allow customers maximum flexibility for their Hach flow sensor inventories.

Compatible FL900 Flow Logger sensors include:

- *FLO-DAR*® AV Sensor with optional Surcharge Velocity Sensor
- *FLO-TOTE*® 3 AV Sensor
- *Sigma Submerged AV Sensor*
- *Hach US9001 Down-Looking Ultrasonic Sensor*
- *Hach US9003 In-Pipe Ultrasonic Sensor*

## Quick Installation/On-Site Confirmation

Not only is the FL900 easy to install with a variety of mounting options, it also includes an LED status light so that you know it's fully functional before leaving the site.



## Applications

- Wastewater
- Collection Systems
- Industrial Water

## Affordable Alarming Capabilities

User-selectable alarms can be sent by email or text (SMS) to specified recipients to keep you continuously informed on your monitoring sites. Up to 16 channel alarms can be selected, as well as alarms for low battery, low RTC battery, low slate memory, slate memory full, sensor timeout, sensor ID error or missed call.

## Wireless Data Available 24/7 with *fsDATA*

Eliminate risk and make smarter, more-timely decisions with your sewer flow data. The *fsDATA* Online Data Manager provides secure 24/7 access to your flow data and wireless meter from the comfort of the internet. With *fsDATA*, site visits to collect flow data or to adjust meter settings are eliminated, decreasing maintenance costs. Set alarms and view sensor diagnostics remotely to maximize uptime. Multiple users can be granted different data access levels based on job function.

## Redundant-Level Flow Monitoring

With FL900 Series plug-and-play flow meters, you can pair a Sigma Submerged AV Sensor with a Hach US9003 In-Pipe Ultrasonic Sensor for integrated redundant-level flow monitoring.

## Specifications\*

### Portable DC Powered Electronics (Includes Models FL901, FL902 & FL904)

<b>Dimensions (W x D x H)</b>	25.4 x 22 x 40 cm (10.0 x 8.7 x 16.0 in.)
<b>Enclosure</b>	PC/ABS structural foam
<b>Environmental Rating</b>	NEMA 6P (IP68)
<b>Weight (Using Model FL900)</b>	4.5 kg (10 lb)—no batteries; 6.3 kg (14 lb)—2 batteries; 8.2 kg (18 lb)—4 batteries
<b>Operating Temperature</b>	-18 to 60°C (0 to 140°F) at 95% RH
<b>Storage Temperature</b>	-40 to 60°C (-40 to 140°F)
<b>Power Requirements</b>	8 to 18 Vdc from batteries or external power source, 2.5W max.

#### Battery Life

Varies with sensor type, logging intervals, telemetry and environment.

For a 15-minute logging interval, 60 minute call frequency, four 6 V lantern batteries at room temperature:  
130 days with 4 lantern batteries and a FLO-DAR sensor  
180 days with 4 lantern batteries and a FLO-TOTE 3 sensor  
160 days with 4 lantern batteries and a Sigma Submerged AV sensor with AV9000 Analyzer  
200 days with 4 lantern batteries and Ultrasonic Down-Looking or In-Pipe sensor

The optional long life alkaline battery pack can be used to extend battery life, if the Flow Logger is ordered with the external power option connector.

#### LED Status Indicator

- Green Flashes every 3 seconds during normal operation.  
Flashes every 15 seconds during sleep mode.
- Red Flashes when an attached sensor does not agree with the logger program, when an expected sensor is not found or the sensor is not working properly.

#### LED Modem Indicator

- Stays green during a call to the server. Goes blank after the call is successfully completed and terminated.
- Flashes red if the call to the server failed.

**Sensor Ports** 1, 2 or 4 ports

**Connectors** Stainless steel connectors

**Datalog Channels** 16 maximum

#### Alarms

Maximum of 16 channel alarms including high/high, high, low, low/low and system alarms including low battery, low RTC battery, low slate memory, slate memory full, sensor timeout, sensor ID error.

#### Alarm Actions

Trigger sampler, change logging interval, change call interval, send an e-mail, or send text message (SMS).

#### Call Monitor

Sends a message by e-mail or text (SMS) if a logger has not called the server within an user-defined amount of time.

#### Logging Intervals

1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30 or 60 minutes  
Primary and secondary intervals for dynamic logging.

#### Data Storage

Event Log: 1,000 events maximum in non-volatile flash memory  
Sample History: 2,000 sample events maximum in non-volatile flash memory  
Datalog: 325,000 data points; 1128 days for 3 channels at 15-minute log intervals

#### Data Storage

Event Log: 1,000 events maximum in non-volatile flash memory  
Sample History: 2,000 sample events maximum in non-volatile flash memory  
Datalog: 325,000 data points; 1128 days for 3 channels at 15-minute log intervals

#### Local Communication

USB  
RS232 (Baud rates: 9600, 19200, 38400, 57600, 115200)

#### Remote Communication

Wireless modem; CDMA or GPRS technology with a mobile provider.

#### Protocols

Local Modbus RTU

#### Timebase Accuracy

±0.002%, synchronized every 24 hours with server software and modem

#### Supported Sensors

FLO-TOTE 3, FLO-DAR, FLO-DAR with SVS, Sigma Submerged AV Sensor†, Sigma 950†, and Rain Gauge

#### Sampler Interface

Compatible with Sigma 900 Standard, Sigma 900MAX, Sigma SD900 to support set-point sampling, flow pacing, and logging sample history.

#### Desktop Software

FLO-WARE software is required for programming the logger and can be used for data management and report generation. It is compatible with desktop/laptop computers utilizing Windows operating system. Minimum resolution needed is 1024x768.

#### Internet Application Software

FSDATA web-based software for flow meter programming, data management and report generation for wireless flow meters.

#### Certifications

Logger: CE; optional AC power supply: UL/CSA/CE

#### Warranty

1 year

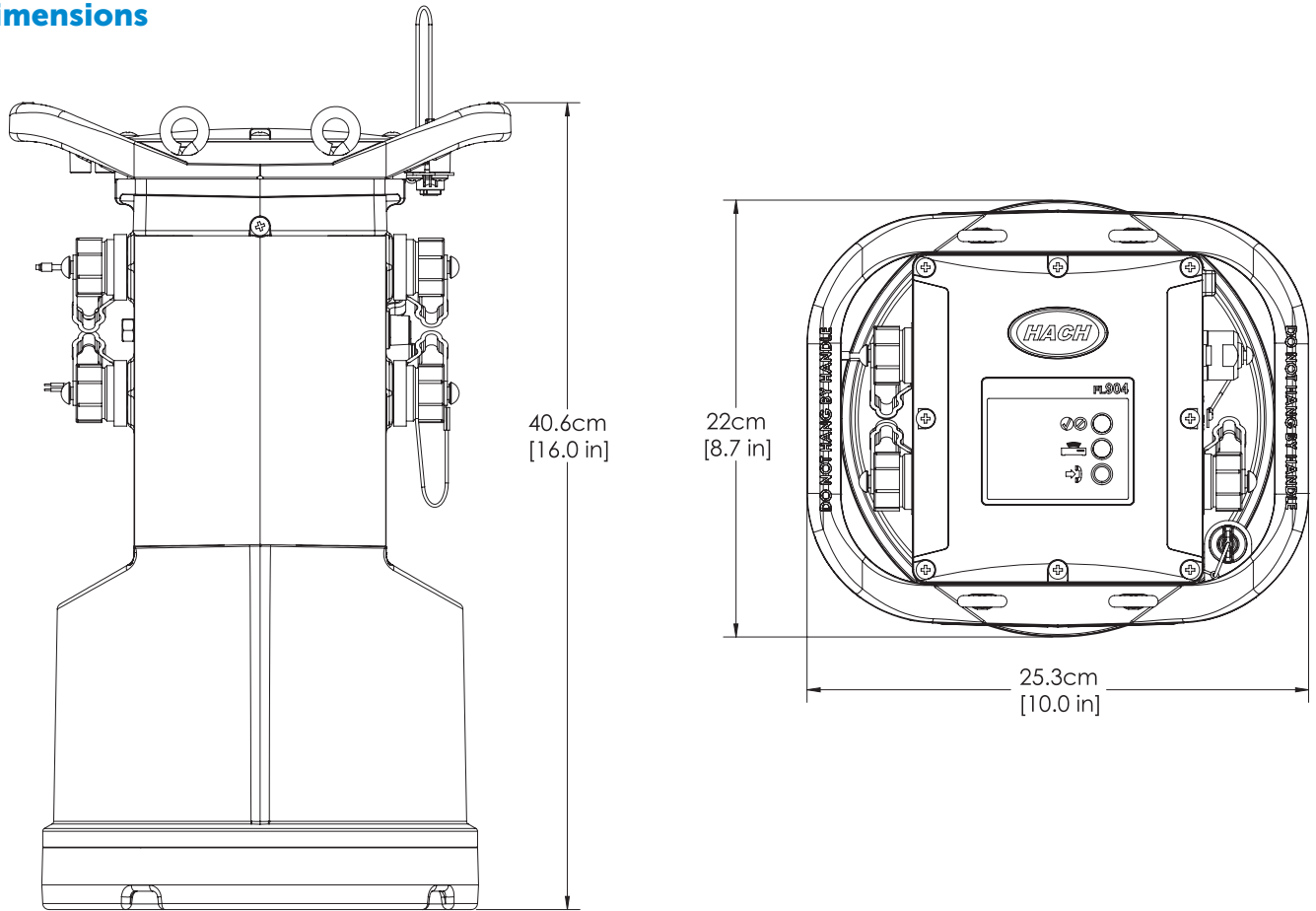


The FL900 Series Loggers meet CE requirements.

<sup>†</sup>Requires external module.

\*Subject to change without notice.

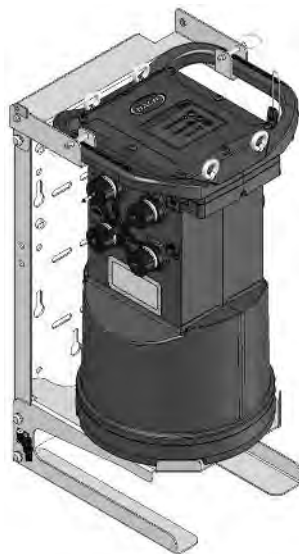
### Dimensions



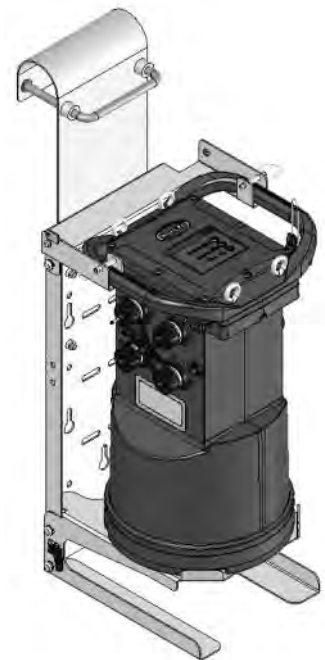
### Installation/Mounting Options



*Flow Logger Suspension Cable with Carabiner (Standard)*



*Flow Logger Wall Mount Prod. No. 8542700 (Optional)*



*Flow Logger Ladder Rung Mount Prod. No. 8544500 (Optional)*



## Ordering Information

FL90X Electronics (Flow Logger)	Model FL90	Sensor Connector(s)	Country Code	Modem	Rain Gauge
1 Sensor Connector		1	97		
2 Sensor Connectors		2			
4 Sensor Connectors		4			
None				X	
AT&T (Activated)				A	
GPRS no SIM				G	
Sprint (Inactive)				R	
Sprint (Activated)				S	
Verizon (Inactive)				U	
Verizon (Activated)				V	
No Rain Gauge Connector					X
With Rain Gauge Connector					R

### External Modules

- 8531300** AV9000 Area Velocity Analyzer module (required to attach a Sigma Sub AV sensor)
- 8549800** IM9001 Interface module (required to attach a Sigma 950 flow meter)

### Cables

- 8528700** Cable, External power, 2 wire, 9 ft.
- 8528200** Cable, Communication, RS232
- 8528300** Cable, Communication, USB
- 8528400** Cable, Aux, 7pin MIL 5015 (Connect to Sigma Sampler), 9 ft.
- 8528401** Cable, Aux, 7pin MIL 5015 (Connect to Sigma Sampler), 25 ft

### Software

- Model T200-900** FLO-WARE Desktop Software
- FS-HOSTING** Monthly data hosting service for FS-DATA
- FS-DATAFR** Monthly wireless service

### Mounting Hardware

- 8543800** Wall mount bracket (304 Stainless)
- 8545600** Wall mount bracket with ladder hanger (304 Stainless)
- 8542700** Wall mount bracket with AC Power Supply shelf (304 Stainless)
- 8544500** Wall mount bracket with AC Power Supply Shelf with ladder hanger (304 Stainless)

### Replacement Parts

- 8755500** Desiccant refill beads, Bulk 1.5 lb
- 11013M** Battery, 6V lantern
- 8542900** Battery, long-life alkaline
- 8543000** Battery pack top cap adaptor and cable (for long-life alkaline battery pack 800017701)
- 8542800** Rain Gauge with 100 ft. cable

For additional information on products mentioned in this data sheet, request the following data sheets:

**FS-DATA® Online Data Manager (LIT2707)**

**FLO-DAR® AV Sensor (LIT2708)**

**FLO-TOTE® 3 AV Sensor (LIT2712)**

**HACH US9000 Ultrasonic Sensors (LIT2804)**

**HACH Redundant Flow Monitoring System (LIT2805)**

**HACH Wireless Level Alarming System (LIT2806)**

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In the interest of improving and updating its equipment,

Hach Company reserves the right to alter specifications to equipment at any time.



Be Right™

# Marsh-McBirney FLO-DAR® Area/Velocity Radar Flow Meter Sensor



*The Flo-Dar Sensor provides an ideal solution for non-contact, maintenance-free portable or permanent sewer flow monitoring.*

## Features and Benefits

The Flo-Dar Area/Velocity Radar Flow Meter provides a revolutionary approach to open channel flow monitoring. The sensor combines advanced Digital Doppler Radar velocity sensing technology with ultrasonic pulse echo depth sensing to remotely measure open channel flow. Use with FL900 Series Flow Logger or Flo-Logger/Logger XT for portable monitoring; for permanent monitoring sites, the Flo-Dar can be connected to the Flo-Station which displays flow rate, velocity, and level. (See Lit. No. 2709 [standard] or Lit. No. 2711 [wireless] for Flow Logger product information, or Lit. No. 2616 for Flo-Station product information). Intrinsically safe models available.

### Accurate Flow Measurement

Flo-Dar provides the user with highly accurate flow measurements under a wide range of flows and site conditions. By measuring the velocity of the fluid from above, Flo-Dar eliminates accuracy problems inherent with submerged sensors including sensor disturbances, high solids content and distribution of reflectors.

### Non-Contact Sensor Eliminates Lost Data

No lost data with non-contact, above the flow sensor that is unaffected by fouling due to debris and grease.

### Easy Installation and Maintenance

As the sensor is mounted above the flow, personnel have little or no contact with the flow during installation. Future sensor removal can be done without the need for confined space entry.

### Independent Accuracy / Long-Term Stability Verification

Flo-Dar sensor accuracy and long-term stability (up to 3 years without need for site calibration) from low flow depths up to surcharge conditions has been independently verified

many times over the years including a formal evaluation by the Alden Research Laboratory, Inc. and recent field evaluations done by municipalities and consulting engineering firms.

### Perfect Solution for Difficult Flow Conditions

Operates in the most difficult conditions including flows with high solids content, high temperature, shallow and caustic flows, large man-made channels, and high velocities up to 20 ft/s.

### Optional Surcharge Velocity Sensor

During surcharge events Flo-Dar's optional electromagnetic sensor will continue to provide uninterrupted and accurate flow monitoring through dry and wet weather flows without the need for routine sensor cleaning or maintenance.

### Applications

#### Municipal

- Sanitary Sewer Evaluation Studies
- Collection Systems
- Capacity Studies
- Combined Sewer Overflows
- Inflow and Infiltration (I&I) Studies
- Billing / Custody Transfer
- Plant Influent and Effluent

#### Industrial

- Process Waste
- Plant Influent
- Plant Effluent
- Non-contact Cooling Water
- Stormwater Monitoring and Compliance

DW = drinking water WW = wastewater municipal PW = pure water / power  
IW = industrial water E = environmental C = collections FB = food and beverage



Be Right™

WW

IW

C

## Specifications\*

### FLO-DAR SENSOR

#### Enclosure

IP68 Waterproof rating, Polystyrene

#### Dimensions

160.5 W x 432.2 L x 297 D mm (6.32 x 16.66 x 11.7 in.), with SVS, D = 387 mm (15.2 in.)

#### Weight

4.8 kg (10.5 lbs.)

#### Operating Temperature

-10 to 50°C (14 to 122°F)

#### Storage Temperature

-40 to 60°C (-40 to 140°F)

#### Power Requirements

Supplied by FL900 Flow Logger, Flo-Logger, or Flo-Station

#### Interconnecting Cable

**-Disconnectable at both sensor and logger or Flo-Station**

Polyurethane, 0.400 (±0.015) in. diameter; IP68  
Standard length 9M (30 ft), maximum 305 m (1000 ft)

Cables are available in two styles:

- connectors both ends
- connector from sensor with open leads to desiccant hub, desiccant hub with connector to logger. A potting/sealant kit will be included. This can be used to run the cable through conduit.

Important Note: The sensor cable assembly with desiccant hub is compatible with either the Marsh-McBirney Flo-Logger/Logger XT or the Hach FL900 Series Flow Loggers. When using this cable assembly with the Marsh-McBirney Flo-Logger, do not disconnect the desiccant cartridge that is attached to the Flo-Logger itself. It is important to keep the air tube plugged.

If using Flo-Dar cable with Flo-Station, the cable will have bare leads to the Flo-Station (30 to 1000 ft. lengths) and there will be no desiccant hub, as the air tube terminates inside of the Flo-Station housing.

#### Warranty

1 year

#### Set-up/Data Retrieval

Flo-Ware for Windows software is the user on-site set-up, data management, and report generation software. It is compatible with desktop/laptop computers utilizing Windows operating system.

#### Certification

The Flo-Dar Transmitter is certified to the following requirements:

- Transmitter type: Field Disturbance Sensor
- Frequency: 24.125 GHz - Doppler pulse
- Maximum rated power output: 128 dbuV (ave) @ 3 meters

Certified to: FCC Part 15.245: FCC ID: VIC-FLODAR24  
Industry Canada Spec. RSS210. v7: IC No.: 6149A-FLODAR24

Use of this device is subject to the following conditions:

1. There are no used serviceable items inside this device.
2. The user must install this device in accordance with the supplied installation instructions and must not modify the device in any manner whatsoever.
3. Any service involving the transmitter must only be performed by Hach Company.
4. The user must ensure that no one is within 20 cm of the face of the transmitter when operating.

### SURCHARGE DEPTH MEASUREMENT

Auto zero function maintains zero error below 0.5 cm (0.2 in.)

#### Method

Piezo-resistive pressure transducer with stainless steel diaphragm

#### Range

3.5 m (138 in.), overpressure rating 2.5 x full scale

### VELOCITY MEASUREMENT

#### Method

Radar

#### Range

0.23 to 6.10 m/s (0.75 to 20 ft/s)

#### Frequency Range

24.075 to 24.175 G-Hz, 15.2mW (max.)

#### Accuracy

±0.5%; ±0.03 m/s (±0.1 ft/s)

### DEPTH MEASUREMENT

#### Method

Ultrasonic

#### Standard Operating Range from Flo-Dar Housing to Liquid

0 to 152.4 cm (0 to 60 in.)

#### Optional Extended Level Operating Range from Transducer Face to Liquid

0 to 6.1 m (0 to 20 ft.) with 43.18 cm (17 in.) dead band, temperature compensated.

#### Accuracy

±1%; ±0.25 cm (±0.1 in.)

### FLOW MEASUREMENT

#### Method

Based on Continuity Equation

#### Accuracy

±5% of reading typical where flow is in a channel with uniform flow conditions and is not surcharged, ±1% full scale max.

### SURCHARGE CONDITIONS DEPTH/VELOCITY

#### DEPTH (Std with Flo-Dar Sensor)

Surcharge depth supplied by Flo-Dar sensor.

#### VELOCITY (Optional Surcharge Velocity Sensor)

#### Method

Electromagnetic

#### Range

±4.8 m/s (±16 ft/s)

#### Accuracy

±0.15 ft/s or 4% of reading, whichever is greater.

#### Zero Stability

> ±0.05 ft/s

### CERTIFICATION INTRINSICALLY SAFE

The Flo-Dar and Surcharge Velocity Sensors are certified to Class I, Zone 1 Standards. They conform to ANSI/UL 60079-11 and are certified to CAN/CSA E60079-11 and EN 60079-11 standards.

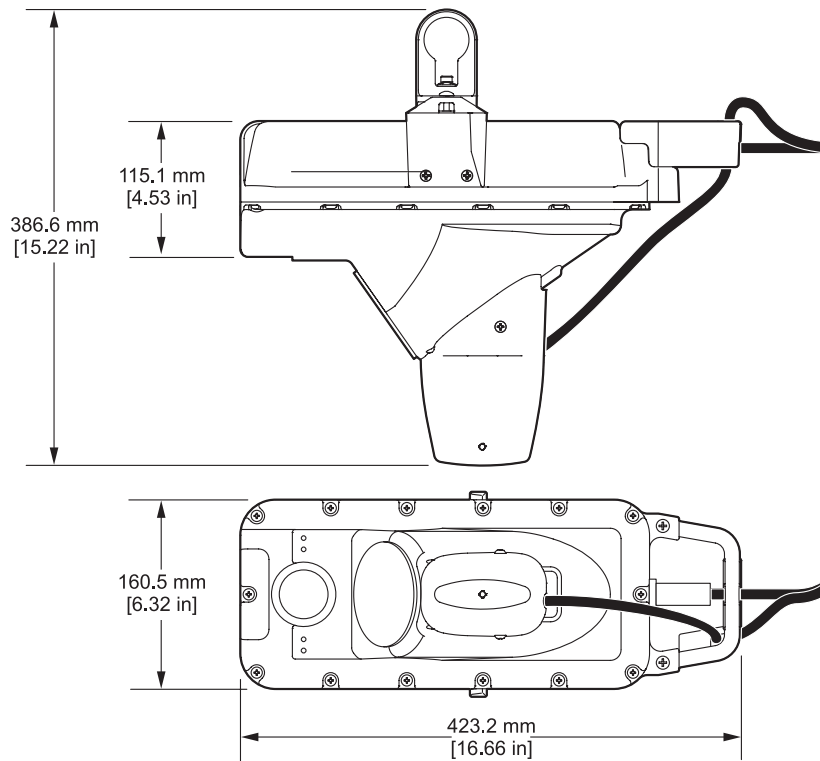


The Flo-Dar sensor meets CE requirements.

## Engineering Specifications

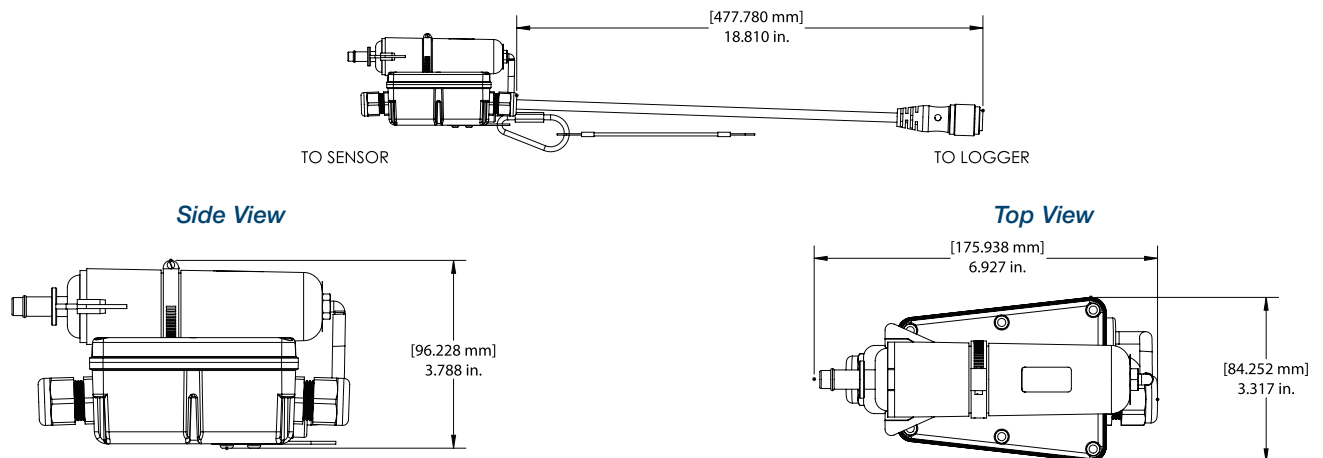
- The flow meter shall be capable of measuring level, average velocity and surcharge depth.
- The method of velocity measurement shall be Doppler radar.
- The sensor shall combine advanced Doppler Radar velocity sensing technology with ultrasonic pulse echo depth sensing to remotely measure open channel flow.
- Flow shall be calculated based on the Continuity Equation ( $Q=V \times A$ ), where  $Q$ =Flow,  $V$ =Average Velocity and  $A$ =Area.
- The range of velocity measurement shall be 0.23 to 6.10 m/s (0.75 to 20 ft/s).
- The method of depth measurement shall be ultrasonic.
- The standard operating range for depth measurement shall be 0 to 152.4 cm (0 to 60 in.) with an optional operating range of 0 to 6.1 m (0 to 20 ft.) with 43.18 cm (17 in.) deadband, temperature compensated.
- The flow meter shall have a surcharge condition velocity sensor option.
- Exterior dimensions of the sensor shall not exceed 160.5 W x 432.2 L x 297 D mm (6.32 W x 16.66 L x 11.7 D in.) or 160.5 W x 432.2 L x 387 D mm (6.32 W x 16.66 L x 15.2 D in.) with Surcharge Velocity option.
- The sensor shall be able to measure bi-directional surcharge flow.
- Optional Intrinsically Safe models available for flow monitoring in hazardous locations.
- The model shall be the Marsh-McBirney Flo-Dar Open Channel Flow Meter Sensor.

## Dimensions



*Flo-Dar Area/Velocity Radar Flow Meter*

The desiccant hub assembly includes a junction box to connect sensor cable to the desiccant and subsequently to the FL900 Logger. The desiccant can easily be replaced without need to purchase a separate desiccant module.



*Desiccant Hub Assemblies for use with portable FL900 Series Loggers and Flo-Logger.  
(Sensor cable for use with Flo-Station will not contain a desiccant hub and will have bare wires on cable end.)*

## Ordering Information

### Configure FLO-DAR Sensor to Logger (Portable)

Flo-Dar Sensor	Model 4000	-	4	X	X
<b>Flo-Dar Sensor with specified cable length</b> (need to add cable as separate line item)			4		
<b>Non Intrinsically Safe</b> <b>Surcharge Velocity Sensor Option</b> (IMPORTANT NOTE: SVS cable length MUST MATCH FloDar Sensor Cable length)				0 3	
<b>Non Extended Range</b> <b>Extended Range Option</b> —Allows use in flow depths up to 18 feet. Allow for 18" deadband. Standard unit max depth is 60". SVS Option requires Remote Extended Range below. <b>Remote Extended Range Option with 6' sensor cable</b> —Flow depths up to 18 feet. Allow for 18" deadband. Standard unit max depth is 60".					0 1 2

### Configure FLO-DAR Sensor to Flo-Station (Permanent)

Flo-Dar Sensor	Model 4000	-	9	X	X
<b>Flo-Dar Sensor with specified cable length</b> (need to add cable as separate line item)			9		
<b>Non Intrinsically Safe</b> <b>Surcharge Velocity Sensor Option</b> (IMPORTANT NOTE: SVS cable length MUST MATCH Flo-Dar Sensor Cable length)				0 3	
<b>Non Extended Range</b> <b>Extended Range Option</b> —Allows use in flow depths up to 18 feet. Allow for 18" deadband. Standard unit max depth is 60". SVS Option requires Remote Extended Range below. <b>Remote Extended Range Option with 6' sensor cable</b> —Flow depths up to 18 feet. Allow for 18" deadband. Standard unit max depth is 60".					0 1 2

### Cables

<b>FD9000CBL-XXX*</b>	FL900 Series Logger to Flo-Dar sensor. Cable w/two connectors.
<b>FDJCTBOXCBL-XXX*</b>	FL900 Series Logger to Flo-Dar sensor. Cable with connector to sensor, open end to desiccant hub, desiccant hub with connector to sensor. Includes finishing kit for potting/sealing desiccant hub. For use with conduit.
<b>6000062XX*</b>	SVS Sensor with connector for use with FL900 Series Logger.
<b>570011800-XXX*</b> <b>Model 4000-9</b>	Flo-Station to Flo-Dar sensor Cable with one connector and bare leads.
<b>6000059XX*</b>	SVS Sensor with bare leads for use with Flo-Station. *Contact customer service for product numbers.
Available Cable Lengths (in feet)	
30	125 225 400 700
60	150 250 450 800
75	175 300 500 900
100	200 350 600 1000

See Lit. No. 2709 (standard models) and Lit. No. 2711 (wireless models) for FL900 Series Flow Logger ordering information. See Lit. No. 2616 for Flo-Station ordering information.

### Mounting Hardware

<b>800016701</b>	Permanent Sensor Mount—Includes sensor frame & all mounting hardware. Portable Sensor Mounts Available (Sizes 34-107") Contact Sales.
------------------	---

### Accessories & Spares

<b>245000501</b>	Sensor Retrieval Pole - Used to place and retrieve sensor from mounting bracket. Pole extends to 7.3 m (21 ft.)
<b>510012701</b>	Sensor Retrieval Hook - Used with Sensor Retrieval Pole
<b>570011401</b>	Grounding Strap (required with Retrieval Pole and Hook when used with IS units)
<b>8755500</b>	Bulk desiccant beads (1.5 pounds)

Lit. No. 2708 Rev 2  
K11 Printed in U.S.A.

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In the interest of improving and updating its equipment, Hach Company reserves the right to alter specifications to equipment at any time.



*At Hach, it's about learning from our customers and providing the right answers. It's more than ensuring the quality of water—it's about ensuring the quality of life. When it comes to the things that touch our lives...*

*Keep it pure.*

*Make it simple.*

*Be right.*

*For current price information, technical support, and ordering assistance, contact the Hach office or distributor serving your area.*

*In the United States and all other countries except Europe, contact:*

HACH COMPANY  
4539 Metropolitan Court  
Frederick, MD 21704-9452, U.S.A.  
Telephone: 800-368-2723  
Fax: 301-874-8459  
E-mail: hachflowsales@hach.com  
[www.hachflow.com](http://www.hachflow.com)

*In Europe contact:*

Flow-Tronic  
Rue J.H. Cool 19a  
B-4840 Welkenraedt Belgium  
Telephone: +32-87-899799  
Fax: +32-87-899790  
E-mail: site@flow-tronic.com  
[www.flow-tronic.com](http://www.flow-tronic.com)



**Be Right™**



# US3 Rain Gauge

## Rain Gauge Tipping Bucket With Leaf Filter



The US3 Rain Gauge tipping bucket uses a standard tipping bucket mechanism that allows for straightforward and effective rainfall measurement. The geometry and material selection of the bucket, along with the inclusion of a leaf filter, help minimize contamination and errors in the measurement process.

The rain gauge features a 8" (200mm) diameter collector funnel. The tipping bucket device is divided into two compartments to enable the measurement of rainfall in fixed increments. The bucket is pivoted at its center and has a preset calibration to tip for a specific amount of rainfall, either 0.5 mm or 1 mm. The tipping action of the bucket magnetically opens and closes a reed switch. When the bucket is full and tips, it triggers the reed switch, generating a pulse signal. The pulse signal from the reed switch is sent to a data logger or RTU.

### Ordering information

**Code**            **US3-RGTB**

### Applications

- Water management
- Rain Measurement
- Flood Control Monitoring
- Environmental telemetry
- Intelligent Irrigation systems
- Integrates with Most Loggers/PLCs

### Technical characteristics

Item	Specification
Measurement object	Rain
Measured rainfall intensity	0-9.5 inch/hour
Sample interval	1s
Resolution	0.004 inch
Accuracy(0.08 inch/min)	±4%
Power consumption	1.6W
Supply	7-24VDC
Output	RS485, RS232, SDI-12 optional
Operating temperature	-40-+176F -40-+80°C
Main material	SS+ABS
Weight (unpacked)	1.4 lbs (0.65kg)





## **Appendix F**

### **PWC Agreement**

THIS AGREEMENT, made this 2nd day of FEBRUARY, 2004 by and between the NORCRESS WATER AND SEWER DISTRICT (hereinafter referred to as "NORCRESS"); and the PUBLIC WORKS COMMISSION of the City of Fayetteville, North Carolina (hereinafter referred to as "COMMISSION").

WITNESSETH THAT

WHEREAS, NORCRESS has contracted with COMMISSION to furnish sanitary sewer treatment service to NORCRESS as per an agreement dated October 14, 2002; and

WHEREAS, both COMMISSION and NORCRESS recognize the complexity of providing sanitary sewer utility service; and

WHEREAS, NORCRESS requests that COMMISSION operate and maintain NORCRESS's proposed sanitary sewer collection system; and

WHEREAS, COMMISSION agrees to operate and maintain said sanitary sewer collection system.

NOW THEREFORE, and in consideration of the benefits each shall derive, the parties mutually agree as follows:

I. COMMISSION will provide the following services:

A. Basic Operation and System Maintenance, to include:

- (1) Repairing damaged, deteriorated, or broken sanitary sewer mains, not to include outright system replacement of large segments (more than 500') of the sanitary sewer collection system which cannot be repaired due to structural failure, natural or manmade disasters, or were not installed with COMMISSION approved plans and specifications;
- (2) Repairing damaged, deteriorated, or broken sanitary sewer service laterals from the main to edge of road right-of-way or easement;
- (3) Routine maintenance and repair of pump station equipment, if any, not to include replacement of major components (parts and/or equipment valued over \$1,000);
- (4) Cleaning and rodding of clogged sewer mains;
- (5) Repairing of manholes, including rings and covers;
- (6) Other routine maintenance and repairs as needed;

- (7) Administrative and engineering support of above, as required;
- (8) 24 hours, 7 days per week on-call dispatch with appropriate response forces;
- (9) Responding to inquiries by existing and potential users of sanitary sewer service;
- (10) Investigating and working to resolve complaint issues;
- (11) Keeping NORCRESS abreast of changes in regulations concerning sanitary sewer utility services;
- (12) Maintaining metered electric service at pumping stations as well as chemicals associated with pump station operation. The cost of metered electric service shall be a recoverable expense to be included in the monthly billing statement;
- (13) Plan review by COMMISSION engineering staff of NORCRESS's plans and/or plans submitted to NORCRESS by others to ensure utility extensions are designed to meet COMMISSION specifications and are compatible with NORCRESS's goals and objectives for meeting overall system needs.

B. COMMISSION will provide other services, upon request, but which will be billed separately and not included in the monthly basic operation and maintenance billing. A partial list of the "other services" that may be available to NORCRESS include the following:

- (1) Sanitary sewer service lateral installation;
- (2) Promote participation agreements with other benefited parties;
- (3) Preparation and administration of utility extension contracts;
- (4) Right-of-way acquisition services for land and easement requirements to be secured in the name of NORCRESS within the limits permitted by law but not to include actions in eminent domain;
- (5) Inspection services during construction;
- (6) Meter reading and billing;
- (7) Miscellaneous services such as GIS mapping as requested.

II. OPERATION AND MAINTENANCE COST – COMMISSION shall render accurate monthly bills to NORCRESS. Such bills shall be computed by multiplying NORCRESS's sewer flow, expressed in thousand (M) gallons, by the applicable rate per thousand (M) gallons for this customer class. The rate per thousand (M) gallons shall be subject to change annually. In addition, COMMISSION shall submit an itemized statement monthly for the



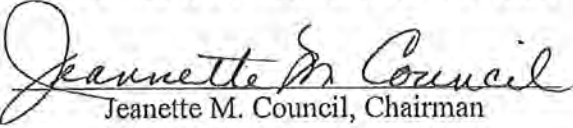
actual cost associated with metered electric service and "other services" as set forth in Paragraph I-B performed by COMMISSION, reflecting the appropriate regular hourly or overtime rate for labor, equipment, and materials (to include an amount for all direct and indirect charges plus profit at 10%).

- III. REPAIRS - COMMISSION shall not be financially responsible for any repairs or cost of repairs needed to the sanitary sewer collection system unless such repairs are due to negligence of COMMISSION or its employees. However, COMMISSION will repair or arrange for all repair services. If not covered under Basic Operation and Maintenance (Paragraph I-A), COMMISSION will seek prior approval from NORCRESS if the anticipated cost of such repairs exceeds \$1,000, unless delay in making repairs could create or prolong discontinuance of sanitary sewer utility services, or create unsafe conditions for customers, COMMISSION's employees or other persons, or create an environmental hazard.
- IV. PAYMENT - Monthly bills rendered for services as provided hereunder are payable within 10 days from their date, at COMMISSION's office, Robert C. Williams Business Center, 201 Hay Street, (28301) P.O. Box 7000, Fayetteville, NC 28302. A late charge of one percent per month from final payment date shall apply to all such bills.
- V. TERM OF AGREEMENT - NORCRESS and COMMISSION mutually agree that the term of this Agreement shall be ten years from the date of COMMISSION's execution thereof, and continuing annually thereafter until terminated by either party's written notice at least three months prior to the end of any such annual term.
- VI. TERMINATION OF AGREEMENT - If NORCRESS or COMMISSION fails to fulfill in a timely and proper manner the obligations under this Agreement, either party shall have the right to terminate this Agreement by specifying the reason for termination in written notice to the other party at least 60 days prior to the date of termination.
- VII. AMENDMENTS - This Agreement shall not be modified, amended, or changed in any respect except in a writing, duly signed by the parties hereto. Each party hereby waives any right to amend the Agreement in any other manner.
- VIII. ASSIGNMENT - This Agreement shall be binding upon and shall inure to the benefit of NORCRESS and its successors and assigns. COMMISSION may only assign this agreement with the written consent of NORCRESS.
- IX. LIABILITY - COMMISSION shall not be liable for injury or damage to NORCRESS or

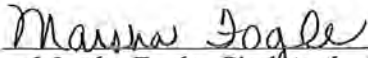
persons or property, unless such injury or damage was caused by the negligence or willful misconduct by COMMISSION or its employees. COMMISSION shall not be responsible for any injuries or damages resulting from acts, omissions, or occurrences, which occurred prior to the date COMMISSION, began operations pursuant to this Agreement. NORCRESS shall indemnify, defend, and save COMMISSION harmless against other/all liability, claims, judgments, losses, costs and expenses for injury, loss, or damage to persons or property, including fines by any federal or state agency, and also including personal injury or property damage to NORCRESS, its employees, sanitary sewer customers, and citizens on account of operation and maintenance of NORCRESS's sanitary sewer system, including any defective construction (other than by COMMISSION or its agents) or equipment of NORCRESS's sanitary sewer system, on NORCRESS's side of the point of delivery from COMMISSION's facilities or on its sanitary sewer customers' side of the service lateral. COMMISSION assumes responsibility for and shall indemnify, defend, and save NORCRESS harmless against all liability, claims, judgments, losses, costs and expenses for injury loss, or damage to persons or property, including fines by any federal or state agency, and also including personal injury or property damage to sanitary sewer customers and citizens on account of operation of NORCRESS's sanitary sewer system on the NORCRESS's side of the point of delivery of sanitary sewer service (metering point) due to the negligence or willful misconduct of COMMISSION.

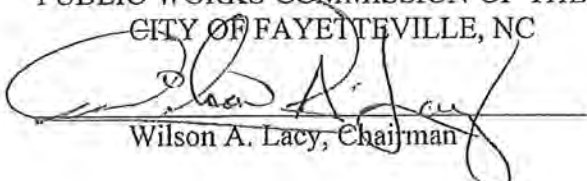
- X. ENTIRE AGREEMENT - This writing embodies the entire Agreement and understanding between the parties hereto and there are no other agreements or understandings, oral or written, with reference to the subject matter hereof that are not merged herein and superseded hereby.

IN TESTIMONY WHEREOF, NORCRESS has executed this instrument by its Chairman and COMMISSION has executed this instrument by its Chairman, each being duly authorized to execute this Agreement.

NORCRESS WATER & SEWER DISTRICT  
  
Jeanette M. Council, Chairman

ATTEST:

  
Marsha Fogle, Clerk to the Board

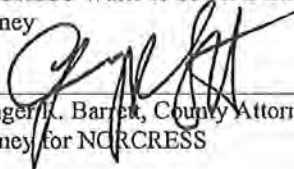
PUBLIC WORKS COMMISSION OF THE  
CITY OF FAYETTEVILLE, NC  
  
Wilson A. Lacy, Chairman

ATTEST:


  
Terri Union, Secretary

NORCRESS:

APPROVED for Legal Sufficiency  
NORCRESS Water & Sewer District  
Attorney

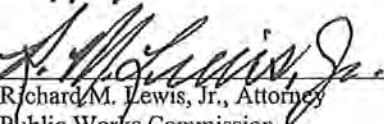
  
Grainger L. Barrett, County Attorney  
Attorney for NORCRESS

This instrument has been pre-audited in the manner  
required by the Local Government Budget and Fiscal  
Control Act.

  
Amy H. Cannon, Assistant County Manager  
Finance Officer for NORCRESS

COMMISSION:

APPROVED as to form this 14<sup>th</sup> day of  
MAY, 2004

  
Richard M. Lewis, Jr., Attorney  
Public Works Commission

This instrument has been pre-audited in the manner  
required by the Local Government Budget and Fiscal  
Control Act.

  
Dwight Miller, Chief Financial Officer  
Public Works Commission

---

NORTH CAROLINA – CUMBERLAND COUNTY

I, Anna L. Hymes, a Notary Public of said County and State do hereby certify that Marsha Fogle personally appeared before me this day and acknowledged that he/she is Clerk of NORCRESS Water and Sewer District, and that the authority duly given and as the act of said, the foregoing instrument was signed in its name by its Chairman, sealed with its corporate seal, and attested by himself/herself as its Clerk.

WITNESS my hand and Notarial Seal, this the 2nd day of Feb., 2004.

My COMMISSION Expires: 8-13-08

Anna L. Hymes  
Notary Public

---

NORTH CAROLINA - CUMBERLAND COUNTY

I, Joan D. Starling, a Notary Public of said County and State do hereby certify that TERRI WATSON, personally appeared before me this day and acknowledged that he is Secretary of The Public Works Commission, an agency of the City of Fayetteville, North Carolina, and that the authority duly given and as the act of the agency, the foregoing instrument was signed in its name by its Chairman, sealed with its seal, and attested by himself as its Secretary.  
herself

WITNESS my hand and Notarial Seal, this the 26 day of May, 2004.

My COMMISSION Expires: April 1, 2007

Joan D. Starling  
Notary Public





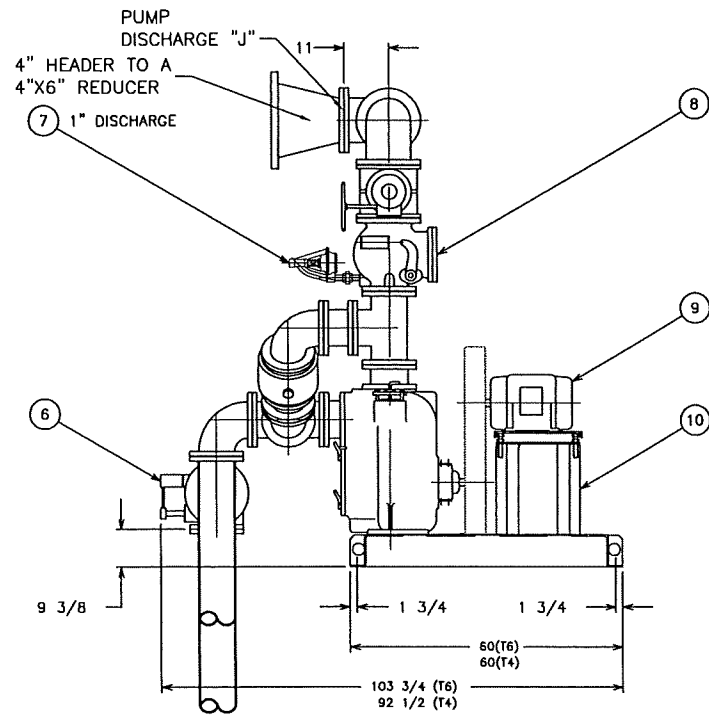
## **Appendix G**

### **Lift Station Record Drawings**

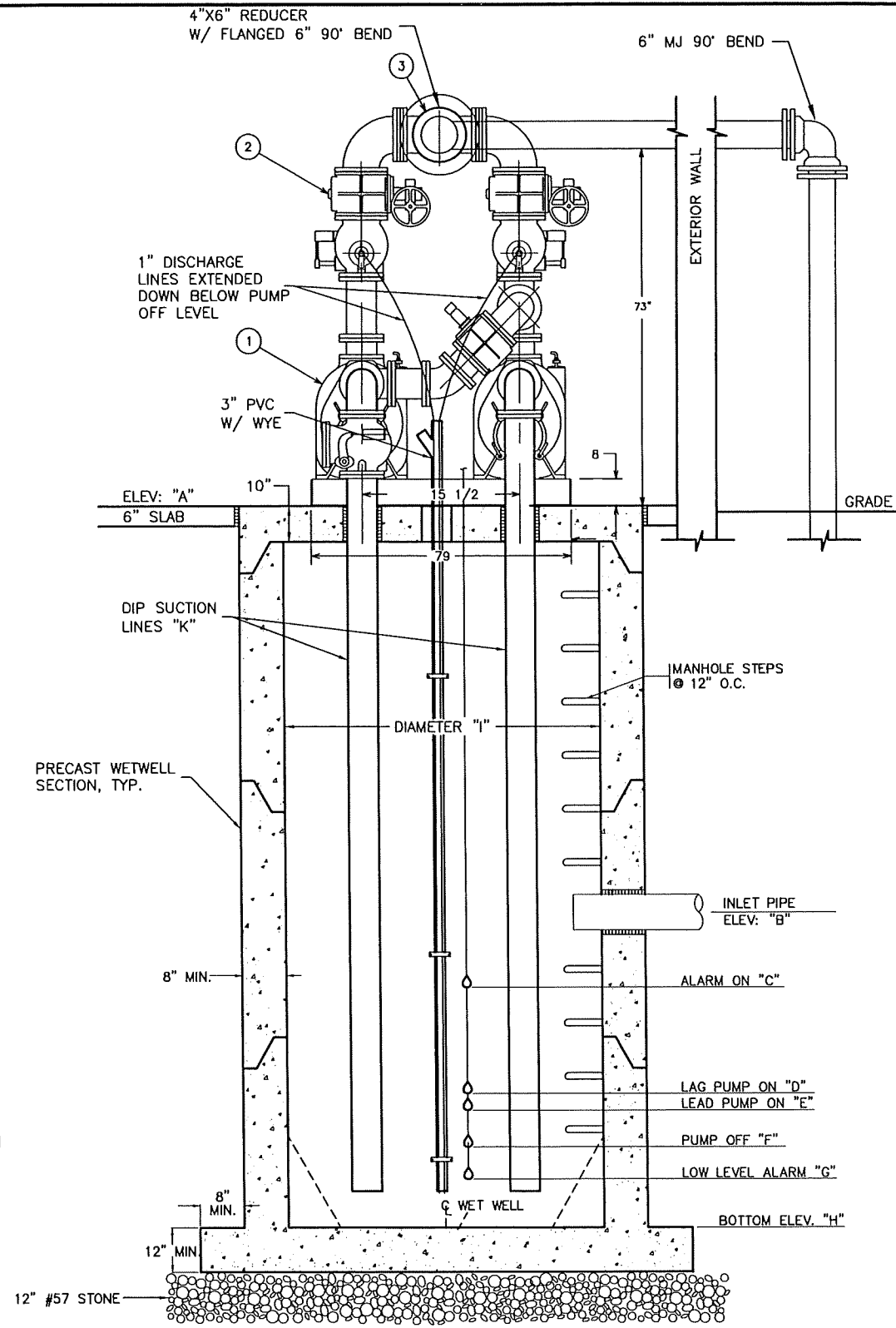




BASE BID-SELF PRIMING PUMP STATION DATA	
	PUMP STATION F-1
DESIGN FLOW	70,000 GPD
PUMP CAPACITY	350 GPM
TDH	108
FM SIZE	8 IN
FM EFFECTIVE LENGTH	18,225
FM HIGH POINT	175.5
VEL. @ PUMP RATE	2.24 FT/SEC
PUMP ON TIME	2.63 MIN
PUMP OFF TIME	16.31 MIN
SELECTED PUMP (OR EQUAL)	GORMAN RUPP T4A-B
RPM	1950
MIN HORSEPOWER	30
MIN EFFICIENCY	44%
IMPELLER	9.75
DISCHARGE	4 IN
WET WELL DIMENSIONS:	
A-RIM	125.28
B-INLET PIPE/ INVERT	EL 116.11 FT
C-HIGH WATER ALARM	EL 115.1 FT
D-LAG PUMP ON	EL 114.8 FT
E-LEAD PUMP ON	EL 113.8 FT
F-LEAD PUMP OFF	EL 111.80 FT
G-LOW LEVEL ALARM	EL 111.10 FT
H-BOTTOM WET WELL	EL 109.80 FT
I-DIAM WET WELL	8 FT
J-DISCHARGE PIPING	6 IN
K-SUCTION PIPING	6 IN



PUMPS SIDE VIEW

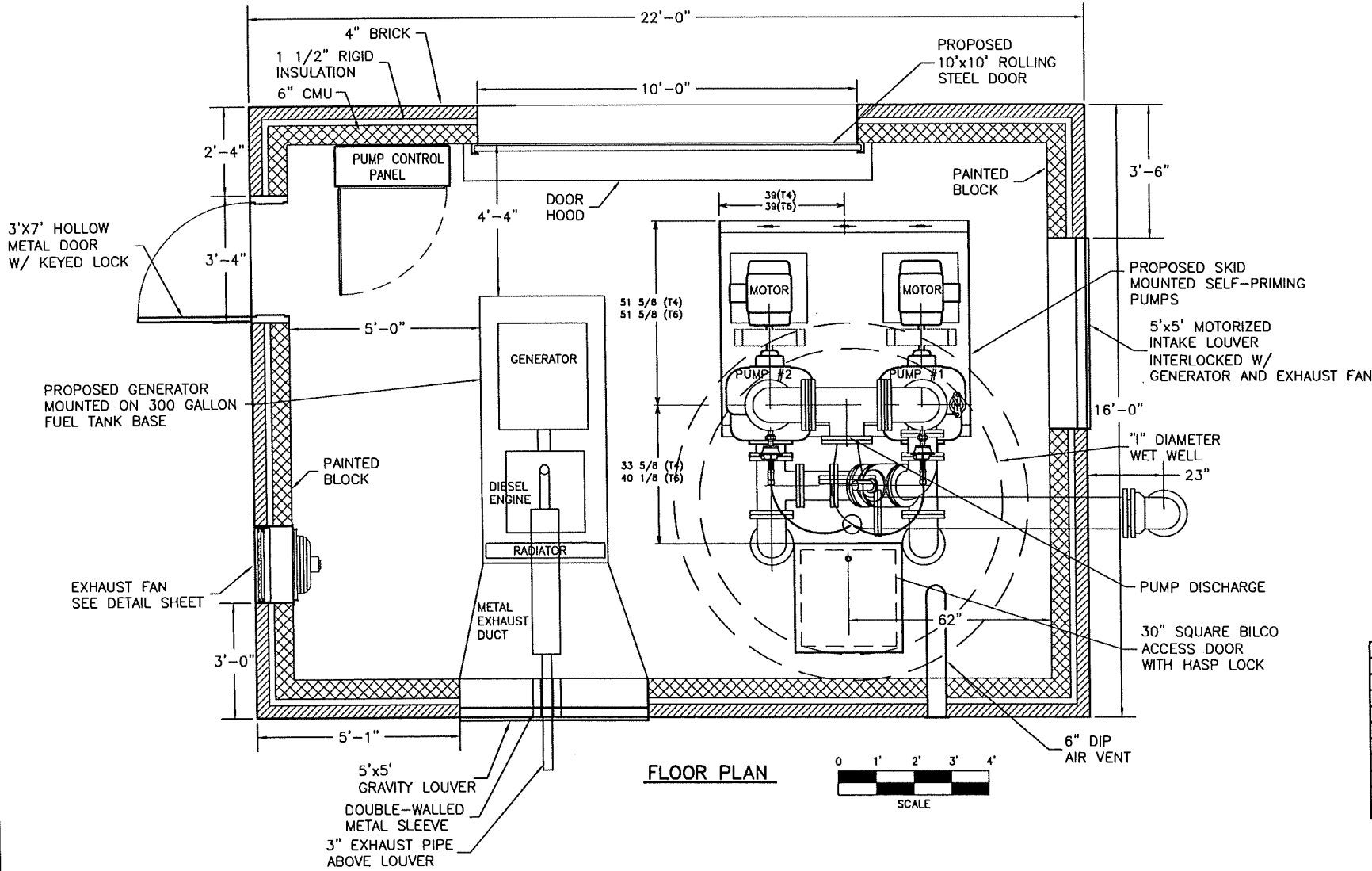


WET WELL SECTION

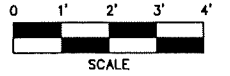
SELF PRIMING PUMPS WITH PARALLEL SERIES PIPING

ITEM	DESCRIPTION	MATERIAL
1	PUMP	CAST IRON
2	DISCHARGE PLUG VALVE	CAST IRON
3	DISCHARGE TEE	CAST IRON
4	INTERCONNECT PLUG VALVE	CAST IRON
5	BELT GUARD ASSY	STEEL
6	SUCTION CHECK VALVE	CAST IRON
7	AIR RELEASE VALVE	CAST IRON 1" (SHIPPED LOOSE)
8	DISCHARGE CHECK VALVE	CAST IRON
9	MOTOR	CAST IRON
10	PUMP & MOTOR BASE ASSY	STEEL

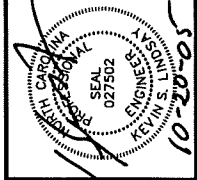
NOTE:  
CONTROL PANELS PROVIDED BY OWNER ALONG WITH TELEMETRY CONTROL UNIT, REMOTE TERMINAL UNIT WITH ANTENNA, FLOATS AND FLOAT SUPPORTS.



FLOOR PLAN



REVISIONS	DATE	BY
SYMBOL	DESCRIPTION	DATE
	REVISED WITH	2011-23-04
		DFW



**Hobbs, Upchurch & Associates, P.A.**  
Consulting Engineers  
SOUTHERN PINES, NC - CHARLOTTE, NC  
MAGS HEAD, NC - RALEIGH, NC  
MYRTLE BEACH, SC - BEAUFORT, SC  
300 S.W. Broad Street, Southern Pines, North Carolina 28387  
Phone: (910) 692-5616 - Fax: (910) 692-4795



PUMP STATIONS FOR THE  
NORCROSS WATER AND SEWER DISTRICT  
CUMBERLAND COUNTY, NORTH CAROLINA  
SELF PRIMING PUMP STATION F1

DATE:	JAN., 2004
DESIGNED:	DFW
DRAWN:	DFW
CHECKED:	KSL
SCALE:	SCALE
SHEET NO.	58
OF:	68

H:\C010103-95\PUMP\BLOG\001\PPBLDGSrev.dwg, FLOORPLAN-FALCON, 10/20/2005 9:12:45 AM, DWG, \\exchange\HPLJ3500, 1,2

# LEGEND

- GFI 20A, 120V, DUPLEX RECEPT, GFI
- WP WEATHERPROOF
- JUNCTION BOX
- S 20A, 120V, SINGLE POLE SWITCH
- DISCONNECT RATING AS SHOWN
- POWER PANEL
- AUTOMATIC TRANSFER SW
- FLOW TRANSMITTER

PANEL TYPE: SQ D I-LINE TYPE HCM  
 VOLTS: 120/240  
 PHASE: 3 PHASE, 4 WIRE  
 30 KAIC

250 AMP MLO  
**"MDP"**

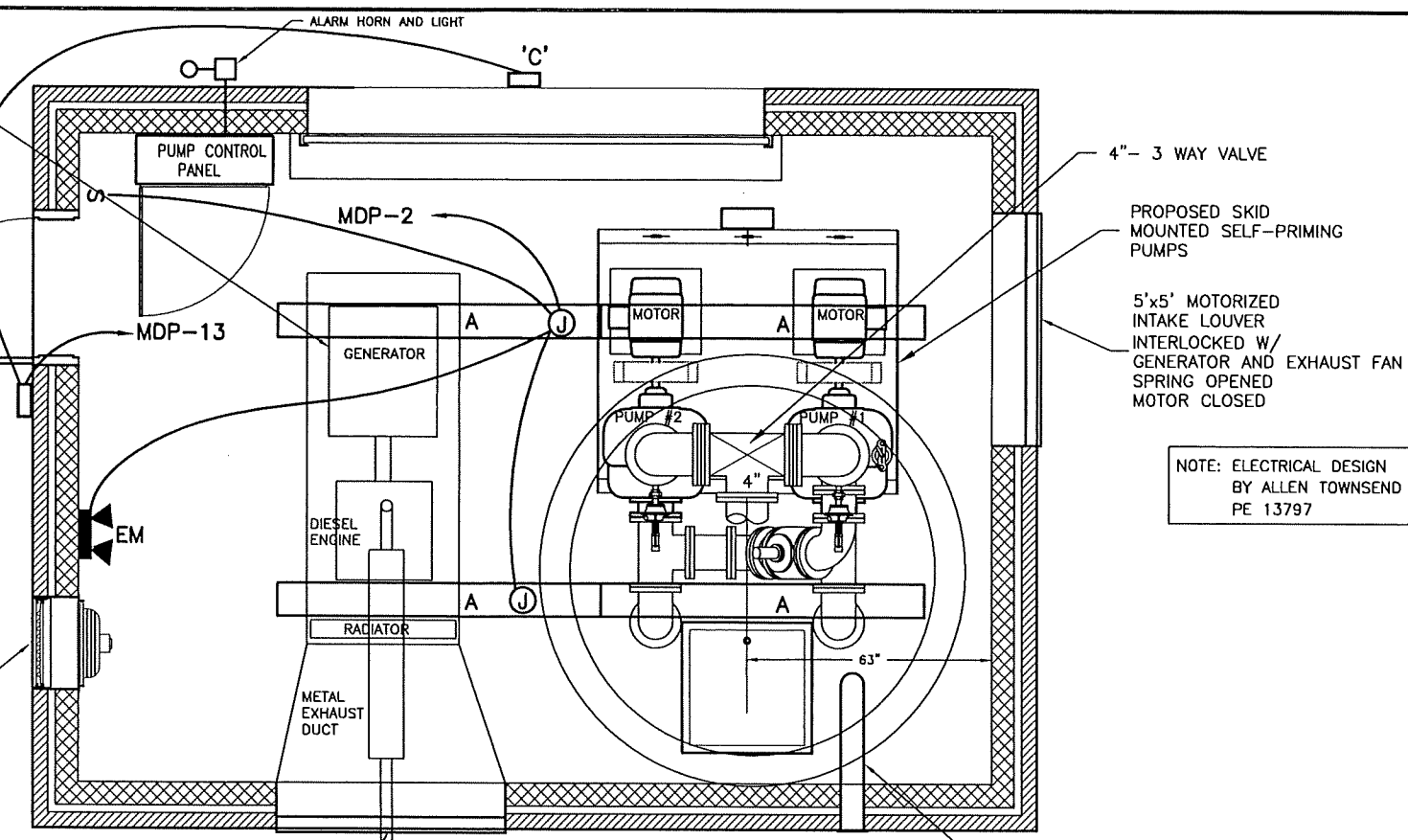
PROVIDE GROUND BAR  
 NEMA 1 ENCLOSURE

W	LOAD DESCRIPTION	WIRE SIZE	BKR. SIZE	CKT. NO.	L1 L2 L3	CKT. NO.	BKR. SIZE	WIRE SIZE	LOAD DESCRIPTION	W
980	EXHAUST FAN / LOUVER	12	20	1		2		4/0	PUMP CONTROL PANEL	26600
984	LIGHTS	12	20	3		4	200	4/0	PUMP CONTROL PANEL	26600
3000	RECEPTACLES	12	20	5		6	3	4/0	PUMP CONTROL PANEL	26600
1500	GEN. BLOCK HEATER	12	20	7		8		10	UNIT HEATER	1666
400	GEN. BATTERY CHARGER	12	20	9		10	30	10	UNIT HEATER	1666
800	SCADA PANEL	12	20	11		12	3	10	UNIT HEATER	1666
300	EXTERIOR LIGHTS	12	20	13		14			SPACE	
				15		16			SPACE	
				17		18			SPACE	
				19		20			SPACE	

PROPOSED GENERATOR MOUNTED ON 300 GALLON FUEL TANK BASE

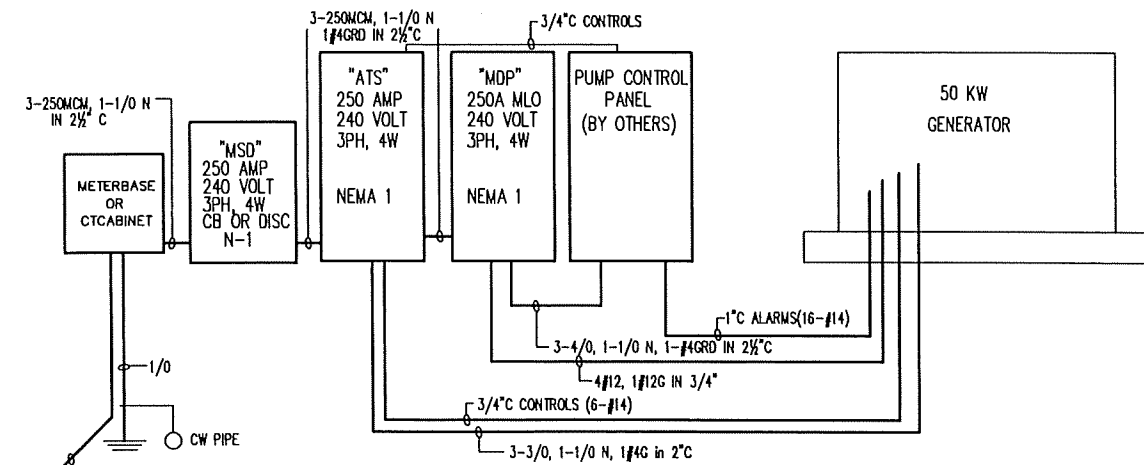
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EXHAUST FAN SEE DETAIL SHEET



**LIGHTING PLAN**  
 SCALE: 0 1' 2' 3' 4'

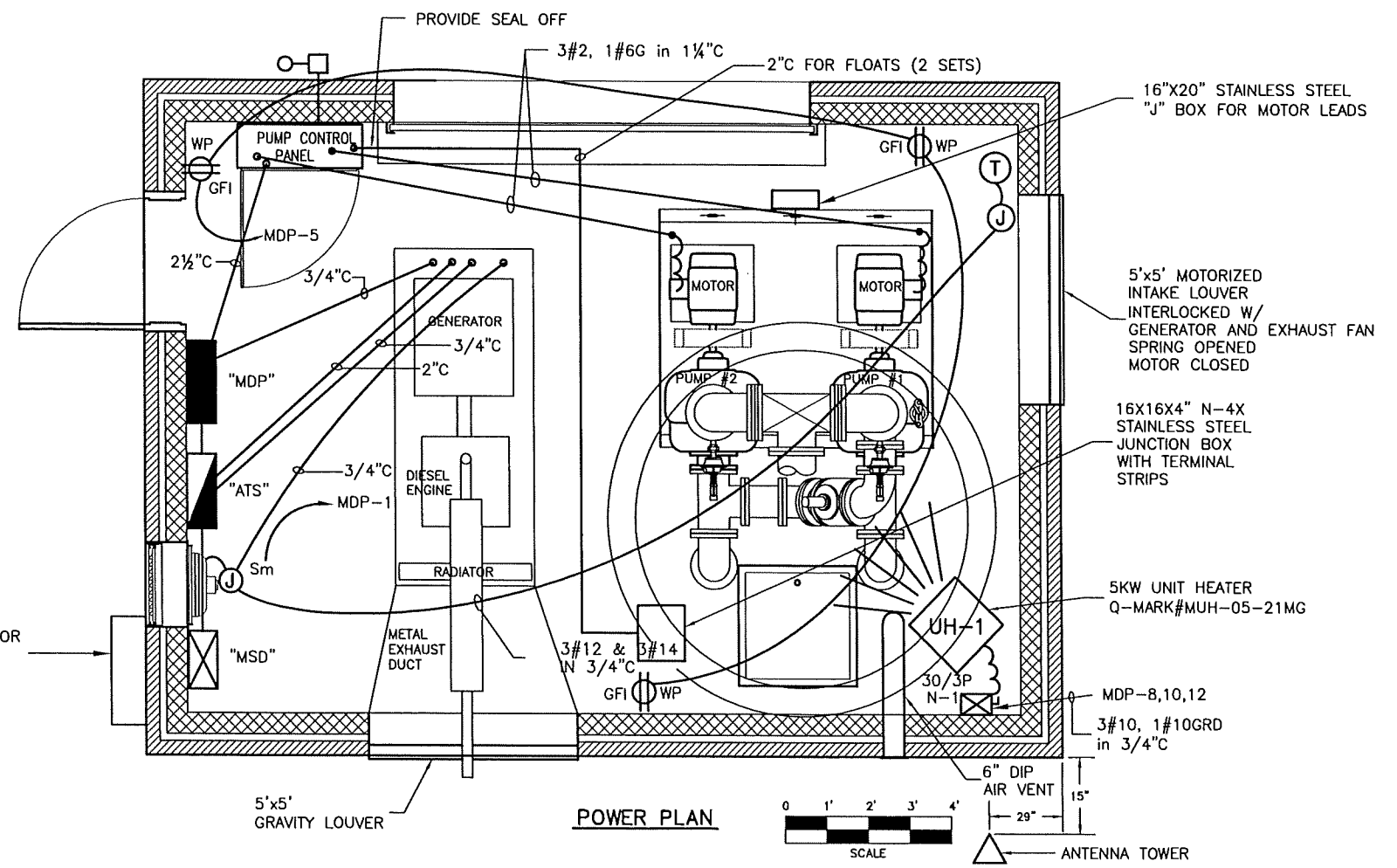
NOTE: ELECTRICAL DESIGN BY ALLEN TOWNSEND PE 13797



**ELECTRICAL RISER DIAGRAM**  
 NTS

## FIXTURE SCHEDULE

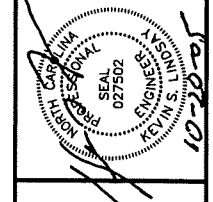
SYMBOL	MANUF.	CAT NO.	LAMPS	REMARKS
A	COLUMBIA	LU8-296HO-120	2-F96T12HO (110 WATT)	PROVIDE SPACER BETWEEN LIGHT & CEILING
B	SPAULDING	WGS1-M100PS-MT	1-100WMH	MOUNT 10'0" AFG
C	SPAULDING	WGST-M175-MT	1-175MH	MOUNT OVER DOOR 12'0" AFG
EM	PRESCOLITE	LMP-16	2-7.2W	MOUNT 10'0" AFF



**POWER PLAN**  
 SCALE: 0 1' 2' 3' 4'

RECORD DRAWINGS OCTOBER 2005

REV.	DATE	DESCRIPTION
1	11-23-04	DFW



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 Consulting Engineers  
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 MAYS HEAD, NC - RALEIGH, NC  
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 300 S.W. Broad Street, Southern Pines, North Carolina 28387  
 Phone: (910) 692-5616 - Fax: (910) 692-4795

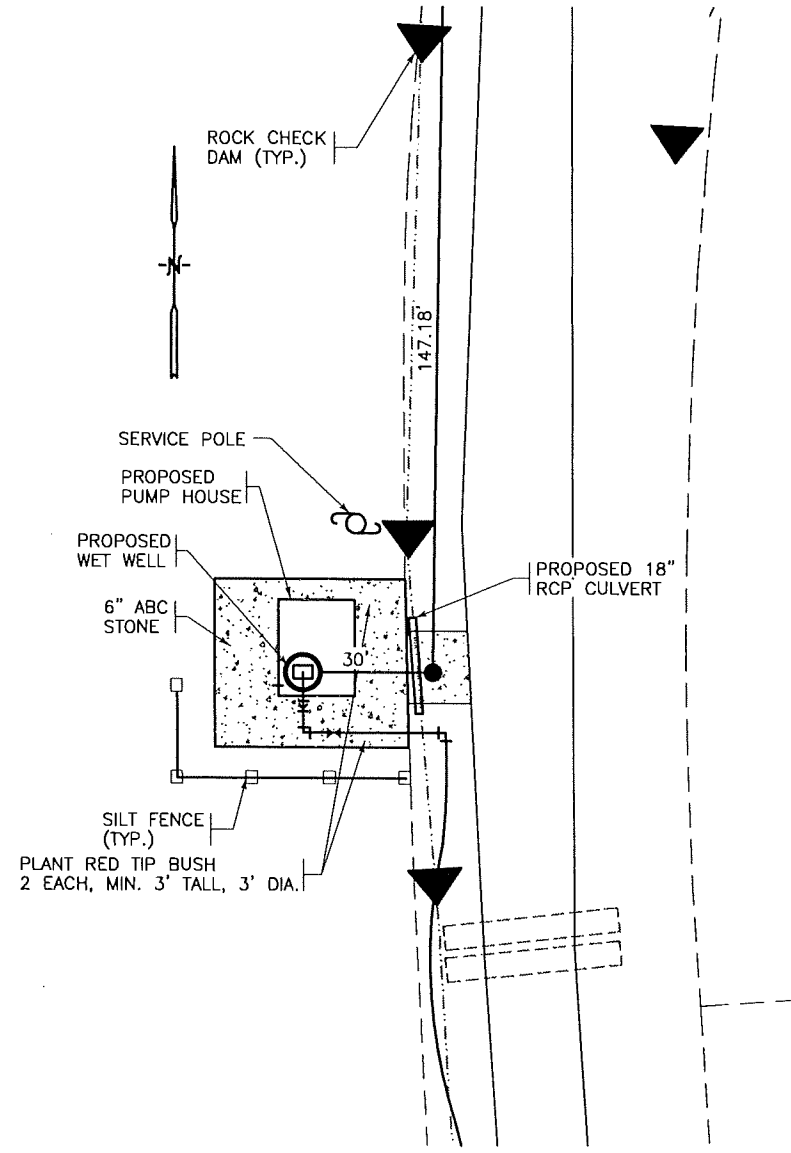


PUMP STATIONS FOR THE  
 NORCRESS WATER AND SEWER DISTRICT  
 CUMBERLAND COUNTY, NORTH CAROLINA  
 PUMP STATION F-1 POWER  
 AND LIGHTING PLANS

DATE:	DEC., 2003
DESIGNED:	DFW
DRAWN:	DFW
CHECKED:	KSL
SCALE:	SCALE
SHEET NO.:	E1

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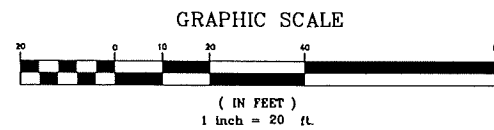
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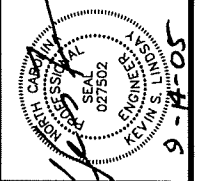
NOTE:  
CONTRACT 3 INCLUDES  
MANHOLE AND 5' STUBOUT  
FOR PUMP STATION

PROPOSED PUMP STATION G-1  
SITE PLAN

SITE ELEVATION 127.67'



SY. NO.	REVISIONS DESCRIPTION	DATE	BY



**Hobbs, Upchurch & Associates, P.A.**  
Consulting Engineers  
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MAYS HEAD, NC - RALEIGH, NC  
MYRTLE BEACH, SC - BEAUFORT, SC

300 S.W. Broad Street, Southern Pines, North Carolina 28387  
Phone: (910) 692-5616 - Fax: (910) 692-4795

TOWN OF GODWIN SANITARY SEWER SYSTEM  
FOR THE  
NORCROSS WATER AND SEWER DISTRICT  
CUMBERLAND COUNTY, NORTH CAROLINA

LAYOUT PUMP STATION G-1

DATE:	DECEMBER, 2002
DESIGNED:	KSL
DRAWN:	HMW3
CHECKED:	KSL
SCALE:	AS SHOWN
SHEET NO.	48
OF:	59





# LEGEND

- GFI 20A, 120V, DUPLEX RECEPT, GFI
- WP WEATHERPROOF
- JUNCTION BOX
- S 20A, 120V, SINGLE POLE SWITCH
- DISCONNECT RATING AS SHOWN
- POWER PANEL
- AUTOMATIC TRANSFER SW
- FLOW TRANSMITTER

PANEL TYPE: SQ D I-LINE TYPE HCM  
VOLTS: 120/240  
PHASE: 3 PHASE, 4 WIRE  
30 KAIC

225 AMP MLO  
"MDP"

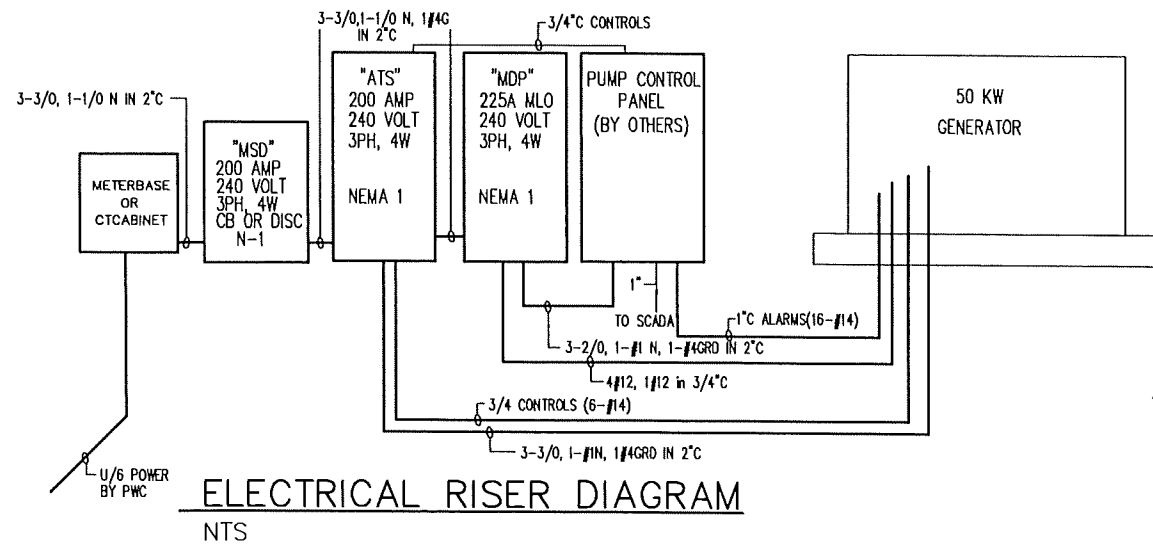
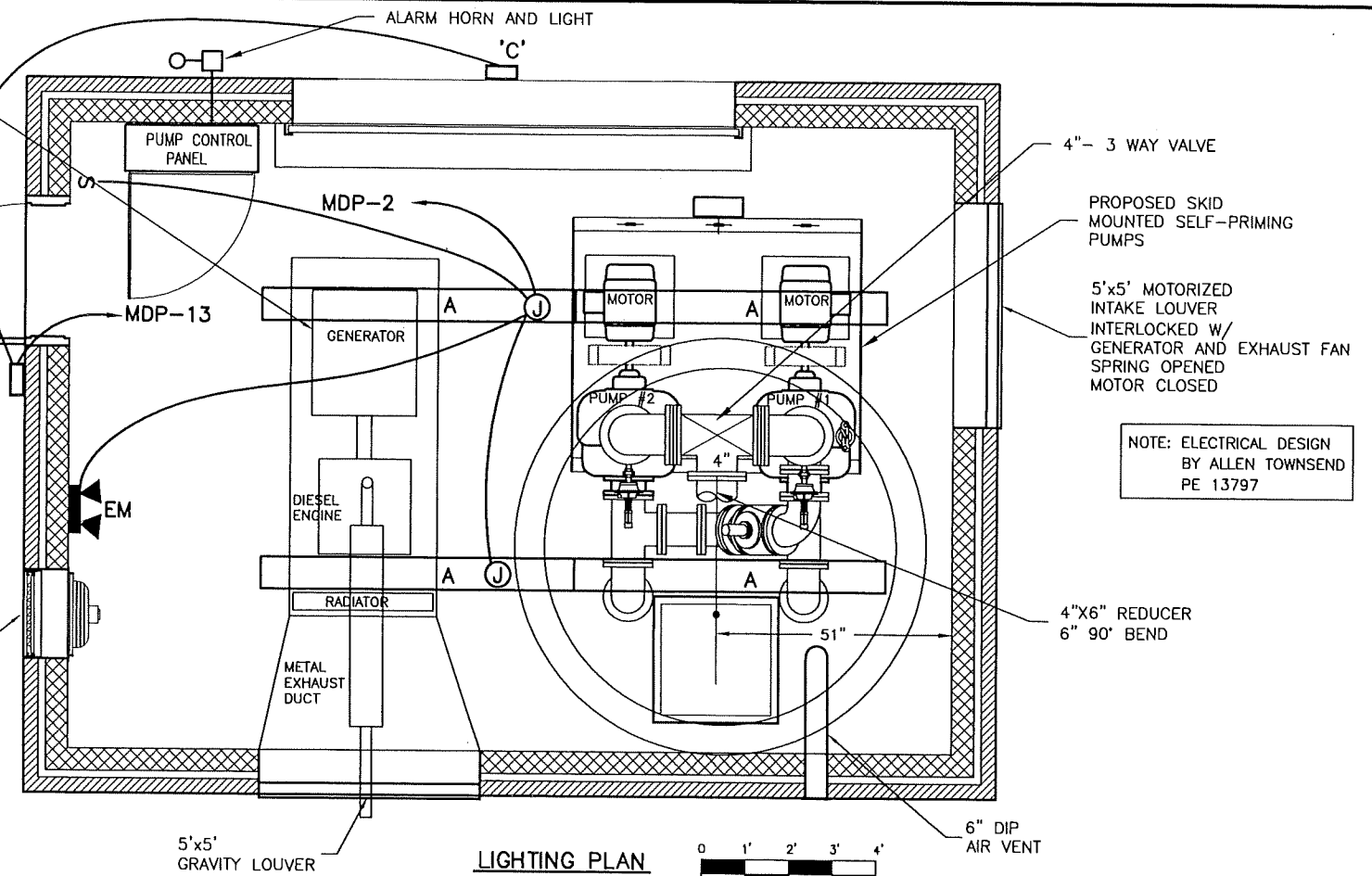
PROVIDE GROUND BAR  
NEMA 1 ENCLOSURE

W	LOAD DESCRIPTION	WIRE SIZE	BKR. SIZE	CKT. NO.	L1	L2	L3	CKT. NO.	BKR. SIZE	WIRE SIZE	LOAD DESCRIPTION	W
980	EXHAUST FAN / LOUVER	12	20	1				2		3/0	PUMP CONTROL PANEL	22900
984	LIGHTS	12	20	3				4	175	3/0	PUMP CONTROL PANEL	22900
3000	RECEPTACLES	12	20	5				6		3/0	PUMP CONTROL PANEL	22900
1500	GEN. BLOCK HEATER	12	20	7				8		10	UNIT HEATER	1666
400	GEN. BATTERY CHARGER	12	20	9				10	30	10	UNIT HEATER	1666
800	SCADA PANEL	12	20	11				12		10	UNIT HEATER	1666
300	EXTERIOR LIGHTS	12	20	13				14				
				15				16				
				17				18				
				19				20				

PROPOSED GENERATOR MOUNTED ON 300 GALLON FUEL TANK BASE

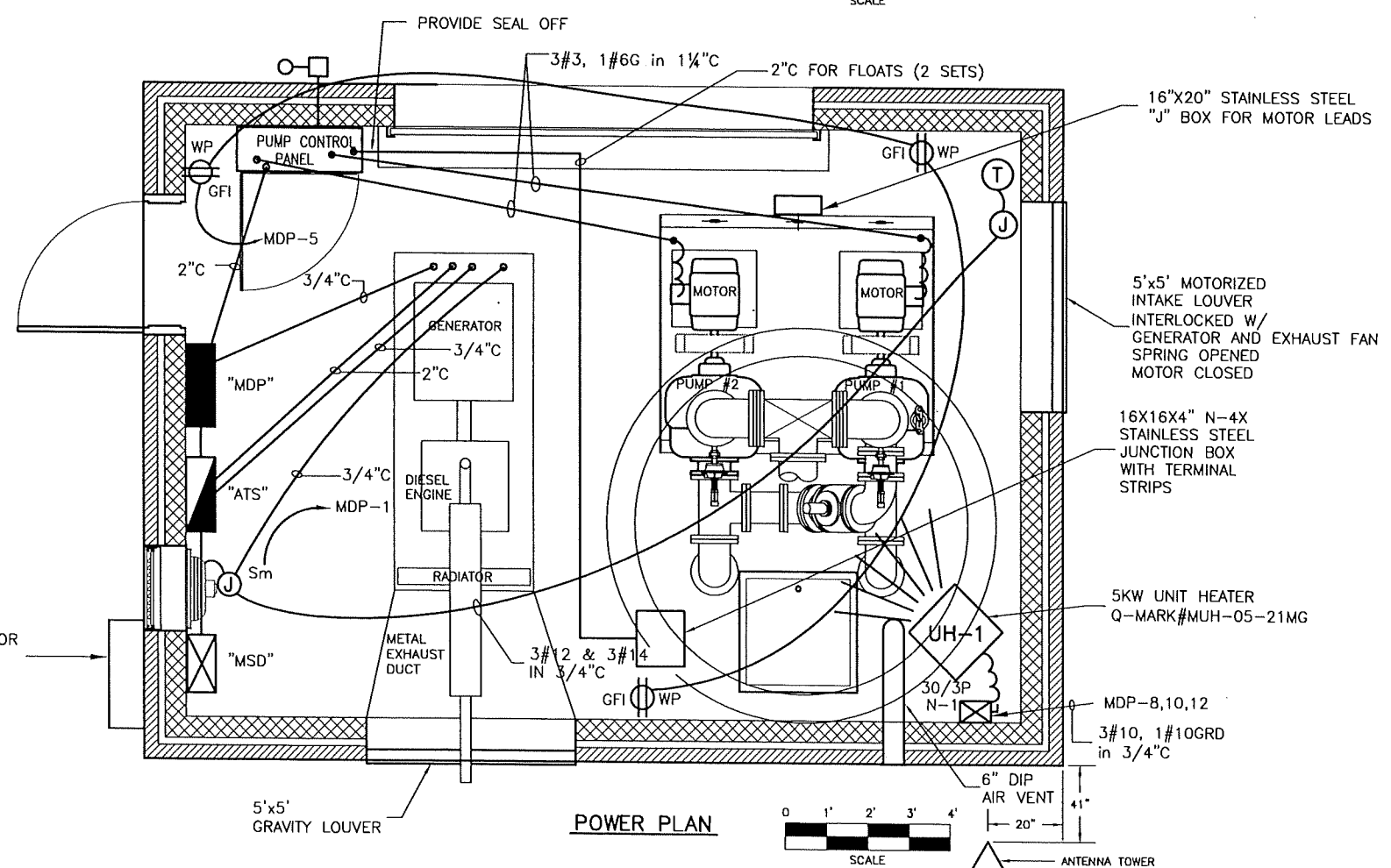
PROVIDE PHOTOCELL B IN THIS LIGHT TO CONTROL BOTH OUTSIDE LIGHT FIXTURES

EXHAUST FAN SEE DETAIL SHEET



### FIXTURE SCHEDULE

SYMBOL	MANUF.	CAT NO.	LAMPS	REMARKS
A	COLUMBIA	LUB-296HO-120	2-F96T12HO (110 WATT)	PROVIDE SPACER BETWEEN LIGHT & CEILING
B	SPAULDING	WCSI-M100PS-MT	1-100WMH	MOUNT 10'0" AFG
C	SPAULDING	WGSI-M175-MT	1-175MH	MOUNT OVER DOOR 12'0" AFG
EM	PRESCOLITE	LMP-16	2-7.2W	MOUNT 10'0" AFF



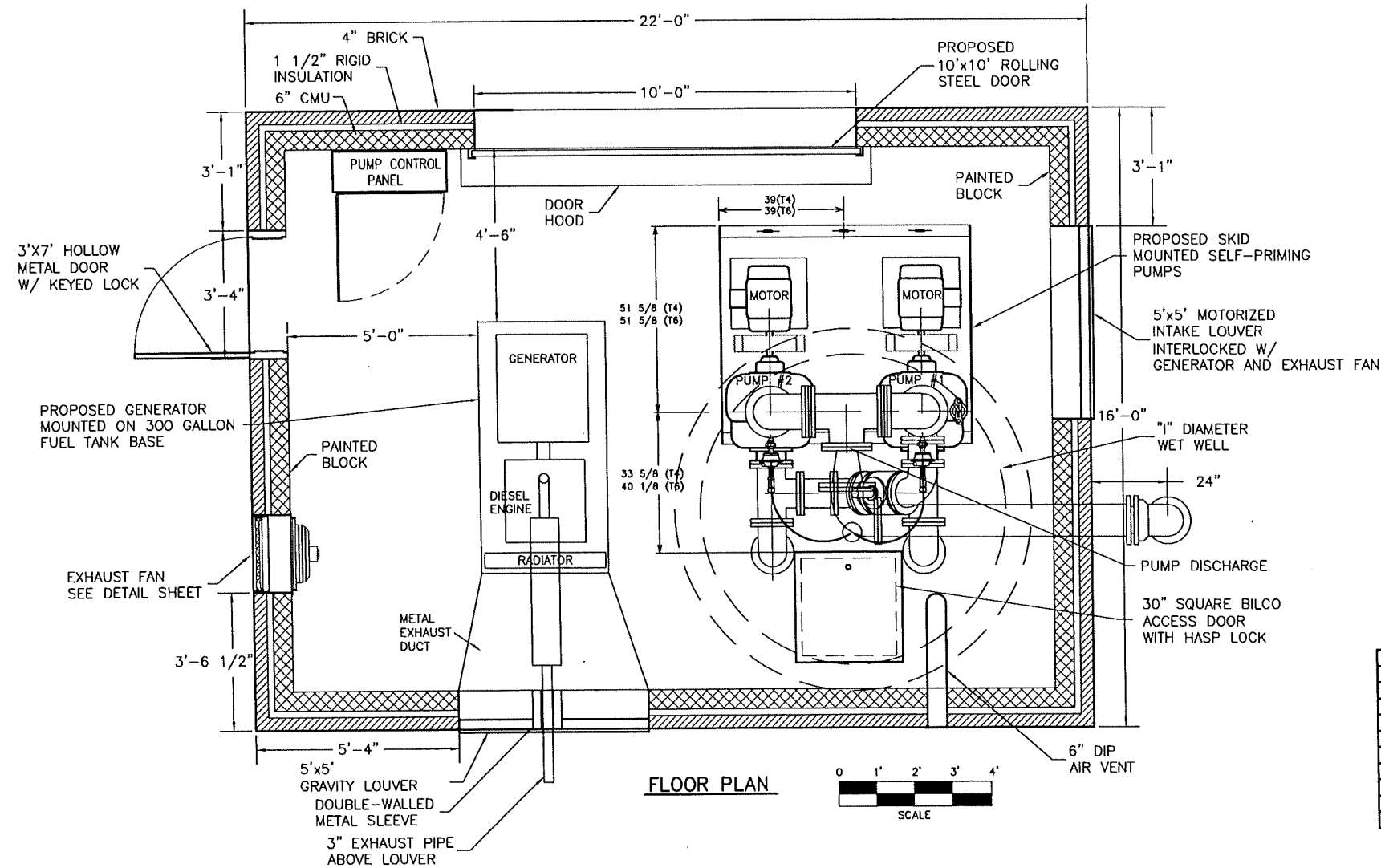
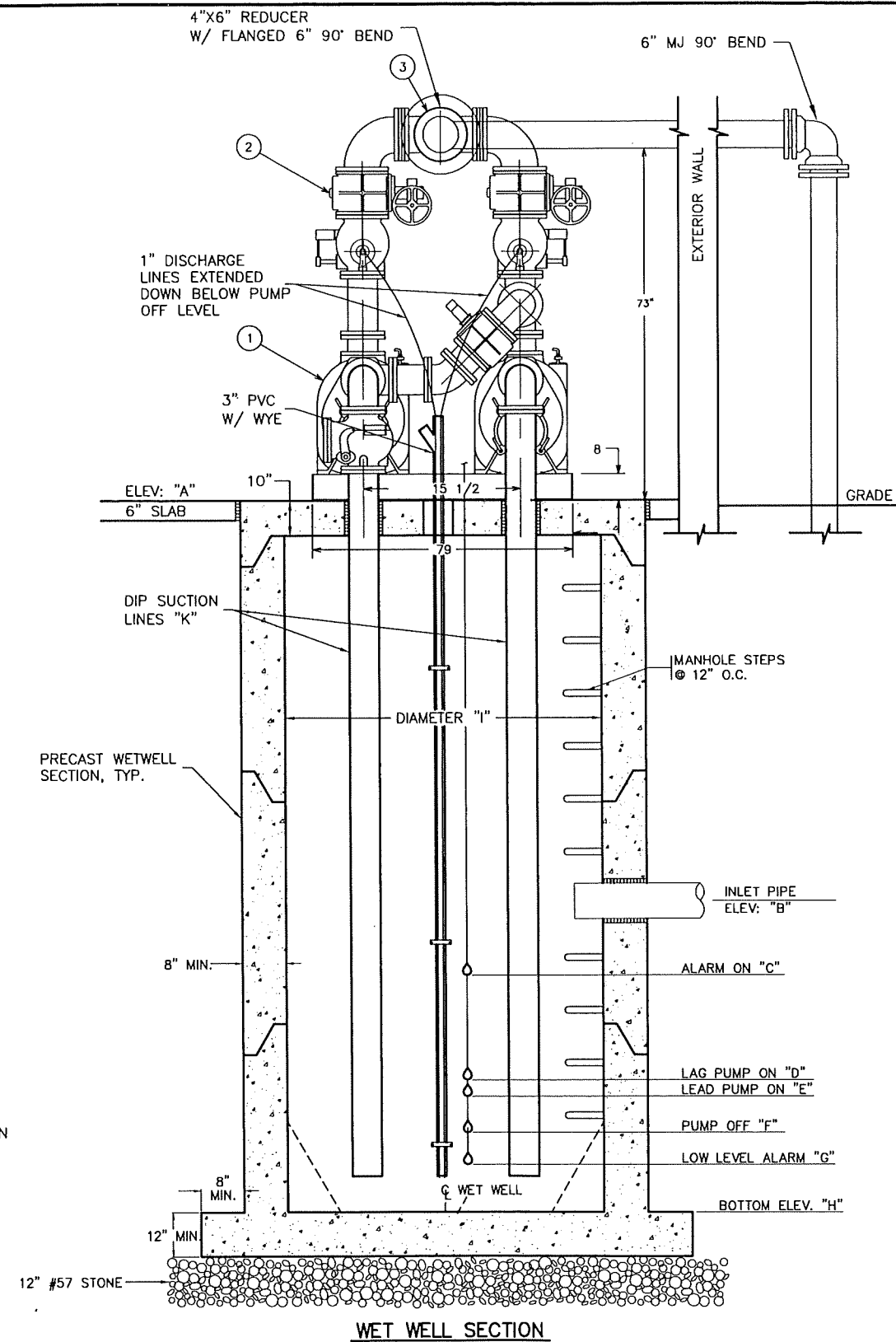
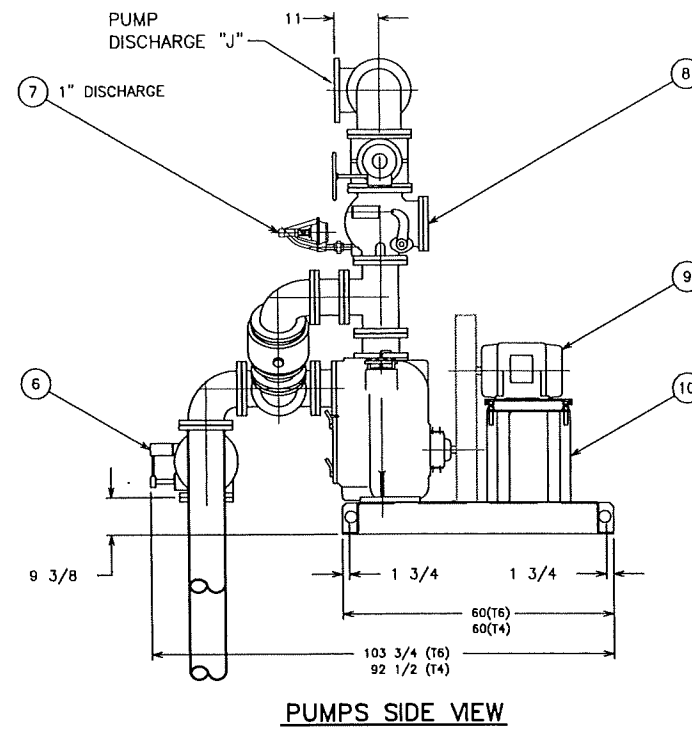
**Hobbs, Upchurch & Associates, P.A.**  
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NAGS HEAD, NC - RALEIGH, NC  
MYRTLE BEACH, SC - BEAUFORT, SC  
300 S.W. Broad Street, Southern Pines, North Carolina 28387  
Phone: (910) 692-5616 - Fax: (910) 692-4795

PUMP STATIONS FOR THE  
NORCROSS WATER AND SEWER DISTRICT  
CUMBERLAND COUNTY, NORTH CAROLINA  
PUMP STATION G-1 POWER  
AND LIGHTING PLANS

DATE: DEC., 2003  
DESIGNED: DFW  
DRAWN: DFW  
CHECKED: KSL  
SCALE: SCALE  
SHEET NO. E1



BASE BID--SELF PRIMING PUMP STATION DATA		
	PUMP STATION W-1	PUMP STATION W-2
DESIGN FLOW	45,000 GPD	125,000 GPD
PUMP CAPACITY	200 GPM	700 GPM
TDH	87 FT	82 FT
FM SIZE	6 IN	10 IN
FM LENGTH	6,081 FT	17,941 FT
FM HIGH POINT	147.5 FT	140.5 FT
VEL. @ PUMP RATE	2.27 FT/SEC	2.86 FT/SEC
PUMP ON TIME	2.23 MIN	1.84 MIN
PUMP OFF TIME	12.03 MIN	12.99 MIN
SELECTED PUMP (OR EQUAL)	GORMAN RUPP T4A3S-B	GORMAN RUPP T6A3S-B
RPM	1700	1400
MIN HORSEPOWER	20	40
MIN EFFICIENCY	35%	55%
IMPELLER	9.75 IN	12.375 IN
DISCHARGE	4 IN	6 IN
WET WELL DIMENSIONS:		
A-RIM	103.57	124.56
B-INLET PIPE/INVERT	12 INCH, @ EL. 91.30 FT	15 INCH, @ EL. 118.30 FT
C-HIGH WATER ALARM	EL. 90.0 FT	EL. 116.5 FT
D-LAG PUMP ON	EL. 89.5 FT	EL. 115.5 FT
E-LEAD PUMP ON	EL. 89.0 FT	EL. 115.0 FT
F-LEAD PUMP OFF	EL. 86.5 FT	EL. 112.5 FT
G-LOW LEVEL ALARM	EL. 85.5 FT	EL. 111.5 FT
H-BOTTOM WET WELL	EL. 84.5 FT	EL. 110.5 FT
I-DIAM WET WELL	8 FT	8 FT
J-DISCHARGE PIPING	4 IN	6 IN



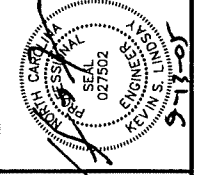
SELF PRIMING PUMPS WITH PARALLEL SERIES PIPING

ITEM	DESCRIPTION	MATERIAL
1	PUMP	CAST IRON
2	DISCHARGE PLUG VALVE	CAST IRON
3	DISCHARGE TEE	CAST IRON
4	INTERCONNECT PLUG VALVE	CAST IRON
5	BELT GUARD ASSY	STEEL
6	SUCTION CHECK VALVE	CAST IRON
7	AIR RELEASE VALVE	CAST IRON 1" (SHIPPED LOOSE)
8	DISCHARGE CHECK VALVE	CAST IRON
9	MOTOR	CAST IRON
10	PUMP & MOTOR BASE ASSY	STEEL

**NOTE:**  
CONTROL PANELS PROVIDED BY OWNER ALONG WITH TELEMETRY CONTROL UNIT, REMOTE TERMINAL UNIT WITH ANTENNA, FLOATS AND FLOAT SUPPORTS.

RECORD DRAWINGS SEPTEMBER 2005

SY. NO.	DESCRIPTION	DATE	BY
1	REVISED WIDTH 30' TO 22'	1-23-04	DFW



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MYRTLE BEACH, SC - BEAUFORT, SC

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Phone: (910) 692-5616 - Fax: (910) 692-4795



PUMP STATIONS FOR THE  
NORCROSS WATER AND SEWER DISTRICT  
CUMBERLAND COUNTY, NORTH CAROLINA

SELF PRIMING PUMP STATION W1, W2

DATE:	JAN., 2004
DESIGNED:	DFW
DRAWN:	DFW
CHECKED:	KSL
SCALE:	SCALE
SHEET NO.	77

H:\C0103-PS\PI\PMBL061800\PMPLD05rev.dwg, FLOOR PLAN-WADE, 9/15/2005 9:10:34 AM, DWIT, \exchange\HPLJ5000, 1,2



# LEGEND

- GFI 20A, 120V, DUPLEX RECEPT, GFI
- WP WEATHERPROOF
- J JUNCTION BOX
- S 20A, 120V, SINGLE POLE SWITCH
- DISCONNECT RATING AS SHOWN
- POWER PANEL
- AUTOMATIC TRANSFER SW
- FLOW TRANSMITTER

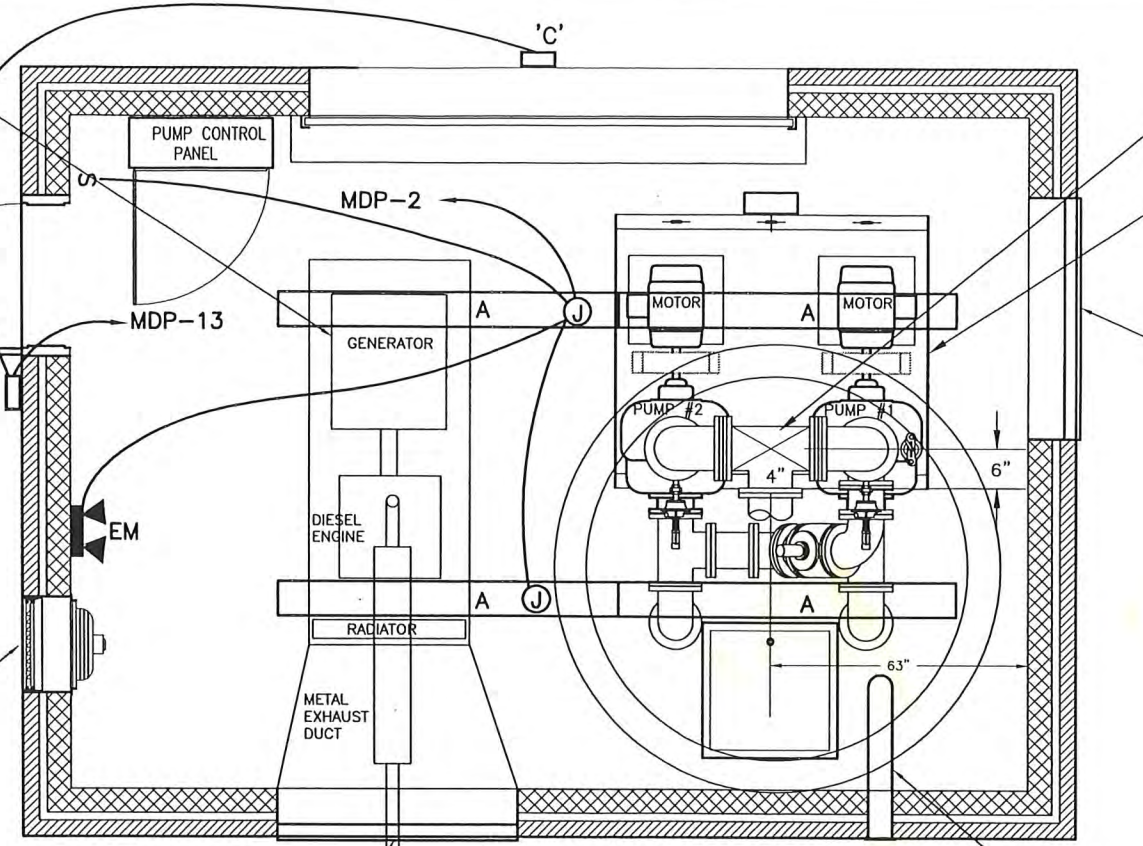
PANEL TYPE: SQ D I-LINE TYPE HCM 225 AMP MLO PROVIDE GROUND BAR  
 VOLTS: 120/240 "MDP" NEMA 1 ENCLOSURE  
 PHASE: 3 PHASE, 4 WIRE 30 KAIC

W	LOAD DESCRIPTION	WIRE SIZE	BKR. SIZE	CKT. NO.	L1	L2	L3	CKT. NO.	BKR. SIZE	WIRE SIZE	LOAD DESCRIPTION	W
980	EXHAUST FAN / LOUVER	12	20	1				2		2/0	PUMP CONTROL PANEL	18600
984	LIGHTS	12	20	3				4	150	2/0	PUMP CONTROL PANEL	18600
3000	RECEPTACLES	12	20	5				6	30	2/0	PUMP CONTROL PANEL	18600
1500	GEN. BLOCK HEATER	12	20	7				8		10	UNIT HEATER	1666
400	GEN. BATTERY CHARGER	12	20	9				10	30	10	UNIT HEATER	1666
800	SCADA PANEL	12	20	11				12		10	UNIT HEATER	1666
300	EXTERIOR LIGHTS	12	20	13				14			SPACE	
	SPACE							16			SPACE	
	SPACE							18			SPACE	
	SPACE							20			SPACE	

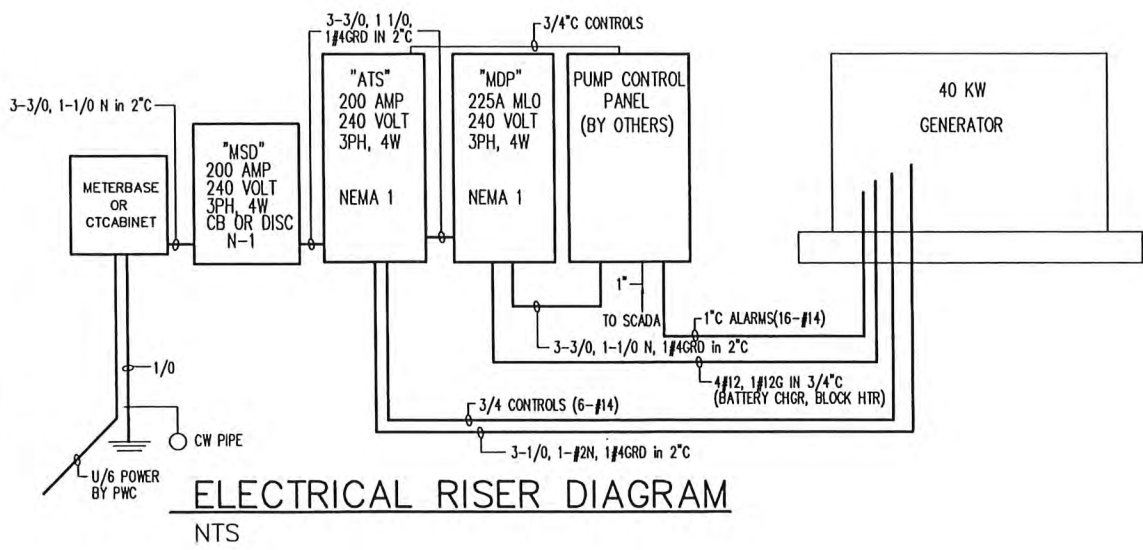
PROPOSED GENERATOR MOUNTED ON 300 GALLON FUEL TANK BASE

PROVIDE PHOTOCELL B IN THIS LIGHT TO CONTROL BOTH OUTSIDE LIGHT FIXTURES

EXHAUST FAN SEE DETAIL SHEET

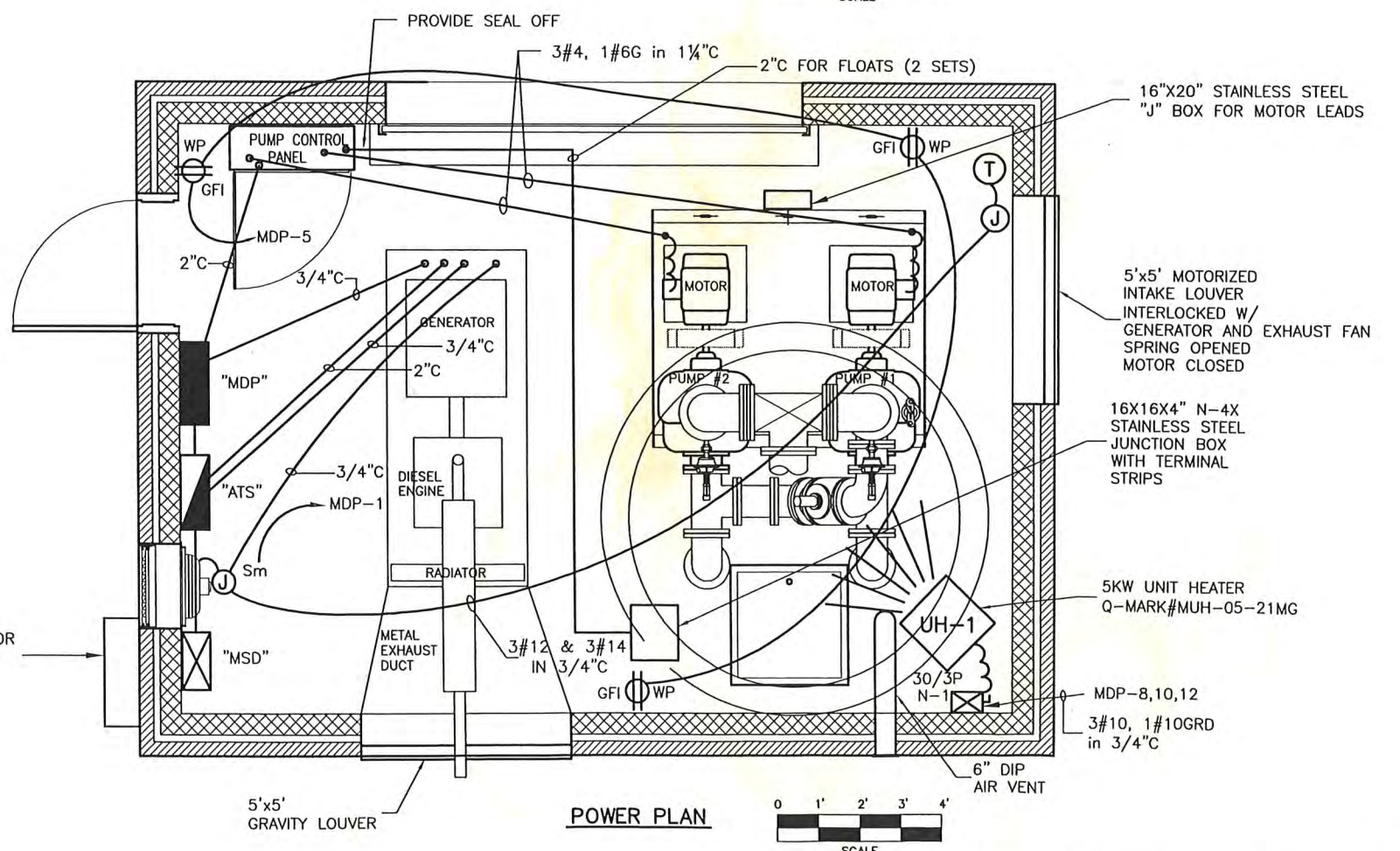


NOTE: ELECTRICAL DESIGN BY ALLEN TOWNSEND PE 13797



### FIXTURE SCHEDULE

SYMBOL	MANUF.	CAT NO.	LAMPS	REMARKS
A	COLUMBIA	LUB-296HO-120	2-F96T12HO (110 WATT)	PROVIDE SPACER BETWEEN LIGHT & CEILING
B	SPAULDING	WGS1-M100PS-MT	1-100WMH	MOUNT 10'0" AFG
C	SPAULDING	WGST-M175-MT	1-175MH	MOUNT OVER DOOR 12'0" AFG
EM	PRESCOLITE	LMP-16	2-7.2W	MOUNT 10'0" AFF



NO.	DESCRIPTION	DATE	BY
1	REVISED WITH 20 TO 22	11-23-04	DFW

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PUMP STATIONS FOR THE NORCROSS WATER AND SEWER DISTRICT CUMBERLAND COUNTY, NORTH CAROLINA  
**PUMP STATION W-1 POWER AND LIGHTING PLANS**

DATE:	DEC., 2003
DESIGNED:	DFW
DRAWN:	DFW
CHECKED:	KSL
SCALE:	SCALE
SHEET NO.	E1

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# LEGEND

- GFI 20A, 120V, DUPLEX RECEPT, GFI
- WP WEATHERPROOF
- J JUNCTION BOX
- S 20A, 120V, SINGLE POLE SWITCH
- DISCONNECT RATING AS SHOWN
- POWER PANEL
- AUTOMATIC TRANSFER SW
- FLOW TRANSMITTER

PANEL TYPE: SQ D I-LINE TYPE HCM		400 AMP MLO		PROVIDE GROUND BAR	
VOLTS: 120/240		<b>"MDP"</b>		NEMA 1 ENCLOSURE	
PHASE: 3 PHASE, 4 WIRE					
		42 KAIC			

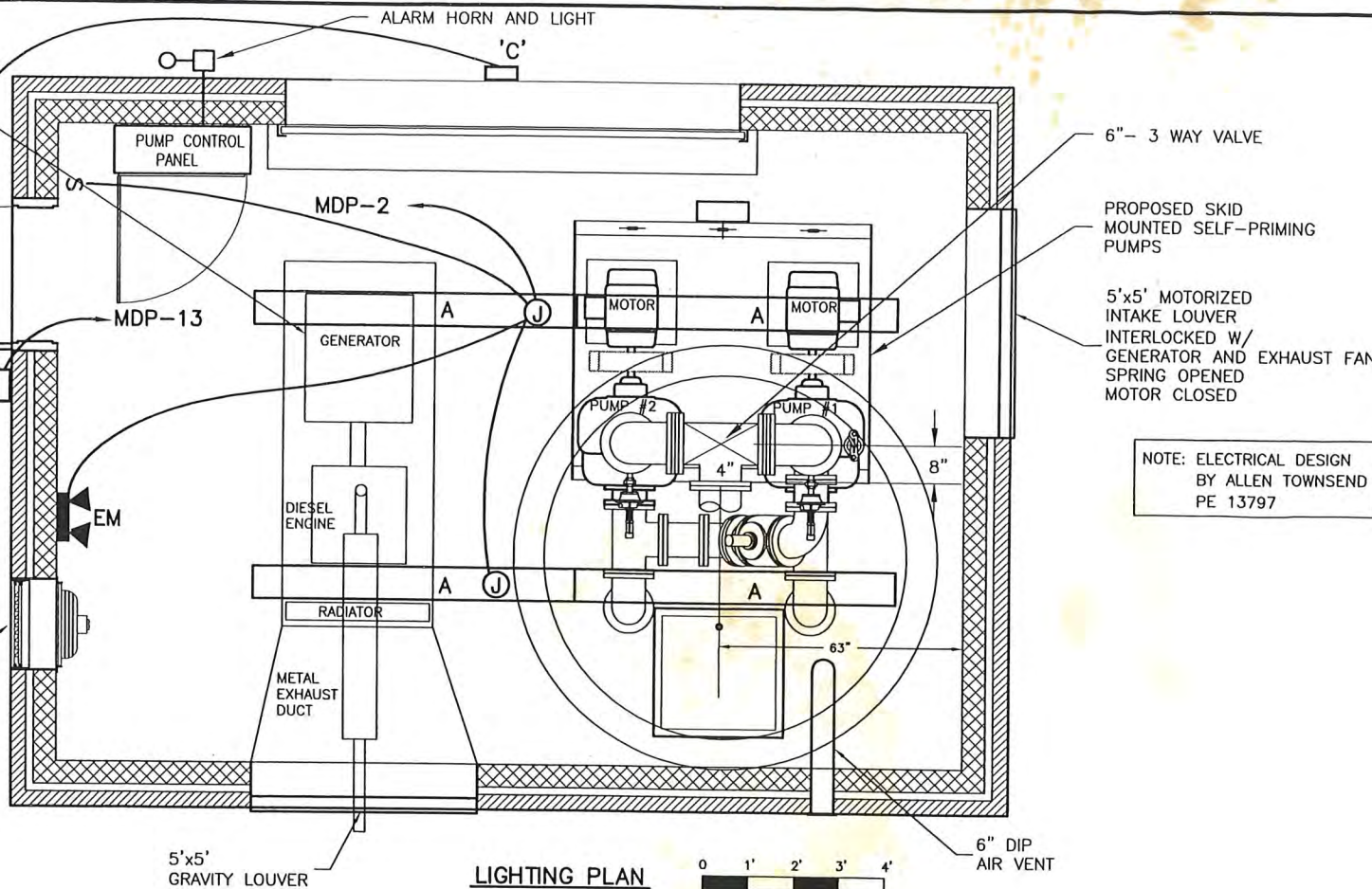
  

W	LOAD DESCRIPTION	WIRE SIZE	BKR. SIZE	CKT. NO.	L1	L2	L3	CKT. NO.	WIRE SIZE	LOAD DESCRIPTION	W
980	EXHAUST FAN / LOUVER	12	20	1				2	250	PUMP CONTROL PANEL	34100
984	LIGHTS	12	20	3				4	250	PUMP CONTROL PANEL	34100
3000	RECEPTACLES	12	20	5				6	250	PUMP CONTROL PANEL	34100
1500	GEN. BLOCK HEATER	12	20	7				8	10	UNIT HEATER	1666
400	GEN. BATTERY CHARGER	12	20	9				10	10	UNIT HEATER	1666
800	SCADA PANEL	12	20	11				12	10	UNIT HEATER	1666
300	EXTERIOR LIGHTS	12	20	13				14	20	FLOWMETER	50
	SPACE							16		SPACE	
	SPACE							18		SPACE	
	SPACE							20		SPACE	

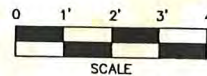
PROPOSED GENERATOR MOUNTED ON 300 GALLON FUEL TANK BASE

PROVIDE PHOTOCELL B IN THIS LIGHT TO CONTROL BOTH OUTSIDE LIGHT FIXTURES

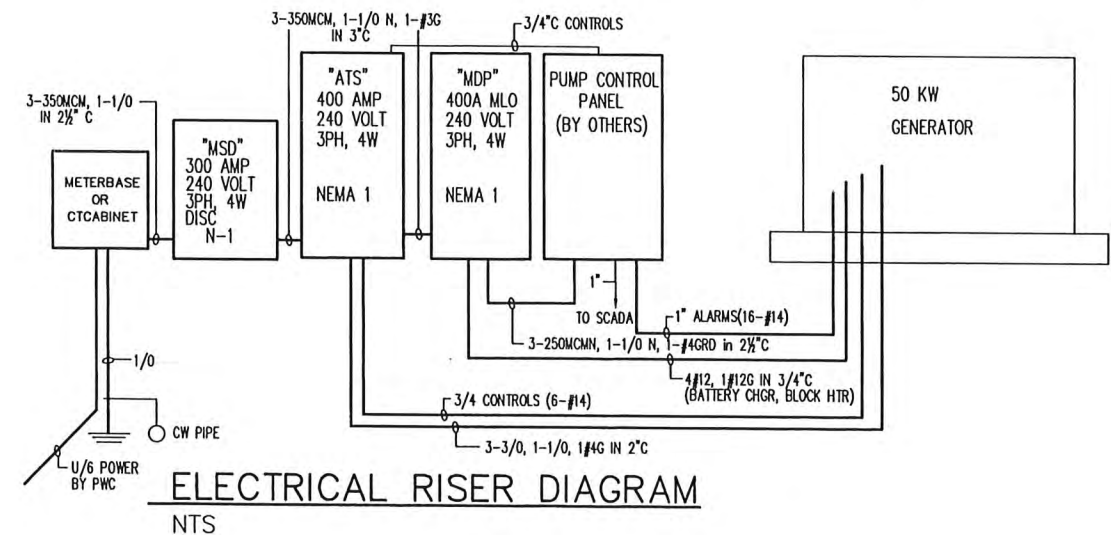
EXHAUST FAN SEE DETAIL SHEET



LIGHTING PLAN



NOTE: ELECTRICAL DESIGN BY ALLEN TOWNSEND PE 13797



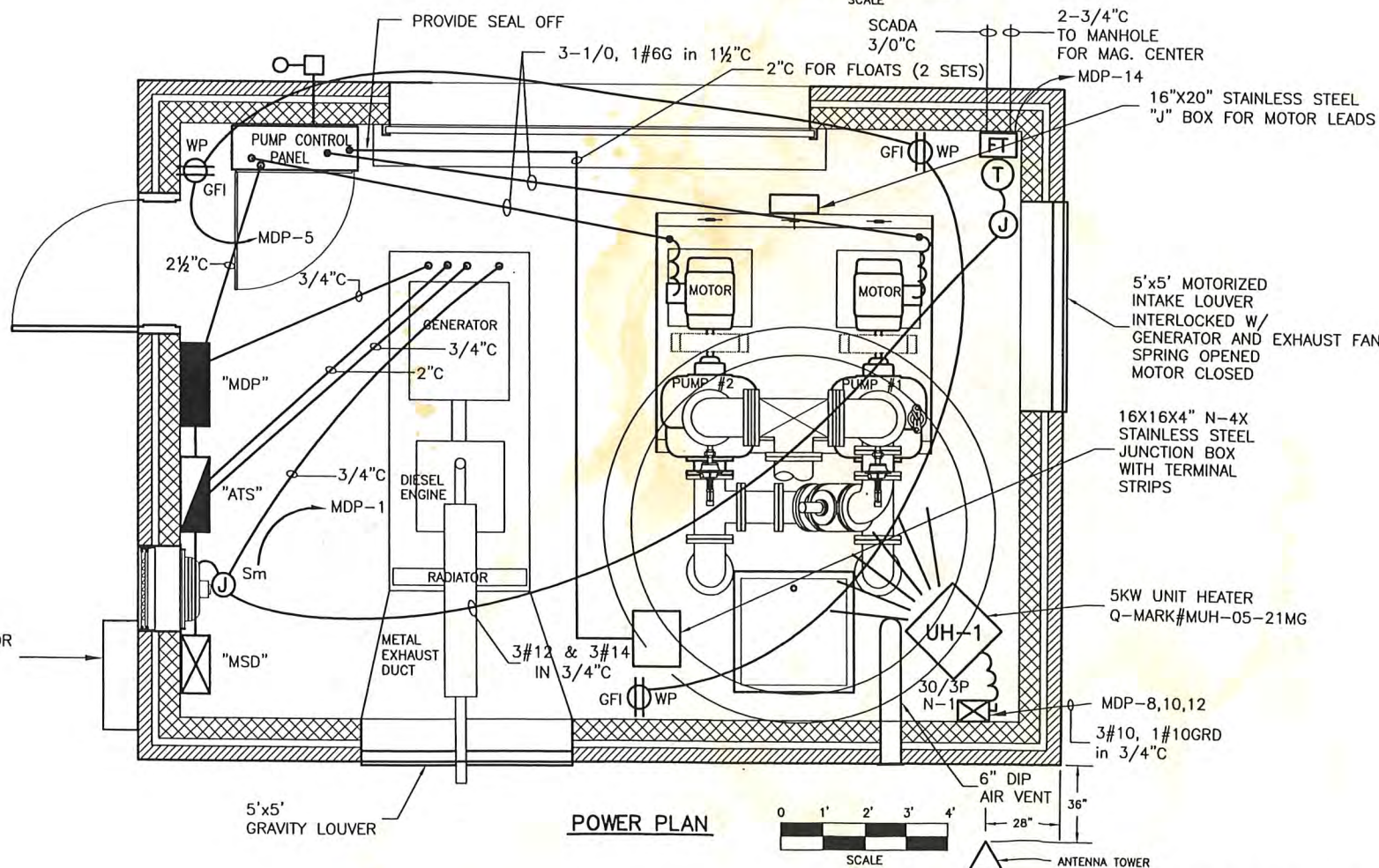
ELECTRICAL RISER DIAGRAM

NTS

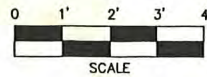
## FIXTURE SCHEDULE

SYMBOL	MANUF.	CAT NO.	LAMPS	REMARKS
A	COLUMBIA	LUB-296HO-120	2-F96T12HO (110 WATT)	PROVIDE SPACER BETWEEN LIGHT & CEILING
B	SPAULDING	WCSI-M100PS-MT	1-100W MH	MOUNT 10'0" AFG
C	SPAULDING	WGST-M175-MT	1-175MH	MOUNT OVER DOOR 12'0" AFG
EM	PRESCOLITE	LMP-16	2-7.2W	MOUNT 10'0" AFF

METERBASE OR CTCABINET WITH PWC



POWER PLAN



RECORD DRAWINGS SEPTEMBER 2005

REVISIONS	DATE	BY
REVISED	10-22-04	DFW

**Hobbs, Upchurch & Associates, P.A.**  
 Consulting Engineers  
 SOUTHERN PINES, NC - CHARLOTTE, NC  
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 300 S.W. Broad Street, Southern Pines, North Carolina 28387  
 Phone: (910) 692-5616 - Fax: (910) 692-4795

PUMP STATIONS FOR THE  
 NORCRESS WATER AND SEWER DISTRICT  
 CUMBERLAND COUNTY, NORTH CAROLINA  
 PUMP STATION W-2 POWER  
 AND LIGHTING PLANS

DATE:	DEC., 2003
DESIGNED:	DFW
DRAWN:	DFW
CHECKED:	KSL
SCALE:	SCALE
SHEET NO.	E2



**SEWER ASSET MANAGEMENT PLAN**

**OVERHILLS  
WATER AND SEWER DISTRICT**

**CUMBERLAND COUNTY, NC**



PINEHURST, NORTH CAROLINA



**SEWER ASSET MANAGEMENT PLAN**

**OVERHILLS  
WATER AND SEWER DISTRICT**

**CUMBERLAND COUNTY, NC**

**MATTHEW JONES, PE**  
matthew.jones@mcgillassociates.com



5 Regional Circle, Suite A  
Pinehurst, North Carolina 28374  
910.295.3159

**AUGUST 2025**

**PROJECT NO. 20.02507**

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## **APPENDICES**

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- Appendix B – Manhole Inspection List**
- Appendix C – Overhills Spring Lake Agreement**
- Appendix D – Lift Station Record Drawings**

## **EXECUTIVE SUMMARY**

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The purpose of this Asset Management Plan (AMP) is to document the condition of the Overhills District sewer system infrastructure to assist the County with becoming more proactive in the management and financing of its sewer collection system. The Overhills Sewer District serves approximately 107 residential connections in the northern area of Cumberland County. There are 318 properties within the district are not currently connected and are paying the sewer availability fee. The District's wastewater collection system consists of approximately three miles of gravity sewer and force main with 119 manholes. Collected wastewater is pumped from the Collingwood Street Lift Station and the Brinkley Drive Lift Station, both of which are owned by Cumberland County and operated by the Town of Spring Lake. Flow generated from the district is ultimately treated at the Spring Lake Wastewater Treatment Plant (NC0030970), which is owned and operated by the Town of Spring Lake.

This asset inventory and assessment consisted of assembling data on sewer pipes, manholes, and other appurtenances in the collection system. This assessment included performing inspections of selected manholes, performing smoke testing throughout the system, and reviewing existing data with County Staff. This information was evaluated and is summarized in this document which includes the asset management plan and capital improvements plan. This process resulted in the development of a 10-year Capital Improvements Plan (CIP) to guide the District with scheduling and financing the capital projects and equipment purchases necessary to maintain and improve its wastewater collection system. Through the AMP process, no significant rehabilitation is currently needed, but additional monitoring and investigation is recommended.

The CIP includes a focused improvement to critical components within the sewer system that need rehabilitation or replacement based on existing condition, and on improvements that could improve management of the sewer system for staff. These planned projects will bring the County into a better position to serve its customers by improving the reliability of the collection system. The County should look to its CIP to guide its next

projects, and the CIP should be updated regularly as priorities change and as projects are completed. It is noted that many factors may impact the priorities including failures, and funding availability both locally and through grant and loan programs. This assessment project provides evidence for the prioritization of manhole rehabilitation and improvement projects in the CIP.

### ***System Evaluation***

All of the pipe material in the Overhills system is PVC and Ductile pipe. The collection system was first put into service in 2019, therefore the relative age of the system is low. All the piping in this system is SDR-26 PVC pipe, which is the most common material used for sewer systems today. The typical useful life for PVC pipe is anywhere from 40 to 60 years.

As part of the AMP, McGill Associates, PA (McGill) assisted the District with evaluating the condition of its sewer infrastructure to identify projects in line with these goals. The following items were included in the AMP scope:

- Identify areas to conduct smoke testing to identify potential sources of I/I into the sewer system;
- Review and analyze County-provided information for the Overhills lift station;
- Inspect selected sewer manholes within the system to establish overall system condition;
- Identify and evaluate potential sewer system improvements;
- Prioritize sewer system improvements;
- Prepare opinions of probable costs for sewer system improvements; and
- Create a Capital Improvements Plan;

### **Manhole Inspections**

All manholes in the Overhills sewer system are precast concrete based on information provided by County staff. The results of the selected manhole inspections performed as a part of this inventory were used to develop an assessment of manhole conditions in the

system. Based on the inspections performed, manholes that were inspected were assigned a condition score, and these scores were combined into an overall condition rating for each manhole- excellent, good, fair, or poor. The results of manhole inspections are summarized in Figures 8 and 9, and the full inventor is included in Appendix A.

### Lift Station Inspection

All sewer flow from the Overhills District is pumped through one of two lift stations to the Town of Spring Lake. The lift stations are on Brinkley Drive and Collingwood Street. Full inspection and assessment of the stations were not included as a part of this assessment.

### Findings and Recommendations

The system evaluation allowed McGill to assemble a list of general recommendations and high priority projects to guide the County in the next 10 years. General recommendations to the District included establishing its own flow monitoring and smoke testing programs in high priority areas to determine sewer rehabilitation needs and inspecting sewer lines and manholes with CCTV equipment during routine cleanings to track the condition of these items. McGill also recommended the County begin rehabilitation of existing manholes within the collection system in order to reduce the risk of I/I. Additionally, we made recommendations for improving the performance of the existing pumps at the Brinkley Road lift station.

Data and field investigation reporting were utilized to identify the priority projects within the collection system, focusing on manhole rehabilitation.

Table 1 summarizes projects identified during this assessment, centering around manhole rehabilitation projects. A project to install flow monitors is included to give greater control and understanding of flows from the collection system.

**Table 1: Summary of Capital Improvements Projects**

No.	Project Name	Cost
1	Manhole Rehabilitation Project 1	\$84,100.00
2	Brinkley Lift Station Improvements	\$33,100.00
3	Manhole Rehabilitation Project 2	\$84,100.00
3	Manhole Rehabilitation Project 3	\$84,100.00
<b>10-Year CIP Total Project Cost</b>		<b>\$285,400.00</b>

***Capital Improvements Plan***

The purpose of this asset inventory and assessment was to document the condition of the District’s inventoried infrastructure to assist the County with becoming proactive in the management of its wastewater system, to include capital project planning. The County does not currently have a Capital Improvements Plan (CIP) for its wastewater system. The CIP being developed from this current assessment will guide the County through its planning for projects within the 10-year window. The CIP will remain a living document and be updated in the future so that it remains current to the Districts’ highest priorities and provides accurate cost estimates. The CIP included in this assessment includes projects focused on rehabilitation of existing manholes, which have been identified to be potential sources for I/I into the system. Through discussion with County staff, field investigation, and review of existing system data, the specific defects and general problematic areas within the wastewater system have been summarized. These results were used to develop the CIP and formulate a ten-year plan.

The complete asset inventory and assessment task consisted of five parts culminating in the development of the Overhills Water and Sewer District’s CIP.

McGill developed cost estimates for all projects based on current 2024 materials and construction costs. The updated CIP is intended to be adopted by the County to guide its selection of sewer system improvement projects over the next decade. This plan also includes a budget-level recommendation for staffing associated with system operations and maintenance for all County utility districts.



### 1.1 BACKGROUND

The Overhills District is located on E. Manchester Road, just outside of the Town of Spring Lake municipal limits in Cumberland County, North Carolina. It is owned by Cumberland County and maintained by the Town of Spring Lake. The District includes a wastewater collection system that currently serves 107 residential customers as of August 2025. The collection system consists of approximately three miles of gravity sewer mains that are 8-inch in diameter and force main that is 6-inch in diameter. These gravity and force main sewer lines are constructed of PVC and were constructed in 2019. Figure 1 shows the existing sewer collection system.

Creating a Capital Improvements Plan (CIP) will allow the County to update its current rate setting model to better estimate future revenue and expenses, capital outlay, indebtedness, and overall health of the sewer system enterprise fund reserves. A model of this nature would continue to balance revenues and expenditures with a longer-term approach to rate setting and establish a financially sound framework for the County to follow.

Even with the relatively young age of the Overhills system, County staff remains cognizant that infiltration and inflow (I/I) is always a concern, particularly in a scenario where the County's operation costs are based on the gallons of flow that enter into the existing lift station. Therefore, the top challenges for the Overhills sewer system are mitigating I/I that results from deteriorating infrastructure and collecting reliable data on existing sewer flows for operations and maintenance planning. The information collected through this assessment project will help identify system deficiencies and develop improvement projects to reach these goals.

This process resulted in the development of a 10-year CIP to guide the County with scheduling and financing the capital projects and equipment purchases necessary to restore its wastewater collection system.

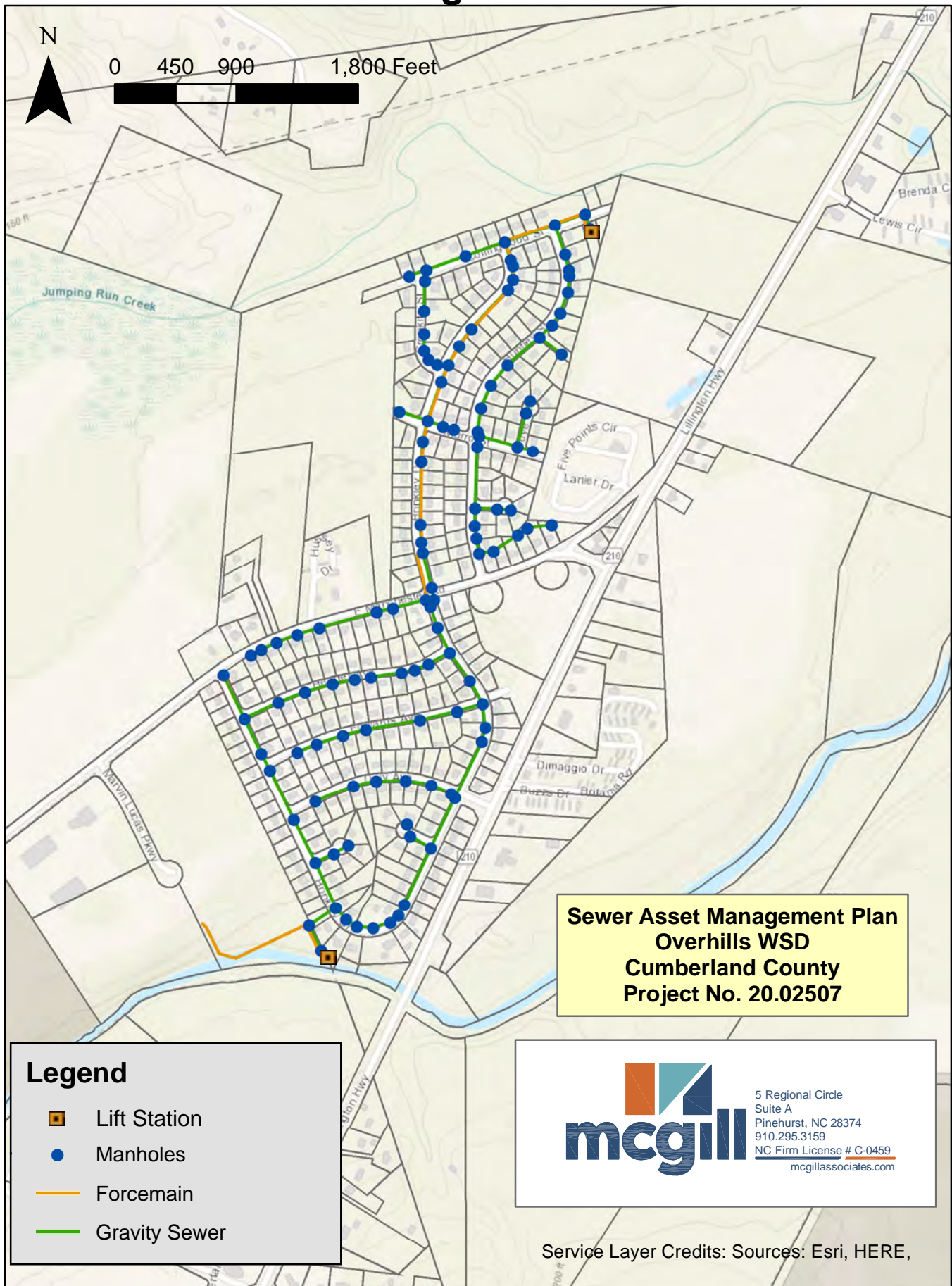
The purpose of this Asset Management Plan (AMP) is to document the condition of the Districts' inventoried infrastructure to assist the District with becoming more viable and proactive in the management and financing of its wastewater system. The District continues to look to its CIP to guide its next projects; therefore, it is vital that the CIP remains current to the Districts' highest priorities and provides accurate cost estimates. This assessment project was utilized for the prioritization of replacement of lines and improvement projects in the CIP.

**Table 2: Summary of Customers by Use**

<b>Diameter</b>	<b>Total</b>	<b>% of System</b>
<b>Flat Rate</b>	<b>107</b>	<b>100%</b>
<b>Total LF</b>	<b>107</b>	<b>100%</b>

# Overhills Overall System Map

## Figure 1



## 2.1 SMOKE TESTING

### 2.1.1 Overview

Smoke testing is one of the most cost-effective ways to locate defects in sewer mains and laterals. In this process, artificially produced non-harmful smoke is injected into the sewer line via a blower placed over a selected manhole. The pressurized smoke travels up and down the sewer line and connections and emerges at openings in the system. This visual aide allows test crews to easily identify, record, and mark locations where defects are present. If the sewer is in good condition, one should only see smoke rising from manhole lids and house roof vents. If the line has defects, such as breaks or illegal connections, the smoke will emerge at these points.

### 2.1.2 Investigation

McGill met with County staff to identify areas that would benefit most from smoke testing. Based on the size of the Overhills District, it was determined that the entire system could be smoke tested. McGill prepared a detailed map of the area based on the County's GIS database. The Fire Department and customers along the route were alerted to the upcoming testing.

### **2.1.3 Methodology**

McGill and County staff smoke tested all three miles of gravity sewer lines over a period of two days to determine locations where I/I enter the wastewater collection system. For each line to be tested, County staff recommended a centrally located manhole on which to place the blower based on the manhole's accessibility and avoidance of traffic. The manhole nomenclature used by the County was utilized and the location, configuration, and condition of each one was recorded.

At each location, the following procedure was executed.

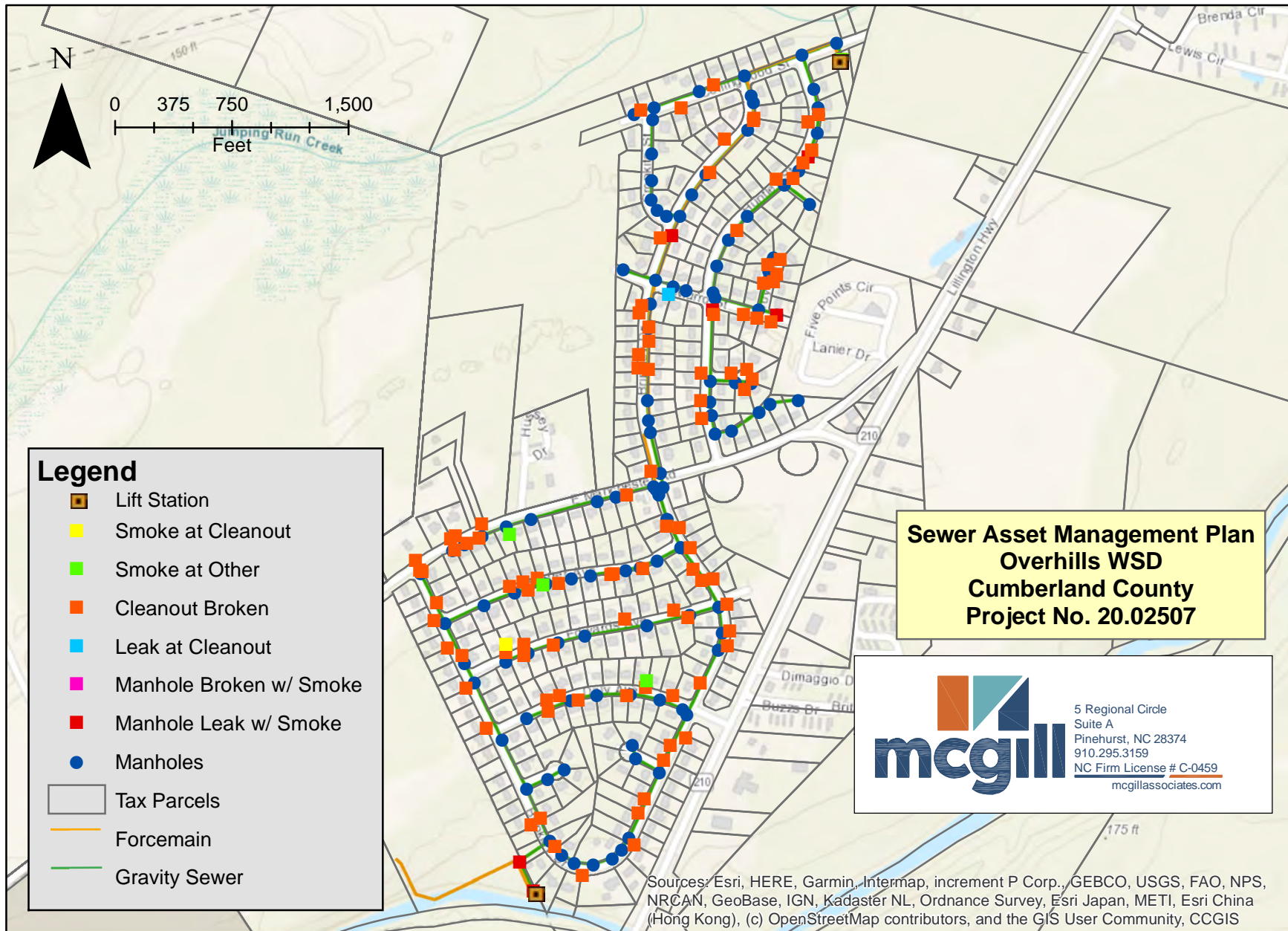
1. Place the blower on the manhole (with the rubber seal, if necessary).
2. Fill smoke pump up to  $\frac{3}{4}$  with liquid smoke.
3. Close all smoke pump valves.
4. Start blower and allow to warm up.
5. Open smoke pump valves.
6. Pressurize smoke pump by pumping the canister manually.
7. Once smoke begins emerging from roof vents, begin surveying for smoke emergencies indicating defects or problem areas in the pipeline.
8. For each defect, record the opening type, address, manhole identifier, and notes.
9. Additionally, mark each defect with paint.

This process continued until all visible defects were marked and recorded. Figure 2 shows some problematic system openings.



# Overhills Smoke Testing Map

## Figure 2



### **2.1.4 Results**

The crew recorded 107 abnormal smoke outlets, which divided generally into four categories.

1. Uncapped cleanouts or elder valves: Several cleanout and elder valve caps were missing or broken. The cumulative number of broken cleanouts in the District can contribute to significant I/I. County staff had repair caps on hand during the testing and were able to install new caps where needed. Some caps on cleanouts and elder valves were unscrewed and were able to be re-affixed during the testing.
2. Broken Cleanouts: Ground smoke was detected adjacent to the cleanout, which appeared to be damaged or below grade. Replacement of the cleanout assembly will be needed.
3. Ground Smoke: Ground smoke can be the result of broken lines, joint separation, etc. Any of these problems can cause significant I/I.
4. Unsealed manholes: Some manholes emitted excess smoke indicating cracked concrete or offset rings. Manholes located in ditches are the most likely to contribute I/I.

A spreadsheet describing all smoke occurrences can be found in Appendix A and all locations were documented in the mapping information in ArcGIS for the County staff's use.



## **2.2 SEWER MAINS**

### **2.2.1 Overview**

Overhills sewer mains consist of polyvinyl chloride (PVC) and ductile iron pipe. The District's existing sewer lines are 8-inches in diameter. The age of the system and system materials were confirmed by the County based on records from construction of the system in 2019. Condition was determined based on visual inspection of select manholes and smoke testing of the system.

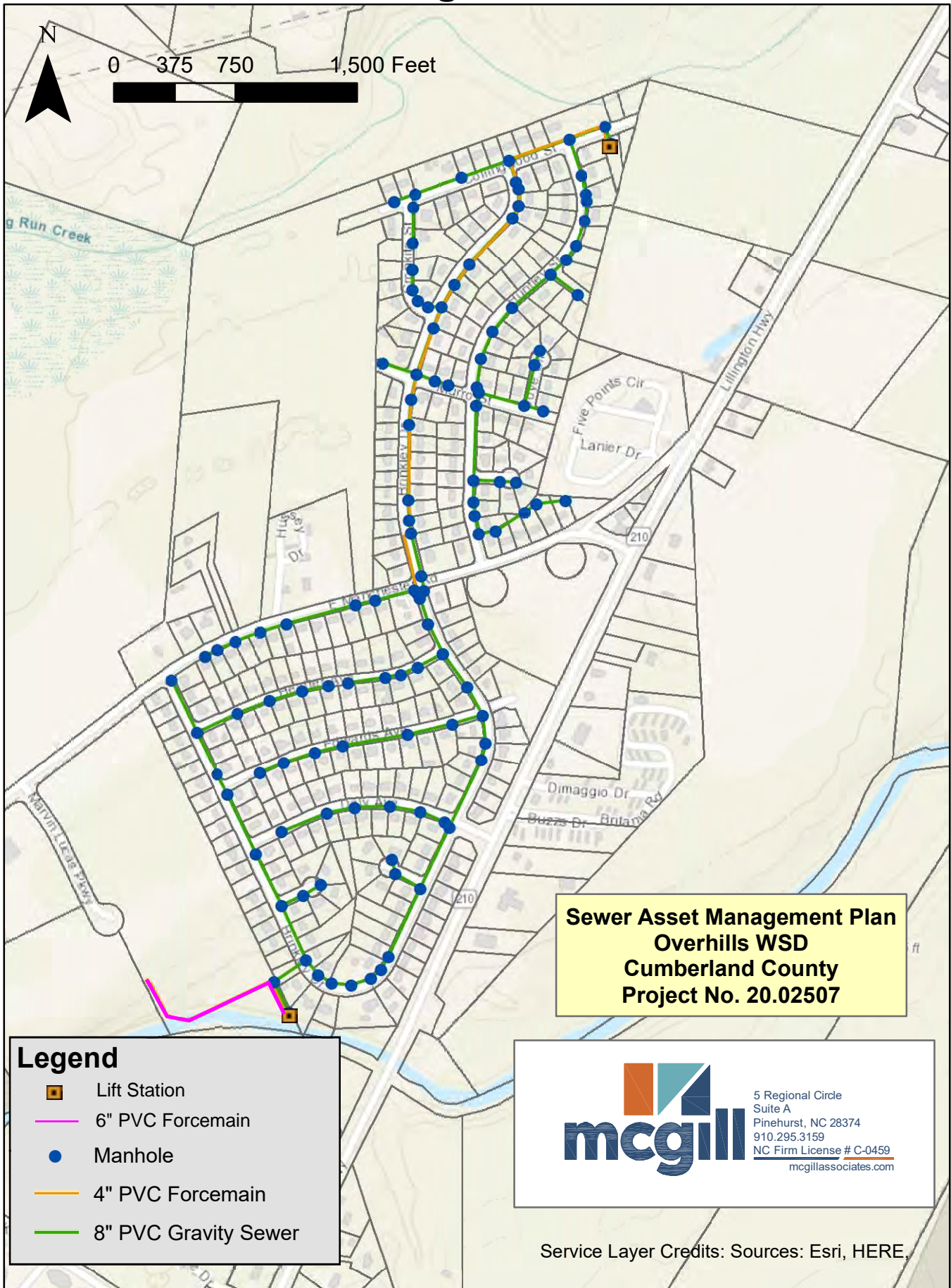
### **2.2.2 Investigation**

With District input from County staff, McGill has reviewed the district's data on the sewer mains throughout the District's collection system. The sewer main material and diameters were verified by the County and updated according to GIS records. Figure 3 shows the sewer line diameter and material in the system.

The purpose of this portion of the assessment was to create a working system inventory and then review which areas of Overhills District have system components in need of replacement or rehabilitation.

# Overhills Sewer Line Diameter Map

## Figure 3



### 2.2.3 Methodology

McGill reviewed the District's GIS data for the sewer collection system. County staff provided information on manholes where deterioration was suspected. Smoke testing was performed throughout the system. The County's GIS mapping was utilized to create maps that document the collection system by material and by diameter.

### 2.2.4 Results

The existing gravity sewer pipe in the sewer system is 8-inch in diameter based on Record Drawings for the system. All pipe diameters therefore do meet current NCDEQ minimum design standards. Based on the young age of the system, the PVC pipe installed in 2019 has not exceeded its useful life, and therefore replacement is not recommended outright. Recommendations will include planned CCTV inspections by the County of the existing piping in order to verify existing conditions and provide future updates to this AMP/CIP. Based on the age of the pipes and no documented issues from County staff, pipe in the system has been noted to be in good/excellent condition. Tables 3 through 6 show the assessment based on material and then broken out by diameter.

**Table 3: Summary of Gravity Sewer Main by Material**

<b>Material</b>	<b>Diameter Range (in)</b>	<b>Total LF</b>	<b>% of GS</b>
<b>Polyvinyl Chloride Pipe</b>	8	<b>17,420</b>	<b>100%</b>
<b>Total LF</b>	<i>N/A</i>	<b>17,420</b>	<b>100%</b>

**Table 4: Summary of Gravity Sewer Main by Diameter**

<b>Diameter</b>	<b>Total LF</b>	<b>% of System</b>
<b>8"</b>	<b>17,420</b>	<b>100%</b>
<b>Total LF</b>	<b>17,420</b>	<b>100%</b>

**Table 5: Summary of Force Main by Material**

<b>Material</b>	<b>Diameters (in)</b>	<b>Total LF</b>	<b>% of System</b>
<b>Polyvinyl Chloride</b>	<b>4, 6</b>	<b>3,948</b>	<b>100%</b>
<b>Total LF</b>	<b>N/A</b>	<b>N/A</b>	<b>100%</b>

**Table 6: Summary of Force Main Sewer Main by Diameter**

<b>Diameter</b>	<b>Total LF</b>	<b>% of System</b>
<b>4"</b>	<b>2,994</b>	<b>76%</b>
<b>6"</b>	<b>954</b>	<b>24%</b>
<b>Total LF</b>	<b>3,948</b>	<b>100%</b>

**Table 7: Summary of Force Main Sewer Main Conditions by Age**

<b>Year Put Into Service</b>	<b>Total LF</b>	<b>% of GS</b>
<b>2019</b>	<b>3,948</b>	<b>100%</b>
<b>Total LF</b>	<b>3,948</b>	<b>100%</b>

## **2.3 MANHOLE INSPECTIONS**

### **2.3.1 Overview**

Manholes are the primary access points to the sanitary sewer system and are essential for its operation and maintenance. As they allow personnel access to the sewer system, manholes are also likely culprits for allowing I/I to enter the sewer system. Manholes in low-lying areas with improperly sealed lids, manhole joints, and poor connection practices can all be sources of I/I. Storm drains or the presence of manholes in ditches and low-lying areas in Overhills frequently allow standing water to remain for hours or days after a storm event which can exacerbate inflow through manhole lids. Reports from construction of the sewer system noted that the existing water lines in the Overhills neighborhood experienced several breaks due to asbestos cement (AC) water lines that are heavily deteriorated in some areas. Additionally, during construction I/I was observed from either groundwater or leaking water lines into various manholes and wetwells in the project area.

One of the most cost-effective practices for managing this intrusion is visual manhole inspections, where the various components of the manhole are rated according to their condition. Some examples of noticeable deficiencies are benches which have deteriorated from abrasion and corrosion and rings which can be moved by traffic, soil, and the freeze/thaw cycle. Defects in any aspect of the manhole can lead to I/I, structural instability, and manhole failure.

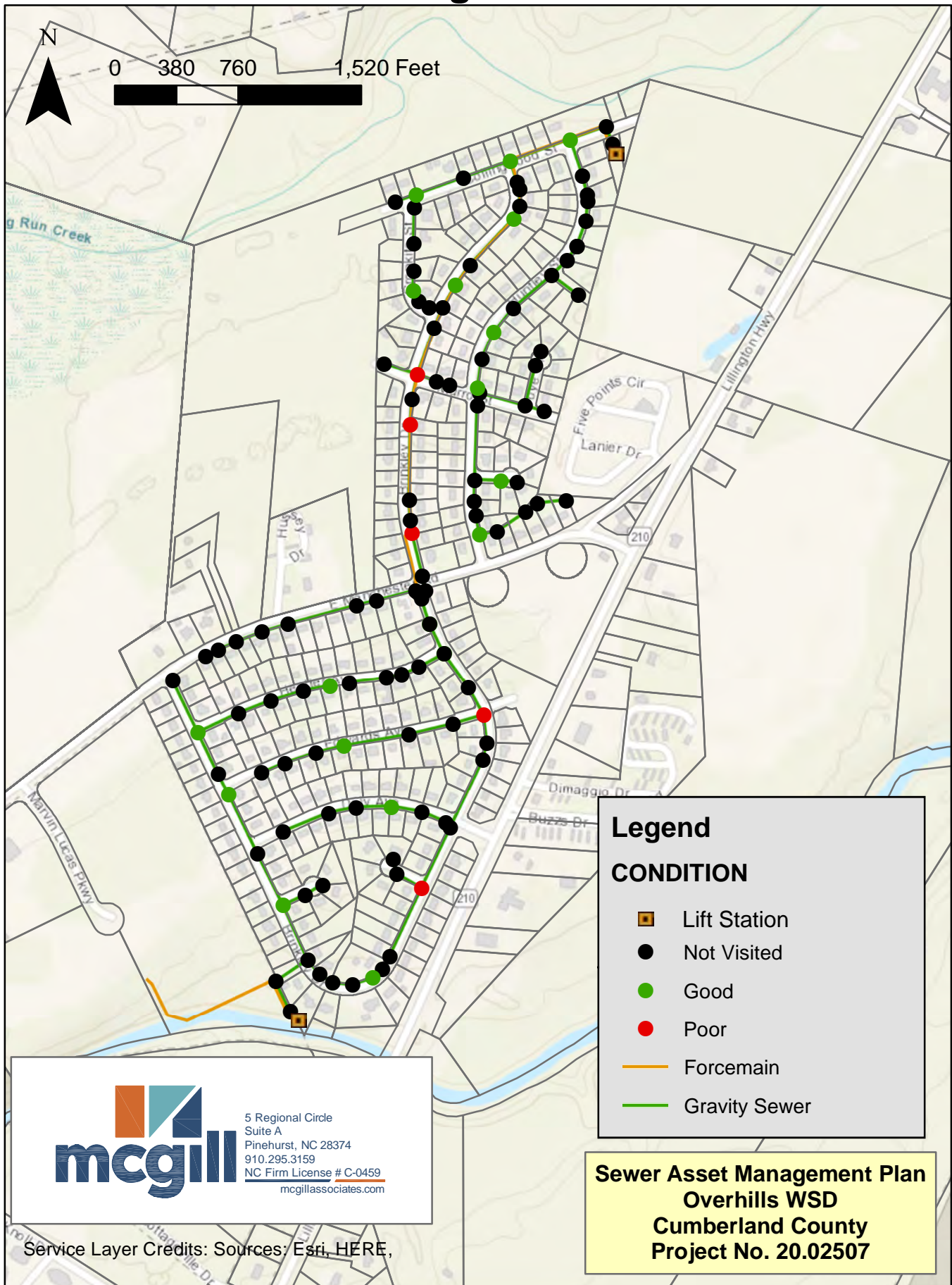
### **2.3.2 Investigation**

After the Overhills system was put into service, the GIS record was created in 2019. The purpose of this portion of the assessment was to perform selected field inspections to determine an overall system assessment. A total of one hundred and nineteen (119) manholes are currently inventoried by the District. A total of 23 manholes were inspected as a part of this inventory and assessment. The map showing which manholes were inspected is shown in Figure 4.



# Overhills Manhole Inspection Map

## Figure 4



**Legend**

**CONDITION**

- Lift Station
- Not Visited
- Good
- Poor
- Forcemain
- Gravity Sewer

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**Sewer Asset Management Plan**  
**Overhills WSD**  
**Cumberland County**  
**Project No. 20.02507**

Service Layer Credits: Sources: Esri, HERE,

### **2.3.3 Methodology**

The District of Overhills sewer collection system contains 119 sewer manholes. Working with County staff, McGill inspected selected manholes within the sewer system to obtain a representative condition sampling. County staff determined which manholes to inspect in each area based on manhole location and orientation. Manholes prioritized for inspection include those located in existing ditches or low-lying areas where the manhole would be susceptible to degradation and inflow from surface water. At each manhole, the inspector recorded the manhole's location, dimensions, material, and condition of its various components. All information including photographs of the interior of the manhole and top area were uploaded into the GIS mapping.

Some typical distresses include:

- Wear and asphalt paving on the cover;
- Corrosion and mud seepage on the ring and frame;
- Gas residue, corrosion, seepage, and deteriorating concrete on the cone and riser;
- Wetness, silt, root intrusion, and deteriorating concrete on the barrel;
- Dirt and corrosion on the rings;
- Silt accumulation on the bench; and
- Misaligned pipes, obstructions, trough deteriorating, standing water, and no flow in the channel.

Based on the recorded comments, each component was assigned a condition score, and these scores were combined into an overall condition rating for each manhole- excellent, good, fair, or poor. The images below depict the interiors of various condition manholes.





MH FID 30, BRINKLEY DRIVE, GOOD.



MH FID 43, BRINKLEY DRIVE, POOR.

### 2.3.4 Results

All of the 23 inspected manholes are precast manholes. Due to the relative low age of the system, County staff confirmed that all the existing manholes in Overhills are precast sewer manholes. The manholes observed were noted as poor or good to excellent condition, which is to be expected based on their age. However, evidence of I/I was observed in several manholes. Based on the condition of those observed, it is suspected that the remaining manholes not inspected would have similar condition to those observed. Tables 8 and 9 summarize the manhole materials and condition.

**Table 8: Summary of Manholes by Material**

<b>Material</b>	<b>Total</b>
<b>Precast Concrete</b>	<b>119</b>
	<b>119</b>

**Table 9: Summary of Manholes by Condition**

<b>Material</b>	<b>Total</b>
<b>Good/Excellent</b>	<b>18</b>
<b>Poor</b>	<b>5</b>
	<b>23</b>

The County maintains its collection system using the ESRI platform and includes the attribute data for each manhole. A spreadsheet including condition comments for each manhole can be found in Appendix B.

## 2.4 LIFT STATION

### 2.4.1 Overview

The Overhills sewer system includes two lift stations, one on Collingwood Street and the other on Brinkley Drive. The Collingwood Lift Station collections flow from the area north of Manchester Road and pumps to a manhole on the south side of Manchester. The Brinkley Lift Station receives all flow for the Overhills system and pumps to an manhole inside of the Spring Lake Sewer Collection System in an existing sewer easement off of Marvin Lucas Parkway.

Both lift stations include flow meters that are used for monitoring and recording flow generated by the Overhills sewer system. The monthly records from the Brinkley station are used for billing and have been used to calculate the average use per user for the system.

Collingwood Street Lift Station:

Lift Station Design Capacity	216,000 GPD
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Brinkley Drive Lift Station:

Lift Station Design Capacity	367,200 GPD
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Overhills Sewer System:

FY 2025 Estimated Average Daily Use per User*	165 GPD
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\*Note: Estimated based on FY 2025 monthly usage, metered at Brinkley Lift Station and data provided to Cumberland County by Town of Spring Lake. Average GPD for Overhills System is 17,606 GPD, with 107 customers as of June 2025.

Recommendations for various sewer system improvements to include the gravity sewer pipe and manholes in the collection system include general recommendations, high priority projects (within 10-years) and future projects (past the 10-year planning window). General recommendations are typically less costly and can be implemented more quickly, whereas high priority projects may require financial assistance and be undertaken in phases.

### **3.1 GENERAL RECOMMENDATIONS**

#### **3.1.1 *Smoke Testing***

Smoke testing is a valuable tool that can be used to locate broken pipe, cleanouts, or manholes that need repair. Any of these issues can be a source for the inflow and infiltration (I&I) of surface water into the sewer collection system. The most common repairs that result from smoke testing include replacing missing or broken cleanout caps and removing buildup from manholes. Other repairs that can be performed at this time are patching the exterior concrete or replacing the rings/lids of manholes identified to be leaking during smoke testing. These may be contributing significant I/I into the wastewater collection system. Similarly, line breaks in flooded areas should also be addressed promptly. It is also recommended that the District continue to perform regular smoke testing to monitor the system's ongoing wear and identify specific areas for improvement. However, if there is a suspected problem in a specific area the District should utilize smoke testing on a more "as needed" basis to troubleshoot possible problem areas.

#### **3.1.2 *Video Evaluations***

Based on information provided by the County, video evaluations were not performed as part of the system inventory. County staff reports that no video evaluations have been performed on the collection system to date. It is recommended that the County plan to perform video evaluation of the system as a part of O&M in order to stay vigilant concerning potential issues within the collection system.

### **3.1.3 Manhole Inspections**

Manhole inspections uncovered some infrastructure deficiencies which can be repaired immediately to improve the condition and function of the wastewater collection system. The full list of manholes and their field assessment is included in Appendix A. Manhole rehabilitation and replacement is the priority work that is targeted by the CIP. The proposed projects are divided out on an annual basis in order to include the improvements as a reasonable component of annual budgeting.

### **3.1.4 Flow Monitoring**

The District and McGill have discussed that flow monitoring is not needed at this time. Should the County begin to suspect the presence of significant I&I, they will engage with a subcontractor to perform flow monitoring to verify as needed. Both existing lift stations have 8-inch flow meters on the lift station discharge, which provide metering of flow received within the district. The flow recorded from these meters are utilized by the County to determine the monthly quantity of wastewater sent for treatment to the Town of Spring Lake.

## **3.2 PRIORITY PROJECTS**

### ***3.2.1 Manhole Rehabilitation Projects***

In these projects for the Overhills system, manholes will be lined where possible, unless a significant amount of deterioration has occurred that would necessitate replacement. The projects are scoped to be undertaken every 2 years. Each project is priority targeting any manhole deficiencies based on the results of the smoke testing performed. There are a range of issues from broken risers to cracks in the frame of the manhole that warrant various repairs. To reduce the amount of I/I that enters the system it is imperative to repair these manholes. The project will be ongoing to spread out the cost for the County over a ten-year period. With 119 manholes in the system, it is estimated that approximately 40% of the manholes in the system would benefit from rehabilitation through lining. As a result, manhole rehabilitation is broken into three projects, which are included in the CIP separately, but can be combined or modified as needed given annual budgetary considerations. The projects also include replacement of existing cleanout assemblies for select residences. The results of the smoke testing identified that some cleanouts were damaged below grade, therefore replacement of the assembly would be necessary.

This project is recommended to be pursued with a manhole rehabilitation specialty company with scopes large enough to get competitive pricing for each mobilization. The manholes proposed for rehabilitation or replacement range in depth; therefore, an average depth of 7 vertical feet (VF) was used per manhole for estimating purposes. The capital improvements plan breaks this project into 3 projects with a budget of approximately \$84,100 every 3 years over a 10-year span, as outlined in Table 10. A preliminary cost estimate for a single project is included in Table 8. The total cost of the manhole rehabilitation/replacement projects is estimated to be \$252,300.

**Table 10: Preliminary Opinion of Probable Cost for Manhole Rehabilitation Projects**

<b>Item</b>	<b>Description</b>	<b>Units</b>	<b>Quantity</b>	<b>Unit Price</b>	<b>Total Cost</b>
1	Mobilization	LS	3%	N/A	\$1,900
2	Rehabilitate Existing Manhole	VF	112	\$500	\$56,000
3	Additional Manhole Repairs	LS	1	\$10,000	\$10,000
<b>Construction Subtotal</b>					<b>\$ 67,900</b>
Construction Contingency (15%)					\$ 10,200
Engineering Assistance (If needed)					\$ 6,000
<b>Total Base Project Cost</b>					<b>\$ 84,100</b>

*\*Cost estimates are based on the knowledge of a professional engineer based on 2024 construction costs and are subject to change due to bidding environment and other factors.*



### 3.2.2 Brinkley Lift Station Improvements Project

This project includes installing a p-trap on the discharge force main line to help allow the pumps to maintain prime with consistent downstream head. The work would involve installing a 4-inch p-trap in the existing force main, as well as a ¾-inch water service line to the trap to provide a drip supply to the trap to keep it full.

The project includes one 4-inch p-trap connected to the existing force main with associated excavation, compaction and backfill. The trap will be installed on the existing force main on the current lift station site. The preliminary cost estimate for this project is \$33,100 as outlined in Table 11 below.

**Table 11: Preliminary Opinion of Probable Cost for Brinkley LS Improvements**

Item	Description	Units	Quantity	Unit Price	Total Cost
1	Mobilization	LS	3%	N/A	\$ 800
2	4-inch P-Trap	LS	1	12,000	\$ 12,000
3	¾" Service Line and Tap	LS	1	16,000	\$ 16,000
<b>Construction Subtotal</b>					<b>\$ 28,800</b>
Construction Contingency (15%)					\$ 4,300
<b>Total Base Project Cost</b>					<b>\$ 33,100</b>

*\*Cost estimates are based on the knowledge of a professional engineer based on 2024 construction costs and are subject to change due to bidding environment and other factors.*

### **3.3 CIP PROJECTS SUMMARY**

The purpose of this asset management plan was to document the condition of the Overhills sewer infrastructure to assist the County with becoming more viable and proactive in the management and financing of its wastewater system. The County intends to look to its CIP to guide its next project; therefore, it is vital that the CIP be established as an accurate depiction of current conditions and reflect the Districts' highest priorities with accurate cost estimates. The development of this AMP will serve as a positive step towards ensuring that the District can maintain its level of service agreement.

Sewer manhole rehabilitation and cleanout replacement was evaluated based on current staff input and the results of the field inspections. The existing manholes and cleanouts were divided into projects recommended for the next 10 years.

McGill prepared cost estimates for all projects based on current materials and construction costs. The 10-year CIP is intended to be adopted by the District to guide its selection of sewer system improvement projects over the next two decades. The cost summary for the 10-year CIP is shown below in Table 12.

**Table 12: CIP Cost Summary**

<b>Year<sup>1</sup></b>	<b>Manhole Rehabilitation Project 1</b>	<b>Brinkley Lift Station Improvements</b>	<b>Manhole Rehabilitation Project 2</b>	<b>Manhole Rehabilitation Project 3</b>	<b>TOTAL COST</b>
1	\$ -	\$ 33,100.00	\$ -	\$ -	\$ 33,100.00
2	\$ 84,100.00	\$ -	\$ -	\$ -	\$ 84,100.00
3	\$ -	\$ -	\$ -	\$ -	\$ -
4	\$ -	\$ -	\$ -	\$ -	\$ -
5	\$ -	\$ -	\$ 84,100.00	\$ -	\$ 84,100.00
6	\$ -	\$ -	\$ -	\$ -	\$ -
7	\$ -	\$ -	\$ -	\$ -	\$ -
8	\$ -	\$ -	\$ -	\$ 84,100.00	\$ 84,100.00
9	\$ -	\$ -	\$ -	\$ -	\$ -
10	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL ESTIMATED CIP COST<sup>2</sup></b>					<b>\$ 285,400.00</b>

*Notes:*

- 1: Considering timeline for adoption of this plan and County budget planning cycle, Year 1 is anticipated to be FY 2026
- 2: Cost estimates are based on the knowledge of a professional engineer based on 2025 construction costs and are subject to change due to bidding environment and other factors

## 4.0

## OPERATIONS AND MAINTENANCE PLAN

### 4.1 GENERAL RECOMMENDATIONS

The purpose of an Operations and Maintenance (O&M) Program is to provide an organized and cost-effective approach to ongoing maintenance, repair and replacement activities that will maintain the sewer collection system, so it performs as intended and meets the requirements of the sewer utility's System-Wide Collection System Permit, issued under North Carolina General Statutes Article 21 of Chapter 143.

This section provides a general description of proactive O&M, which can be defined as scheduled maintenance activities (preventive maintenance), performed on a regular basis in order to achieve the highest level of system performance using available resources and minimizing failures that can result in Sewer System Overflows (SSOs)

Developing an O&M Program begins with accurate records of infrastructure inventory, asset locations, and physical condition. Coupled with work records and system performance history, preventive maintenance schedules can be developed to efficiently address general system needs, from cleaning and debris removal to site-specific maintenance work such as cutting and repair work.

The following elements provide the foundation for an effective O&M program:

- Maintain up-to-date wastewater treatment plant equipment documentation, sewer collection system maps and related work history and operational data.
- Develop a routine preventive O&M program and activities for staff and contractors maintaining the sewer collection system and a system to document scheduled activities.
- Develop a rehabilitation and replacement plan identifying and prioritizing system deficiencies and implement short- and long-term actions to address the deficiencies.
- Develop and implement training programs to build technical competence and emergency preparedness.
- Develop and provide equipment and replacement part inventories, including critical replacement parts.

## **Sewer System Mapping**

Sewer system maps and related databases are typically managed using a Geographic Information System (GIS). The District currently utilizes ESRI as the GIS platform from which to manage the utility systems. This GIS mapping is supported by a database that records sewer main size, material types, and locations of manholes and clean-out connections. The platform has the ability to store more information that is currently being utilized by the County, including invert and rim elevations and other attributes of system appurtenances. If County intends to utilize the GIS platform for managing and recording maintenance performed and planned, it is recommended that the County investigate alternative software to ensure that they are utilizing a software that meets their needs with respect to budget.

The GIS database should be updated on a regular basis. Software applications such as work order systems are available to allow field staff to update GIS data as inspection and maintenance activities are completed. Other applications can also allow staff to update and edit maps. Field information that was gathered by McGill and County staff as a part of this assessment is now included in the County's GIS system database for future reference.

GIS can organize work history along with operational data, inspection records and images to provide managers, operations staff and engineers with powerful data sets to track current resource allocations and forecast short and long-term operational and capital needs. Outcomes of detailed analysis such as recommended sewer main rehabilitation work versus sewer overflows can be mapped to present the relationship visually for ease of understanding.

## **Preventive Operation and Maintenance (O&M)**

Preventive maintenance is performing routine and scheduled maintenance activities before wastewater treatment plant and lift station equipment or buried infrastructure fails, for the purpose of extending useful life, reducing overall operating costs, and increasing system reliability. This proactive approach to maintenance work is more efficient and cost effective than reactive and curative operations. Preventive maintenance activities will also help operations staff to better understand the wastewater treatment plant equipment, lift station equipment, and collection system components and how they work under various conditions. This knowledge is essential to setting maintenance priorities and developing the scope and timing of long-term rehabilitation and replacement projects.

## **Scheduled Cleaning of Sewers**

EPA recommends, at a minimum, 100% of sewer mains should be cleaned every 5 years, or 20% of the system annually. The sewer utility's Collection System Operating Permit requires 10% of the gravity sewers to be cleaned annually. High pressure jetting is the most common approach using various spray nozzles for general cleaning and debris removal. Mechanical cutters are used to address root intrusion and cleaning agents can be added to help remove fats, oils, and grease (FOG).

More frequent cleaning is scheduled for areas with a history of heavy debris, grease buildup and roots. CCTV inspections are also used to identify areas to clean more often, such as sections with minor defects such as offset joints and service taps protruding into the main line. Sewer sections near siphons are cleaned more frequently to ensure continuous and uninterrupted operation.

As part of the O&M Program, a master list of cleaning operations, priority locations and scheduling can be incorporated into GIS. Maps can be produced to define work areas, schedule resources, including contracted services, track progress and task completion. Updating GIS maintenance operations data (partial blockages found, debris quantity, etc.)

will help managers adjust cleaning frequency and area boundaries as needed to increase program efficiency, reduce sewer blockages, and avoid SSOs.

## **Routine Visual Inspections**

Routine inspections are used to assess the condition of lift stations, manholes and surface facilities, recording general conditions and evidence of possible structural problems or failures (offset structures, etc.), corrosion, surcharging, overflows and excessive Inflow and Infiltration (I&I). Work orders are generated based on inspection records to effect operational adjustments, scheduling more detailed inspections and/or making necessary repairs.

## **Manhole Inspection Program**

Manhole inspections keep the asset inventory up-to-date and are used not only to update collection system maps, but to determine structural condition. During manhole inspections, a complete inventory is taken of each manhole including construction materials, ring size, depth to invert, flow conditions and evidence of problems. The National Association of Sewer Service Companies (NASSCO) Manhole Assessment and Certification Program (MACP) may be adopted or used as a guide to ensure consistency and reliability of evaluation and ranking methodology.

The results from routine manhole inspections and monitoring are used to prioritize areas needing CCTV inspections to assess pipe condition such as manholes with evidence of slow flow or surcharging. Information is recorded and used to schedule maintenance and repairs.

## **CCTV Inspection Program**

While routine cleaning and visual inspection are used to assess the condition of surface facilities and manholes, CCTV video inspections are the primary method used to assess the condition of the sewer pipes. Using conventional defect criteria is highly recommended to provide standardization and consistency in sewer pipe condition



assessment and ranking. The NASSCO Pipeline Assessment and Certification Program (PACP) may be adopted or used as a guide to ensure consistency and reliability of evaluation and ranking methodology.

## **Maintenance Activity Records**

Detailed records and daily logs of O&M work provide valuable information to help managers evaluate the effectiveness of maintenance activities and make adjustments to optimize the use of limited resources. Equipment, manpower and other resources are tracked along with detailed descriptions of defects and/or obstructions encountered including debris, FOG, structural failures, etc. Maintenance work resulting in system modifications or extensions is required to be incorporated into record drawings and system maps. Scheduled testing of emergency and standby equipment is also a requirement of the collection system permit.

These records are required to be reviewed periodically to identify problems that cannot be resolved in a short period of time in order to develop a plan to address the problem(s). Maintaining these records for an extended period of time (5-years or more) will also provide accurate reference points of maintenance investments made over time that will track the effectiveness of operation and maintenance activities.

In the event of a sewer spill or system overflow, maintenance records will need to provide sufficient detail to satisfy reporting requirements for the event, including location(s), volume of wastewater, corrective actions, etc. This data may also be integrated into GIS to allow mapping of these events over time in order to identify patterns and/or trends that will assist with scheduling maintenance and planning rehabilitation and other capital improvements.

## **Resolution of Customer Complaints**

Customer complaints are primarily for sewer backups and odors. Sewer backups require an immediate response to diagnose and resolve the problem. These complaints can occur outside normal business hours, significantly escalating costs. Detailed records of the problems found, and the resources needed to address the failed condition, provide valuable feedback for making adjustments to the preventive maintenance program that can reduce these types of calls and help lower overall maintenance costs.

These records can also identify areas where private service laterals frequently fail. Notifying customers in these areas will allow them the opportunity to address deficiencies proactively, which will also help reduce customer “emergency” calls.

## **Capital Improvements Plan**

A Capital Improvements Plan (CIP) is required by the collection system permit to identify rehabilitation, replacement and expansion needs of the system. The CIP is required to address the short and long-term needs of the system, covering at least a 3 to 5-year planning period, and must include the estimated cost of each capital project.

CIP development incorporates maintenance activity, cleaning and inspection records, and system performance data that may include flow monitoring and hydraulic modeling to evaluate the existing system and to recommend improvements needed to correct existing deficiencies, and ensure adequate capacity is maintained throughout the system.

Capital planning includes consideration of on-going funding for rehabilitation and replacement of the collection system as it wears out, and potential upgrades for expansion as needed.

## **Training Program**

Training programs provide a mechanism for educating employees and establishing their technical competence to perform operations, maintenance, and emergency responses safely and effectively. A combination of in-house skill training and specialized training purchased or provided through state and national associations, conferences and vendor training programs are typically used to build and enhance skills for performing daily work duties. Periodic training reinforces previous efforts, as people often overlook things that are used infrequently. It also provides an opportunity to train new staff and learn about new problems, new techniques, and changes in equipment.

Emergency training educates system personnel about emergency situations and resulting effects on the wastewater system, public health, and environmental impacts. It also provides an opportunity to practice responses. Good record keeping ensures personnel are properly trained and prepared to effectively operate and maintain the collection system under any given circumstance. Regular review of training records is essential for keeping content up-to-date and maintaining proper employee awareness.

## **Equipment and Replacement Parts**

A reasonable supply of equipment and replacement parts should be maintained to fully support all operations and maintenance activities. A detailed inventory is essential to ensure availability under normal operations and emergency conditions. Specialized equipment or parts may be too costly to keep in stock, so arrangements with vendors and/or contractors may be necessary to ensure availability during non-business hours or during emergencies.

## 4.2 STAFFING RECOMMENDATIONS

Cumberland County is responsible for three wastewater collection systems and one water system: NORCRESS, Overhills, Kelly Hills, and Southpoint Water System. While each of these districts maintains its own operating budget, the Board leadership and operational management is performed solely by Cumberland County. Therefore, in consideration of the typical utility system management and operations and maintenance that is necessary for maintaining each of the systems, McGill has considered all of the four (4) utility systems cumulatively. While each system could be analyzed separately, considering the systems together is more consistent with actual management of the systems.

Typical metrics for analyzing full-time equivalent (FTE, representing quantity full-time workers) are based on either the population served by the system or by miles of utility piping (water main or sewer line) within each system. For reference, Table 13 below summarizes the customers and piping in each of the County’s utility systems.

**Table 13: Utility System Comparison**

DISTRICT	Number of Connections		Paying Avail. Fee	Pipe in System (mi.)
	Water	Sewer		
<b>Southpoint</b>	84		129	2.8
<b>Kelly Hills</b>		102	166	4.5
<b>Overhills</b>		107	318	4.0
<b>NORCRESS</b>		452	666	41.1
<b>TOTALS</b>	<b>84</b>	<b>661</b>	<b>1279</b>	<b>52.4</b>

**Table 14: Typical Population vs. Pipe Length**

<b>Population</b>	<b>Pipe in System (mi.)</b>
0-100	5
101-500	5
501-3300	21
3301-10000	62

The typical sizes of utility systems from a community system EPA study<sup>1</sup> are shown in Table 14, and are generally consistent when compared to the County’s systems. This study was selected as a basis for comparison due to its comprehensive nature, having included water systems nationwide in its breadth. NORCRESS is the exception when compared to Table 14. This is mostly likely indicative of the system serving a more rural population where the connection density is less, and resulting from the length of force main piping in the system that increases the overall length but does not contribute to population density. Overall, these metrics were found to be reasonably consistent with the County’s systems. Similarly, the data is consistent regardless of whether the utility system is a water systems or wastewater collection system.

The objective is to make budget-level staffing recommendations for the County’s utility systems based on what is typical across the industry and other utility systems of comparable size. The EPA study utilized provides typical FTE for the roles of manager, plant operator, distribution (and collection, for our purposes), and administrative functions. All of these were considered applicable to management and operation of the County’s utility systems. Note: while the County is not responsible for plant operation in any system, the lift stations in the NORCRESS and Overhills systems are the County’s responsibility, therefore this metric was used, albeit in a smaller percentage, to account for the management of those resources.

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<sup>1</sup> Analysis conducted using excerpts from US EPA document, “National Characteristics of Drinking Water Systems Serving 10,000 or Fewer People,” published July 2011.

Table 15 shows Further utilizing the EPA statistics as base for typical FTE for each of the positions, based on the system size in terms of miles of pipe main.

**Table 15: Average Community System Statistics**

Employee Category	System Size (miles of Main)		Mean	Cumberland County
	Pop. 500-3300	Pop. 3300-10000		
	21	62	41.5	51.7
<b>Manager FTE</b> per mile	0.6	1.1	0.85	1.06
	0.029	0.018	0.020	0.020
<b>Plant Operator FTE</b> per mile	0.6	1.3	0.95	1.03
	0.029	0.021	0.023	0.023
<b>Distribution FTE</b> per mile	0.8	2.5	1.65	2.06
	0.038	0.040	0.040	0.040
<b>Administrative FTE</b> per mile	0.6	1.5	1.05	1.31
	0.029	0.024	0.025	0.025

The green highlighted cells are the calculated FTEs that were applied to estimate staffing size based on the quantity of pipe across the County’s four utility systems. Those calculated FTEs are based on the size of systems managed by the County and reasonable estimate of staffing needed for these systems.

Each of the FTEs is applied to each respective employee category. McGill utilized wage information from Zip Recruiter and a benefits multiplier of 1.38 from the U.S. Bureau of Labor Statistics to develop the summary shown in Table 16.

**Table 16: Overall Salary Estimates**

Employee Category	Hourly Rate	Annual Salary	Ben. Mult.	Total	Applied FTE	Applied Budget Cost
Manager	\$38.50	\$80,080.00	1.38	\$110,510.40	1.06	\$117,000
Operator	\$24.52	\$51,001.60	1.38	\$70,382.21	1.03	\$72,700
Distribution	\$23.57	\$49,025.60	1.38	\$67,655.33	2.06	\$139,100
Administrative	\$21.33	\$44,366.40	1.38	\$61,225.63	1.31	\$80,100
<b>Total Applied Budget Cost Based FTEs</b>						<b>\$408,900</b>

Utilizing industry metrics and comparing to systems of comparable size, McGill offers the proceeding section as a general staffing recommendation. This section and these budget values are provided for preliminary planning purposes only.

Staffing levels appear to be reasonable based on the District's ability to operate and maintain the system while providing a reliable level service to its customers.

While this budget number is higher than the current budget staffing, consideration should also be given to the cumulative effect cost to the County for contracted operation and distribution support in the NORCRESS and Kelly Hills district.





# **APPENDICES**



## **Appendix A**

### **Smoke Testing Results List**



**Overhills Smoke Testing Cleanouts**

Date:		September 19th, 2024	
Facility ID	Status	Notes	
2	Broken		
3	Broken	Cap replaced	
5	Broken		
13	Broken	Smoking from c/o	
15	Broken	Smoking from c/o	
18	Broken		
23	Broken		
26	Broken	Smoking from c/o	
28	Broken		
29	Broken		
42	Broken		
48	Broken		
50	Broken		
10	Broken	No smoke but lid is broken	
53	Broken	Smoking lid needs to be replaced	
	Broken	Lateral broken, smoke around elder valve and ground	
58	Broken		
59	Broken		
66	Broken	Missing elder valve cap	
68	Broken	Both valves smoking and house	
69	Broken		
70	Broken	Cap missing on elder valve	
74	Broken	Smoking from valve	
79	Broken	Elder valve missing cap	
80	Broken		
82	Broken	Lid unscrewed	
87	Broken	Smoking, Replaced on site	
89	Broken	Smoking from c/o	
92	Broken		
94	Broken		
96	Broken	Smoking from c/o	
96	Broken		
97	Broken		
100	Broken	Smoking from valve	
101	Broken	Smoking from c/o	
107	Broken		
116	Broken	Smoking from valve and house	
119	Broken		
121	Broken	Valve and house smoking	
	Broken	Multiple clean outs smoking in yard and from house	
125	Broken		
127	Broken	Smoking from valve	
128	Broken	Smoking from valve	
129	Broken		
136	Broken	Smoking from valve and ground	
139	Broken	Smoking from house and valve	
142	Broken		
143	Broken	Smoking from c/o	
149	Broken		
150	Broken		
152	Broken	Smoking from c/o	
154	Broken	No smoke but cap broken	
157	Broken	Missing cap	
159	Broken	Cap broken no smoke	
160	Broken	Broken	
162	Broken	Broken	
163	Broken		
164	Broken	Broken valve smoking	
165	Broken		
168	Broken	Elder valve cap missing	
169	Broken		
170	Broken		
172	Broken	Lid bent	
175	Broken		
177	Broken	Lid unscrewed	
178	Broken		
180	Broken		
181	Broken		
183	Broken		
184	Broken		
187	Broken		
188	Broken		
201	Broken	Smoking from ground/co	
204	Broken		
206	Broken		
	Broken	Smoking, C/o broken and filled w/trash	
207	Broken		
208	Broken	C/o smoking	
210	Broken		
220	Broken		
225	Broken		
226	Broken	Elder valve lid	
235	Broken	Elder valve cap	
240	Broken		
243	Broken		
247	Broken	Lid loose	
260	Broken	Elder valve	
246	Broken		
266	Broken	Smoking c/o	
264	Broken		
267	Broken		
270	Broken	Smoking	
272	Broken		
273	Broken	Smoking c/o	
285	Broken	Smoking c/o replaced on site	
286	Broken	Cap missing	
317	Broken		
1112	Broken		
1512	Broken		
1513	Broken		
1514	Broken		
2712	Broken		
2713	Broken		

<b>Overhills Smoke Testing Manholes</b>		
<b>Date:</b>		<b>September 19th, 2024</b>
<b>Facility ID</b>	<b>Status</b>	<b>Notes</b>
53	Leak	
54	Leak	Smoking from MH and underneath lift station
62	Leak	
64	Leak	
73	Leak	
99	Leak	MH smoking (inside fence w/ lift station fence locked)
120	Leak	



## **Appendix B**

### **Manhole Inspection List**



# Overhills Manhole Inspection

Date: April 10th, 2024

Manhole/Facility ID	Condition	Notes
7	Good	
11	Good	
16	Good	
17	Good	
21	Good	
25	Good	
26	Good	
30	Good	
35	Poor	
43	Poor	
52	Poor	
56	Good	
60	Poor	
68	Poor	
74	Good	
80	Good	
81	Good	
86	Good	
94	Good	
96	Good	
101	Good	
104	Good	
110	Good	

Total Manhole Inspected	23
Total Good Comdition	18
Total Poor Condition	5



## **Appendix C**

### **Overhills Spring Lake Agreement**



THIS AGREEMENT made and entered into this 8<sup>th</sup> day of September, 2014 by and between the Town of Spring Lake, a North Carolina municipal corporation, (hereinafter referred to as "Spring Lake"), and the County of Cumberland, a North Carolina Body Politic, acting by and through its Overhills Park Water & Sewer District, (hereinafter referred to as "Overhills").

WITNESSETH

THAT WHEREAS, Overhills wishes to contract with Spring Lake to furnish sanitary sewer treatment and provide for the operation and maintenance of the Overhills Park Water & Sewer District in an area as shown on Exhibit "A" attached hereto; and

WHEREAS, Spring Lake has agreed to treat sanitary sewer for Overhills to include operation and maintenance of the sanitary sewer collection system installed by Overhills within the delineated service area according to the following terms and conditions:

1. The sanitary sewer collection system being constructed by Overhills shall be built in accordance with engineering plans and specifications and constructed by a contractor licensed to perform utility construction in North Carolina.

2. Overhills will be responsible for the cost of constructing the sanitary sewer collection system as sized accordingly to serve the delineated service area as approved by USDA with Spring Lake being responsible for upgrades, in materials and line sizing as it may deem necessary.

3. The cost of operation and maintenance of the sanitary sewer collection system is built into the sanitary sewer rate being charged to Overhills as shown on Exhibit "B". Spring Lake shall render accurate monthly bills to Overhills. Such bills shall be computed by multiplying Overhills' sewer flow, expressed in thousand (M) gallons, by the applicable rate per thousand (M) gallons for this customer class. The rate per thousand (M) gallons shall be subject to change annually. Routine operation and maintenance includes: (1) Repair damaged, deteriorated, or broken sewer mains; (2) Repair damaged, deteriorated, or broken sewer service laterals from the main to edge of road right-of-way or easement; (3) Routine maintenance and repair of pump station equipment; (4) Cleaning and rodding of clogged sewer mains; (5) Repair of manholes to include rings and covers; and (6) Other routine maintenance and repairs as needed; (7) Administrative and engineering support of above, as required; (8) 24 hours, 7 days per week on-call dispatch with appropriate response forces; (9) Responding to inquiries by existing and potential users of sanitary sewer service; (10) Investigating and working to resolve complaint issues; (11) Maintaining metered electric service at pumping stations, as well as, chemicals associated with pump station operation.

4. Monthly bills rendered for services as provided hereunder are payable within 30 days from their date, at Spring Lake's office, Town of Spring Lake, P.O. Box 617, Spring Lake, NC 28390.

5. Spring Lake will be responsible for the cost associated with upsizing mains within the delineated Overhills service as may be deemed necessary in order to meet Spring Lake's existing and future sanitary sewer needs which would not be otherwise required for the sanitary sewer collection system being installed by Overhills pursuant to this Agreement.

6. All sanitary sewer lines installed by Overhills that are funded with USDA loan and/or grant funds will not be charged a capacity or impact fee and shall be owned and operated by Overhills subject to Spring Lake's right to upsize such mains at its expense and to transmit sanitary sewer through such mains to areas beyond the Overhills area.



7. Overhills will acquire all rights-of-way and/or encroachments as may be needed for construction of the sanitary sewer collection system as referenced herein. Spring Lake currently controls an existing easement that was dedicated to the Town of Spring Lake for the sole purpose of constructing a lift station to serve the Overhills Park Subdivision. The Town of Spring Lake will not charge Overhills any fees for the use of the easement and Overhills will own the lift station.

8. Spring Lake reserves the right to extend or continue sanitary sewer mains from such mains as initially constructed by Overhills to points outside of the delineated Overhills service area. Future connections or main extensions that occur outside of the delineated Overhills area are not subject to this Agreement and shall be the property of Spring Lake unless the Overhills boundary is expanded by mutual agreement of the parties herein in order to serve development of contiguous properties.

9. The further extension of or connection to mains within the delineated Overhills service area will be pursuant to applicable extension and connection policies and procedures of Overhills in effect at the time a request for service is made.

10. Overhills may by resolution adopt a policy whereby future customers and/or extenders of sanitary sewer infrastructure in the Overhills service area will be subject to the then current applicable Spring Lake Policies and Procedures to simplify the application process for customers with the understanding that such customers remain responsible to Overhills for compliance with such policies and procedures.

11. Laterals not installed during the initial sanitary sewer collection system as constructed by Overhills will be subject to the applicable lateral charge and facility investment fee charged by Spring Lake. Overhills customers will not be charged a main charge by Spring Lake if located within the Overhills service area on mains installed by Overhills.

12. Annual Notification of Anticipated Usage and Restriction: (a) Spring Lake reserves the right and authority to limit the annual increase in usage by Overhills to an amount not greater than 20% of the previous calendar year's usage. However, additional limits may be imposed if an outside agency having jurisdiction over the treatment facilities requires restrictions on increases in usage on the Spring Lake's system. Consideration will be given on a case-by-case basis to address anticipated sanitary sewer needs in excess of the above stated 20% increase; (b) any limitations or restrictions on sanitary sewer usage due to situations beyond Spring Lake's control will also apply to Overhills. Overhills will be responsible to ensure the individual sanitary sewer customers on its system comply with these restrictions or limitations.

13. The term of this Agreement may be amended by written agreement between Spring Lake and Overhills. The term of this Agreement is for five years from Sept. 8, 2014, and at the end of each anniversary date of this Agreement, the termination date of the term of this Agreement shall automatically extend for an additional period of one year unless terminated by said parties giving not less than two years written notice to the other party including the initial term or by mutual consent of both parties.

14. *Severability*: It is hereby declared to be the intention of Spring Lake and Overhills that the paragraphs, sentences, clauses and phrases of this Agreement are severable. If one or more paragraphs, sections, sentences, clauses or phrases shall be declared void, invalid or otherwise unenforceable for any reason by valid and final judgment or decree of any court of competent jurisdiction, such judgment or decree shall not affect the remaining provisions of this Agreement and the same shall continue to be fully effective and enforceable on the basis that said remaining provisions would have been agreed to by Spring Lake and Overhills without the incorporation of such void, invalid or otherwise unenforceable paragraph, section, sentence, clause or phrase.

15. *Notices:* Whenever written notices are required under this Agreement, said notice shall be in writing and shall be delivered personally or shall be sent by prepaid registered or certified mail. If notice is mailed to Spring Lake, it should be addressed as follows:

Mayor, Town of Spring Lake  
P.O. Box 617  
Spring Lake, NC 28390

If notice is mailed to Overhills, it should be addressed as follows:

Chairman, Board of Governors  
Overhills Park Water & Sewer District  
P.O. Box 1829  
Fayetteville, NC 28302-1829

Either party may change its mailing address by giving written notice of the new address. Unless so changed, the addresses set forth above shall apply.

18. *Binding Effect:* This contract shall be binding upon and inure to the benefit of the parties hereto, their heirs, successors and assigns.

19. *Entire Agreement:* This contract contains the entire agreement of the parties and there are no representations, inducements or other provisions other than those expressed in writing.

20. *Governing Law:* This contract shall be governed by the laws of the State of North Carolina.

IN WITNESS WHEREOF, the parties hereto through their duly authorized officers has executed this contract as to the date and year first above written.

OVERHILLS PARK WATER & SEWER DISTRICT



ATTEST:

Candice White  
Candice White, Clerk to the Board

By: Jeannette M. Council  
Jeannette M. Council, Chair

APPROVED for Legal Sufficiency  
OVERHILLS PARK Water & Sewer District  
Attorney

Rick L. Moorefield  
Rick L. Moorefield, County Attorney  
Attorney for OVERHILLS PARK  
*it properly executed*

This instrument has been pre-audited in the manner required by the Local Government Budget and Fiscal Control Act.

Melissa Cardinali  
Melissa Cardinali, Finance Director  
Finance Officer for OVERHILLS PARK

THE TOWN OF SPRING LAKE



ATTEST:

Rhonda Webb  
Rhonda Webb, Town Clerk

By: Chris V. Rey  
Chris V. Rey, Mayor

APPROVED, as to form this 8<sup>th</sup> day of September, 2014.

Robert A. Buzzard  
Robert A. Buzzard  
Spring Lake Attorney

This instrument has been preaudited in the manner required by the Local Government Budget and Fiscal Control Act.

Tina J. West  
Allen L. Coats, Finance Director  
Financial Officer for Spring Lake  
Tina J. West, Interim Finance Director

NORTH CAROLINA - CUMBERLAND COUNTY

I, \_\_\_\_\_, a Notary Public of said County and State do hereby certify that \_\_\_\_\_ personally appeared before me this day and acknowledged that he/she is the Clerk to the Board of the OVERHILLS PARK Water and Sewer District, and that the authority duly given and as the act of said, the foregoing instrument was signed in its name by its Chairman, sealed with its corporate seal and attested by himself/herself as its \_\_\_\_\_.

WITNESS my hand and Notarial Seal, this the \_\_\_\_ day of \_\_\_\_\_, 2014.

My Commission Expires: \_\_\_\_\_

\_\_\_\_\_  
Notary Public

NORTH CAROLINA - CUMBERLAND COUNTY

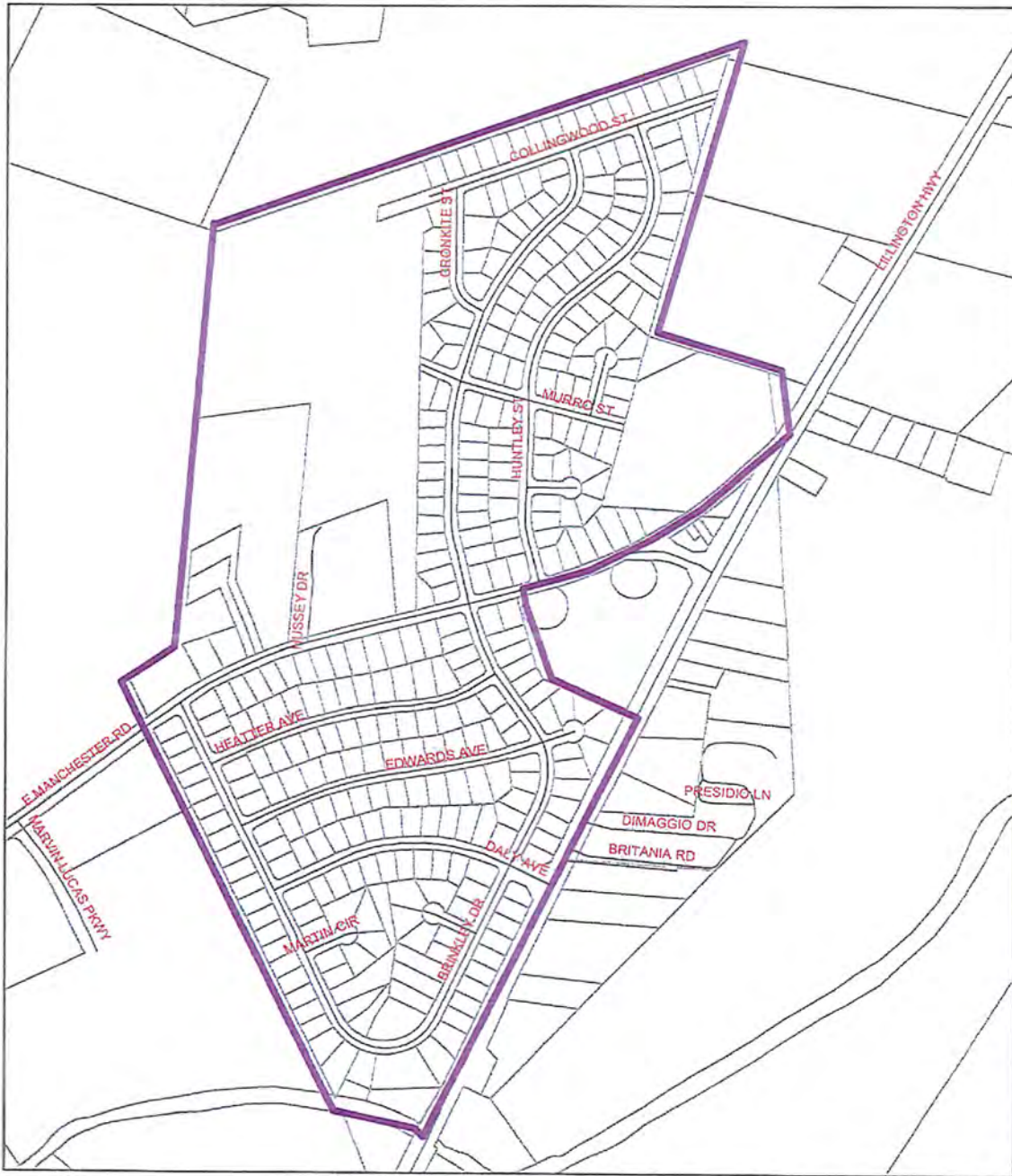
I, Patricia M. Hickman, a Notary Public of said County and State do hereby certify that Khonda D. Webb, personally appeared before me this day and acknowledged that she is Clerk of The Town of Spring Lake, North Carolina, and that the authority duly given and as the act of the agency, the foregoing instrument was signed in its name by its Mayor, sealed with its seal and attested by himself/herself as the Town Clerk.

WITNESS my hand and Notarial Seal, this the 8<sup>th</sup> day of September, 2014.

My Commission Expires:  
November 26, 2016

Patricia M. Hickman  
Notary Public  


Exhibit A



OVERHILLS PARK WATER & SEWER DISTRICT

## Exhibit B

### Rate Schedule

\$4.00 per thousand gallons

\$9.25 per tap



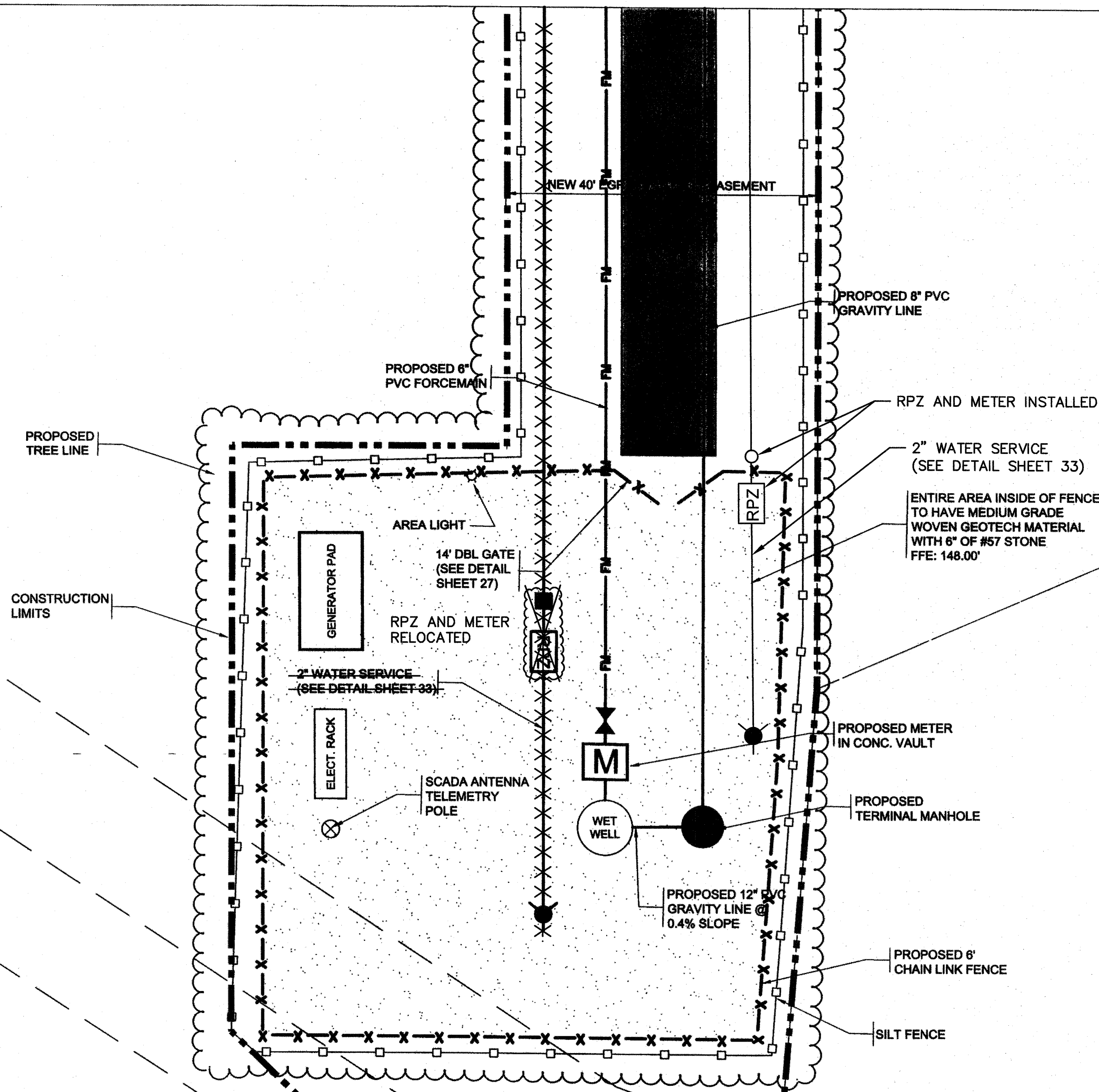


## **Appendix D**

### **Lift Station Record Drawings**



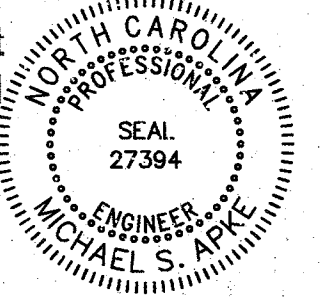
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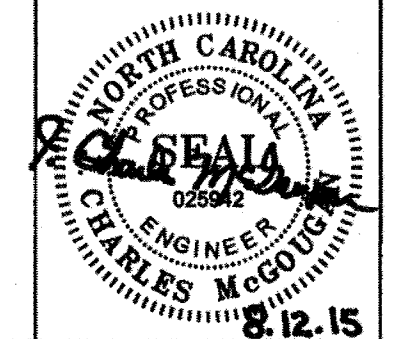
By *Michael S. Apple* Date *8/2/19*

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LEGEND			
	NEW FORCEMAIN		WETLANDS
	NEW GRAVITY LINE		NEW ACCESS ROAD
	EASEMENT LINE		NEW 6" #57 STONE
	PROPERTY LINE		EXIST. ROAD
	WETLANDS BUFFER		NEW MANHOLE
	EXIST. WATER LINE		
	CHAIN LINK FENCE		
	NEW CONTOUR		
	EXIST. CONTOUR		

**PS-1  
BRINKLEY DRIVE PUMP STATION  
SITE PLAN**  
SCALE: 1"=10'

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JCM	6/15/15	ADDED CONST. LIMITS/CONST. ENTR. NOTES	

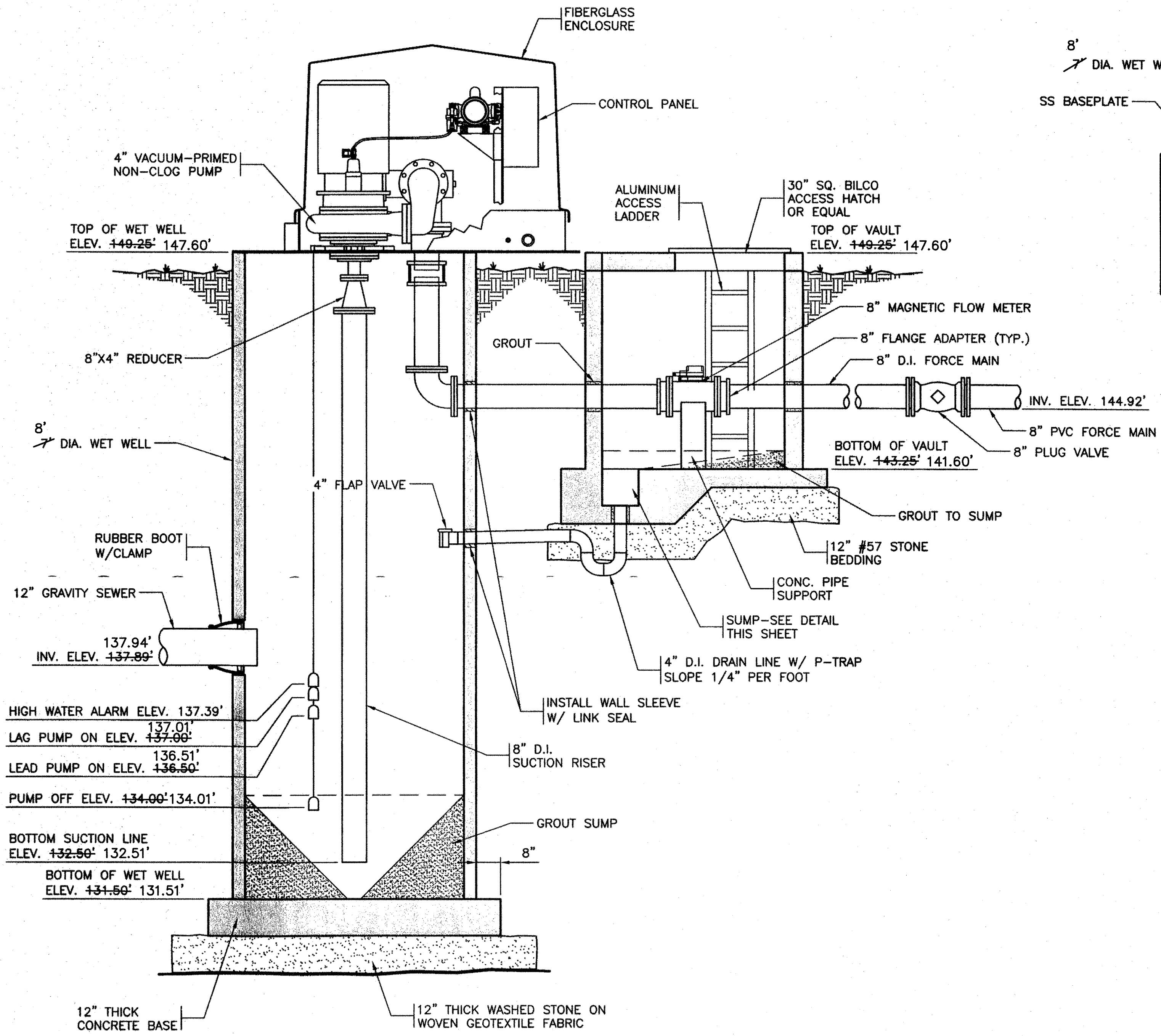


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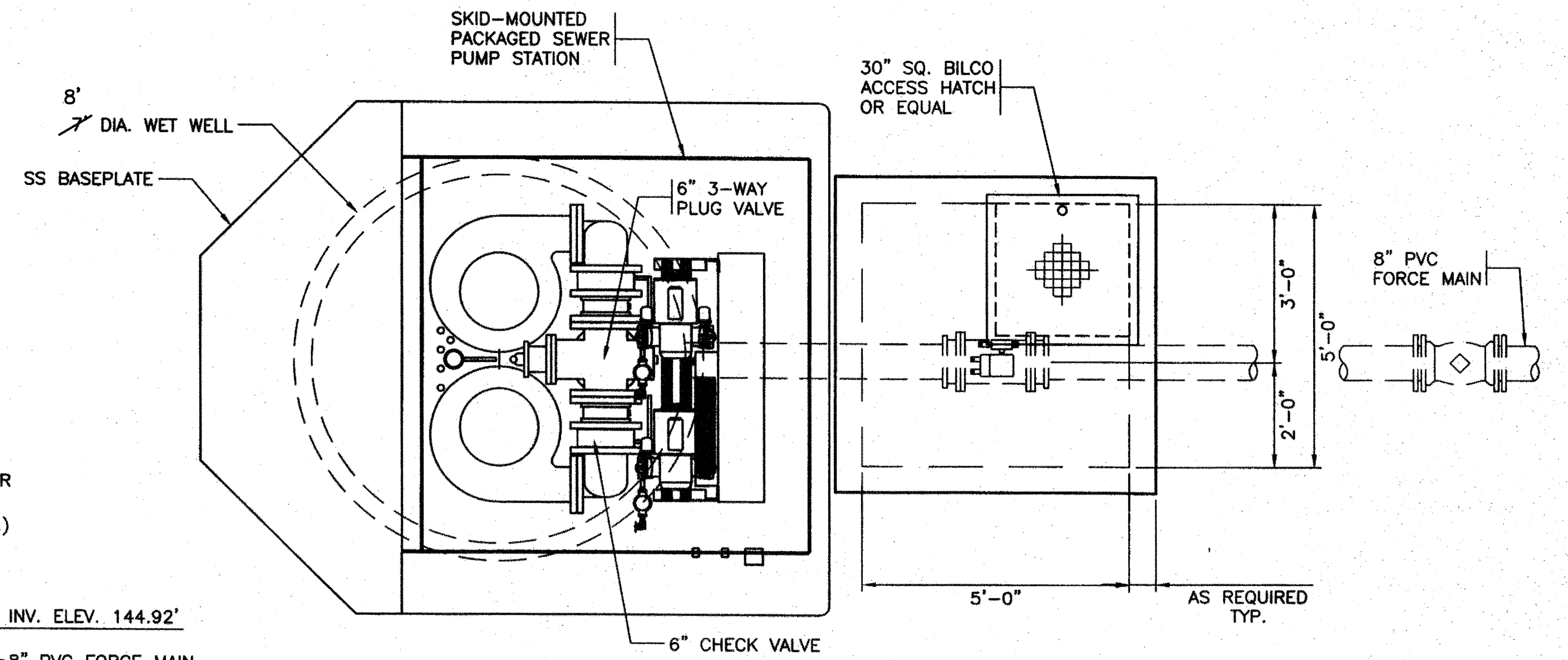
**BRINKLEY DRIVE PUMP STATION SITE PLAN**

**OVERHILLS SUBDIVISION WASTEWATER SERVICE**  
Cumberland County, North Carolina

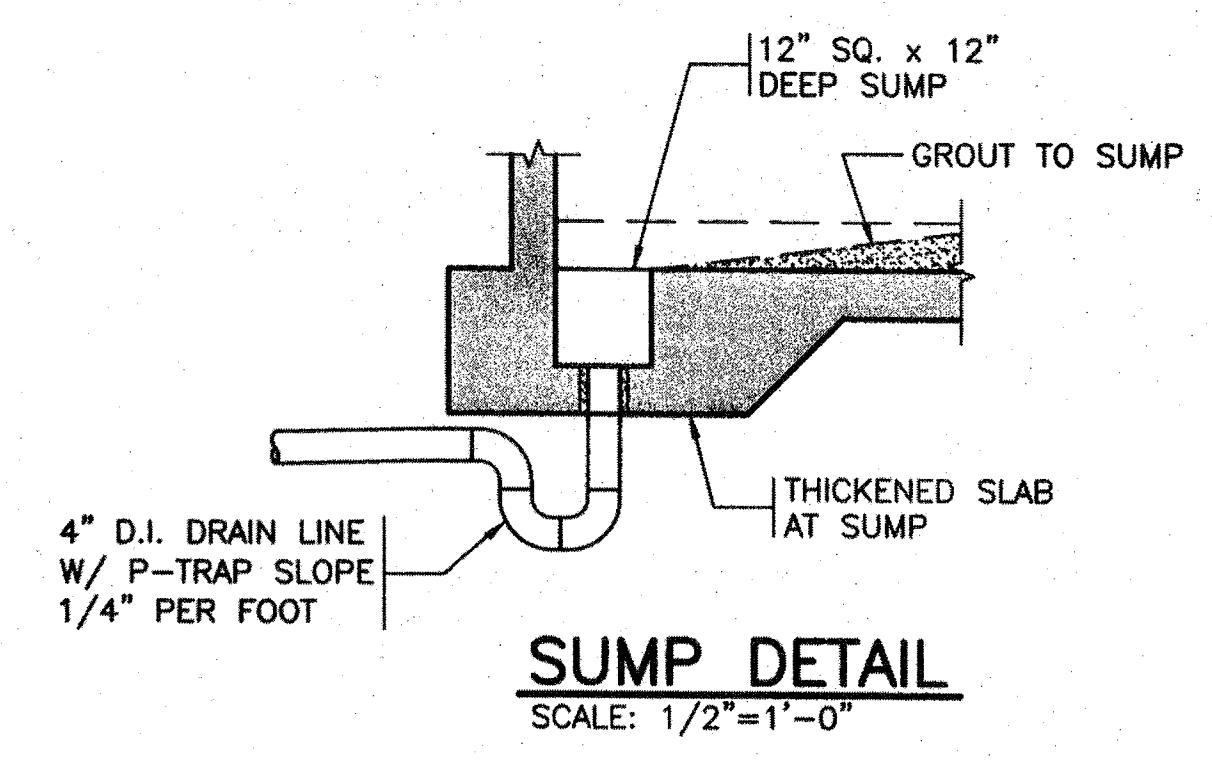
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**BRINKLEY DR PUMP STATION**  
**ELEVATION VIEW**  
 SCALE: 1/2" = 1'-0"



**BRINKLEY DR PUMP STATION**  
**PLAN VIEW**  
 SCALE: 1/2" = 1'-0"



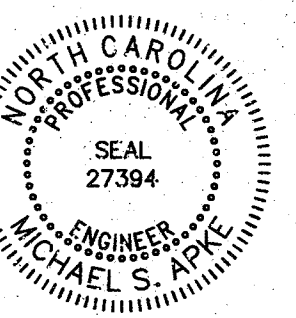
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 SCALE: 1/2" = 1'-0"

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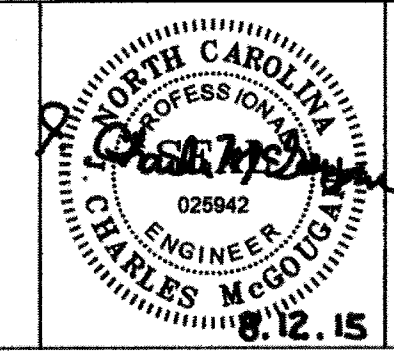
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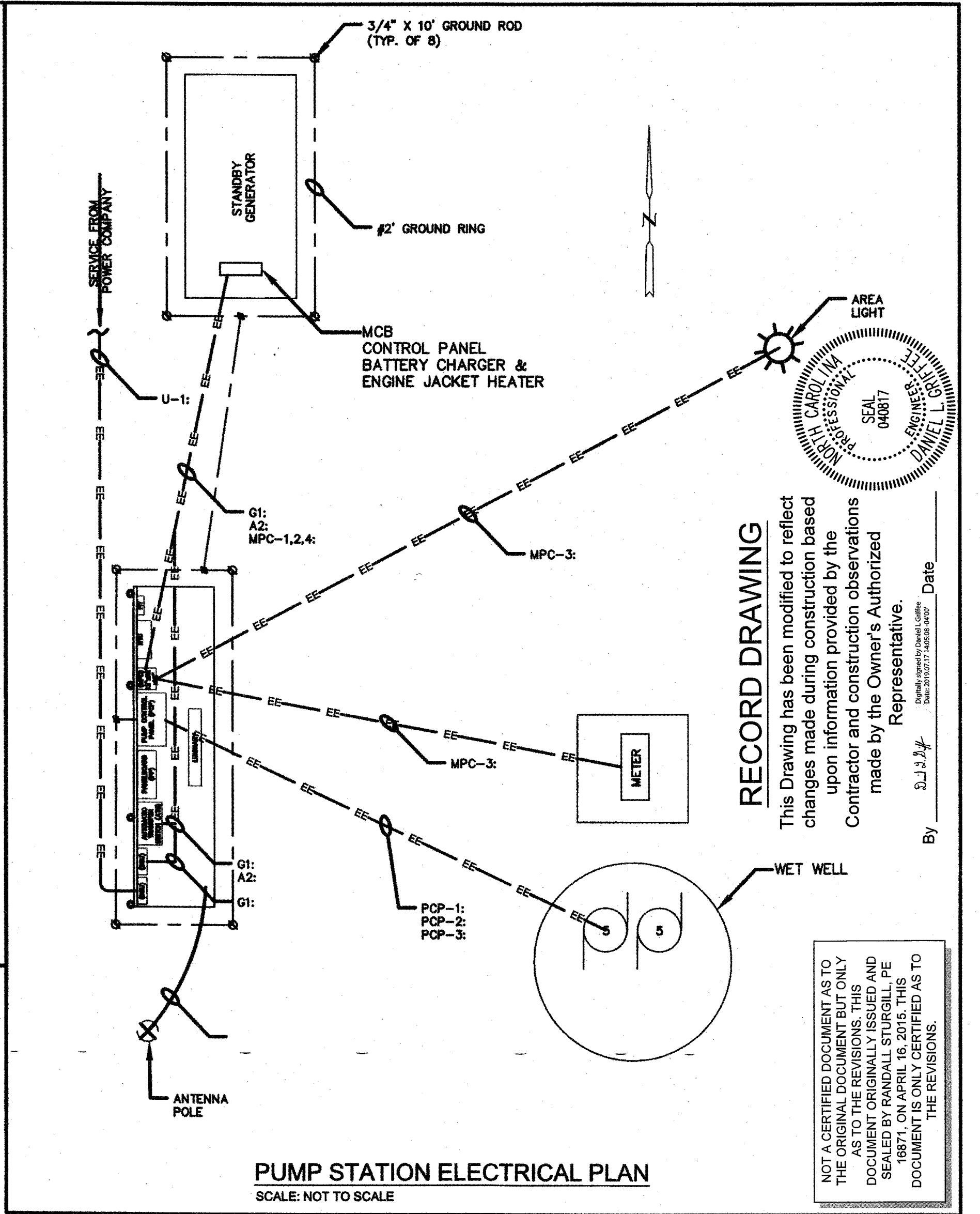
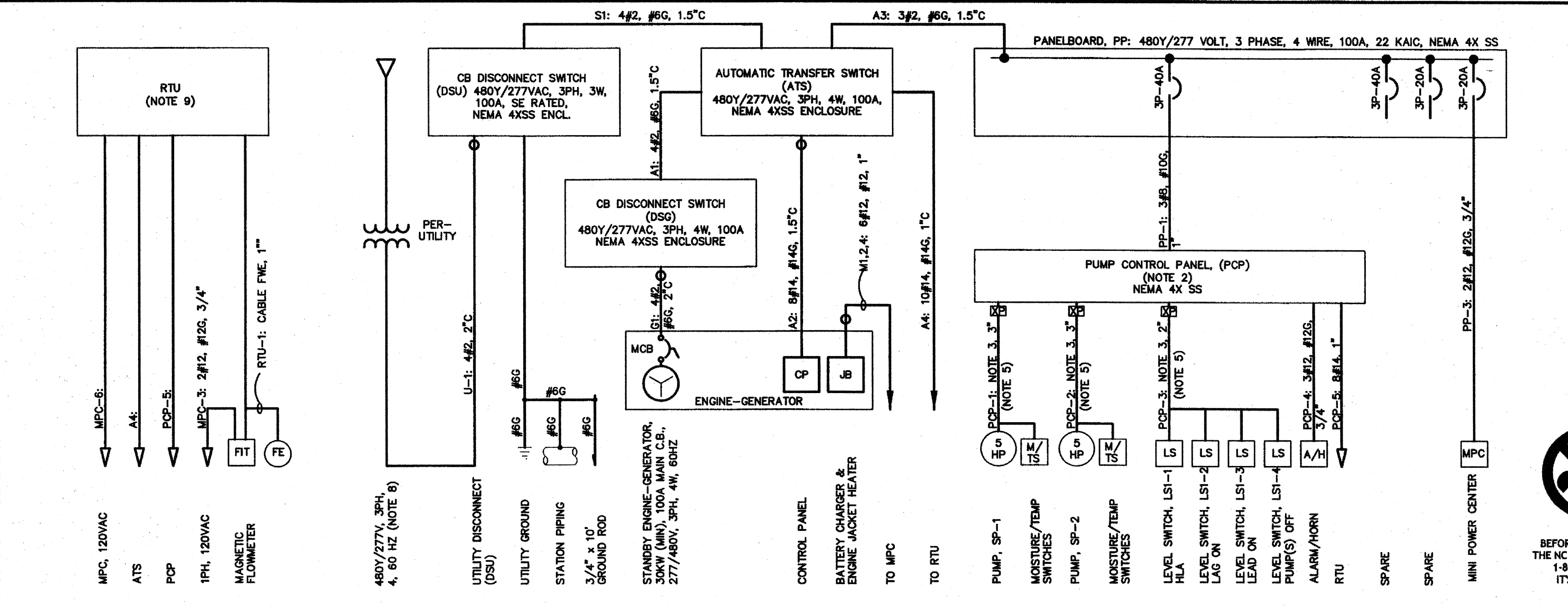
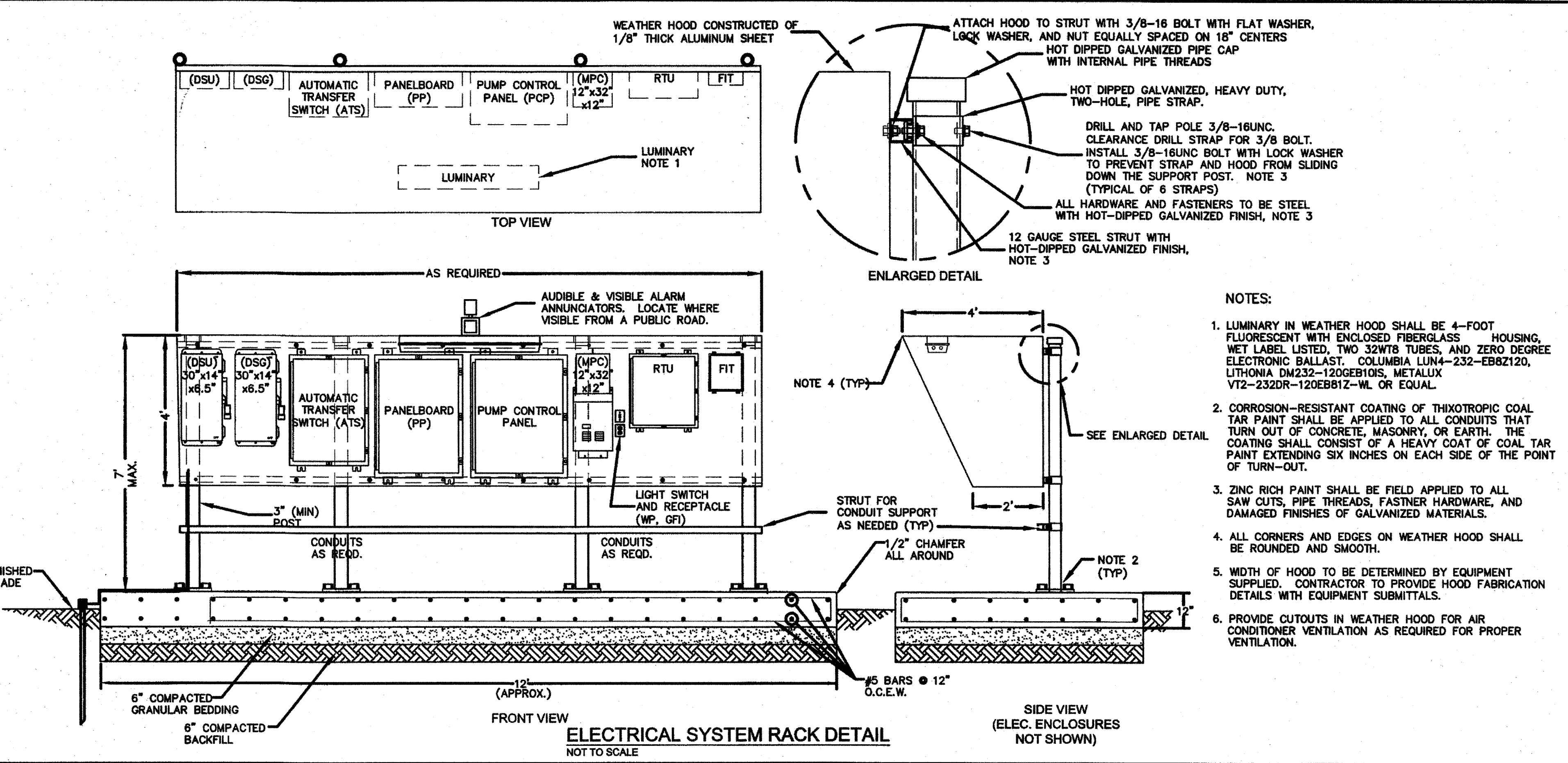
**BRINKLEY DRIVE**  
**PUMP STATION**  
**PLAN & DETAILS**

**OVERHILLS SUBDIVISION**  
**WASTEWATER SERVICE**  
 Cumberland County, North Carolina

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Job No.: 29001	Of: 33 Version:



PROJECT NAME: Overhills Subdivision Wastewater Service, P.A. Consultant: MBD Consulting Engineers, P.A. Combined County - Overhills Subdivision Wastewater Service, P.A. Consultant: MBD Consulting Engineers, P.A. Date: 12/16/2014 - 0.1



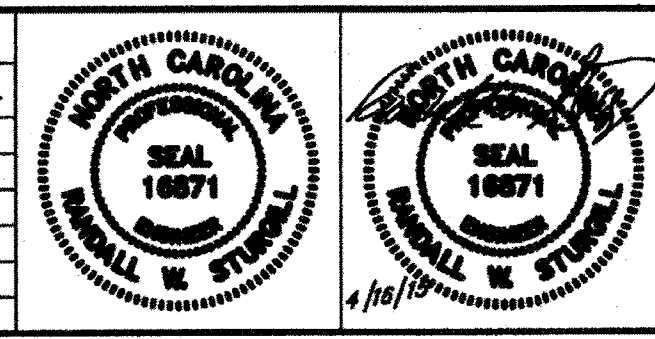
PANELBOARD: MPC		BUS: AS REQ'D		MAIN CB: 20A-2P XFMR PRIMARY	
SERVICE: 480 - 120/240 VAC, 1PH		RATING: 5 KVA		MAIN CB: 30A-2P XFMR SECONDARY	
MOUNTING: POST, NEMA 3R SS		LOCATION: PUMP STATION		LOCATION: PUMP STATION	
LOAD	AMP	POLE	CKT #	POLE	AMP
BATTERY CHARGER	20	1P	1	2P	20
MAG METER	20	1P	3	4	
SPARE	20	1P	5	6	1P
SPARE	20	1P	7	8	1P
HOOD LIGHT AND RECEPTACLE	20	1P	9	10	1P
SPARE	20	1P	11	12	1P

- NOTES:**
- SEE SHEET E1 FOR LEGEND, ABBREVIATIONS AND GENERAL NOTES.
  - CONTROL PANEL PROVIDED WITH EQUIPMENT AND INSTALLED BY CONTRACTOR.
  - CABLE PROVIDED WITH PUMPS, LEVEL PROBE, FLOATS. CONDUIT AND INSTALLATION BY CONTRACTOR.
  - COORDINATE EXACT LOCATION OF EQUIPMENT PRIOR TO INSTALLATION.
  - WETWELL AREA IS DEFINED HAZARDOUS, CLASS 1, DIVISION 1, GROUP D BY THE NEC. ALL CONDUITS ENTERING THE HAZARDOUS AREAS SHALL BE RIGID STEEL AND PROVIDED WITH SUITABLE SEAL-OFFS.
  - ALL CONDUIT TURN-UPS SHALL BE RIGID STEEL.
  - AS ALLOWED BY CODE AND UNLESS OTHERWISE NOTED, PVC SCHEDULE 40 OR 80 IS ACCEPTABLE FOR UNDERGROUND CONDUITS. UP SIZE SCHEDULE 80 AS REQUIRED.
  - UNDERGROUND SERVICE REQUIRED FROM UTILITY TO SERVICE DISCONNECT. ANY UTILITY CHARGES TO BE PAID BY CONTRACTOR.
  - RTU PANEL SHALL BE PER TOWN OF SPRING LAKE REQUIREMENTS.



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BY	DATE	DESCRIPTION	SYM.



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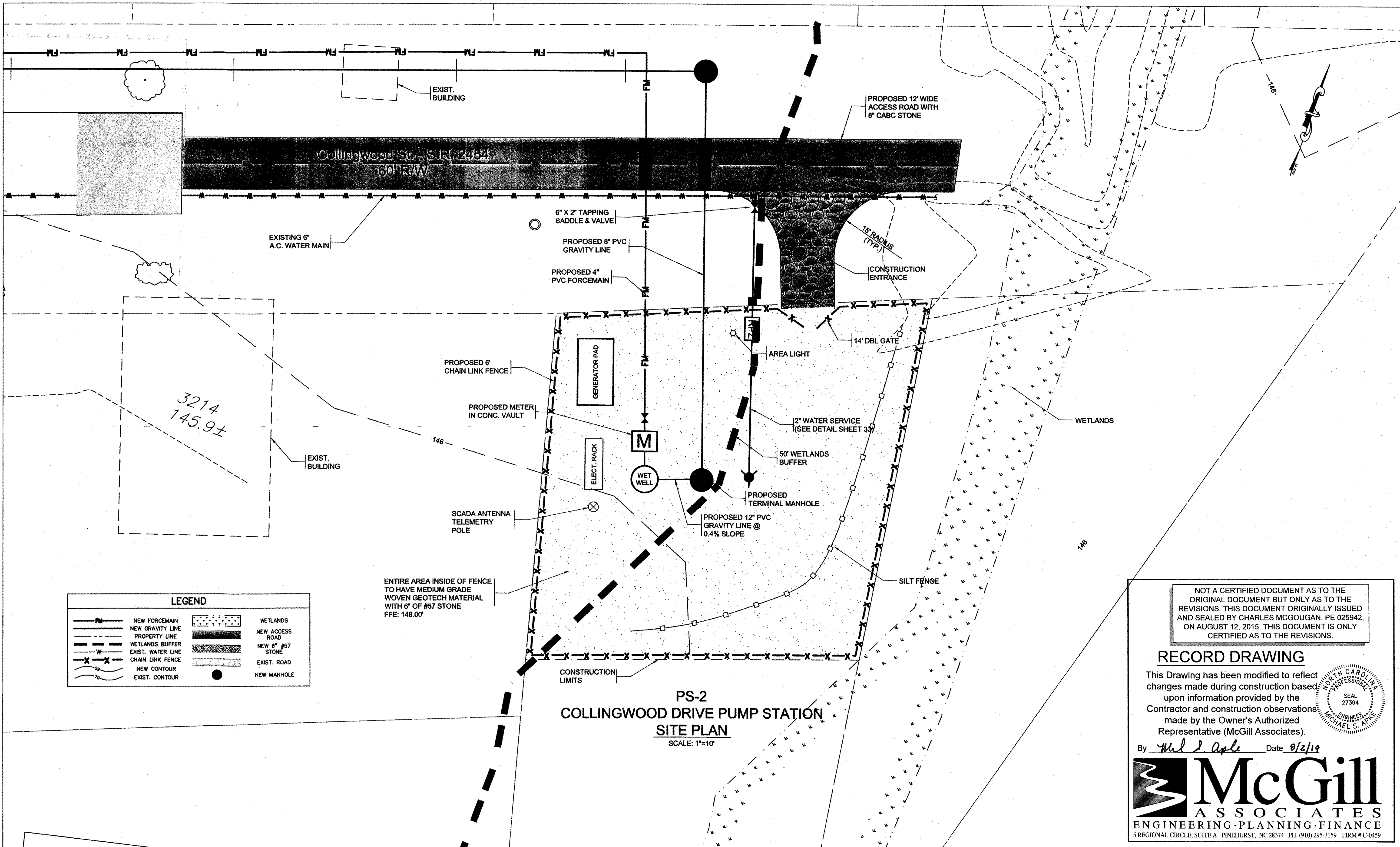
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ASHEBORO, NC 27204  
Phone: (336) 629-3931  
Fax (336) 629-3932

**PUMP STATION NO. 1  
BRINKLEY DRIVE  
ELECTRICAL SITE PLAN  
AND ONE-LINE DIAGRAM**

**OVERHILLS SUBDIVISION  
WASTEWATER SERVICE  
Cumberland County, North Carolina**

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**LEGEND**

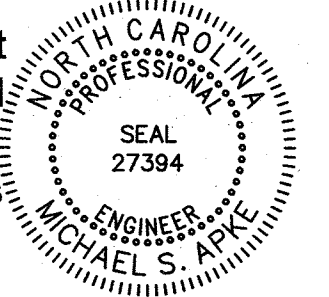
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	NEW GRAVITY LINE		NEW ACCESS ROAD
	PROPERTY LINE		NEW 6\"/>
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	EXIST. WATER LINE		NEW MANHOLE
	CHAIN LINK FENCE		
	NEW CONTOUR		
	EXIST. CONTOUR		

**PS-2  
COLLINGWOOD DRIVE PUMP STATION  
SITE PLAN**  
SCALE: 1"=10'

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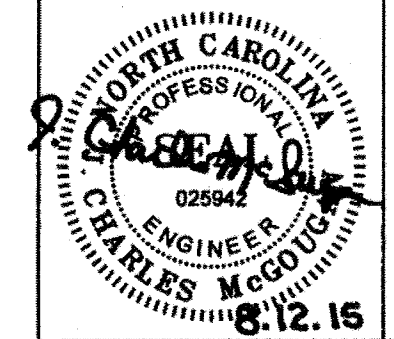
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By Michael S. Apple Date 8/2/19



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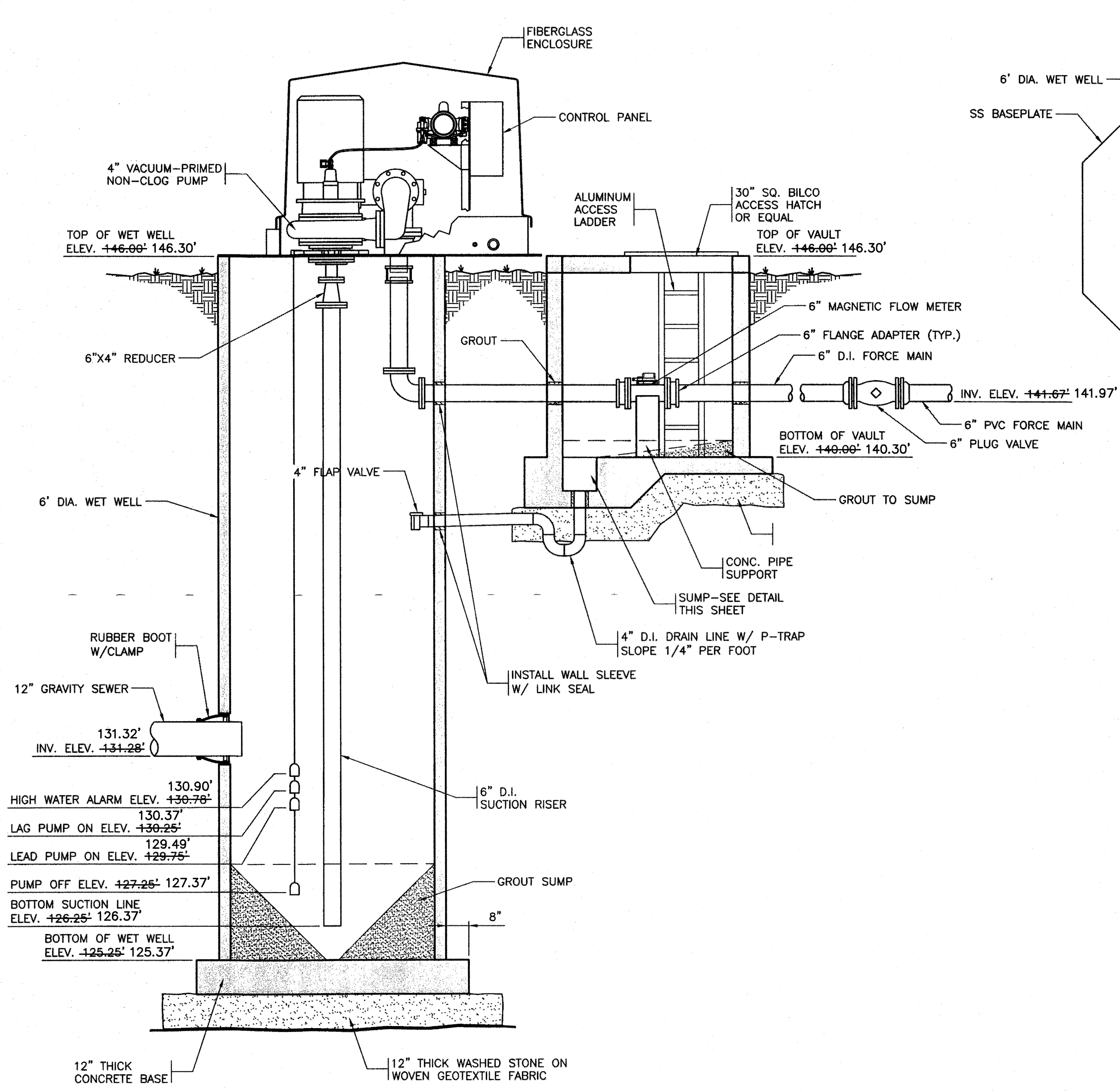


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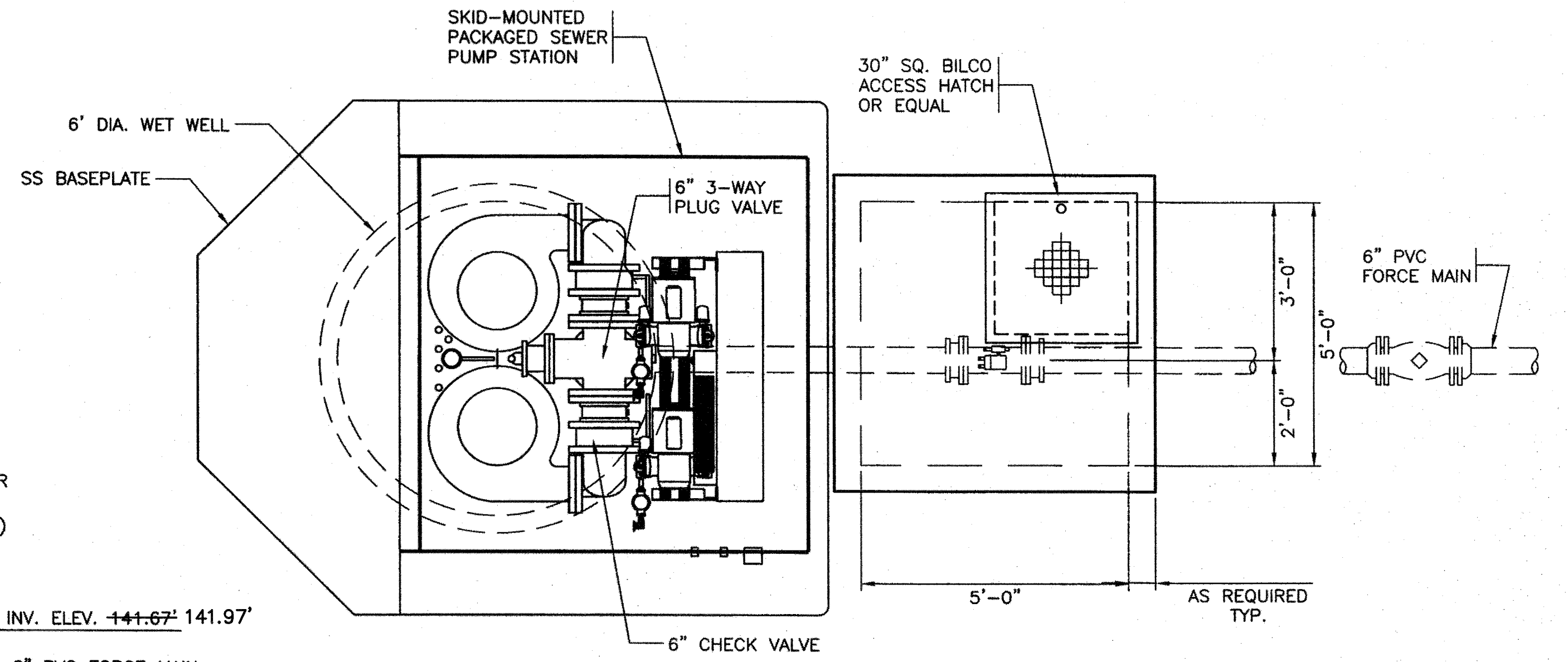
**COLLINGWOOD DRIVE  
PUMP STATION  
SITE PLAN**

**OVERHILLS SUBDIVISION  
WASTEWATER SERVICE**  
Cumberland County, North Carolina

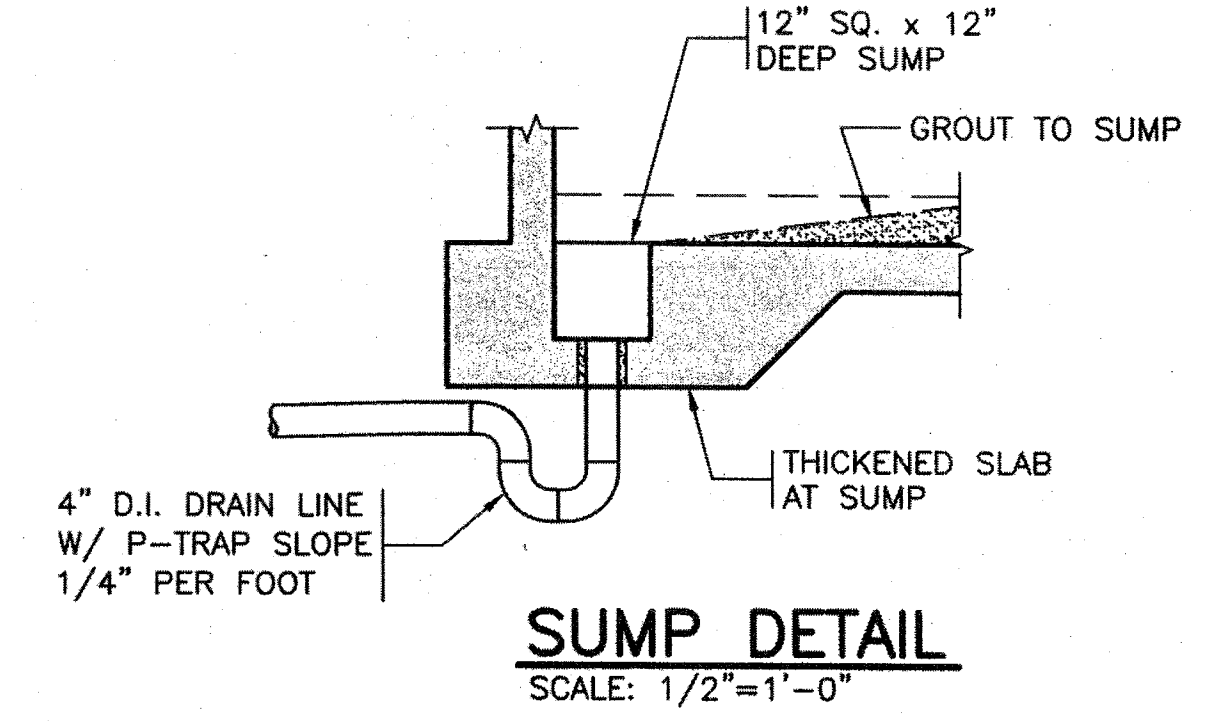
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Job No.: 29001	Of: 33 Version: 1



**COLLINGWOOD DR PUMP STATION**  
**ELEVATION VIEW**  
 SCALE: 1/2"=1'-0"



**COLLINGWOOD DR PUMP STATION**  
**PLAN VIEW**  
 SCALE: 1/2"=1'-0"

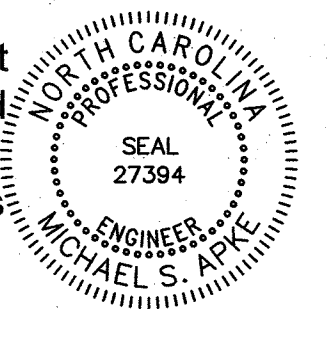


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 SCALE: 1/2"=1'-0"

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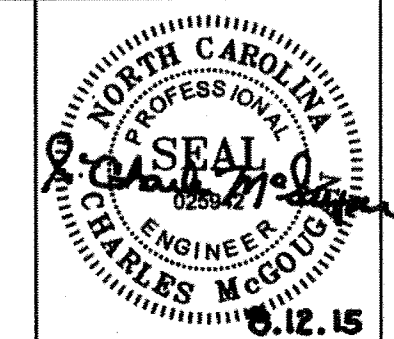
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**COLLINGWOOD DRIVE**  
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**PLAN & DETAILS**

**OVERHILLS SUBDIVISION**  
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 Cumberland County, North Carolina

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**WATER ASSET MANAGEMENT PLAN**

**SOUTHPOINT SUBDIVISION WATER SYSTEM**  
**GRAYS CREEK WATER AND SEWER DISTRICT**

**CUMBERLAND COUNTY, NC**



PINEHURST, NORTH CAROLINA

**WATER ASSET MANAGEMENT PLAN**

**SOUTHPOINT SUBDIVISION WATER SYSTEM**  
**GRAYS CREEK WATER AND SEWER DISTRICT**

**CUMBERLAND COUNTY, NC**

**MATTHEW JONES, PE**  
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**AUGUST 2025**

**PROJECT NO. 20.02507**

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<b>Appendix B – 2013 O&amp;M Plan for Cumberland County Water System</b>
<b>Appendix C – NC0309055 Well Treatment Process Summary</b>
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## EXECUTIVE SUMMARY

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The purpose of this Asset Management Plan (AMP) is to inventory and document the condition of the water infrastructure for Southpoint Subdivision's Water System within the Gray's Creek Water and Sewer District. This will assist the County in becoming more proactive in the management and financing of its water system. The Southpoint Subdivision is a community located in Cumberland County. Cumberland County purchases potable water from the Bladen County Regional Water System and distributes the water to the Southpoint Subdivision and the adjacent community in southern Cumberland County.

The County does not have a previous Asset Management Plan for the water system, therefore this development process has resulted in the assembly of an AMP and 10-year Capital Improvements Plan (CIP) to guide the County with prioritizing capital projects and equipment purchases necessary to rehabilitate and maintain its water system.

This Asset Management Plan seeks to provide a foundation for evaluating the Southpoint Subdivision's distribution system. To address existing system deficiencies and improve overall operations, capital improvement projects are recommended for implementation within a 10-year planning period. An operation and maintenance plan is also provided to ensure long-term system efficiency and reliability. This report was prepared per NCDEQ Division of Water Infrastructure Asset Management Guidance, system operator knowledge, field work conducted by McGill Associates (McGill), Local Water Supply Plan information, and system mapping information prepared by McGill as a result of the field work.

Developing a Capital Improvements Plan (CIP) will allow the County to update its current rate setting model to better estimate future revenue and expenses, capital outlay, indebtedness, and overall health of the water distribution system enterprise fund reserves. A model of this nature would continue to balance revenues and expenditures with a longer-term approach to rate setting and establish a financially sound framework for the County to follow. This plan also includes a budget-level recommendation for staffing associated with system operations and maintenance for all County utility districts.

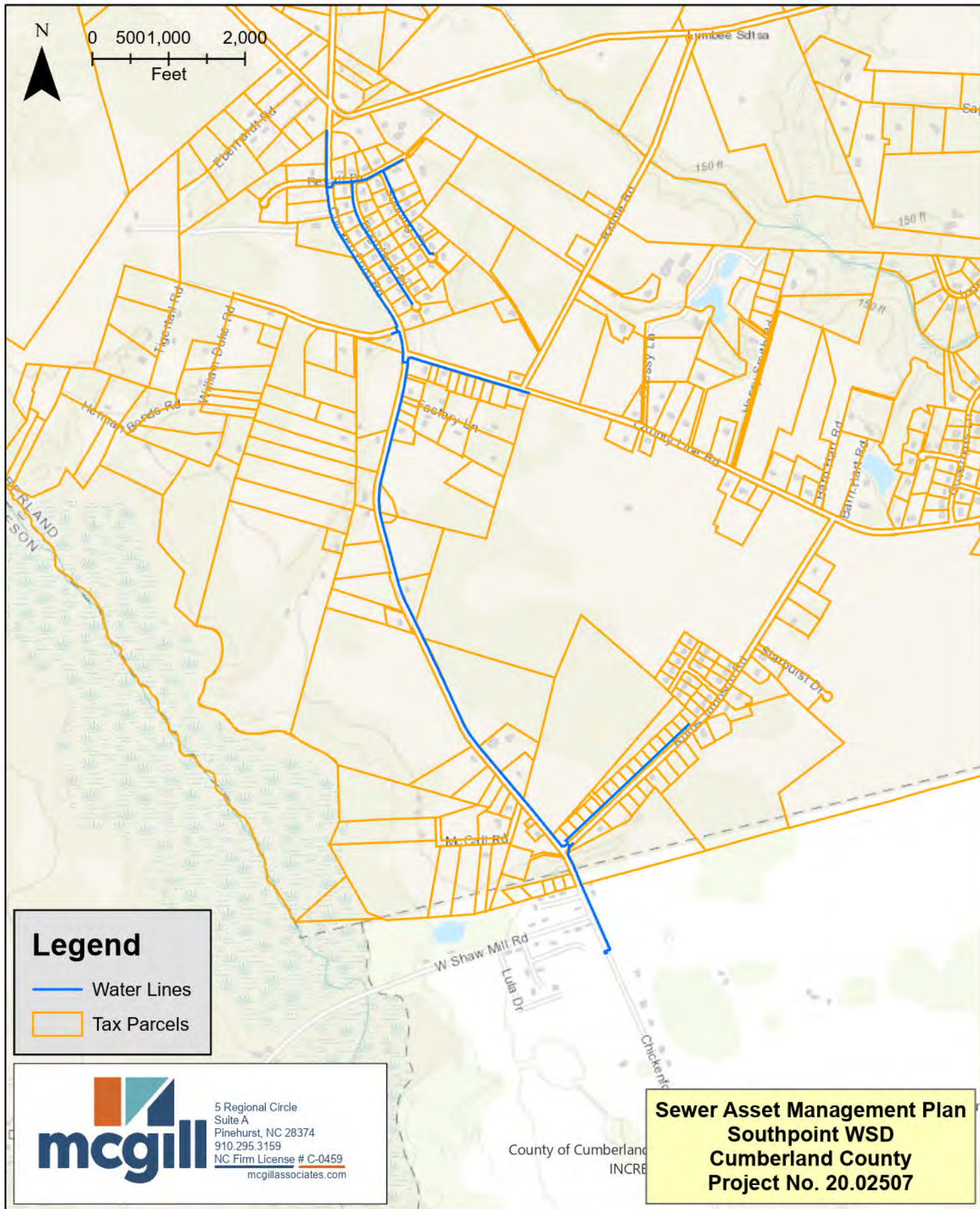
**1.1 BACKGROUND**

The Southpoint Subdivision Water System is in the Gray's Creek Water and Sewer District, located in Cumberland County, North Carolina, and is owned and operated by Cumberland County. The Southpoint Water District includes a water distribution system that currently serves 84 residential connections. Southpoint's Water Distribution System includes approximately 16,900 LF of 6-inch, 8-inch, and 12-inch water main, 12 hydrants, and 84 water meter service connections. The water mains are constructed of PVC pipe and were put into service in 2013. According to the 2022 Local Water Supply Plan (LWSP), the Southpoint community purchased a daily average of 0.0105 MGD of water from Bladen County. Figure 1 shows the current system.

The water source for the Southpoint water system is the Tobemory Well (#9) in the Bladen County Water Distribution-West Bladen water system, PWS ID 0309055. According to the Source Water Assessment Program (SWAP) Report for 2020, the well has a depth of 98 feet and yields water at 300 gallons per minute. Excerpted pages from the SWAP are included in orthophosphate used for corrosion control, Bladen County treats the water at Tobemory Well for iron through pressure sand filtration and for organics through granular activated carbon (GAC).



# Overall System Map Figure 1



## 1.2 EXISTING WATER DISTRIBUTION SYSTEM

The Southpoint water distribution system consists of 84 metered connections and approximately three miles of water distribution pipes, comprised of polyvinyl chloride, and ranging in size from 6-inches to 12-inches in diameter. Based on record drawing review and field work completed by McGill as part of this project, the system includes 12 fire hydrants and six valves. The system was put into service in 2013. The County reports no known issues with the existing system equipment.

Table 1 summarizes the existing assets within the water distribution system. Figure 2 shows the location of hydrants and valves within the system, and Figure 3 shows the diameter of existing water main.

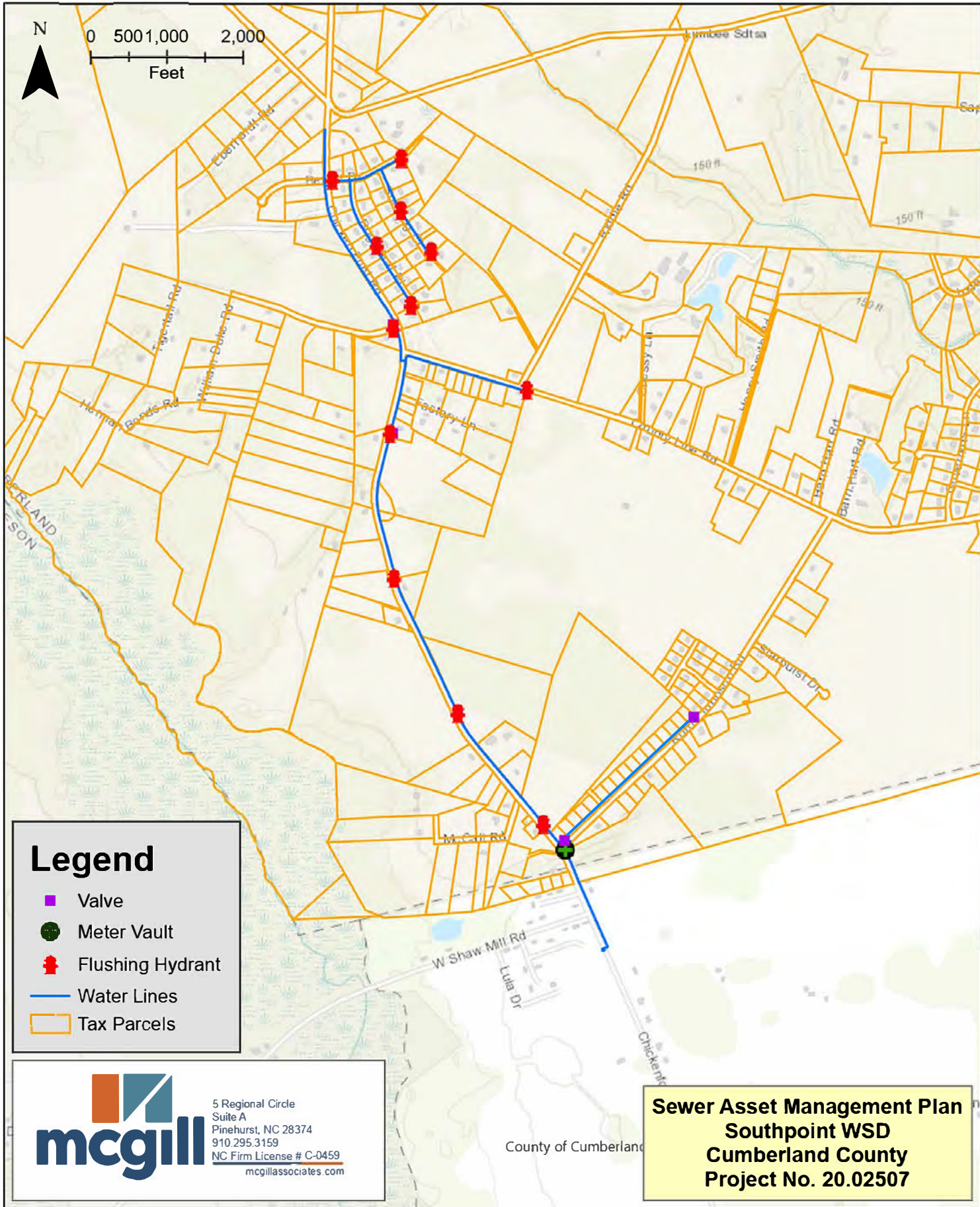
**Table 1: Water Distribution System Inventory**

<b>Asset</b>	<b>Size Range (in)</b>	<b>Estimated Length (feet)</b>
Polyvinyl Chloride Pipe	6-12	16,900
Valves	6-12	6
Fire Hydrants	N/A	12
Water Meters	N/A	81



# Hydrants and Valves Map

## Figure 2



### Legend

- Valve
- Meter Vault
- Flushing Hydrant
- Water Lines
- Tax Parcels



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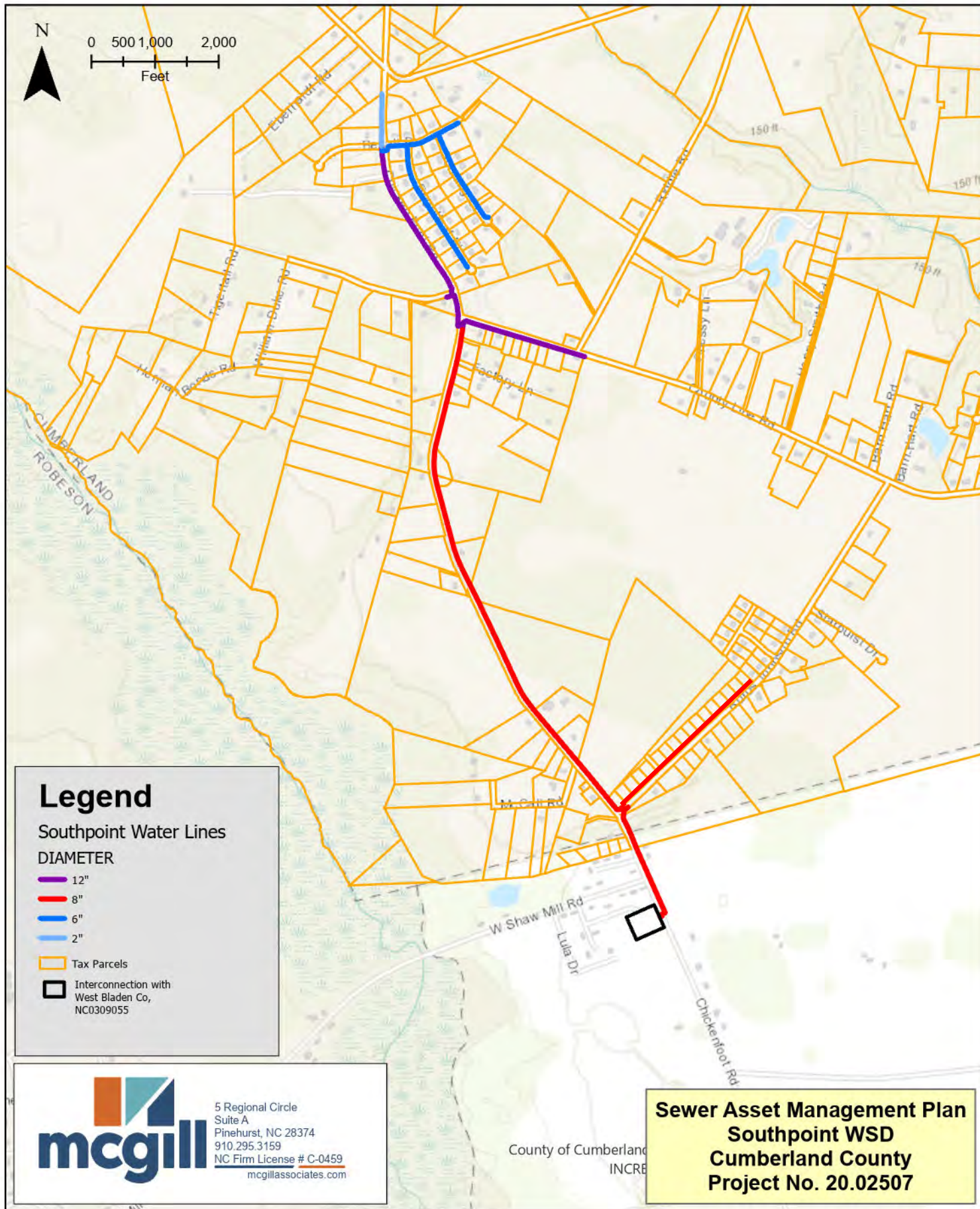
**Sewer Asset Management Plan**  
**Southpoint WSD**  
**Cumberland County**  
**Project No. 20.02507**

County of Cumberland



# Water Line Diameter Map

## Figure 3



## 2.0

## CONDITION ASSESSMENT

### 2.1 WATER DISTRIBUTION SYSTEM

McGill Associates used a combination of water system GIS mapping, visual observations, record drawings, and operator/staff knowledge to assess the condition of the existing distribution system.

The analysis concluded that the general condition of the system is good, based on the low age of the system and primarily residential users connected to the system. The water meter condition is noted as good/fair, based on the age of the meters and the software no longer being supported.

**Table 2: Distribution System Condition Assessment**

Line Type	Size Range (in)	Quantity	% of System	Condition
PVC Pipe	6-12	16,900 LF	100%	Good
Meters	N/A	84 EA	100%	Good/Fair

**Table 3: Hydrant Condition Assessment**

Fire Hydrant Manufacturer	Average Age	Excellent	Good	Fair	Poor	Unknown	Total
American	20 years	-	12	-	-	-	12

**Table 4: Valve Condition Assessment**

Excellent	Good	Fair	Poor	Total
-	6	-	-	6

## **2.2 WATER SYSTEM HYDRAULICS AND CAPACITY**

The water system has an average pressure of 55 psi based on hydrant testing conducted by the McGill and County staff. The lowest static pressure noted during any test was 51 psi, which is still well above the minimum pressure of 30 psi for a public water system under peak flow conditions. Ground elevations within the area are relatively consistent from 160 to 165-ft above sea level.

The water system is not designed to provide fire protection. For the purposes of this report, fire hydrant flow tests were performed in the field to understand the characteristics of the system.

The Southpoint water system has 45,000 GPD of total capacity under the County's current operating agreement with Bladen County. As of March 2024, the County has approximately 10,900 GPD of remaining capacity that is currently unobligated. The County has seen a recent increase in requests from residential developers for properties that would be served by the water system. As a result, the County is interested in in-ground storage to increase its available capacities. Based on existing treatment at the source well in the Bladen County system, Cumberland County may choose to implement additional filtration ahead of proposed water storage.

The County has worked for several years to provide public water to citizens in the Gray's Creek Area, of which the Southpoint S/D water system is a part. As a part of this investigation, the County contracted with HDR to pursue funding for construction of deep wells, treatment, and distribution lines. This project would provide benefit to both the existing customers in the Southpoint S/D water system with increased hydraulic reliability and fire protection, as well as making public water available to the broader Gray's Creek area. This project with cost estimate prepared by HDR is included in the CIP for this report.

## 2.2 CONCLUSION

The existing distribution system is relatively young, and therefore the County does not face the challenge of replacing aging infrastructure at this point. Recommendations for operations and maintenance are included in this report that will serve to extend the life of the existing equipment and infrastructure in the system. Therefore, the focus of the County's needs in this system relate to other operational needs that stem from having only one full-time staff person who oversees the management of the County's three existing sewer systems and this Southpoint water system. The recommended improvements to the system are targeted at improving operational capabilities and developing resiliency within the system:

- Replacing AMR water meters with new AMI water meters and updated meter reading system
- Procure new billing software
- Construct ground-level storage tank with water filtration.

These items have been addressed in the Capital Improvements Plan.



## **3.0**

## **CAPITAL IMPROVEMENTS PLAN**

---

The fieldwork, asset inventory, review of existing documentation, and consideration of staff input provided evidence for various water system improvements including specific and general recommendations. Specific recommendations determined the imminent projects in the next few years, and general recommendations are primarily maintenance and further investigation and can be implemented at minimal cost.

### **3.1 GENERAL RECOMMENDATIONS**

#### **3.1.1 Valve Turning**

EPA recommends exercising all mainline valves in the system once per year to ensure valves can be located and opened/closed properly during emergency shut-down periods. Recording the number and direction of turns to open/close will help identify problems and need for maintenance. During valve exercising, a complete evaluation of the asset should be made including difficulty accessing the valve, excessive force needed to operate and leaking during operation. Also, when exercising, complete inventory should be taken of each valve including size, type, valve box/manhole condition, depth of cover, operating condition, and evidence of other potential problems.

#### **3.1.2 Hydrant Testing**

It is recommended to continue testing hydrants throughout the year to verify that the pressures at each hydrant in the system can meet the current fire flow requirements. Hydrant tests can also give valuable information in order to find existing or additional deficiencies in the system.

### **3.1.3 Mapping**

The mapping completed as part of the AIA has been provided to the County on ArcGIS online such that the County staff can maintain and update as needed in the future. It is recommended that the County update materials for water lines where known and as maintenance and replacements are completed. Any age information should be inserted as well as keeping the system map up-to-date and providing information for future work.

## 3.2 PRIORITY PROJECTS

### 3.2.1 Water Meter Replacement Project

This project includes replacement of existing AMR meters with AMI based water meters, as well as new meter reading equipment, installation, startup and training for the associated water meter reading software and data logging software.

**Table 5: Preliminary Opinion of Probable Cost for Water Meter Replacement Project**

Item	Description	Units	Quantity	Unit Price	Total Cost
1	AMI Residential Water Meter	EA	84	\$ 500	\$ 42,000
2	Water Meter Reading System and Startup	LS	1	\$ 20,000	\$ 20,000
<b>Construction Subtotal</b>					<b>\$ 62,000</b>
Contingency (15%)					\$ 9,300
<b>Total Base Project Cost</b>					<b>\$ 71,300</b>

*\*Cost estimates are based on the knowledge of a professional engineer based on 2024 construction costs and are subject to change due to bidding environment and other factors.*

### 3.2.2 Water Storage Tank and Filtration Project

This project includes the construction of a ground storage tank to provide additional capacity for the water system, as well as additional filtration equipment.

**Table 6: Preliminary Opinion of Probable Cost for Water Storage Tank Project**

Item	Description	Units	Quantity	Unit Price	Total Cost
1	22,500 Gallon Ground Storage Tank	LS	1	\$ 55,000	\$ 55,000
2	Greensand Iron Manganese Filter	LS	1	\$ 175,000	\$ 175,000
<b>Construction Subtotal</b>					<b>\$ 230,000</b>
Contingency (15%)					\$ 43,500
Engineering Assistance (If Needed)					\$ 30,000
<b>Total Base Project Cost</b>					<b>\$ 303,500</b>

*\*Cost estimates are based on the knowledge of a professional engineer based on 2024 construction costs and are subject to change due to bidding environment and other factors.*

### 3.2.3 Construct New Wells and Water Main

This project includes approximately 25,550 linear feet of 12-inch distribution pipeline to help reduce the contamination in private drinking water wells. This project will provide well pumps and wellheads, the transmission of raw water from production wells to a treatment unit for a variety of cleaning processes, and then to distribute the water to a maximum of 100 connections throughout Gray's Creek.

Item	Description	Units	Quantity	Unit Price	Total Cost
1	Source (pumps and wellheads for 2 existing wells, 3,660 LF raw water main)	LS	1	\$ 2,861,732	\$ 2,861,732
2	Treatment (pre-filtration, IX, GAC, disinfection, ground storage, booster pumps)	LS	1	\$ 3,447,158	\$ 3,447,158
3	Distribution Lines (25,500 LF, 12" distribution line)	LS	1	\$ 8,203,417	\$ 8,203,417
<b>Construction Subtotal</b>					<b>\$ 14,512,307</b>
Contingency (10%)					\$ 1,451,231
Engineering Assistance (If Needed)					\$ 1,915,625
Administration Cost					\$ 1,734,974
<b>Total Base Project Cost</b>					<b>\$ 19,614,136</b>

### **3.3 CIP PROJECTS SUMMARY**

Cumberland County's goal is to provide clean, safe and economical water service to current and future customers. The customers include primarily residential households and businesses within the County. The County intends to provide and maintain a reliable and safe water supply and water distribution system in the Southpoint water system, which exceeds the standards imposed to protect the public health and the quality of the receiving waters.

Throughout the AIA process, the Southpoint water system was evaluated through visual inspections, hydrant testing, and water modeling. The highest priorities were collected and put into a 10-year capital improvements plan. In this plan, projects were prioritized based on existing conditions and providing operational benefit to the County.

A Capital Improvements Plan (CIP) is a plan and schedule of anticipated and required capital expenditures for public utility facilities with descriptions of project needs, estimated project costs, and timing of work over a planning period. Thus, a CIP is an important planning tool that allows a public utility to prepare for upcoming projects and to proactively determine how and when to fund them.

**Table 7: CIP Cost Summary**

Year	Water Meter Replacement	Ground Storage Tank and Filter	Construct New Wells and Water Main	TOTAL COST
1	\$ -	\$ -	\$ -	\$ -
2	\$ 71,300	\$ -	\$ -	\$ 71,300
3	\$ -	\$ -	\$ 19,614,136	\$ 19,614,136
4	\$ -	\$ -	\$ -	\$ -
5	\$ -	\$ 303,500	\$ -	\$ 303,500
6	\$ -	\$ -	\$ -	\$ -
7	\$ -	\$ -	\$ -	\$ -
8	\$ -	\$ -	\$ -	\$ -
9	\$ -	\$ -	\$ -	\$ -
10	\$ -	\$ -	\$ -	\$ -
<b>TOTAL ESTIMATED CIP COST</b>				<b>\$ 19,988,936</b>



**4.1 GENERAL RECOMMENDATIONS**

The purpose of an Operations and Maintenance (O&M) Program is to provide an organized and cost-effective approach to ongoing maintenance, repair and replacement activities that will maintain the water distribution system, so it performs as intended and adheres to applicable sections of the of the Water System Management Plan, set forth under North Carolina Office of Administrative Hearings, Subchapter 18c of Title 15A.

This section provides a general description of proactive O&M, that can be defined as scheduled maintenance activities (preventive maintenance), performed on a regular basis in order to achieve the highest level of system performance using available resources and minimizing failures that can result in low pressure, degraded quality, service interruptions and possible contamination.

Developing an O&M Program begins with accurate records of infrastructure inventory, asset locations and physical condition. Coupled with work records and system performance history, preventive maintenance schedules can be developed to efficiently address general system needs, from regular flushing of stagnate water to site-specific maintenance work such as leak repairs.

The following elements provide the foundation for an effective O&M program:

- Maintain up-to-date water distribution system maps and related work history and operational data.
- Develop a routine preventive O&M program and activities for staff and contractors maintaining the water distribution system and a system to document scheduled activities.
- Develop a rehabilitation and replacement plan identifying and prioritizing system deficiencies and implement short- and long-term actions to address the deficiencies.
- Develop and implement training programs to build technical competence and emergency preparedness.

- Develop and provide equipment and replacement part inventories, including critical replacement parts.

The County has an Operations and Maintenance Plan for the water system that was developed by Koonce, Noble and Associates in 2013. The plan focuses on six areas, including: Frost Prevention, Leak Detection and Repair, Meter Calibration, Flushing, Valve Exercise, and Control of Authorized Use. A copy of this plan is included in Appendix B of this report. In addition to and as an elaboration on that plan, McGill suggests the following as critical elements to proactive O&M.

### **Water System Mapping**

Water system maps and related databases are typically managed using a Geographic Information System (GIS). These maps and datasets can be viewed through a GIS desktop program (i.e. ArcGIS), or by creating digital (typically pdf format) maps and tables to be viewed on screen, exported to other software (excel) for analysis, or printed for manual markup, editing, etc. GIS mapping is supported by a database that records water main size, material types, locations of valves, meters, service connections and other attributes of system appurtenances. It can also attach images and records such as field inspections to specific asset(s) or location(s) and attach performance data such as operating pressure or fire flow to sections of the distribution system. GIS provides a powerful tool to build, organize and display the physical and operational attributes of the water distribution system.

The GIS database should be updated on a regular basis. Software applications such as work order systems are available to allow field staff to update GIS data as inspection and maintenance activities are completed. Other applications can also allow staff to update and edit maps.

GIS can organize work history along with operational data, inspection records and images to provide managers, operations staff and engineers with powerful data sets to track current resource allocations and forecast short and long-term operational and capital needs. Outcomes of detailed analysis such as recommended water main rehabilitation work versus water main break history can be mapped to present the relationship visually for ease of communicating and understanding.

### **Preventive Operation and Maintenance (O&M)**

Preventive maintenance is performing routine and scheduled maintenance activities before equipment or buried infrastructure fails, for the purpose of extending useful life, reducing overall operating costs, and increasing system reliability. This proactive approach to maintenance work is more efficient and cost effective than reactive and curative operations.

Preventive maintenance activities will also help operations staff to better understand the distribution system and how it works under various conditions. This knowledge is essential to setting maintenance priorities and developing the scope and timing of long-term rehabilitation and replacement projects.

### **Scheduled Flushing/Cleaning of Water Mains**

A regular flushing schedule for maintaining or improving water quality, primarily by raising chlorine residual, in key locations is typically developed based on the history of regular sampling and/or customer complaints. Care must be taken to flow sufficient volume to remove stagnant water at a rate of flow capable of removing sediments that contribute to degraded water quality. Monitoring chlorine residuals will provide a good indicator that water quality has reached the desired level to complete the task. Automatic flushing valves may be installed to reduce labor costs and ensure regular flushing at appropriate intervals and duration to accomplish the desired results.

More frequent flushing may be necessary during summer months when temperature will speed up degradation and possible formations of disinfectant byproducts. Unidirectional flushing should also be considered on a periodic basis to enhance sediment removal as needed. Mechanical cleaning, forcing a “pig” through the pipe network may be considered where extensive sedimentation and tuberculation occurs.

As part of the O&M Program, a master list of flushing/cleaning operations, priority locations and scheduling can be incorporated into GIS. Maps can be produced to define work areas, schedule resources, including contracted services, track progress and task completion. Updating GIS maintenance operations data (water quality monitoring, sediment quantity, etc.) will help managers adjust cleaning frequency and area boundaries as needed to increase program efficiency, maintain water quality and reduce customer complaints.

### **Routine Visual Inspections**

Routine inspections are used to assess the condition of valve structures, hydrants and other surface facilities, recording general conditions and evidence of water leaks, possible structural problems or failures (offset structures, etc.), corrosion and other damage. Work orders are generated based on inspection records to effect operational adjustments, scheduling more detailed inspections and/or making necessary repairs.

### **Valve Exercising Program**

EPA recommends exercising all mainline valves in the system once per year to ensure valves can be located and opened/closed properly during emergency shut-down periods. Recording the number and direction of turns to open/close will help identify problems and need for maintenance. During valve exercising, a complete evaluation of the asset is made including difficulty accessing the valve, excessive force needed to operate and leaking during operation.

During valve exercising complete inventory is taken of each valve including size, type, valve box/manhole condition, depth of cover, operating condition, and evidence of other potential problems.

Develop a standard form for recording information to ensure consistency of work and accuracy of records. These records are used to prioritize maintenance and repair scheduling and provide a history of condition assessments that will help develop the scope of rehabilitation and replacement work.

### **Leak Detection and Water Loss Reduction**

Proactively identifying and repairing system leaks will reduce the amount of finished water that does not reach the customer and would also increase the overall cost of water delivered to the customer. Reducing water system loss will help to contain utility costs, reduce the need and frequency of rate increases, and preserve a valuable natural resource.

Developing a water loss control program is essential to meeting these goals. Two options are the small system water audit, which was developed from the N.C. Division of Water Resources' Local Water Supply Plan (LWSP), and the American Water Works Association (AWWA) water loss control committee's free water audit. While the AWWA water audit applies to all systems, smaller systems (less than 10,000 people) with more limited resources may elect to complete a slightly less comprehensive audit. DWR has developed an alternative water audit that is available on the division's website.

## **Maintenance Activity Records**

Detailed records and daily logs of O&M work provide valuable information to help managers evaluate the effectiveness of maintenance activities and make adjustments to optimize the use of limited resources. Equipment, manpower and other resources are tracked along with detailed descriptions of defects and other repair needs encountered. Maintenance work resulting in system modifications or extensions should be incorporated into record drawings and system maps. Scheduled testing of emergency and standby equipment is also recommended.

These records should be reviewed periodically to identify problems that cannot be resolved in a short period of time in order to develop a plan to address the problem(s). Maintaining these records for an extended period of time (5 years or more) will also provide accurate reference points of maintenance investments made over time that will track the effectiveness of operation and maintenance activities.

In the event of pressure loss or boil water notice, maintenance records will need to provide sufficient detail to satisfy reporting requirements for the event, including location(s), corrective actions, testing and monitoring, etc. This data may also be integrated into GIS to allow mapping of these events over time in order to identify patterns and/or trends that will assist with scheduling maintenance and planning rehabilitation and other capital improvements.

## **Resolution of Customer Complaints**

Customer complaints are primarily for low pressure, tastes and odors. These conditions require an immediate response to diagnose and resolve the problem. These calls can occur outside normal business hours, significantly escalating costs. Detailed records of the problems found, and the resources needed to address the conditions provide valuable feedback for making adjustments to the preventive maintenance program that can reduce these types of calls and help lower overall maintenance costs.

## **Capital Improvements Plan**

A Capital Improvements Plan (CIP) identifies rehabilitation, replacement and expansion needs of the system. The CIP should address the short and long-term needs of the system, covering at least a 5 to 10-year planning period, and includes the estimated cost of each capital project.

CIP development incorporates maintenance activity, cleaning and inspection records, and system performance data that may include flow monitoring and hydraulic modeling to evaluate the existing system and to recommend improvements needed to correct existing deficiencies, and ensure adequate capacity is maintained throughout the system.

Capital planning includes consideration of on-going funding for rehabilitation and replacement of the collection system as it wears out, and potential upgrades for expansion as needed.



## **Training Program**

Training programs provide a mechanism for educating employees and establishing their technical competence to perform operations, maintenance, and emergency responses safely and effectively. A combination of in-house skill training and specialized training purchased or provided through state and national associations, conferences and vendor training programs are typically used to build and enhance skills for performing daily work duties. Periodic training reinforces previous efforts, as people often overlook things that are used infrequently. It also provides an opportunity to train new staff and learn about new problems, new techniques, and changes in equipment.

Emergency training educates system personnel about emergency situations and resulting effects on the wastewater system, public health and environmental impacts. It also provides an opportunity to practice responses. Good record keeping ensures personnel are properly trained and prepared to effectively operate and maintain the collection system under any given circumstance. Regular review of training records is essential for keeping content up-to-date and maintaining proper employee awareness.

## **Equipment and Replacement Parts**

A reasonable supply of equipment and replacement parts should be maintained to fully support all operations and maintenance activities. A detailed inventory is essential to ensure availability under normal operations and emergency conditions. Specialized equipment or parts may be too costly to keep in stock, so arrangements with vendors, contractors and other utilities (under mutual aid agreements) may be necessary to ensure availability during non-business hours or during emergencies.

## 4.2 STAFFING RECOMMENDATIONS

Cumberland County is responsible for three wastewater collection systems and one water system: NORCRESS, Overhills, Kelly Hills, and Southpoint Water System. While each of these districts maintains its own operating budget, the Board leadership and operational management is performed solely by Cumberland County. Therefore, in consideration of the typical utility system management and operations and maintenance that is necessary for maintaining each of the systems, McGill has considered all of the four utility systems cumulatively. While each system could be analyzed separately, considering the systems together is more consistent with actual management of the systems.

Typical metrics for analyzing full-time equivalent (FTE, representing quantity full-time workers) are based on either the population served by the system or by miles of utility piping (water main or sewer line) within each system. For reference, Table 6 below summarizes the customers and piping in each of the County's utility systems.

**Table 6: Utility System Comparison**

DISTRICT	Number of Connections		Paying Avail. Fee	Pipe in System (mi.)
	Water	Sewer		
<b>Southpoint</b>	84		129	2.8
<b>Kelly Hills</b>		102	166	4.5
<b>Overhills</b>		107	318	4.0
<b>NORCRESS</b>		452	666	41.1
<b>TOTALS</b>	<b>84</b>	<b>661</b>	<b>1279</b>	<b>52.4</b>

**Table 7: Typical Population vs. Pipe Length**

<b>Population</b>	<b>Pipe in System (mi.)</b>
0-100	5
101-500	5
501-3300	21
3301-10000	62

The typical sizes of utility systems from a community system EPA study<sup>1</sup> are shown in Table 7, and are generally consistent when compared to the County’s systems. This study was selected as a basis for comparison due to its comprehensive nature, having included water systems nationwide in its breadth. NORCRESS is the exception when compared to Table 7. This is mostly likely indicative of the system serving a more rural population where the connection density is less, and resulting from the length of force main piping in the system that increases the overall length but does not contribute to population density. Overall, these metrics were found to be reasonably consistent with the County’s systems. Similarly, the data is consistent regardless of whether the utility system is a water systems or wastewater collection system.

The objective is to make budget-level staffing recommendations for the County’s utility systems based on what is typical across the industry and other utility systems of comparable size. The EPA study utilized provides typical FTE for the roles of manager, plant operator, distribution (and collection, for our purposes), and administrative functions. All of these were considered applicable to management and operation of the County’s utility systems. Note: while the County is not responsible for plant operation in any system, the lift stations in the NORCRESS and Overhills systems are the County’s responsibility, therefore this metric was used, albeit in a smaller percentage, to account for the management of those resources.

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<sup>1</sup> Analysis conducted using excerpts from US EPA document, “National Characteristics of Drinking Water Systems Serving 10,000 or Fewer People,” published July 2011.

Table 8 shows Further utilizing the EPA statistics as base for typical FTE for each of the positions, based on the system size in terms of miles of pipe main.

**Table 8: Average Community System Statistics**

Employee Category	System Size (miles of Main)		Mean	Cumberland County
	Pop. 500-3300	Pop. 3300-10000		
	21	62	41.5	51.7
<b>Manager FTE</b>	0.6	1.1	0.85	1.06
per mile	0.029	0.018	0.020	0.020
<b>Plant Operator FTE</b>	0.6	1.3	0.95	1.03
per mile	0.029	0.021	0.023	0.023
<b>Distribution FTE</b>	0.8	2.5	1.65	2.06
per mile	0.038	0.040	0.040	0.040
<b>Administrative FTE</b>	0.6	1.5	1.05	1.31
per mile	0.029	0.024	0.025	0.025

The green highlighted cells are the calculated FTEs that were applied to estimate staffing size based on the quantity of pipe across the County’s four utility systems. Those calculated FTEs are based on the size of systems managed by the County and reasonable estimate of staffing needed for these systems.

Each of the FTEs is applied to each respective employee category. McGill utilized wage information from Zip Recruiter and a benefits multiplier of 1.38 from the U.S. Bureau of Labor Statistics to develop the summary shown in Table 9.

**Table 9: Overall Salary Estimates**

Employee Category	Hourly Rate	Annual Salary	Ben. Mult.	Total	Applied FTE	Applied Budget Cost
Manager	\$38.50	\$80,080.00	1.38	\$110,510.40	1.06	\$117,000
Operator	\$24.52	\$51,001.60	1.38	\$70,382.21	1.03	\$72,700
Distribution	\$23.57	\$49,025.60	1.38	\$67,655.33	2.06	\$139,100
Administrative	\$21.33	\$44,366.40	1.38	\$61,225.63	1.31	\$80,100
<b>Total Applied Budget Cost Based FTEs</b>						<b>\$408,900</b>

Utilizing industry metrics and comparing to systems of comparable size, McGill offers the proceeding section as a general staffing recommendation. This section and these budget values are provided for preliminary planning purposes only.

Staffing levels appear to be reasonable based on the District's ability to operate and maintain the system while providing a reliable level service to its customers.

While this budget number is higher than the current budget staffing, consideration should also be given to the cumulative effect cost to the County for contracted operation and distribution support in the NORCRESS and Kelly Hills district.

# **APPENDICES**





## **Appendix A**

**Excerpt from West Bladen County Water System SWAP**



**Source Water Assessment Program Report for  
BLADEN CO WTR DIST-WEST BLADEN**  
*Community Water System*

**Introduction: What is a Source Water Assessment?**

The North Carolina Division of Water Resources, Public Water Supply (PWS) Section is responsible for implementing the Source Water Assessment Program (SWAP) and completing assessments for all public drinking water supplies in the state. The 1996 amendments to the Safe Drinking Water Act provided federal support and required states to conduct assessments of all public water systems. A source water assessment is a qualitative evaluation of the potential of a drinking water source to become contaminated by the identified potential contaminant sources (PCS) within the delineated area. In North Carolina there are approximately 8,000 public water supply sources that were assessed by the state. The PWS Section has gathered information for each water supply and developed a process for completing the assessments. This process is summarized in the next few pages and detailed in Section 6 of this report.

This report provides a summary of the results for the **Source Water Assessment** for your drinking water source(s).

**What is the Source of Your Drinking Water?**

Everyone wants clean, safe drinking water and we assume this natural resource will always be available to us. However, drinking water sources can be threatened by many potential contaminant sources, including underground storage tanks for gasoline, permitted wastewater discharges and other waste disposal sites, improper handling of hazardous materials, urban storm water runoff, or other types of non-point source contamination such as runoff produced by agricultural activities and land clearing for development. Your drinking water source(s) is listed in Table 1. Protecting your drinking water from becoming contaminated is a wise investment in public health and your community's future.

**Table 1. Public Water Supply System Information**

System Name	BLADEN CO WTR DIST-WEST BLADEN
City	ELIZABETHTOWN
PWS ID	NC0309055
Source Name	WELL #10 MT HOREB WELL
Source Name	WELL #11
Source Name	WELL #13
Source Name	WELL #4/ABBOTTSBURG
Source Name	WELL #5/WHITE'S XRD
Source Name	WELL #8
Source Name	WELL #9 TOBEMORY

In addition to the sources listed in Table 1 above, this water supply system has interconnections to allow for the purchase of water from the following water system(s) or "Seller" system(s):

**BLADENBORO, TOWN OF  
CLARKTON, TOWN OF  
EAST ARCADIA, TOWN OF  
ELIZABETHTOWN, TOWN OF**

## **TAR HEEL WATER CORP**

Please refer to the Source Water Assessment Program Report for the "Seller" system(s) to review the assessment results for the purchased water supply sources that provide drinking water for this water system.

### **Assessment Report Contents**

This assessment report includes the following sections:

- Section 1: Assessment Area Delineation
- Section 2: Potential Contaminant Source Inventory and Map
- Section 3: What is a Susceptibility Rating?
- Section 4: Reviewing Your SWAP Results
- Section 5: Maps, Tables and Figures for your Drinking Water Source(s)
- Section 6: North Carolina's SWAP Approach

### **Section 1: Assessment Area Delineation**

The area delineated for your well(s) for the purpose of this assessment is the contributing area for the well(s). When a well is pumped, it begins to influence groundwater that is flowing through the subsurface and towards the well. The pumping of the well creates a contributing area around the well that supplies water to the well. This is the area through which contaminants, if released to the environment, can be reasonably expected to move through the ground and reach the well.

### **Section 2: Potential Contaminant Source Inventory and Map**

The potential contaminant source inventory map shows the delineated area for your drinking water source(s). This is the area where potential contaminant sources, if released to the environment, could reasonably be expected to be a risk or a potential for contamination of your drinking water supply. A PCS in this assessment report is a facility or site regulated under a state or federal regulatory program. These facilities are identified in electronic databases that contain location information for each facility. Only databases that include statewide information were used for this source water assessment. Included in this report are:

- 1) A table of any PCS identified within the delineated assessment area; and
- 2) A map of the delineated assessment area showing PCSs, roads, jurisdictional boundaries and other pertinent information.

It is important to note that the PCSs identified in this report are only potential sources of contamination to your drinking water source. Environmental contamination is not likely to occur if harmful contaminants are managed properly.

### **Section 3: What is a Susceptibility Rating?**

In North Carolina the susceptibility of any drinking water source is based on two components, a contaminant rating and an inherent vulnerability rating. Your drinking water source(s) was assigned a qualitative susceptibility rating of higher, moderate or lower based on the results of the contaminant rating and inherent vulnerability rating process as described in the following paragraphs.

## **Susceptibility Rating**

The final susceptibility rating for your drinking water source(s) is determined by combining the contaminant rating and the inherent vulnerability rating. More detailed information on the susceptibility rating process can be found in Section 6 of this report.

### **Contaminant Rating**

The contaminant rating for your drinking water source(s) was determined based on the number and location of PCSs within the delineated area. Each PCS identified within the delineated area was assigned a risk rating of higher, moderate or lower. The number of PCSs that occur within the delineated area was determined and a contaminant rating of higher, moderate, or lower was assigned to your drinking water source(s).

### **Inherent Vulnerability Rating**

The inherent vulnerability rating of your well(s) refers to the geologic characteristics or existing conditions of the well and its delineated assessment area. These characteristics include aquifer rating, unsaturated zone rating and well integrity/well construction rating. The aquifer rating is an assessment of the water transmitting characteristics of the aquifer. The unsaturated zone rating is an assessment of the likelihood that contaminants from surface and shallow sources will follow the path of aquifer recharge and reach the water table. The well integrity/construction rating is an assessment of the quality of the construction of the well. An inherent vulnerability rating of higher, moderate or lower was assigned to your well(s).

**Table 2. SWAP Results Summary**

<b>Source Name</b>	<b>Inherent Vulnerability Rating</b>	<b>Contaminant Rating</b>	<b>Susceptibility Rating</b>
WELL #10 MT HOREB WELL	Lower	Lower	Lower
WELL #11	Lower	Lower	Lower
WELL #13	Lower	Lower	Lower
WELL #4/ABBOTTSBURG	Lower	Lower	Lower
WELL #5/WHITE'S XRD	Moderate	Lower	Moderate
WELL #8	Lower	Lower	Lower
WELL #9 TOBEMORY	Moderate	Lower	Moderate

It is important to understand that a susceptibility rating of higher does not imply poor water quality. Susceptibility is an indication of a water supply's potential to become contaminated by the identified PCSs within the assessment area.

**Table 3. Well Information**

<b>Source Name</b>	<b>Well Yield (Gallons/Min)</b>	<b>Well Depth (Feet)</b>
WELL #10 MT HOREB WELL	300	293
WELL #11	320	283
WELL #13	250	205
WELL #4/ABBOTTSBURG	500	127
WELL #5/WHITE'S XRD	390	144
WELL #8	300	188
WELL #9 TOBEMORY	300	98

#### **Section 4: Reviewing Your SWAP Results**

Please review the information on your drinking water source(s) provided in this report. If you believe any of this information is incorrect please contact the Public Water Supply Section by e-mail at the following address: **SWAP@ncdenr.gov** or you may submit comments to us at:

SWAP  
Public Water Supply Section  
1634 Mail Service Center  
Raleigh, NC 27699-1634

Or you may contact the Source Water Assessment staff by phone at 919-707-9098.

#### **Section 5: Maps, Tables and Figures for Your Drinking Water Source(s)**

Maps, tables and figures specific to your drinking water source(s) are included in this report in the following pages and are listed below.

Map 1. Location Map

Map 2. Delineated Area and PCS Map

Table 4. Potential Contaminant Source Attributes

Table 5. Inherent Vulnerability Rating

Table 6. Unsaturated Zone Rating Calculation or Watershed Characteristics Rating Calculation

Figure 1. Land Use / Land Cover Categories

Figure 2. Unsaturated Zone Rating or Watershed Characteristics Rating

Figure 3. Vertical Hydraulic Conductance Rating or Average Annual Precipitation Rating

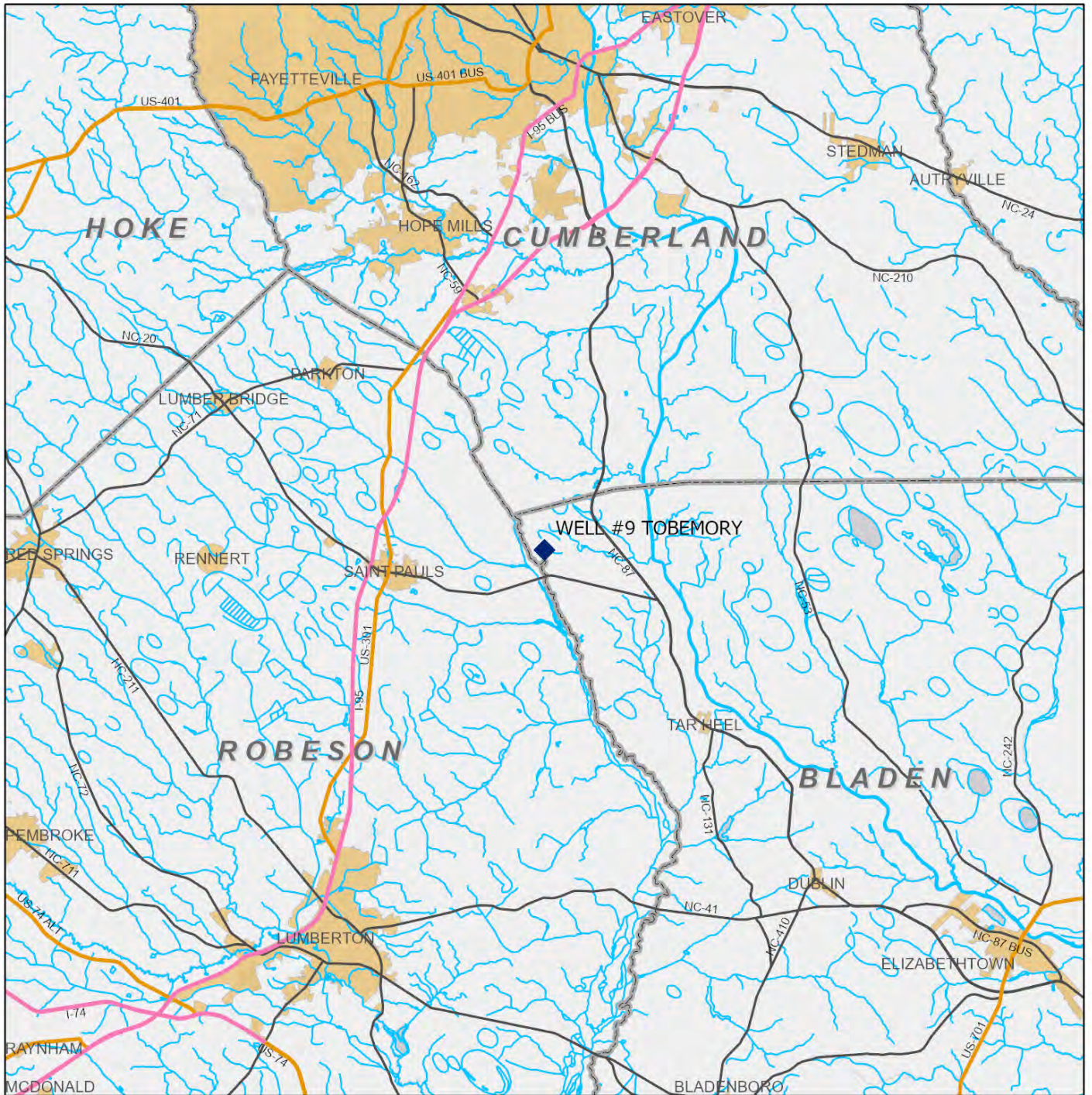
Figure 4. Land Surface Slope Rating

Figure 5. Land Use Rating

Figure 6. Land Cover Rating

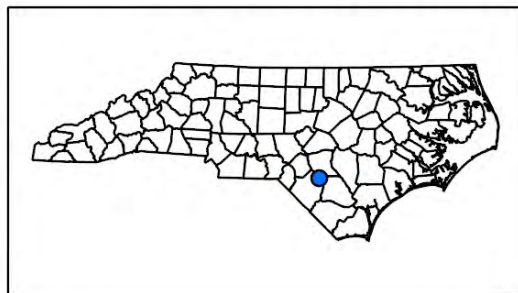
Figure 7. Ground Water Contribution Rating (only applicable to surface water sources)



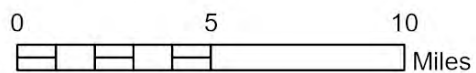


MAP 1. LOCATION MAP

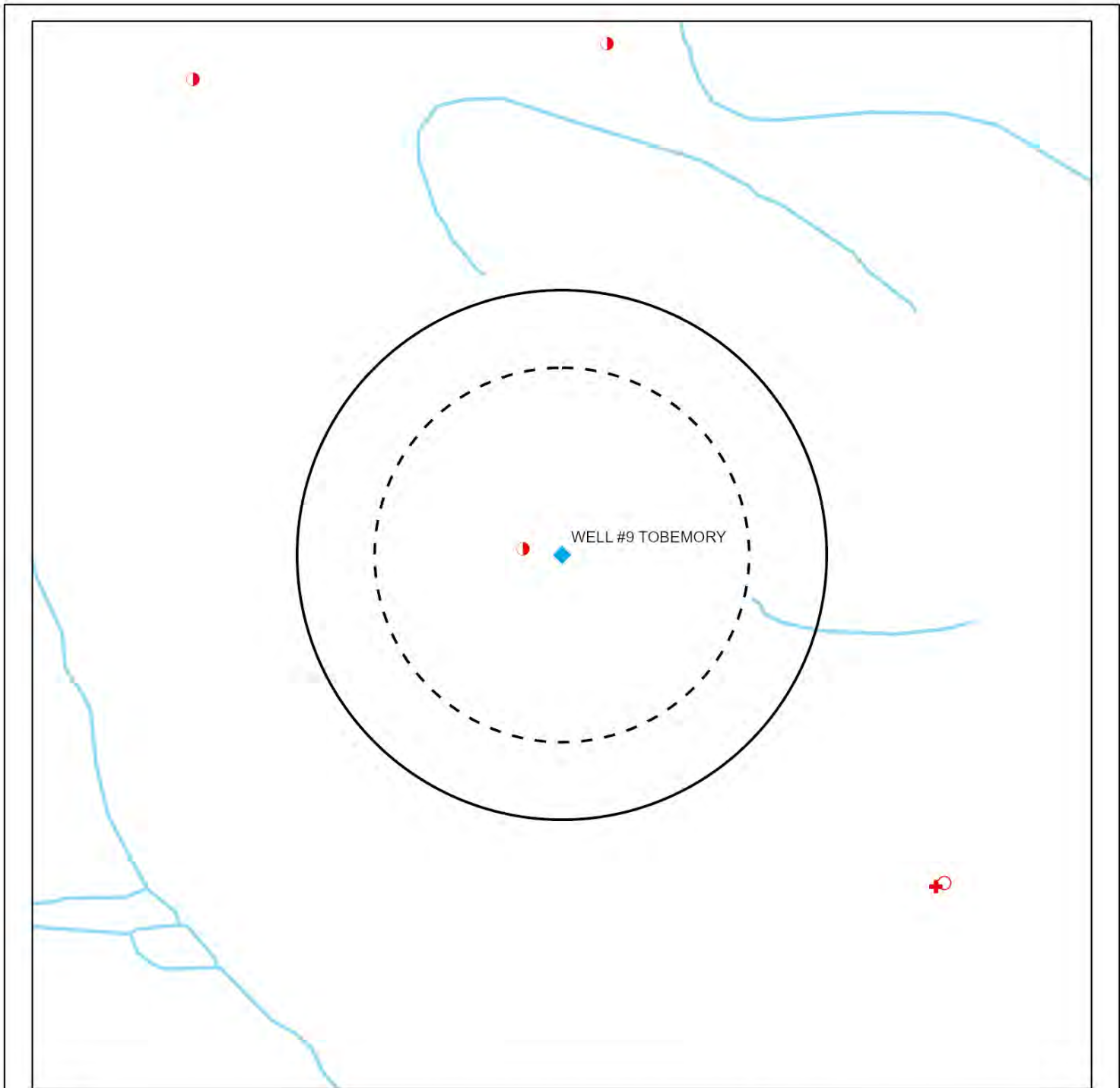
BLADEN CO WTR DIST-WEST BLADEN, PWS ID: 0309055, WELL #9 TOBEMORY



- |             |                      |
|-------------|----------------------|
| Major Roads | Major Hydrology      |
| Interstate  | Municipal Boundaries |
| US Route    | County Boundaries    |
| NC Route    | Rivers and Streams   |







### MAP 2. DELINEATED AREA AND PCS MAP

BLADEN CO WTR DIST-WEST BLADEN, PWS ID: 0309055, WELL #9 TOBEMORY

**PCS Types**

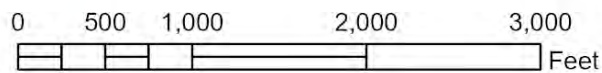
- Animal Operations
- CERCLA-Fed. Remediation
- Hazardous Waste Sites
- Inactive Hazardous Waste Sites
- Non Discharge Permits
- NPDES Permits
- PCB Sites
- Pollution Incidents

- Septage Disposal Sites
- Soil Remediation Sites
- Solid Waste Facilities
- Tier II Sites
- Old Landfill Sites
- UIC Permits
- UST Permits

**Major Roads**

- Interstate
- US Route
- NC Route
- Rivers and Streams
- Major Hydrology
- Municipal Boundaries

- Ground Water Assessment Area - Delineated Area
- Ground Water Assessment Area - Zone A



**Table 4. Potential Contaminant Source Attributes  
BLADEN CO WTR DIST-WEST BLADEN  
PWS ID: NC0309055, WELL #9 TOBEMORY**

PCS Name	PCS ID	PCS Type	PCS Risk Rating	Street Address	City	Zip	County
Tobermory Well	WQ0033325	Non-Discharge Permits	Moderate				Bladen

**Table 5. Inherent Vulnerability Rating  
BLADEN CO WTR DIST-WEST BLADEN  
PWS ID: NC0309055, WELL #9 TOBEMORY**

Ground Water Source Characteristics	Vulnerability
Aquifer Rating	Moderate
Unsaturated Zone Rating	Moderate
Well Integrity/Construction Rating	Higher

**Inherent Vulnerability Rating: Moderate**

**Table 6. Unsaturated Zone Rating Calculation  
BLADEN CO WTR DIST-WEST BLADEN  
PWS ID: NC0309055, WELL #9 TOBEMORY**

<b>Unsaturated Zone Score</b>	<b>59.7</b>
-------------------------------	-------------

**Notes:**

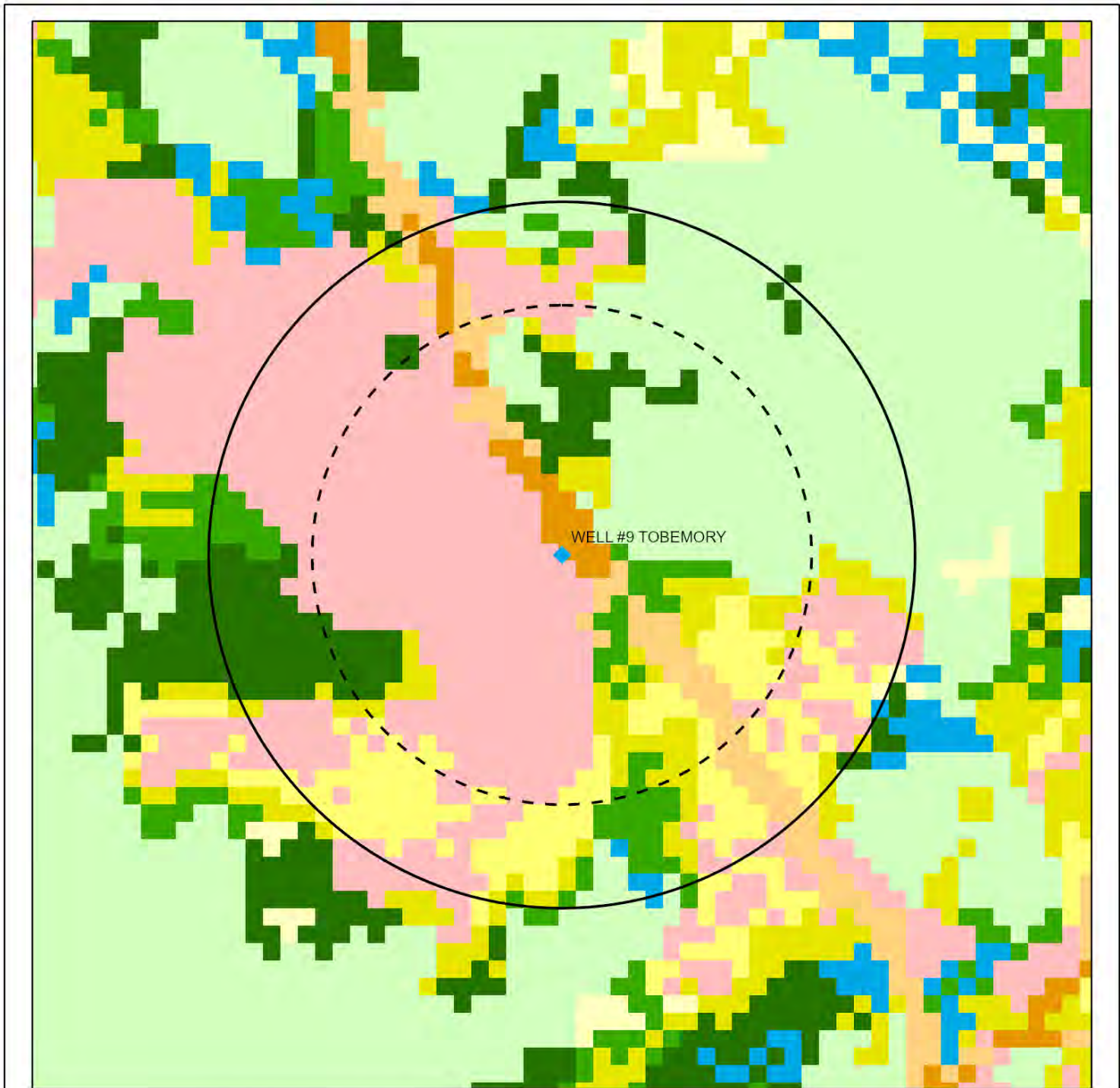
1. Unsaturated Zone Score for each cell (CS):

$$CS = [3 \times (\text{vertical hydraulic conductance score})] + [2 \times (\text{land surface slope score})] + [3 \times (\text{land use score})] + [2 \times (\text{land cover score})]$$

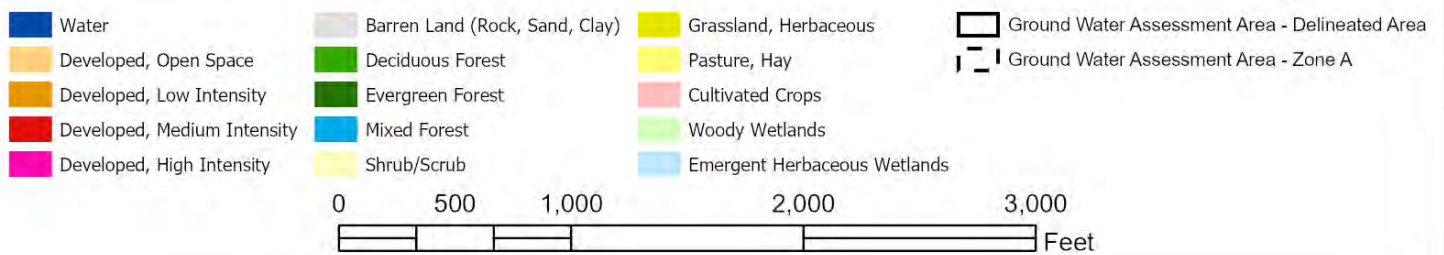
2. Unsaturated Zone Score (S) for the entire assessment area is the mean of the cell scores (CS) calculated as:

The sum of all cell unsaturated zone scores (CS) divided by the number of cells (N) within the assessment area:  $S = (\sum CS) / N$

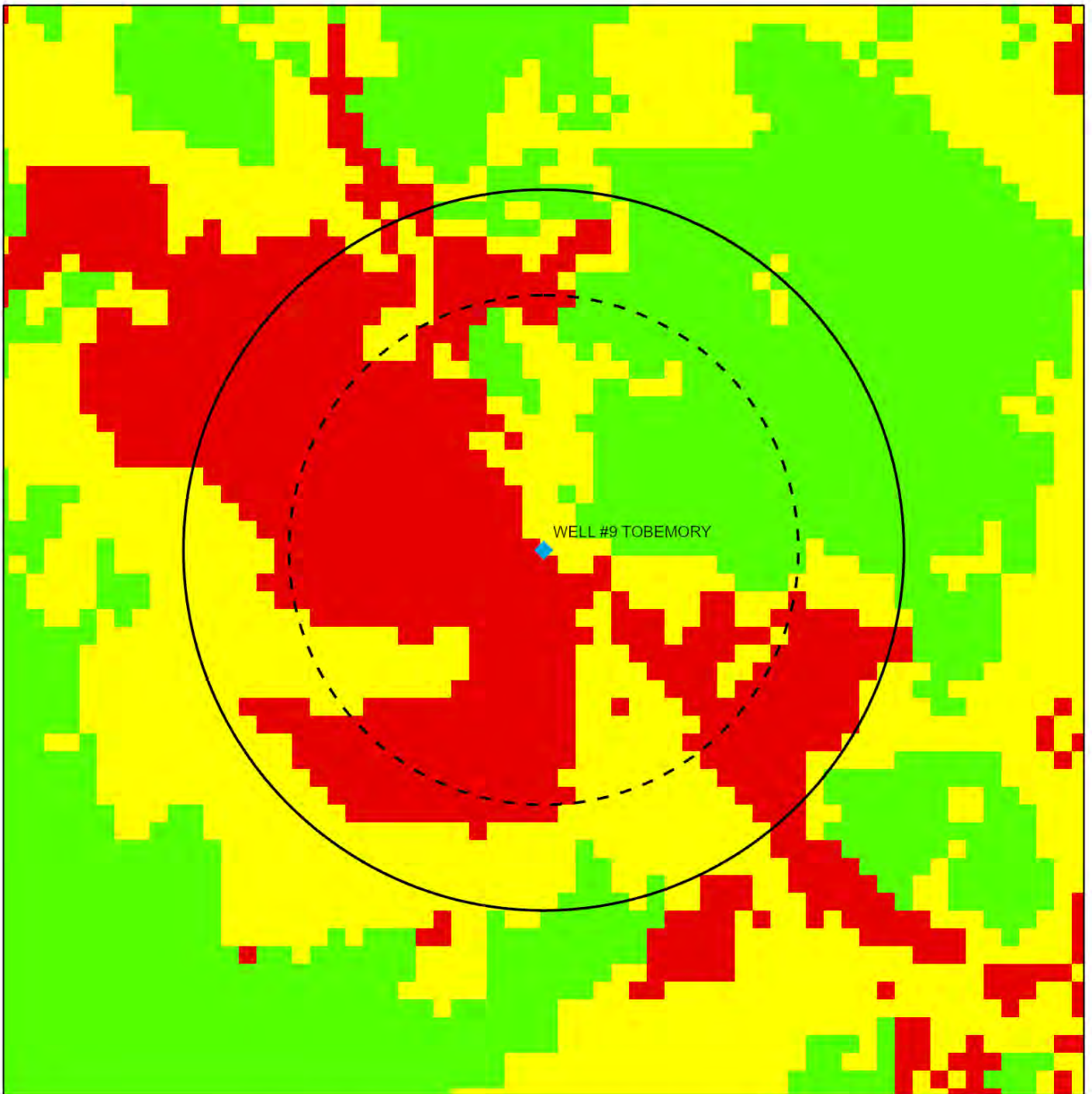
3. The USGS publication "Methods of ranking unsaturated zone and watershed characteristics of public water supplies in North Carolina", by J. L. Eimers, J. C. Weaver, S. Terziotti, and R. W. Midgette, 1999, provides a detailed discussion of the methods used to determine unsaturated zone ratings.



**FIGURE 1. LAND USE/LAND COVER CATEGORIES**  
 BLADEN CO WTR DIST-WEST BLADEN, PWS ID: 0309055, WELL #9 TOBEMORY



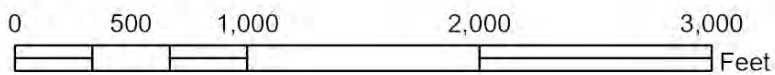




**FIGURE 2. UNSATURATED ZONE RATING**  
 BLADEN CO WTR DIST-WEST BLADEN, PWS ID: 0309055, WELL #9 TOBEMORY



- Lower  $\leq 50$
- Moderate  $> 50$  to  $65$
- Higher  $> 65$
- Ground Water Assessment Area - Delineated Area
- Ground Water Assessment Area - Zone A



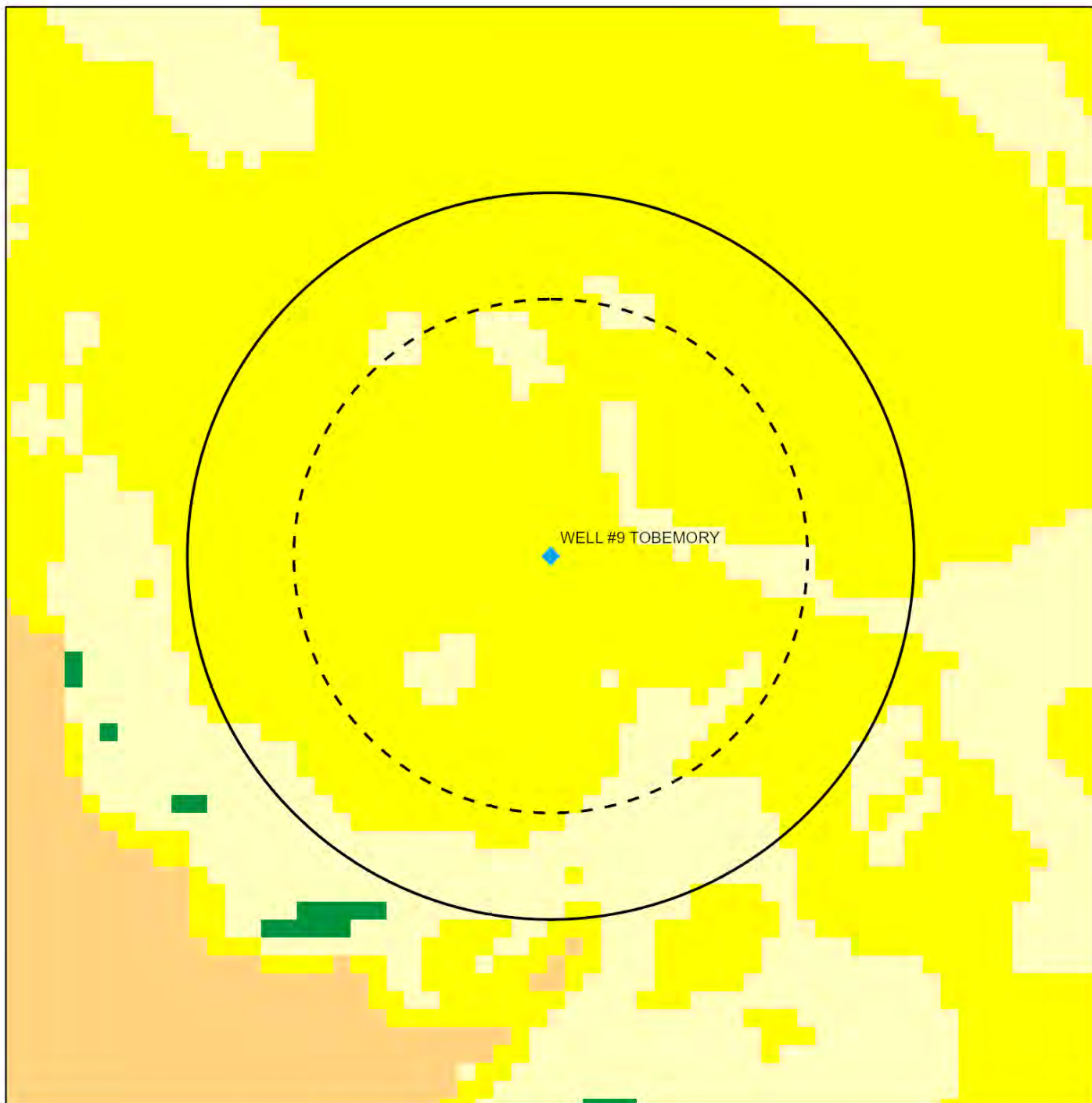
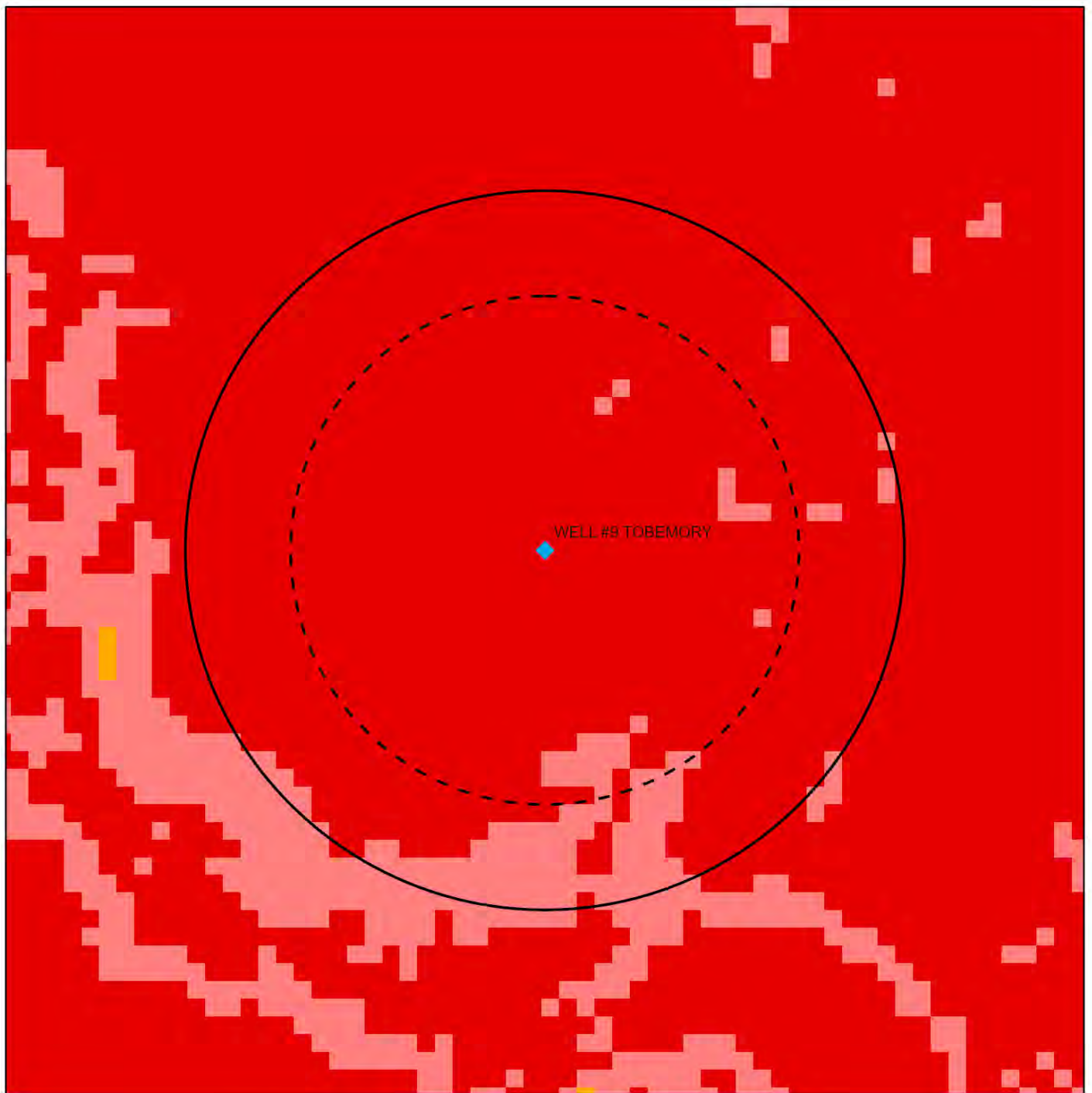


FIGURE 3. VERTICAL HYDRAULIC CONDUCTANCE RATING  
 BLADEN CO WTR DIST-WEST BLADEN, PWS ID: 0309055, WELL #9 TOBEMORY





**FIGURE 4. LAND SURFACE SLOPE RATING**  
 BLADEN CO WTR DIST-WEST BLADEN, PWS ID: 0309055, WELL #9 TOBEMORY



- |                        |                       |  |
|------------------------|-----------------------|--|
| 1 (> 50 percent)       | 7 (> 5 to 10 percent) | Ground Water Assessment Area - Delineated Area |
| 3 (> 20 to 50 percent) | 9 (> 2 to 5 percent)  | Ground Water Assessment Area - Zone A          |
| 5 (> 10 to 20 percent) | 10 (<= 2 percent)     |  |





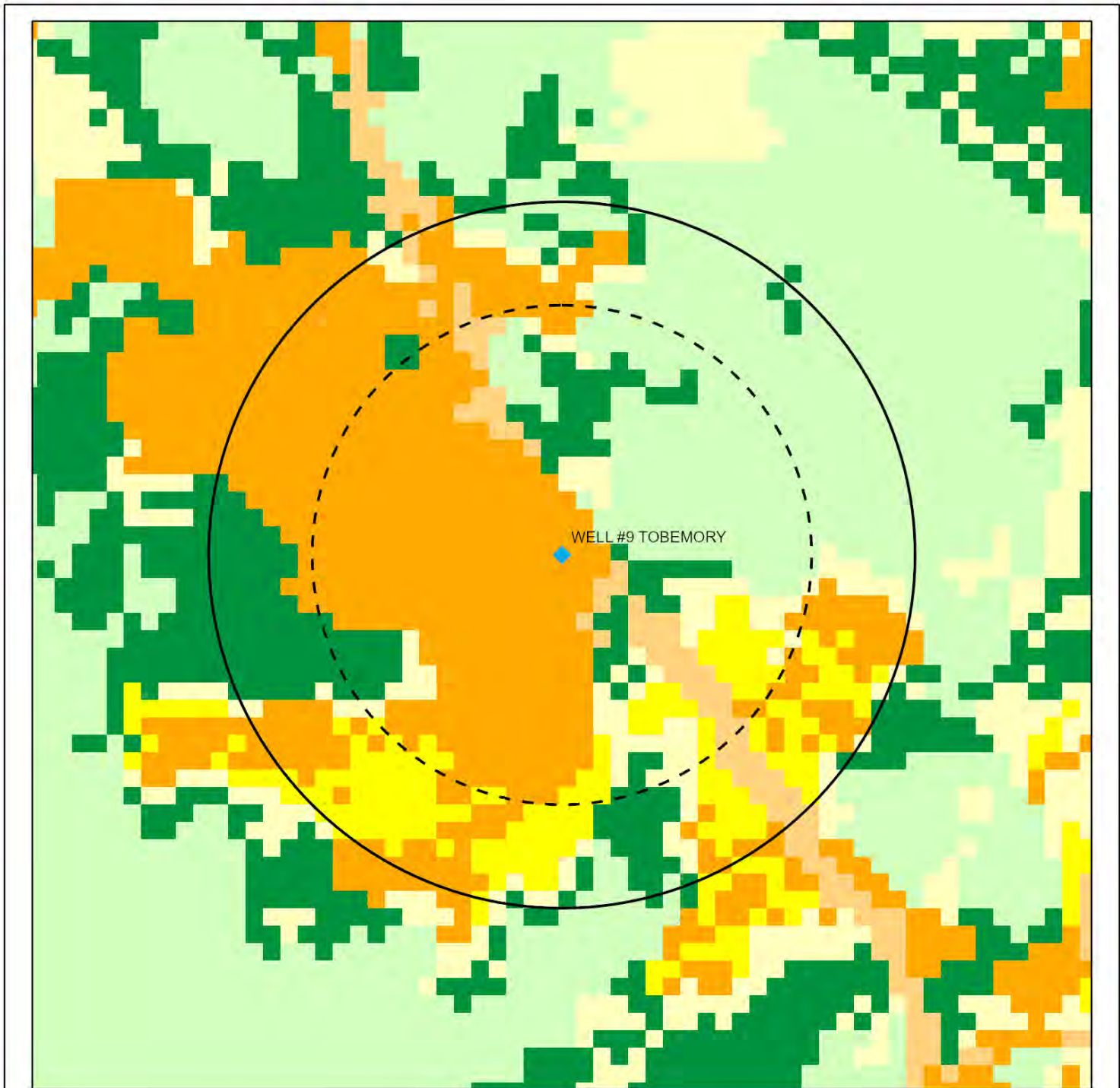
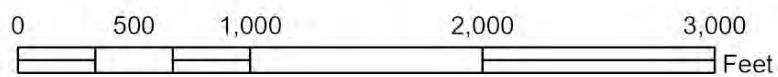


FIGURE 5. LAND USE RATING

BLADEN CO WTR DIST-WEST BLADEN, PWS ID: 0309055, WELL #9 TOBEMORY



- |   |   |   |
|---|---|---|
| <span style="color: #90EE90;">■</span> 1 Water, Wetlands (Woody and Herbaceous) | <span style="color: #FFFF00;">■</span> 5 Pasture/Hay                                | <span style="color: #FF0000;">■</span> 10 Developed, High Intensity   |
| <span style="color: #66CDAA;">■</span> 2 Barren Land (Rock/Sand/Clay)           | <span style="color: #FFDAB9;">■</span> 6 Developed, Open Space                      | <span style="border: 1px solid black; display: inline-block; width: 10px; height: 10px;"></span> Ground Water Assessment Area - Delineated Area |
| <span style="color: #008000;">■</span> 3 Forest (Deciduous, Evergreen, Mixed)   | <span style="color: #FF8C00;">■</span> 7 Developed, Low Intensity; Cultivated Crops | <span style="border: 1px dashed black; display: inline-block; width: 10px; height: 10px;"></span> Ground Water Assessment Area - Zone A         |
| <span style="color: #FFFF00;">■</span> 4 Grassland/Herbaceous; Shrub/Scrub      | <span style="color: #FFB6C1;">■</span> 8 Developed, Medium Intensity                |   |





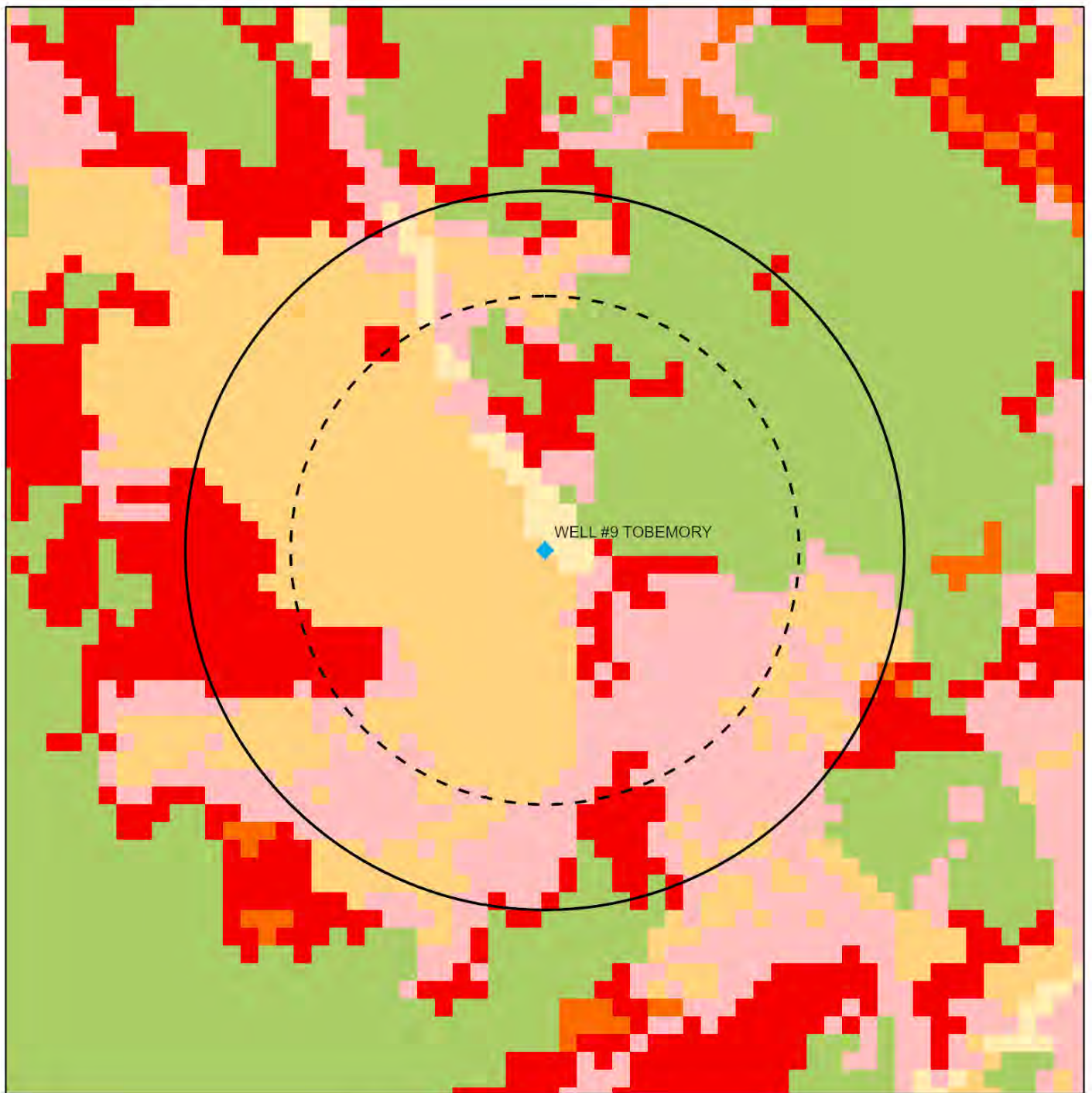


FIGURE 6. LAND COVER RATING

BLADEN CO WTR DIST-WEST BLADEN, PWS ID: 0309055, WELL #9 TOBEMORY



- |   |   |
|---|---|
| <span style="color: #90EE90;">■</span> 1 Developed, High Intensity                                | <span style="color: #FF8C00;">■</span> 9 Shrub/Scrub  |
| <span style="color: #3CB371;">■</span> 2 Water; Wetlands; Developed, Medium Intensity             | <span style="color: #FF0000;">■</span> 10 Deciduous, Evergreen and Mixed Forest   |
| <span style="color: #FFD700;">■</span> 4 Developed, Low Intensity                                 | <span style="border: 1px solid black; display: inline-block; width: 10px; height: 10px;"></span> Ground Water Assessment Area - Delineated Area |
| <span style="color: #FFA500;">■</span> 6 Barren Land (Rock, Sand, Clay); Cultivated Crops         | <span style="border: 1px dashed black; display: inline-block; width: 10px; height: 10px;"></span> Ground Water Assessment Area - Zone A         |
| <span style="color: #FFB6C1;">■</span> 8 Grassland/Herbaceous; Pasture/Hay; Developed, Open Space |   |





## **Appendix B**

### **2013 O&M Plan for Cumberland County Water System**



**OPERATION AND MAINTENANCE PLAN  
CUMBERLAND COUNTY WATER SYSTEM/  
WEST BLADEN PURCHASE SYSTEM**

**PWS I.D. NO.: 50-26-026**

**County Of Cumberland North Carolina  
130 Gillespie Street, Room 215  
Fayetteville, NC 28301**

**Cumberland County**

**Phone: 910-678-7637**

**Email: [ahall@co.cumberland.nc.us](mailto:ahall@co.cumberland.nc.us)**

**PREPARED BY:  
KOONCE, NOBLE AND ASSOCIATES, INC.  
CONSULTING ENGINEERS  
LUMBERTON, NORTH CAROLINA**

**MARCH, 2013**

**F-0103**



## CUMBERLAND COUNTY WATER SYSTEM

### Operation and Maintenance

Some problems associated with water supply systems can be alleviated if not corrected by observing proper procedures for operating and maintaining the system. Proper maintenance practices should be adhered to according to a pre-established schedule (Walski 1987b, AWWA 1987).

#### A. Frost Prevention

Severe winter conditions may warrant actions to prevent water from freezing and bursting pipes or other structures. The easiest short-term action is to keep water moving in problem pipes either by requesting that consumers run water or by bleeding water from pipes at crucial points in the system. Dead-end sections are most susceptible to freezing. Storage tanks, pump stations and meter vaults are susceptible to freezing and, therefore, are possible candidates for supplemental heating.

#### B. Leak Detection and Repair

Unless specific measures are taken to detect and repair leaks, a considerable amount of water can be lost through poor joints or cracked pipes. Leak detection techniques can uncover previously undetected leaks or pinpoint suspected ones. Most leak detection surveys use sonic equipment that allows operators to listen for the source of the leak. Experienced operators can accurately locate the leak and, in some instances, estimate the leakage rate. Leak detection surveys are often conducted by private firms that contract with the water utility, which often follows up on the survey and repairs the leaks. The cost of leak detection and repair usually is less than the value of water that would have been lost through unrepaired leaks over some reasonably short period of time (Moyer et al. 1983, Moyer 1985). Leak detection surveys can be one-time affairs or can be scheduled periodically. The value of leak detection is not realized unless the identified leaks are repaired. It is possible that extremely high leakage in one pipe segment might warrant replacement of the entire pipe segment instead of repair. Leak detection and repair will also help determine which geographic areas and types of pipe are more likely to leak. The degree to which this approach will alleviate water loss depends on the condition of the system. Leak repair might also contribute to a longer-lasting system. First, leaking water tends to erode soil surrounding and supporting a pipe. Continued leaking, therefore, might lead to a more costly break. Second, the increased soil moisture resulting from the leak can promote corrosion if stray direct current is present (because of its higher electric conductivity in wet soil). Repair may not eliminate the cause of leaks and future leakage may result. Poor joint material and corrosion (caused by direct current, bimetallic connections, poor soil, or corrosive water in unlined pipe) are possible causes

that need to be addressed to prevent recurrence of the leaks. Some leaks do not require repair but merely tightening or replacing fittings (Male, Noss and Moore 1985; Moyer et al. 1983; Brown and Caldwell 1984; Walski 1984b).

C. Meter Calibration

Master meters (connection to Bladen County) can over-register, thereby creating the appearance that more water is being used in the system than actually is. Calibration of the meter(s) will not save any water, but will contribute to better accounting practices, which in turn will lead to better operation of the existing system and better design of improvements. Master meter calibration should be a routine part of preventive maintenance. Consumer meters should also be tested and calibrated on a periodic basis. Consumer meters often tend to under-register as they age. This under-registration results in lost revenue (in cases where consumers are being billed) and an elevated assessment of unaccounted-for water. Meters can be checked on a periodic basis, and, in addition, failed meters can be identified by surveillance of billing records (Male, Noss and Moore 1985; AWWA 1986d).

D. Flushing

In some systems with turbidity problems, periodic flushing of the system will improve water quality by removing any settled material. This sediment can occasionally be resuspended and cause dirty water. Flushing assures that when the material is resuspended, it is removed from the lines. Periodic flushing is particularly useful where velocities are slow, such as in dead ends. Flushing eliminates symptoms but does not eliminate the underlying problem. When flushing in a complex grid, it is helpful to isolate individual lines to maximize velocities and hence the effectiveness of the flushing (California-Nevada AWWA 1981).

E. Valve Exercise

Regular exercising of valves is important for several reasons. First, it helps to ensure that the valves can be found and that they will operate when necessary. Second, valves may have been incorrectly left closed or partially closed, and periodic exercise will allow correct positioning. Third, valve exercise also serves as training, allowing personnel to find valves more quickly in an emergency. Records of valve exercising should be kept to determine the effectiveness of the program (e.g., number of valves found stuck), and to ensure that each valve is exercised within a reasonable time period. Valves do not need to be exercised every week but do need to be exercised every few years.

F. Control of Unauthorized Use

Utility personnel need to be on the alert for apparent theft of water. Meter readers, valve crews and construction inspectors all need to be on the alert for water theft.





## **Appendix C**

### **NC0309055 Well Treatment Process Summary**



<a href="#">County Map of NC</a>	<a href="#">Water System Search</a>	<a href="#">Public Water Supply Section Home Page</a>	
<b><a href="#">Water System Detail Information</a></b>			
Water System No.:	NC0309055	Federal Type:	C
Water System Name:	BLADEN CO WTR DIST-WEST BLADEN	Federal Source:	GW
Principal County Served:	BLADEN	System Status:	A
Principal City Served:	ELIZABETHTOWN	Activity Date:	11-01-1989

<b>Water System Facility</b>			
Facility ID No.	P09	Type:	TP - Treatment Plant
Facility Name	TREATMENT_PLT_WELL #9	Status/Reason	A
Water Type	GW	ACTIVITY_DATE	07-01-2007

<b>Sample Points</b>		
<b>Sample Point ID</b>	<b>Location Description</b>	<b>Type</b>
E09	WELL #9	EP

<b>Water System Facility Contacts</b>		
<b>Type</b>	<b>Contact</b>	<b>Communication</b>

<b>Facility Annual Operating Period(s)</b>			
<b>Effective Begin Date</b>	<b>Effective End Date</b>	<b>Start Month/Day</b>	<b>End Month/Day</b>

<b>Treatment Plant</b>	
<b>Treatment Plant Filter Type</b>	

<b>Treatment Plant Contact Time</b>				
<b>Status</b>	<b>Status Date</b>	<b>Contact Time (Minutes)</b>	<b>Disinfection Concentration (mg/L)</b>	<b>CT Value (mg.min/L)</b>

<b>Treatment Plant Disinfection Profiling Benchmark</b>							
<b>Giardia Status</b>	<b>Giardia Inact. Log</b>	<b>Giardia Inact.</b>	<b>Giardia Status Date</b>	<b>Virus Status</b>	<b>Virus Inact Log</b>	<b>Virus Inact</b>	<b>Virus Status Date</b>

Treatment Plant Analyte Removal					
Code	Analyte Name	Removal Credited	Removal Achieved	Removal/Inact. Required	Inactivation Needed

Treatment Plant BIN Determination		
Status	BIN	Status Date

Treatment Plant Filter Backwash Recycling Rule						
Schem Stat	Schem Rec	Schem Rev	Alt Ret Loc Req Stat	Alt Ret Loc Req Stat Dt	Corr Act Req Stat	Corr Act Req Stat Dt

Treatment Units								
Type	Name	Subtype	Cont. Dis.	Aerator Type	Sludge Rem. Type	Filter Media Type	Basin Count	Subunit Count
<u>GU - Generic Unit</u>	GENERIC UNIT						0	0
<b>Treatment Objective Process Associations</b>								
	<b>Primary</b>	<b>Obj. Code</b>	<b>Objective Name</b>		<b>Proc. Code</b>	<b>Process Name</b>		
		C	CORROSION CONTROL		741	PH ADJUSTMENT, POST		
		C	CORROSION CONTROL		445	INHIBITOR, ORTHOPHOSPHATE		
		D	DISINFECTION		423	HYPOCHLORINATION, PRE		
		D	DISINFECTION		421	HYPOCHLORINATION, POST		
		F	IRON REMOVAL		742	PH ADJUSTMENT, PRE		
		F	IRON REMOVAL		344	FILTRATION, PRESSURE SAND		
		O	ORGANICS REMOVAL		121	ACTIVATED CARBON, GRANULAR		

Treatment Plant Unit Process Flows				
Train ID	Sequence ID	Supply	Receive	Connection Type

WSF Indicators		
Type	Value	Date

## **Appendix D**

### **Hydrant Flow Test Reports**









PROJECT: Cumberland County Public Utilities  
Asset Management Plan

McGill Associates, P.A.  
5 Regional Circle, Suite A  
Pinehurst, North Carolina 28374  
Phone (910-295-3159) / Fax (910-295-3647)

## Hydrant Flow Test Report

Location Southpoint Neighborhood, Cumberland County, NC Date 4/10/2024  
Test made by Demi Watkins, Dean Byrd, Amy Hall Time 3:40 PM

Conditions	Sunny, 85 degrees		
Flow Hydrant		Residual Hydrant	
No.	<u>8634 Brightleaf</u>	No.	<u>8480 Brightleaf</u>
Location	<u>Place</u>	Location	<u>Place</u>
Size nozzle	<u>2 1/2 Steamer</u>	Static	<u>54</u> psi
Inlet type	<u></u>	Residual	<u>1</u> psi
Discharge coefficient	<u></u>	Elev. (Autocad)	<u>161</u>
Pitot Pressure	<u>1</u> psi	Residual Hydrant 2 (if applicable)	
GPM	<u>168</u>	No.	<u></u>
		Location	<u></u>
		Static	<u></u> psi
		Residual	<u></u> psi

Remarks Amy was at the Residual hydrant, Dean and Demi were at the Flow hydrant.

*Disclaimer: Hydrant test results indicated are for the single point in time that the test was conducted, and are subject to variation. A number of factors may affect test results which are specific to conditions during testing. These conditions include water system demand, water tank levels, booster pump station status, valve positions, etc.*



# Cumberland County Water and Sewer Asset Inventory and Assessment





# Asset Inventory & Assessment

## History:

- In 2021, Cumberland County was designated as “distressed” by the Local Government Commission and the State Water Infrastructure Authority.
- County staff began working to address required steps to be removed from distressed list
- In 2023, Cumberland County contracted with McGill to develop Asset Management Plans (AMP) for each of the existing utility districts.
- Cumberland County intended to adopt CIP’s for each of the utility districts in order to perform and adopt a System Development Fee study.
- McGill utilized NCDEQ AIA guidance and industry standards to **inventory** and **assess** the County’s one water distribution system and three wastewater collection systems.





# What is an Asset Management Plan?

It is a **WORKING** plan and includes 4 key components:

- An **Inventory** of system assets:  
WATER: water main, water valves, fire hydrants, interconnections  
SEWER: sewer line, manholes, lift stations
- A summary of **Asset Conditions**
- A **Capital Improvements Plan**
- An **Operations and Maintenance and Staffing Recommendations Plan**





# Summary of NORCRESS System Assets

- Year put into service: 2005
- Active Service Connections : 452 (394 residential, 87%)
- Performed smoke testing, manhole inspections, flow monitoring

## Sewer Mains – 138,200 feet (26.2 mi)

- PVC (97%) and Ductile Iron Pipe

## Sewer Manholes – 424

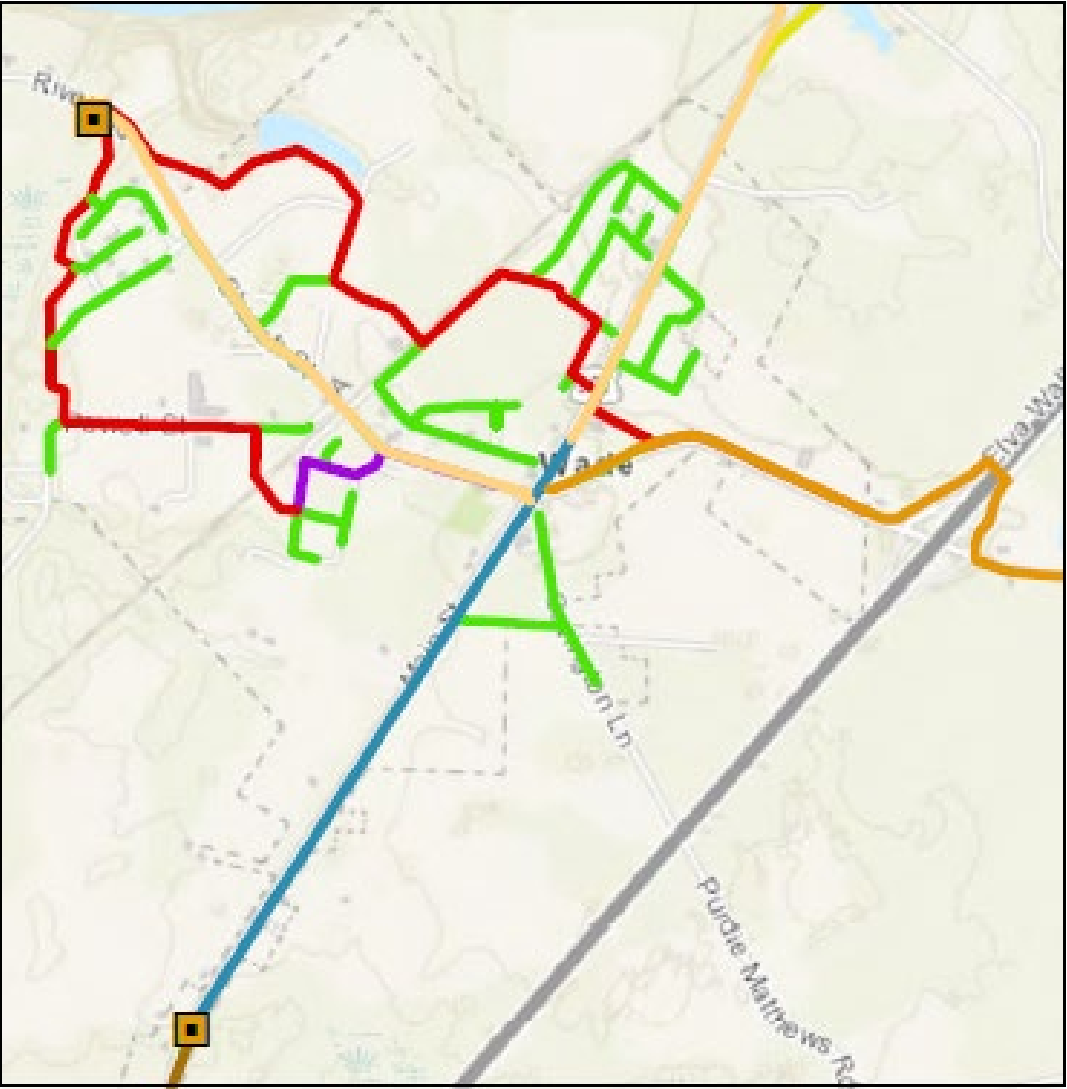
- All Precast Concrete Material
- Beginning to show some corrosion
- Generally good condition

## Lift Stations - 4

- Godwin LS, Falcon LS, Wade #1 LS, Wade #2 LS



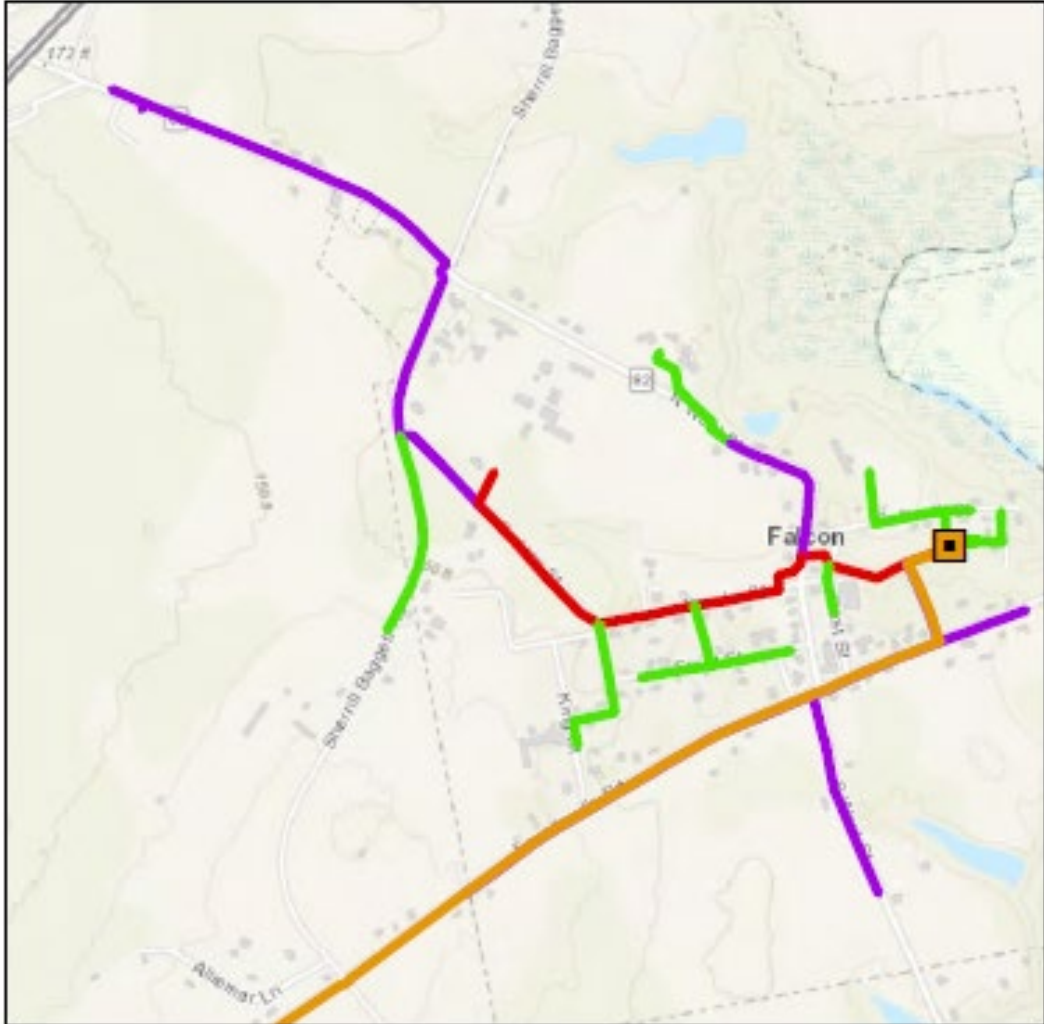
# Wade



# Godwin



# Falcon



**Legend**

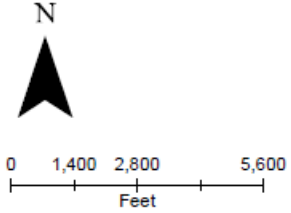
GRAVITY SEWER DIAMETER

- 8" (Green line)
- 10" (Purple line)
- 12" (Red line)
- 15" (Blue line)

FORCE MAIN DIAMETER

- 3" (Yellow line)
- 6" (Orange line)
- 8" (Dark Orange line)
- 10" (Brown line)

☐ Lift Station







# NORCRESS Sewer Capital Improvement Projects

No.	Project Name	Cost
1	New Generators – All Lift Stations	\$640,000.00
2	Upgrade SCADA	\$240,000
3	Flow Meter Project	\$203,900.00
4	Flow Monitoring Study	\$25,440.00
5	Falcon Force Main and ARV Project	\$80,000.00
6	Manhole Rehabilitation Project 1	\$118,600.00
7	Manhole Rehabilitation Project 2	\$118,600.00
8	Manhole Rehabilitation Project 3	\$118,600.00
9	Manhole Rehabilitation Project 4	\$118,600.00
	<b>10-Year CIP Total Project Cost</b>	<b>\$1,714,620.00</b>



# Summary of Kelly Hills System Assets

- Year put into service: 2005
- Active Service Connections: 102 (all residential)
- Performed Smoke testing, manhole inspections

## Sewer Mains – 23,540 feet (4.4 mi)

- PVC (84%) and Ductile Iron Pipe

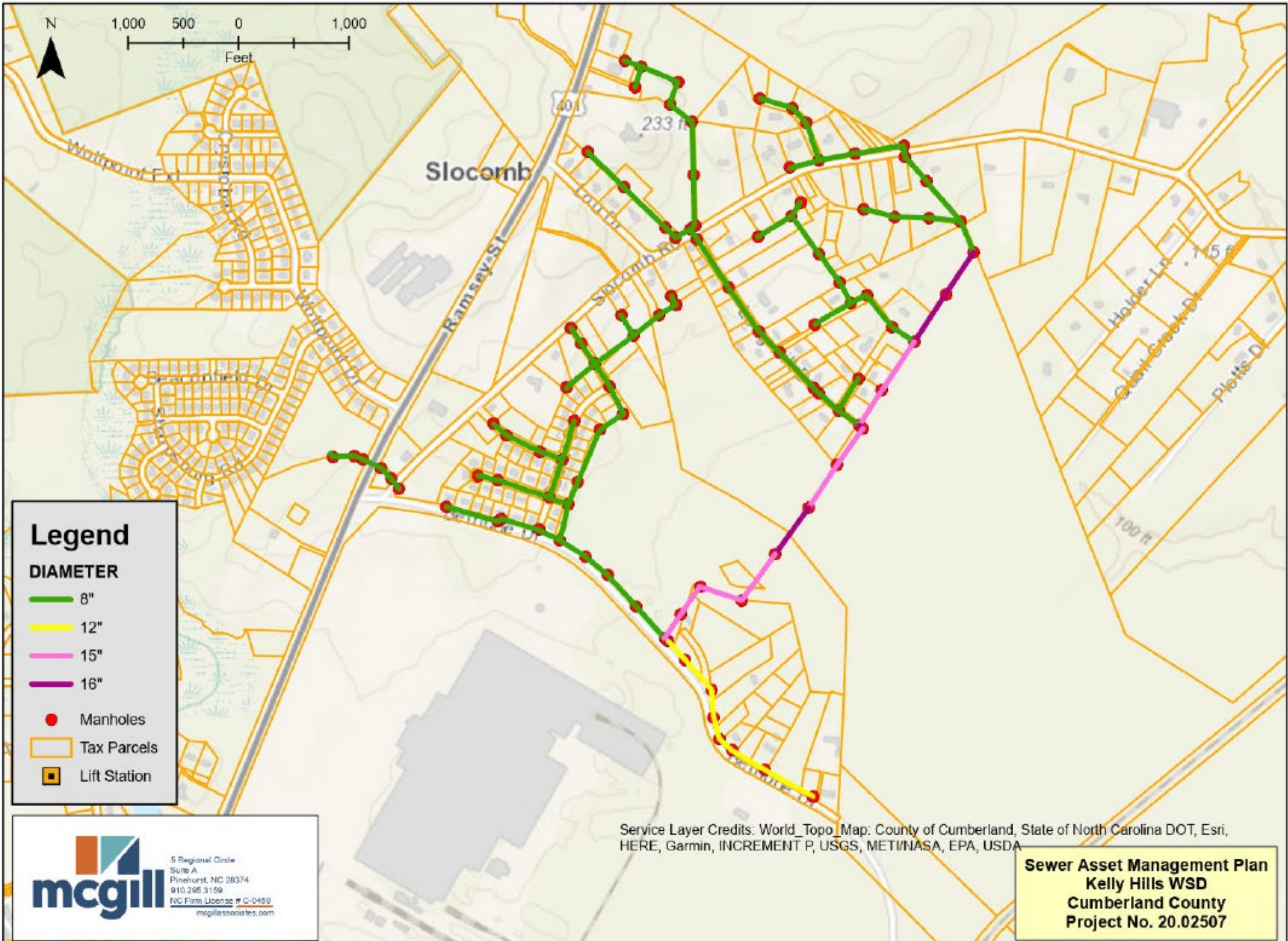
## Sewer Manholes – 100

- All Precast Concrete Material
- Beginning to show some corrosion
- Generally good condition

## Lift Station - 1

- Unobligated Capacity: 53,580 GPD (~230 res. conn.)









# Kelly Hills Sewer Capital Improvement Projects

No.	Project Name	Cost
1	Manhole Rehabilitation Project 1	\$81,000.00
2	Flow Monitoring Improvements	\$103,900.00
3	Manhole Rehabilitation Project 2	\$81,000.00
4	Manhole Rehabilitation Project 3	\$81,000.00
5	Manhole Rehabilitation Project 4	\$81,000.00
	<b>10-Year CIP Total Project Cost</b>	<b>\$427,900.00</b>



# Summary of Overhills System Assets

- Year put into service: 2019
- Active Service Connections: 107 (all residential)
- Performed Smoke testing, manhole inspections

## Sewer Mains – 17,420 feet

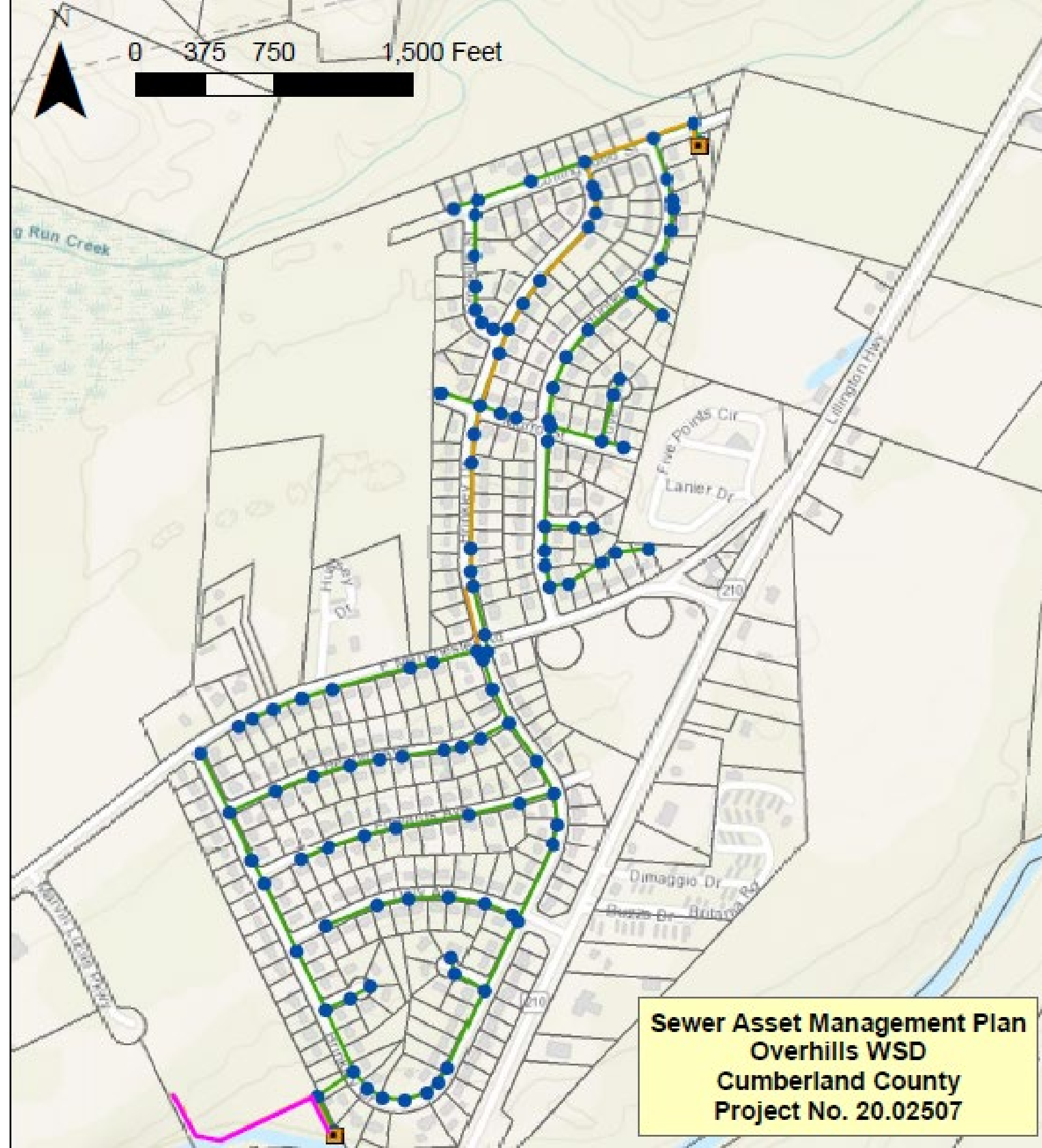
- All 8" PVC Pipe

## Sewer Manholes – 119

- All Precast Concrete Material

## Lift Stations - 2

- Collinswood LS, Brinkley LS
- FY 2025 Daily Flow Per Connection: 84 – 276 GPD



**Legend**

- Lift Station
- 6" PVC Forcemain
- Manhole
- 4" PVC Forcemain
- 8" PVC Gravity Sewer

**Sewer Asset Management Plan  
Overhills WSD  
Cumberland County  
Project No. 20.02507**



# Overhills Sewer Capital Improvement Projects

No.	Project Name	Cost
1	Brinkley Lift Station Improvements	\$33,100.00
2	Manhole Rehabilitation Project 1	\$84,100.00
3	Manhole Rehabilitation Project 2	\$84,100.00
4	Manhole Rehabilitation Project 3	\$84,100.00
	<b>10-Year CIP Total Project Cost</b>	<b>\$285,400.00</b>





# Summary of Southpoint Water Assets

- Year Put into service: 2013
- Active Service Connections: 84 (all residential)
- Flow testing performed, 55 psi average pressure

## Water Main – 16,900 feet

- Diameters: 12-inch, 8-inch, 6-inch, 2-inch

## Valves – 6

- Condition generally good

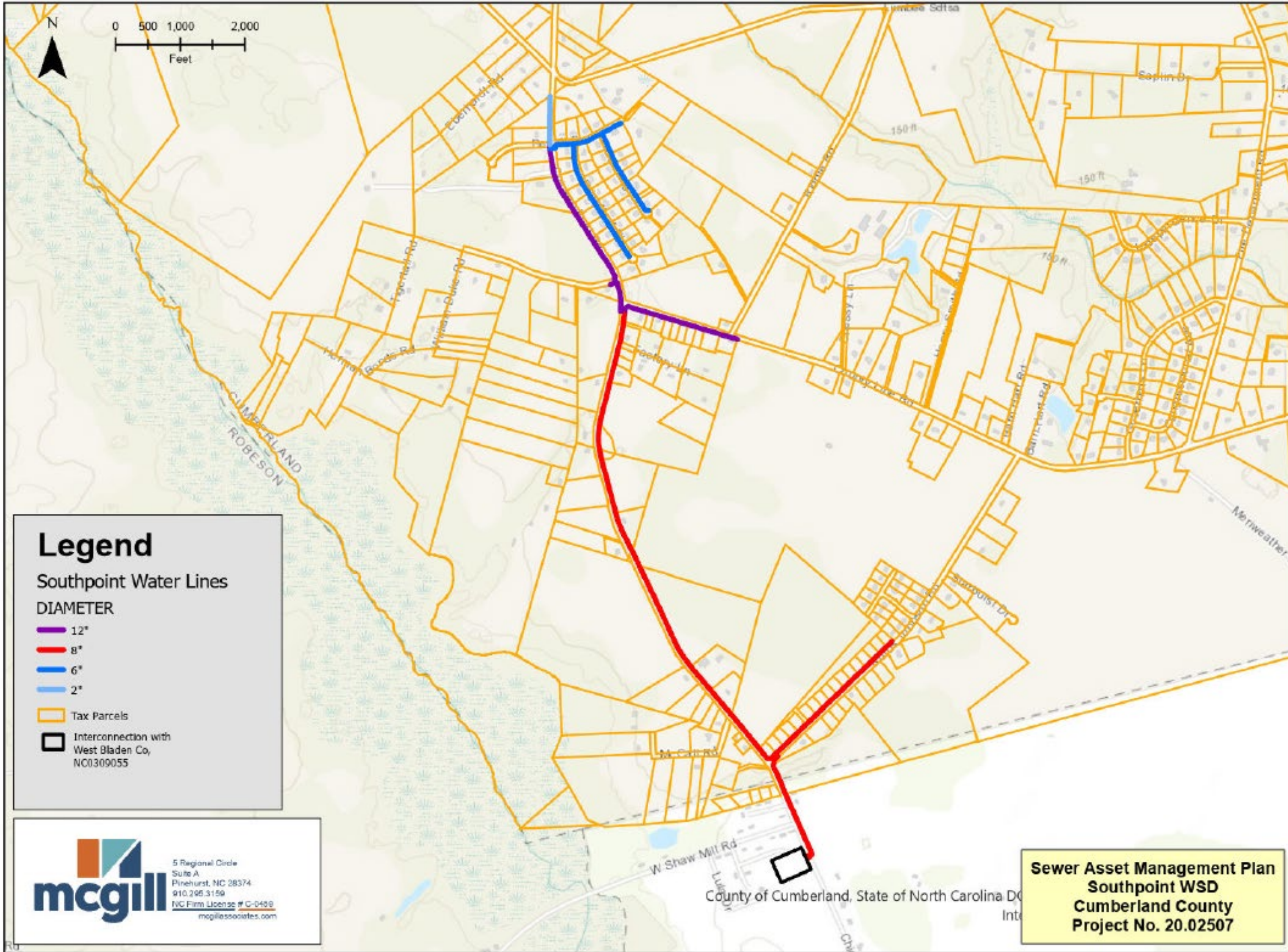
## Fire Hydrants– 12

- Condition generally good

## System Interconnection – Bladen County Water

- 45,000 GPD capacity
- 10,500 GPD average usage





### Legend

Southpoint Water Lines

DIAMETER

- 12"
- 8"
- 6"
- 2"

- Tax Parcels
- Interconnection with West Bladen Co, NC0309055

5 Regional Circle  
Suite A  
Pinehurst, NC 28374  
910.296.3159  
I/C Firm License # C-0428  
mcgillassociates.com

**Sewer Asset Management Plan**  
**Southpoint WSD**  
**Cumberland County**  
**Project No. 20.02507**

County of Cumberland, State of North Carolina





# Southpoint Water Capital Improvement Projects

No.	Project Name	Cost
1	Water Meter Replacement	\$71,300.00
2	Construction New Wells and Water Main	\$19,614,136.00
3	Ground Storage Tank and Filter	\$303,500.00
	<b>10-Year CIP Total Project Cost</b>	<b>\$19,988,936.00</b>



# Staffing Recommendations

- County is responsible for management of 3 Sewer Systems and 1 Water System
- Staffing analysis was performed based on typical staffing from EPA study
- EPA study utilizes population and pipe length to estimate staffing
- Table 19 shows calculated Full Time Equivalent (FTE) based on position type

**Table 19: Average Community System Statistics**

Employee Category	System Size (miles of Main)		Mean	Cumberland County
	Pop. 500-3300	Pop. 3300-10000		
	21	62	41.5	51.7
Manager FTE	0.6	1.1	0.85	1.06
per mile	0.029	0.018	0.020	0.020
Plant Operator FTE	0.6	1.3	0.95	1.03
per mile	0.029	0.021	0.023	0.023
Distribution FTE	0.8	2.5	1.65	2.06
per mile	0.038	0.040	0.040	0.040
Administrative FTE	0.6	1.5	1.05	1.31
per mile	0.029	0.024	0.025	0.025



# Staffing Recommendations

- Calculated FTE's were applied based on employee categories
- Wage information based on Zip Recruiter statistics and Benefits Multiplier from U.S. Bureau of Labor Statistics
- Provided for preliminary planning purposes only

**Table 20: Overall Salary Estimates**

Employee Category	Hourly Rate	Annual Salary	Ben. Mult.	Total	Applied FTE	Applied Budget Cost
Manager	\$38.50	\$80,080.00	1.38	\$110,510.40	1.06	\$117,000
Operator	\$24.52	\$51,001.60	1.38	\$70,382.21	1.03	\$72,700
Distribution	\$23.57	\$49,025.60	1.38	\$67,655.33	2.06	\$139,100
Administrative	\$21.33	\$44,366.40	1.38	\$61,225.63	1.31	\$80,100
<b>Total Applied Budget Cost Based FTEs</b>						<b>\$408,900</b>

Any questions?

Thank you!





# Additional Information as needed





# System Development Fees

- Enacted in the North Carolina Public Water and Sewer System Development Fee Act approved in 2017 (House Bill 436)
- Enables public water and sewer utilities in North Carolina to assess system development fees for utility service to new development
- The SDF Act defines new development as:
  1. Subdivision of land
  2. Construction or structural change that increases service needs, or
  3. Any use of land which increases service needs
- SDFs serve as the mechanism by which “growth pays for growth”



# System Development Fees

- Fee calculation in a written analysis prepared by a financial professional or licensed engineer employing generally accepted accounting, engineering and planning methodologies
- The analysis must be posted on the County's website and provide a means by which public comments are received for 45 days
- Comments received must be considered by the preparer of the analysis for possible adjustments to the analysis
- A public hearing must be held prior to considering adoption



## **SOLID WASTE MANAGEMENT**

### **MEMORANDUM FOR BOARD OF COMMISSIONERS AGENDA OF SEPTEMBER 15, 2025**

**TO: BOARD OF COUNTY COMMISSIONERS**

**FROM: AMANDA LEE, PE, GENERAL MANAGER FOR NATURAL RESOURCES**

**DATE: 9/10/2025**

**SUBJECT: APPROVAL OF ASSET MANAGEMENT PLANS FOR THE WATER AND SEWER DISTRICTS**

#### **BACKGROUND**

The Public Utilities Department has been working with McGill Associates, PA, on Asset Management Plans (AMP) for the water and sewer districts owned by Cumberland County. These plans are needed to effectively manage the systems and budget for projects that support the utility needs of customers within each district. As part of the AMP studies a 10-year Capital Improvements Plan (CIP) is being included for each district in accordance with NC Department of Environmental Quality Division of Water Infrastructure Guidance. Projects will include focusing on operational and maintenance challenges and consideration to potential growth.

The suggested CIP was incorporated into the FY26 budget. The CIP for the Water and Sewer Enterprise funds can be found on page 77 of the Recommended Annual Budget for FY26. It should be noted that in the CIP Cost Summary for each AMP has a year one of FY26, and continues for ten years, whereas FY30+ is combined in the CIP Recommended Budget document. All amounts remain the same.

Matthew Jones, PE, with McGill Associates, presented an overview of the studies to the Infrastructure Committee on September 8, 2025. The Infrastructure Committee approved moving this item to the Consent Agenda of the September 15, 2025, Board of Commissioners' meeting, as well as to the Consent Agendas of the Kelly Hills Water and Sewer District Governing Board, the NORCRESS Water and Sewer District Governing Board, the Overhills Park Water and Sewer District Governing Board, and the Gray's Creek Water and Sewer District Governing Board.

#### **RECOMMENDATION / PROPOSED ACTION**

The Public Utilities Project Manager, General Manager for Natural Resources and Management recommend

the following proposed actions for the Board of Commissioners and the Kelly Hills Water and Sewer District Governing Board, the NORCRESS Water and Sewer District Governing Board, the Overhills Park Water and Sewer District Governing Board, and the Gray's Creek Water and Sewer District Governing Board:

Approve the Asset Management Plans (AMP), including the 10-year Capital Improvements Plans (CIP), for the Kelly Hills, NORCRESS, Overhills Park, and Gray's Creek Water and Sewer Districts.

**ATTACHMENTS:**

Description	Type
Kelly Hills Asset Management Plan	Backup Material
NORCRESS Asset Management Plan	Backup Material
Overhills Asset Management Plan	Backup Material
Southpoint Asset Management Plan	Backup Material
McGill Associates AMP Presentation	Backup Material

**SEWER ASSET MANAGEMENT PLAN**

**KELLY HILLS / SLOCOMB ROAD  
WATER AND SEWER DISTRICT**

**CUMBERLAND COUNTY, NC**



PINEHURST, NORTH CAROLINA

**SEWER ASSET MANAGEMENT PLAN**

**KELLY HILLS / SLOCOMB ROAD  
WATER AND SEWER DISTRICT**

**CUMBERLAND COUNTY, NC**

**MATTHEW JONES, PE**  
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**AUGUST 2025**

**PROJECT NO. 20.02507**

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- Appendix A – Manhole Inspection List**
- Appendix B – Smoke Testing Results List**
- Appendix C – Wastewater Collection System Permit**
- Appendix D – PWC Agreement**

## EXECUTIVE SUMMARY

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The purpose of this Asset Management Plan (AMP) is to document the condition of the Kelly Hills/Slocomb Road (Kelly Hills) Sewer District's infrastructure to assist the County with becoming more proactive in the management, operation and financing of its sewer collection system. The Kelly Hills Sewer District serves approximately 102 residential connections in the northern area of Cumberland County. There are 166 properties within the Kelly Hills District are not currently connected and are paying the sewer availability fee. The District's sewer collection system consists of approximately four and a half miles of gravity sewer and approximately 100 manholes. Collected wastewater is pumped from the Kelly Hills Lift Station, which is owned and operated by Fayetteville PWC, to the PWC collection system. Wastewater generated from the district is ultimately treated at the Cross Creek Water Reclamation Facility (NC0023957), which is also owned and operated by Fayetteville PWC.

This asset inventory and assessment consisted of assembling data on sewer pipe, manholes, and other appurtenances in the collection system. This assessment included performing inspections of selected manholes, performing smoke testing throughout the system, and reviewing existing data with County Staff. This information was evaluated and is summarized in this document which includes the asset management plan and capital improvements plan. This process resulted in the development of a 10-year Capital Improvements Plan (CIP) to guide the County with scheduling and financing the capital projects and equipment purchases necessary to maintain and improve its wastewater collection system. Through the AMP process, approximately 20% of the manholes and 25% of the cleanouts in the sewer collection system are in need of rehabilitation due to deterioration and fair condition.

The CIP includes a focused improvement to components within the sewer system that need rehabilitation or replacement based on existing condition, and on improvements that could improve management of the sewer system for staff. These planned projects will bring the County into a better position to serve its customers by improving the reliability

of the collection system. The County should look to its CIP to guide its next projects, and the CIP should be updated regularly as priorities change and as projects are completed. It is noted that many factors may impact the priorities including failures, and funding availability both local and through grant and loan programs. This assessment project provides evidence for the prioritization of manhole rehabilitation and improvement projects in the CIP.

### ***System Evaluation***

All of the pipe material in the Kelly Hills sewer system is PVC pipe. The collection system was first put into service in 2005, therefore the relative age of the system is low. PVC pipe is the most common material used for sewer systems today. The typical useful life for PVC pipe is anywhere from 40 to 60 years.

As part of the AMP, McGill Associates, PA (McGill) assisted the County with evaluating the condition of its sewer infrastructure to identify projects in line with these goals. The following items were included in the AMP scope:

- Identify areas to conduct smoke testing to identify potential sources of I/I into the sewer system;
- Analyze the Kelly Hills lift station, based on County-provided data
- Inspect selected sewer manholes within the system to establish overall system condition;
- Identify and evaluate potential sewer system improvements;
- Prioritize sewer system improvements;
- Prepare opinions of probable costs for sewer system improvements; and
- Create a Capital Improvements Plan.

### **Manhole Inspections**

All manholes in the Kelly Hills sewer system are precast concrete based on information provided by County staff. The results of the selected manhole inspections performed as a part of this inventory were used to develop an assessment of manhole conditions in the

system. Based on the inspections performed, manholes that were inspected were assigned a condition rating – excellent, good, fair, or poor. Of the ten manholes they were all in good to fair condition. The remaining 90 are noted as unknown condition, but the manholes inspected are believed to be representative of the system based on input from County staff. These results are recorded in Figure 5 and included in Appendix A.

### Lift Station Inspection

The Lift Station serving the Kelly Hills District is owned and operated by Fayetteville PWC, therefore inspection of the station was not included as a part of this assessment. The Lift Station is located at 355 Bethune Drive. Analysis of flow data and customer usage was performed and is included in this report.

### Findings and Recommendations

The system evaluation allowed McGill to assemble a list of general recommendations and high priority projects to guide the County in the next 10 years. General recommendations to the District included establishing its own flow monitoring and smoke testing programs in high priority areas to determine sewer rehabilitation needs and inspecting sewer lines and manholes with CCTV equipment during routine cleanings to track the condition of these items. McGill also recommended the County begin rehabilitation and/or replacement of existing manholes within the collection system in order to reduce the risk of I/I.

Data and field investigation reporting were utilized to identify the priority projects within the collection system, focusing on manhole rehabilitation.

Table 1 summarizes projects identified during this assessment, centering around manhole rehabilitation projects. A project to install flow monitors is included to give greater control and understanding of flows from the collection system.

**Table 1: Summary of Capital Improvements Projects**

No.	Project Name	Cost
1	Manhole Rehabilitation Project 1	\$81,000.00
2	Flow Monitoring Improvements	\$103,900.00
3	Manhole Rehabilitation Project 2	\$81,000.00
4	Manhole Rehabilitation Project 3	\$81,000.00
5	Manhole Rehabilitation Project 4	\$81,000.00
<b>10-Year CIP Total Project Cost</b>		<b>\$427,900.00</b>

***Capital Improvements Plan***

The purpose of this asset inventory and assessment was to document the condition of the District’s inventoried infrastructure to assist the County with becoming proactive in the management of its wastewater system, to include capital project planning. The County does not currently have a Capital Improvements Plan (CIP) for its wastewater system. The CIP being developed from this current assessment will guide the County through its planning for projects within the 10-year window. The CIP will remain a living document and be updated in the future so that it remains current to the Districts’ highest priorities and provides accurate cost estimates. The CIP included in this assessment includes projects focused on rehabilitation of existing manholes, which have been identified to be potential sources for I/I into the system. Through discussion with County staff, field investigation and review of existing system data, the specific defects and general problematic areas within the wastewater system have been summarized. These results were used to develop the CIP and formulate a 10-year plan.

The complete asset inventory and assessment task consisted of multiple field work and analysis components, culminating in the development of the Kelly Hills/Slocomb Road Water and Sewer District’s CIP. McGill developed cost estimates for all projects based on current 2024 materials and construction costs. The updated CIP is intended to be adopted by the County to guide its selection of sewer system improvement projects over the next decade. This plan also includes a budget-level recommendation for staffing associated with system operations and maintenance for all County utility districts.

### 1.1 BACKGROUND

The Kelly Hills/Slocomb Road Water and Sewer District is located in Cumberland County, North Carolina, and is owned and operated by Cumberland County. The District includes a wastewater collection system that currently serves 102 residential customers as of August 2025. The collection system consists of approximately four and a half miles of gravity sewer mains that are 8-inch, 12-inch, 15-inch, and 16-inch in diameter. These gravity sewer mains are constructed of PVC and Ductile Iron pipe. The system was put into service in 2005. Figure 1 shows the existing sewer collection system.

Developing a Capital Improvements Plan (CIP) will allow the District to update its current rate setting model to better estimate future revenue and expenses, capital outlay, indebtedness, and overall health of the sewer system enterprise fund reserves. A model of this nature would continue to balance revenues and expenditures with a longer-term approach to rate setting and establish a financially sound framework for the District to follow.

The District has experienced the degradation of manholes within its sewer collection system due to the age of the system and resulting from wear over time.

Even with the relatively young age of the Kelly Hills system, County staff remains cognizant that infiltration and inflow (I/I) is always a concern, particularly in a scenario where the County's operation costs are based on the gallons of flow that enter into the existing lift station. Therefore, the top challenges for the Kelly Hills sewer system are mitigating I/I that results from deteriorated infrastructure and collecting reliable data on existing sewer flows for operations and maintenance planning. The information collected through this assessment project will help identify system deficiencies and develop improvement projects to reach these goals.

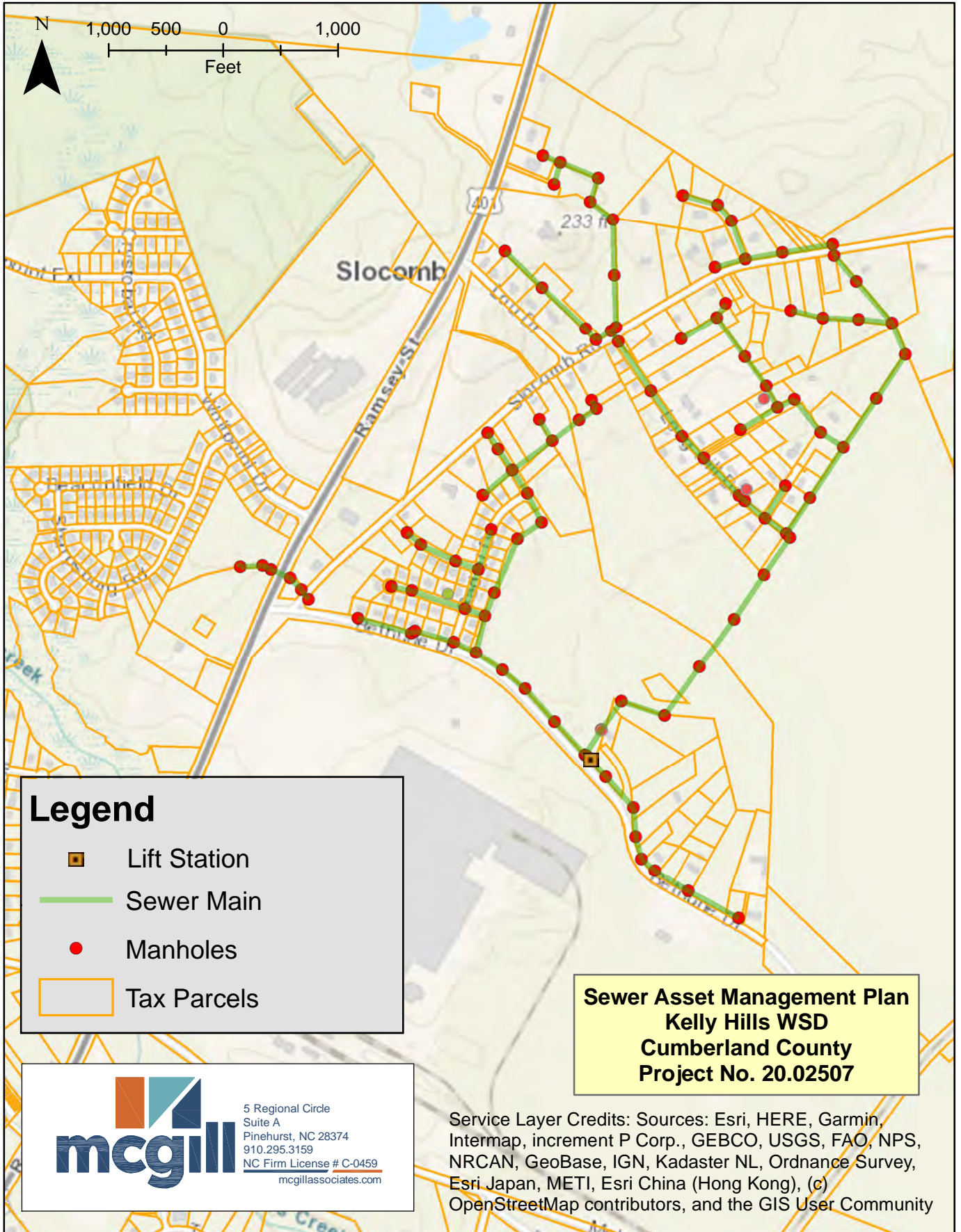
This process resulted in the development of a 10-year Capital Improvements Plan (CIP) to guide the District with scheduling and financing the capital projects and equipment purchases necessary to restore its wastewater collection system. Through the AMP process, the McGill and County staff have identified approximately multiple that require rehabilitation or replacement due to their poor condition.

The purpose of this Asset Management Plan (AMP) is to document the condition of the Districts' inventoried infrastructure to assist the District with becoming more viable and proactive in the management and financing of its wastewater system. The District continues to look to its CIP to guide its next projects; therefore, it is vital that the CIP remains current to the Districts' highest priorities and provides accurate cost estimates. This assessment project was utilized for the prioritization of replacement of lines and improvement projects in the CIP.



# Kelly Hills Overall System Map

## Figure 1



**2.1 SMOKE TESTING****2.1.1 Overview**

Smoke testing is one of the most cost-effective ways to locate defects in sewer mains and laterals. In this process, artificially produced non-harmful smoke is injected into the sewer line via a blower placed over a selected manhole. The pressurized smoke travels up and down the sewer line and connections and emerges at openings in the system. This visual aide allows test crews to easily identify, record, and mark locations where defects are present. If the sewer is in good condition, one should only see smoke rising from manhole lids and house roof vents. If the line has defects, such as breaks or illegal connections, the smoke will emerge at these points.

**2.1.2 Investigation**

McGill met with County staff to identify areas that would benefit most from smoke testing. Based on the size of the Kelly Hills District, it was determined that the entire system could be smoke tested. McGill prepared a detailed map of the area based on the County's GIS database. The Fire Department and customers along the route were alerted to the upcoming testing.

### **2.1.3 Methodology**

McGill and County staff smoke tested all four and a half miles of gravity sewer lines over a period of two days to determine locations where I/I enter the wastewater collection system. For each line to be tested, County staff recommended a centrally located manhole on which to place the blower based on the manhole's accessibility and avoidance of traffic. The manhole nomenclature used by the County was utilized and the location, configuration and condition of each one was recorded.

At each location, the following procedure was executed.

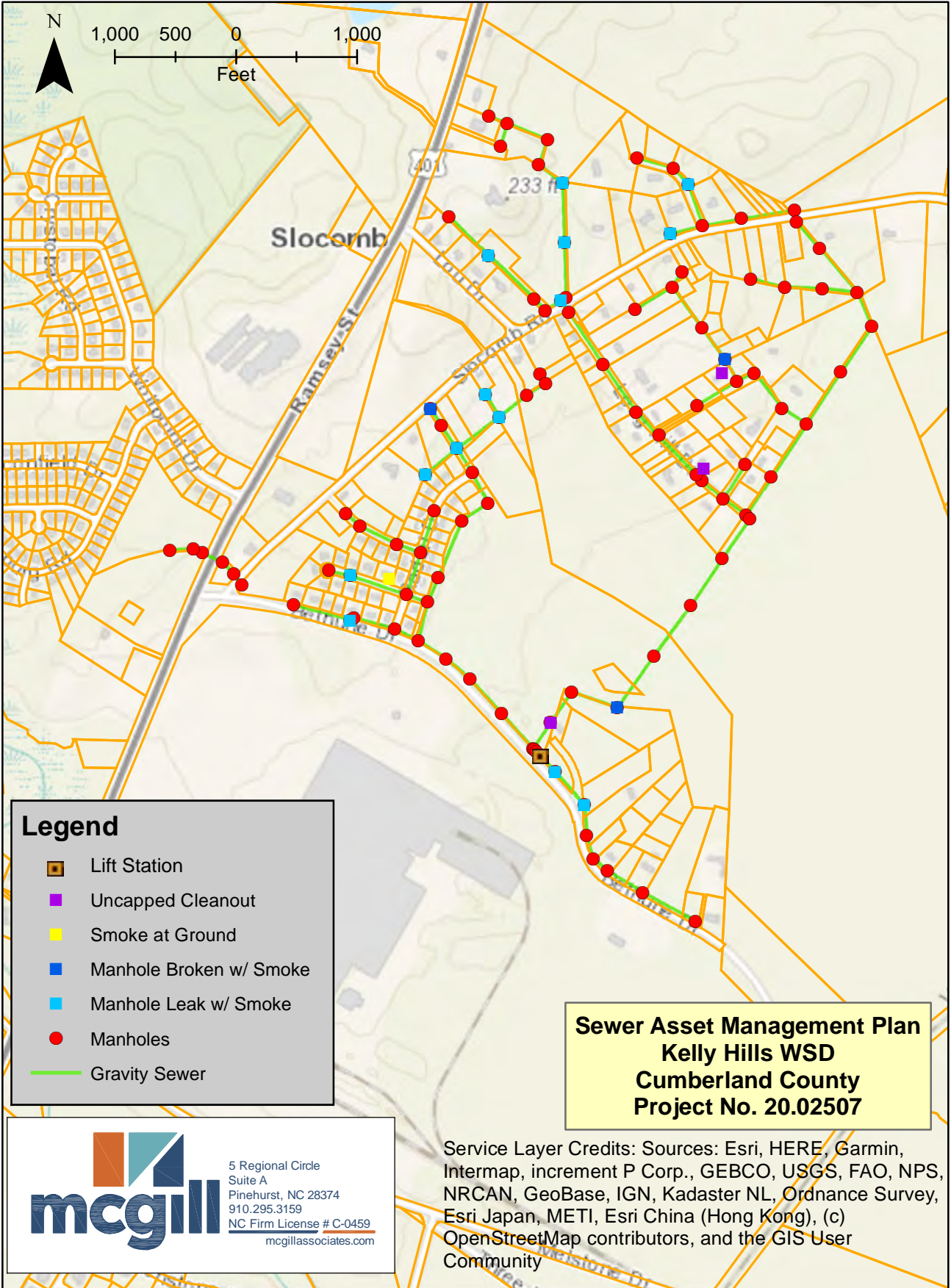
1. Place the blower on the manhole (with the rubber seal, if necessary).
2. Fill smoke pump up to  $\frac{3}{4}$  with liquid smoke.
3. Close all smoke pump valves.
4. Start blower and allow to warm up.
5. Open smoke pump valves.
6. Pressurize smoke pump by pumping the canister manually.
7. Once smoke begins emerging from roof vents, begin surveying for smoke emergencies indicating defects or problem areas in the pipeline.
8. For each defect, record the opening type, address, manhole identifier, and notes.
9. Additionally, mark each defect with paint.

This process continued until all visible defects were marked and recorded. Figure 2 shows some problematic system openings.



# Kelly Hills Smoke Testing Map

## Figure 2



**Legend**

- Lift Station
- Uncapped Cleanout
- Smoke at Ground
- Manhole Broken w/ Smoke
- Manhole Leak w/ Smoke
- Manholes
- Gravity Sewer

**Sewer Asset Management Plan  
Kelly Hills WSD  
Cumberland County  
Project No. 20.02507**



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## **2.2.4 Results**

The crew recorded 54 abnormal smoke outlets, which divided generally into four categories.

1. **Uncapped cleanouts:** Several cleanout caps were missing or broken. The cumulative number of broken cleanouts in the District can contribute significant I/I. County staff had repair caps on hand during the testing and were able to install new caps where needed.
2. **Broken Cleanouts:** Ground smoke was detected adjacent to the cleanout, which appeared to be damaged or below grade. Replacement of the cleanout assembly will be needed.
3. **Ground Smoke:** Ground smoke can be the result of broken lines, joint separation, etc. Any of these problems can cause significant I/I.
4. **Unsealed manholes:** Some manholes emitted excess smoke indicating cracked concrete or offset rings. Manholes located in ditches are most likely to contribute I/I.

A spreadsheet describing all smoke occurrences can be found in Appendix A and all locations were documented in the mapping information in ArcGIS for the County staff's use.

## **2.2 SEWER MAINS**

### **2.2.1 Overview**

Kelly Hills/Slocomb road sewer mains consist of polyvinyl chloride (PVC) pipe. The District's existing sewer lines range from 8-16-inches in diameter. The age of the system and system materials were confirmed by the County based records from construction of the system in 2005. Condition was determined based on visual inspection of select manholes and smoke testing of the system.

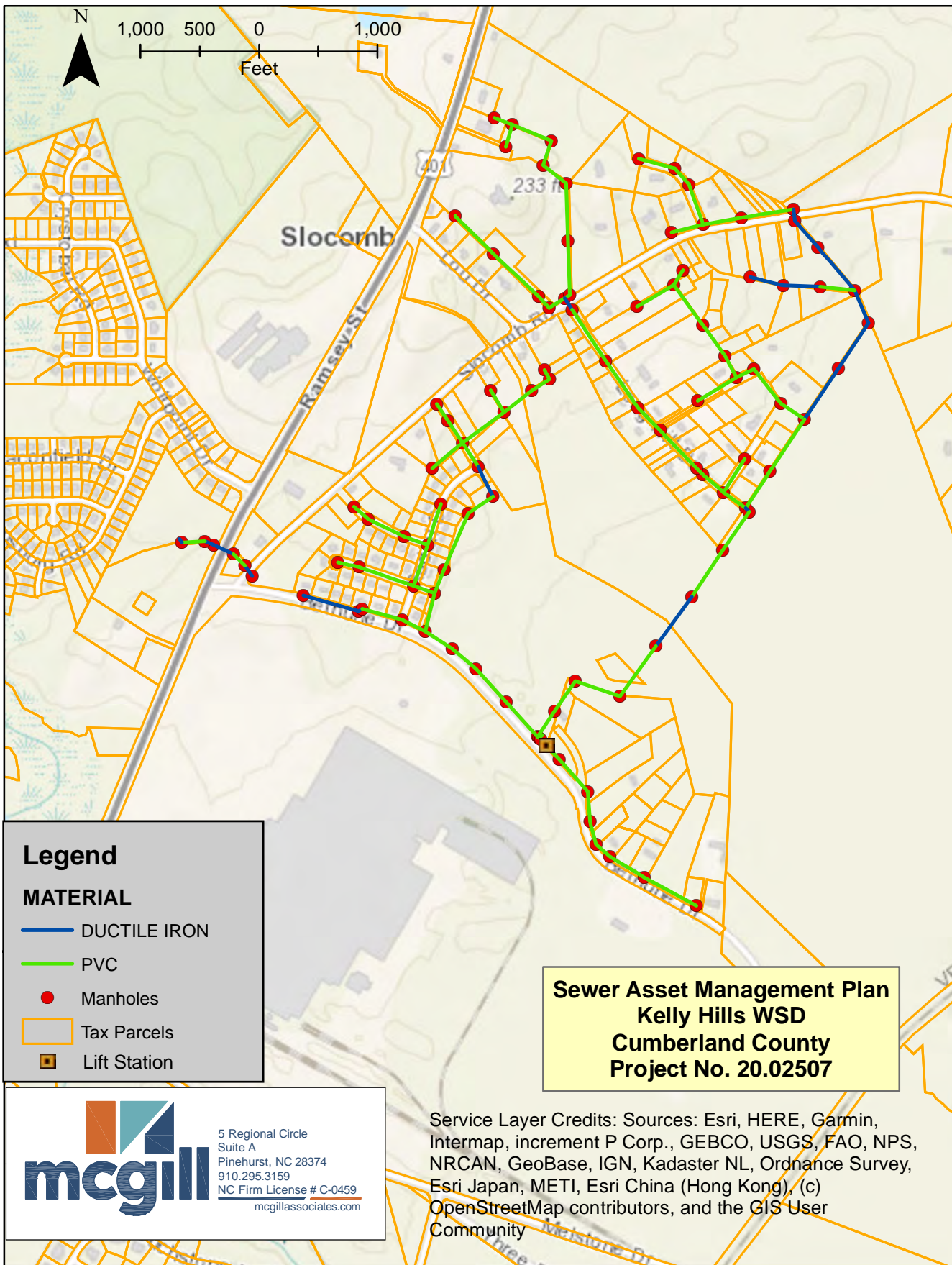
### **2.2.2 Investigation**

With District input from County staff, McGill has reviewed the district's data on the sewer mains throughout the District's collection system. The sewer main material and diameters were verified by the County and updated according to GIS records. Figure 3 shows the sewer line materials in the system, and Figure 4 shows the sewer line diameter throughout the system.

The purpose of this portion of the assessment was to create a working system inventory and then review which areas of Kelly Hills District have system components in need of replacement or rehabilitation.

# Kelly Hills Sewer Line Material Map

## Figure 3



### Legend

#### MATERIAL

— DUCTILE IRON

— PVC

● Manholes

□ Tax Parcels

■ Lift Station

**Sewer Asset Management Plan  
Kelly Hills WSD  
Cumberland County  
Project No. 20.02507**



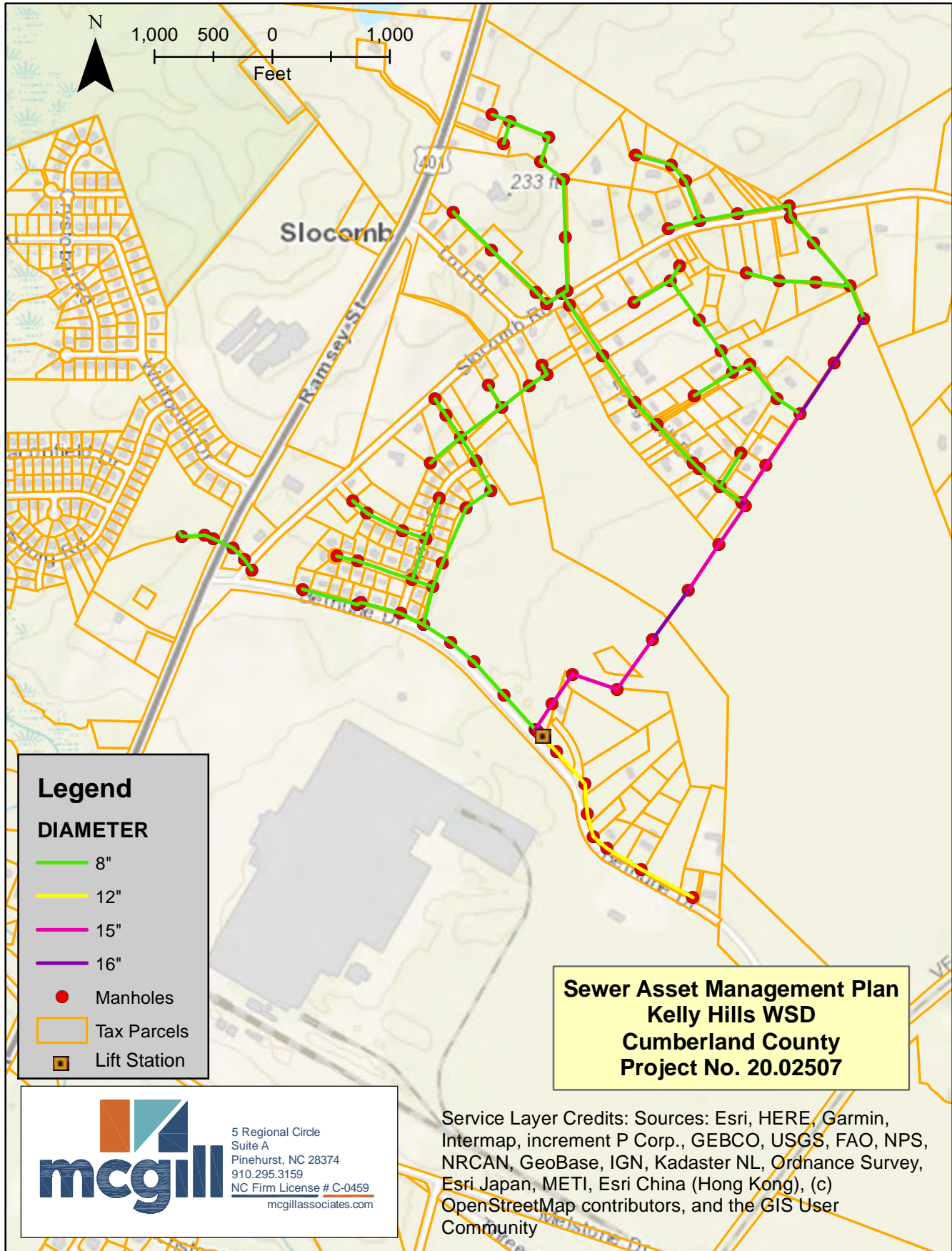
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# Kelly Hills Sewer Line Diameter Map

## Figure 4



### 2.2.3 Methodology

McGill reviewed the District's GIS data for the sewer collection system. County staff provided information on manholes where deterioration was suspected. Smoke testing was performed throughout the system. The County's GIS mapping was utilized to create maps that document the collection system by material and by diameter.

### 2.2.4 Results

The existing gravity sewer pipe in the sewer system ranges from 8-inch to 16-inch in diameter based on County records. All pipe diameters therefore do meet current NCDEQ minimum design standards. Based on the age of the system, the PVC and ductile iron pipe installed in 2005 has not exceeded its useful life, and therefore replacement is not recommended outright. Recommendations will include planned CCTV inspections by the County of the existing piping in order to verify existing condition and provide future updates to this AMP/CIP. Based on the age of the pipes and no documented issues from County staff, pipe in the system has been noted to be in good/excellent condition. Tables 2 and 3 show the assessment based on material and then broken out by diameter.

**Table 2: Summary of Gravity Sewer Main by Material**

<b>Material</b>	<b>Diameters (in)</b>	<b>Total LF</b>	<b>% of System</b>
<b>Polyvinyl Chloride</b>	<i>8, 12, 15</i>	<b>19,750</b>	<b>83.9%</b>
<b>Ductile Iron</b>	<i>8, 16</i>	<b>3,790</b>	<b>16.1%</b>
<b>Total LF</b>		<b>23,540</b>	<b>100%</b>

**Table 3: Summary of Gravity Sewer Main by Diameter**

<b>Diameter</b>	<b>Total LF</b>	<b>% of System</b>
<b>8"</b>	<b>17,900</b>	<b>76.0%</b>
<b>12"</b>	<b>1,670</b>	<b>7.1%</b>
<b>15"</b>	<b>2,690</b>	<b>11.4%</b>
<b>16"</b>	<b>1,280</b>	<b>5.5%</b>
<b>Total LF</b>	<b>23,540</b>	<b>100%</b>

**Table 4: Summary of Gravity Sewer Main Conditions by Age**

<b>Year Put Into Service</b>	<b>Total LF</b>	<b>% of System</b>
<b>2005</b>	<b>23,544</b>	<b>100%</b>
<b>Total LF</b>	<b>23,544</b>	<b>100%</b>

## **2.3 MANHOLE INSPECTIONS**

### **2.3.1 Overview**

Manholes are the primary access points to the sanitary sewer system and are essential for its operation and maintenance. As they allow personnel access to the sewer system, manholes are also likely culprits for allowing I/I to enter the sewer system. Manholes in low-lying areas with improperly sealed lids, manhole joints, and poor connection practices can all be sources of I/I. Storm drains or the presence of manholes in ditches and low-lying areas in Kelly Hills/Slocomb road frequently allow standing water to remain for hours or days after a storm event which can exacerbate inflow through manhole lids.

One of the most cost-effective practices for managing this intrusion is visual manhole inspections, where the various components of the manhole are rated according to their condition. Some examples of noticeable deficiencies are benches which have deteriorated from abrasion and corrosion and rings which can be moved by traffic, soil, and the freeze/thaw cycle. Defects in any aspect of the manhole can lead to I/I, structural instability, and manhole failure.

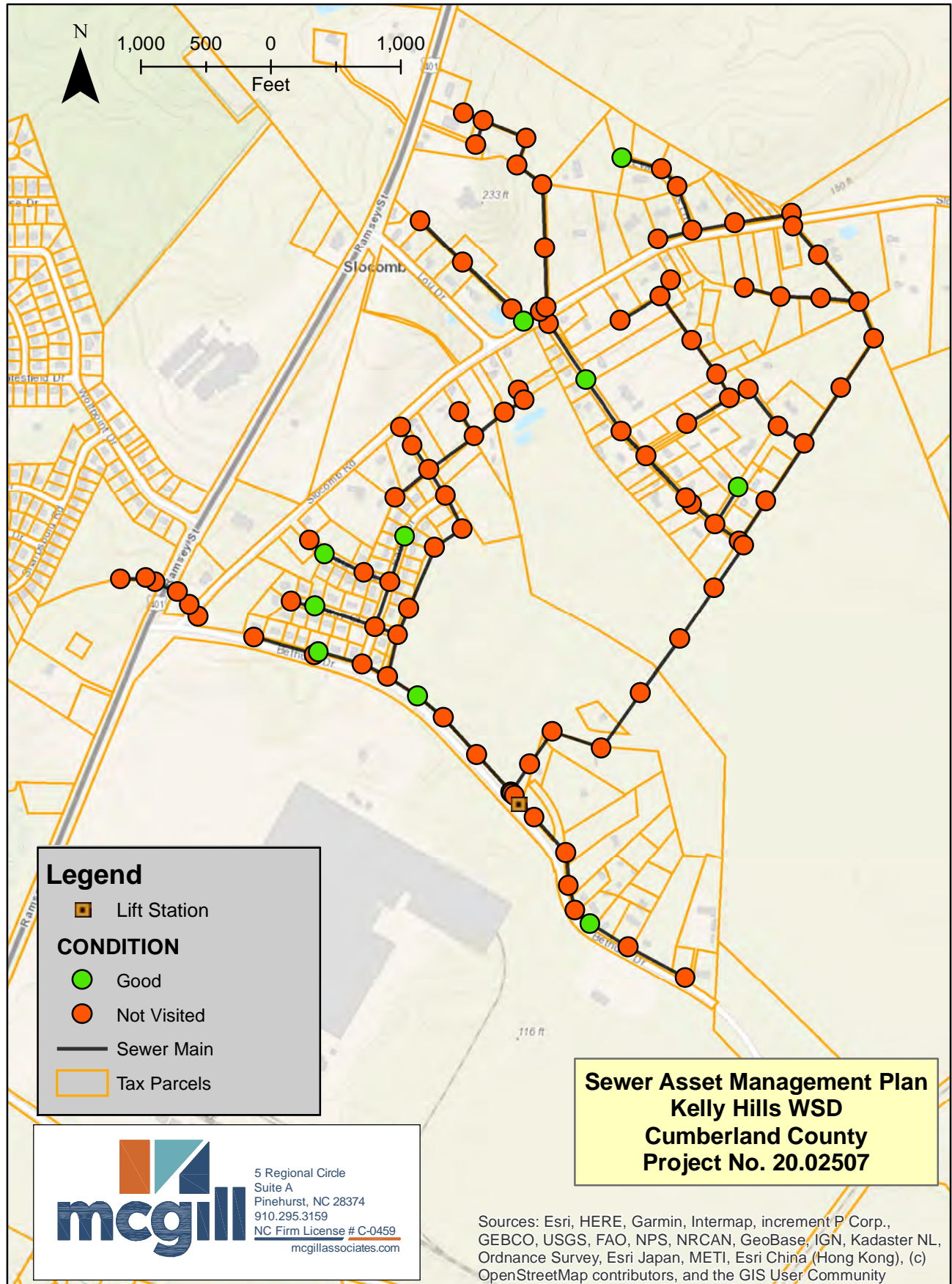
### **2.3.2 Investigation**

After the Kelly Hills system was put into service, the GIS record was created in 2006. The purpose of this portion of the assessment was to perform selected field inspections to determine an overall system assessment. A total of 100 manholes are currently inventoried by the District. Approximately ten manholes were inspected as a part of this inventory and assessment. The map of the diameter of all manholes that were accessible (not paved over or otherwise not located) are shown in Figure 3.



# Kelly Hills Manhole Condition Map

## Figure 5



### **2.3.3 Methodology**

The District of Kelly Hills/Slocomb Road sewer collection system contains 100 sewer manholes. Working with County staff, McGill inspected selected manholes within the sewer system to obtain a representative condition sampling. County staff determined which manholes to inspect in each area based on manhole location and orientation. Manholes prioritized for inspection include those located in existing ditches or low-lying areas where the manhole would be susceptible to degradation and inflow from surface water. At each manhole, the inspector recorded the manhole's location, dimensions, material, and condition of its various components. All information including photographs of the interior of the manhole and top area were uploaded into the GIS mapping.

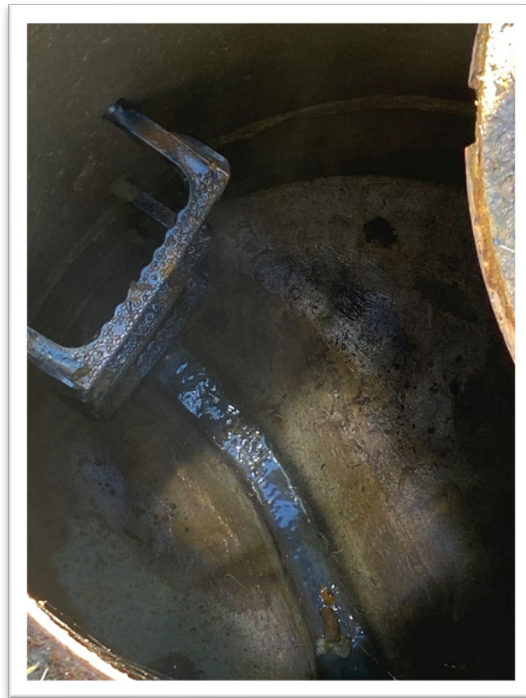
Some typical distresses include:

- Wear and asphalt paving on the cover;
- Corrosion and mud seepage on the ring and frame;
- Gas residue, corrosion, seepage, and deteriorating concrete on the cone and riser;
- Wetness, silt, root intrusion, and deteriorating concrete on the barrel;
- Dirt and corrosion on the rungs;
- Silt accumulation on the bench; and
- Misaligned pipes, obstructions, trough deteriorating, standing water, and no flow in the channel.

Based on the recorded comments, each component was assigned a condition score, and these scores were combined into an overall condition rating for each manhole- excellent, good, fair, or poor. The images below depict the interiors of various condition manholes.



*SMH-027203, Treadway Court. Precast manhole shows signs of corrosion and wear over time. Invert is well-formed.*



*SMH-027197, Bethune Drive. Precast manhole in good condition, invert well formed.*



### 2.3.4 Results

All of the ten inspected manholes are precast manholes. Due to the relative low age of the system, County staff confirmed that all of the existing manholes in Kelly Hills are precast sewer manholes. Of the manholes observed, all were noted as good to fair condition. Still, the presence of I/I and deterioration was observed in several instances. Based on the condition of those observed, it is suspected that the remaining manholes not inspected would have similar condition to those observed. Tables 5 and 6 summarize the manhole materials and condition.

**Table 5: Summary of Manholes by Material**

<b>Material</b>	<b>Total</b>
<b>Precast Concrete</b>	<b>100</b>
	<b>100</b>

**Table 6: Summary of Manholes by Condition**

<b>Condition</b>	<b>Total</b>
<b>Good-Fair</b>	<b>10</b>
<b>Unknown</b>	<b>90</b>
	<b>100</b>

The County maintains its collection system using the ESRI platform and includes the attribute data for each manhole. A spreadsheet including condition comments for each manhole can be found in Appendix A.

## 2.4 LIFT STATION

### 2.4.1 Overview

The Kelly Hills Lift Station is owned and operated by Fayetteville PWC. The station includes a flow meter that is used for recording flow generated by the Kelly Hills Sewer Collection System. The monthly records from that station were provided by the County and have used to develop an average use per user for the District. The results of the analysis are below.

Lift Station Design Capacity	100,000 GPD
Metered Average Daily Use	16,900 GPD
Permitted, Not Yet Tributary Flow	29,520 GPD
<i>Pending Development Usage</i>	<i>41,400 GPD</i>
Lift Station Available Capacity*	<b>53,580 GPD</b>

\*Does not include pending development usage. Available capacity including pending amount is 12,150 GPD.

Recommendations for various sewer system improvements to include the gravity sewer pipe and manholes in the collection system include general recommendations, high priority projects (within 10-years) and future projects (past the 10-year planning window). General recommendations are typically less costly and can be implemented more quickly, whereas high priority projects may require financial assistance and be undertaken in phases.

### **3.1 GENERAL RECOMMENDATIONS**

#### **3.1.1 *Smoke Testing***

Smoke testing is a valuable tool that can be used to locate broken pipe, cleanouts, or manholes that need repair. Any of these issues can be a source for the inflow and infiltration (I&I) of surface water into the sewer collection system. It is recommended that the District utilize smoke testing on an “as needed” basis to troubleshoot possible problem areas. The most common repairs that would result from smoke testing include replacing missing or broken cleanout caps and removing buildup from manholes. Other repairs that can be performed at this time are patching the exterior concrete or replacing the rings/lids of manholes identified to be leaking during smoke testing. These may be contributing to significant I/I into the wastewater collection system. Similarly, line breaks in flooded areas should also be addressed promptly. It is also recommended that the District continue to conduct regular smoke testing to monitor the system’s ongoing wear and identify specific areas for improvement.

#### **3.1.2 *Video Evaluations***

Based on information provided by the County, video evaluations were not performed as part of the system inventory. County staff reports that no video evaluations have been performed on the collection system to date. It is recommended that the County plan to perform video evaluation of the system as a part of O&M in order to stay vigilant concerning potential issues within the collection system.

### **3.1.3 Manhole Inspections**

Manhole inspections uncovered some infrastructure deficiencies which can be repaired immediately to improve the condition and function of the wastewater collection system. The full list of manholes and their field assessment is included in Appendix A. Manhole rehabilitation and replacement is the priority work that is targeted by the CIP. The proposed projects are divided out on an annual basis in order to include the improvements as a reasonable component of annual budgeting.

### **3.1.4 Flow Monitoring**

The District and McGill have discussed that flow monitoring is not needed at this time. Should the County begin to suspect the presence of I&I, they will engage in flow monitoring to verify as needed. The PWC Lift Station does provide for metering of flow received within the district. It is recommended within the CIP that the County install an in-line flow meter within the collection system just upstream of the lift station, in order to assist with recording of data and calibration with the PWC maintained lift station.

## 3.2 PRIORITY PROJECTS

### 3.2.1 *Manhole Rehabilitation Projects*

In these projects, manholes will be repaired and lined. The projects are scoped to be undertaken every 3 years. Each project is priority targeting any manhole deficiencies or evidence of I/I observed during manhole inspections or leaks based on the results of the smoke testing. There are a range of issues from broken risers to cracks in the frame of the manhole that warrant various repairs. To reduce the amount of I/I that enters the system it is imperative to repair these manholes. The project will be ongoing to spread out the cost for the County over a 10-year period. There are 100 manholes in the system, and for planning purposes it is assumed that 50% of the manholes would benefit from rehabilitation and lining. In order to fit a reasonable budgeting target, the rehabilitation of those 50 manholes is broken into four projects, which are included in the CIP separately, but can be combined or modified as needed given annual budgetary considerations. The projects also include replacement of existing cleanout assemblies for select residences. The results of the smoke testing identified that some cleanouts were damaged below grade, therefore replacement of the assembly would be necessary.

This project is recommended to be pursued with a manhole rehabilitation specialty company with scopes large enough to get competitive pricing for each mobilization. The manholes proposed for rehabilitation or replacement range in depth; therefore an average depth of seven vertical feet (VF) was used per manhole for estimating purposes. The capital improvements plan breaks this project into four phases with a budget of approximately \$81,000 every three years over a 10-year span with the exception of year four, if the County elects to perform the flow monitoring improvement project, as outlined in Table 7. The total cost of the manhole rehabilitation projects is estimated to be \$324,000.

**Table 7: Preliminary Opinion of Probable Cost for Manhole Rehabilitation Projects**

Item	Description	Units	Quantity	Unit Price	Total Cost
1	Mobilization	LS	3%	N/A	\$ 1,900
2	Rehabilitate Existing Manhole	VF	84	\$ 500	\$ 42,000
3	Additional Manhole Repairs	LS	1	\$ 10,000	\$ 10,000
4	Asphalt Surface Restoration	LS	1	\$ 8,500	\$ 8,500
5	Replace Cleanout Assembly on Existing Service	EA	3	\$ 1,100	\$ 3,300
<b>Construction Subtotal</b>					<b>\$ 65,700</b>
Contingency (15%)					\$ 9,800
Engineering Coordination					\$ 5,500
<b>Total Base Project Cost</b>					<b>\$ 81,000</b>

*\*Cost estimates are based on the knowledge of a professional engineer based on 2024 construction costs and are subject to change due to bidding environment and other factors.*

**3.2.2 Flow Monitoring Improvement Project**

This project includes installing two in-line flow monitoring devices on the two downstream collection lines within the sewer system. These devices will allow the County to monitor its own sewer flow. This data can be utilized by staff for planning and budgeting purposes.

The project includes two 8-inch electromagnetic flow meters in a precast underground bypass vault with associated piping and appurtenances. The meters will be installed on the County’s 12-inch and 15-inch lines outside of the existing lift station. The preliminary cost estimate for this project is \$103,900 as outlined in Table 8 below.

**Table 8: Preliminary Opinion of Probable Cost for Flow Monitoring Improvements Project**

Item	Description	Units	Quantity	Unit Price	Total Cost
1	Mobilization	LS	3%	N/A	\$ 2,400
2	8-inch Mag Meter	EA	2	\$ 25,000	\$ 50,000
3	Precast Concrete Valve Vault	EA	2	\$ 8,000	\$ 16,000
4	Piping, Valves, Fittings	LS	1	\$ 15,000	\$ 15,000
<b>Construction Subtotal</b>					<b>\$ 83,400</b>
Construction Contingency (15%)					\$ 12,500
Engineering Coordination					\$ 8,000
<b>Total Base Project Cost</b>					<b>\$ 103,900</b>

*\*Cost estimates are based on the knowledge of a professional engineer based on 2024 construction costs and are subject to change due to bidding environment and other factors.*



### **3.3 CIP PROJECTS SUMMARY**

The purpose of this asset management plan was to document the condition of the Kelly Hills sewer infrastructure to assist the County with becoming more viable and proactive in the management and financing of its wastewater system. The County intends to look to its CIP to guide its next project; therefore, it is vital that the CIP be established as an accurate depiction of current conditions and reflect the Districts' highest priorities with accurate cost estimates. The development of this AMP will serve as a positive step towards ensuring that the District can maintain its level of service agreement.

Sewer manhole rehabilitation and cleanout replacement was evaluated based on current staff input and the results of the field inspections. The existing manholes and cleanouts were divided into projects recommended for the next 10-years.

McGill prepared cost estimates for all projects based on current materials and construction costs. The 10-year CIP is intended to be adopted by the District to guide its selection of sewer system improvement projects over the next two decades. The cost summary for the 10-year CIP is shown below in Table 9.

**Table 7: CIP Cost Summary**

Year <sup>1</sup>	Manhole Rehabilitation Project 1	Flow Monitoring Improvements	Manhole Rehabilitation Project 2	Manhole Rehabilitation Project 3	Manhole Rehabilitation Project 4	TOTAL COST
1	\$ 81,000.00	\$ -	\$ -	\$ -	\$ -	\$ 81,000.00
2	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3	\$ -	\$ 103,900.00	\$ -	\$ -	\$ -	\$ 103,900.00
4	\$ -	\$ -	\$ 81,000.00	\$ -	\$ -	\$ 81,000.00
5	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
7	\$ -	\$ -	\$ -	\$ 81,000.00	\$ -	\$ 81,000.00
8	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
9	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
10	\$ -	\$ -	\$ -	\$ -	\$ 81,000.00	\$ 81,000.00
<b>TOTAL ESTIMATED CIP COST</b>						<b>\$ 427,900.00</b>

Notes:

1: Considering timeline for adoption of this plan and County budget planning cycle, Year 1 is anticipated to be FY 2026

**4.1 GENERAL RECOMMENDATIONS**

The purpose of an Operations and Maintenance (O&M) Program is to provide an organized and cost-effective approach to ongoing maintenance, repair and replacement activities that will maintain the sewer collection system, so it performs as intended and meets the requirements of the sewer utility's System-Wide Collection System Permit, issued under North Carolina General Statutes Article 21 of Chapter 143.

This section provides a general description of proactive O&M, which can be defined as scheduled maintenance activities (preventive maintenance), performed on a regular basis in order to achieve the highest level of system performance using available resources and minimizing failures that can result in Sewer System Overflows (SSOs)

Developing an O&M Program begins with accurate records of infrastructure inventory, asset locations and physical condition. Coupled with work records and system performance history, preventive maintenance schedules can be developed to efficiently address general system needs, from cleaning and debris removal to site-specific maintenance work such as cutting and repair work.

The following elements provide the foundation for an effective O&M program:

- Maintain up-to-date wastewater treatment plant equipment documentation, sewer collection system maps and related work history and operational data.
- Develop a routine preventive O&M program and activities for staff and contractors maintaining the sewer collection system and a system to document scheduled activities.
- Develop a rehabilitation and replacement plan identifying and prioritizing system deficiencies and implement short- and long-term actions to address the deficiencies.
- Develop and implement training programs to build technical competence and emergency preparedness.
- Develop and provide equipment and replacement part inventories, including critical replacement parts.

## **Sewer System Mapping**

Sewer system maps and related databases are typically managed using a Geographic Information System (GIS). The District of Kelly Hills/ Slocomb Road currently utilizes ESRI as the GIS platform from which to manage the utility systems. This GIS mapping is supported by a database that records sewer main size, material types, and locations of manholes and clean-out connections. The platform has the ability to store more information that is currently being utilized by the County, including invert and rim elevations and other attributes of system appurtenances. If County intends to utilize the GIS platform for managing and recording maintenance performed and planned, it is recommended that the County investigate alternative software to ensure that they are utilizing a software that meets their needs with respect to budget.

The GIS database should be updated on a regular basis. Software applications such as work order systems are available to allow field staff to update GIS data as inspection and maintenance activities are completed. Other applications can also allow staff to update and edit maps. Field information that was gathered by McGill and County staff as a part of this assessment is now included in the County's GIS system database for future reference.

GIS can organize work history along with operational data, inspection records and images to provide managers, operations staff and engineers with powerful data sets to track current resource allocations and forecast short and long-term operational and capital needs. Outcomes of detailed analysis such as recommended sewer main rehabilitation work versus sewer overflows can be mapped to present the relationship visually for ease of understanding.

## **Preventive Operation and Maintenance (O&M)**

Preventive maintenance is performing routine and scheduled maintenance activities before wastewater treatment plant and lift station equipment or buried infrastructure fails, for the purpose of extending useful life, reducing overall operating costs, and increasing system reliability. This proactive approach to maintenance work is more efficient and cost effective than reactive and curative operations. Preventive maintenance activities will also help operations staff to better understand the wastewater treatment plant equipment, lift station equipment, and collection system components and how they work under various conditions. This knowledge is essential to setting maintenance priorities and developing the scope and timing of long-term rehabilitation and replacement projects.

## **Scheduled Cleaning of Sewers**

EPA recommends, at a minimum, that 100% of sewer mains should be cleaned every five (5) years, or 20% of the system annually. The sewer utility's Collection System Operating Permit requires 10% of the gravity sewers to be cleaned annually. High pressure jetting is the most common approach using various spray nozzles for general cleaning and debris removal. Mechanical cutters are used to address root intrusion and cleaning agents can be added to help remove fats, oils, and grease (FOG).

More frequent cleaning is scheduled for areas with a history of heavy debris, grease buildup and roots. CCTV inspections are also used to identify areas to clean more often, such as sections with minor defects such as offset joints and service taps protruding into the main line. Sewer sections near siphons are cleaned more frequently to ensure continuous and uninterrupted operation.

As part of the O&M Program, a master list of cleaning operations, priority locations and scheduling can be incorporated into GIS. Maps can be produced to define work areas, schedule resources, including contracted services, track progress and task completion. Updating GIS maintenance operations data (partial blockages found, debris quantity, etc.)

will help managers adjust cleaning frequency and area boundaries as needed to increase program efficiency, reduce sewer blockages, and avoid SSOs.

## **Routine Visual Inspections**

Routine inspections are used to assess the condition of lift stations, manholes and surface facilities, recording general conditions and evidence of possible structural problems or failures (offset structures, etc.), corrosion, surcharging, overflows and excessive Inflow and Infiltration (I&I). Work orders are generated based on inspection records to effect operational adjustments, scheduling more detailed inspections and/or making necessary repairs.

## **Manhole Inspection Program**

Manhole inspections keep the asset inventory up-to-date and are used not only to update collection system maps, but to determine structural condition. During manhole inspections, a complete inventory is taken of each manhole including construction materials, ring size, depth to invert, flow conditions and evidence of problems. The National Association of Sewer Service Companies (NASSCO) Manhole Assessment and Certification Program (MACP) may be adopted or used as a guide to ensure consistency and reliability of evaluation and ranking methodology.

The results from routine manhole inspections and monitoring are used to prioritize areas needing CCTV inspections to assess pipe condition such as manholes with evidence of slow flow or surcharging. Information is recorded and used to schedule maintenance and repairs.

## **CCTV Inspection Program**

While routine cleaning and visual inspection are used to assess the condition of surface facilities and manholes, CCTV video inspections are the primary method used to assess the condition of the sewer pipes. Using conventional defect criteria is highly recommended to provide standardization and consistency in sewer pipe condition

assessment and ranking. The NASSCO Pipeline Assessment and Certification Program (PACP) may be adopted or used as a guide to ensure consistency and reliability of evaluation and ranking methodology.

## **Maintenance Activity Records**

Detailed records and daily logs of O&M work provide valuable information to help managers evaluate the effectiveness of maintenance activities and make adjustments to optimize the use of limited resources. Equipment, manpower and other resources are tracked along with detailed descriptions of defects and/or obstructions encountered including debris, FOG, structural failures, etc. Maintenance work resulting in system modifications or extensions is required to be incorporated into record drawings and system maps. Scheduled testing of emergency and standby equipment is also a requirement of the collection system permit.

These records are required to be reviewed periodically to identify problems that cannot be resolved in a short period of time in order to develop a plan to address the problem(s). Maintaining these records for an extended period of time (5-years or more) will also provide accurate reference points of maintenance investments made over time that will track the effectiveness of operation and maintenance activities.

In the event of a sewer spill or system overflow, maintenance records will need to provide sufficient detail to satisfy reporting requirements for the event, including location(s), volume of wastewater, corrective actions, etc. This data may also be integrated into GIS to allow mapping of these events over time in order to identify patterns and/or trends that will assist with scheduling maintenance and planning rehabilitation and other capital improvements.



## **Resolution of Customer Complaints**

Customer complaints are primarily for sewer backups and odors. Sewer backups require an immediate response to diagnose and resolve the problem. These complaints can occur outside normal business hours, significantly escalating costs. Detailed records of the problems found, and the resources needed to address the failed condition, provide valuable feedback for making adjustments to the preventive maintenance program that can reduce these types of calls and help lower overall maintenance costs.

These records can also identify areas where private service laterals frequently fail. Notifying customers in these areas will allow them the opportunity to address deficiencies proactively, which will also help reduce customer “emergency” calls.

## **Capital Improvements Plan**

A Capital Improvements Plan (CIP) is required by the collection system permit to identify rehabilitation, replacement and expansion needs of the system. The CIP is required to address the short and long-term needs of the system, covering at least a 3 to 5-year planning period, and must include the estimated cost of each capital project.

CIP development incorporates maintenance activity, cleaning and inspection records, and system performance data that may include flow monitoring and hydraulic modeling to evaluate the existing system and to recommend improvements needed to correct existing deficiencies, and ensure adequate capacity is maintained throughout the system.

Capital planning includes consideration of on-going funding for rehabilitation and replacement of the collection system as it wears out, and potential upgrades for expansion as needed.

## **Training Program**

Training programs provide a mechanism for educating employees and establishing their technical competence to perform operations, maintenance, and emergency responses safely and effectively. A combination of in-house skill training and specialized training purchased or provided through state and national associations, conferences and vendor training programs are typically used to build and enhance skills for performing daily work duties. Periodic training reinforces previous efforts, as people often overlook things that are used infrequently. It also provides an opportunity to train new staff and learn about new problems, new techniques, and changes in equipment.

Emergency training educates system personnel about emergency situations and resulting effects on the wastewater system, public health, and environmental impacts. It also provides an opportunity to practice responses. Good record keeping ensures personnel are properly trained and prepared to effectively operate and maintain the collection system under any given circumstance. Regular review of training records is essential for keeping content up-to-date and maintaining proper employee awareness.

## **Equipment and Replacement Parts**

A reasonable supply of equipment and replacement parts should be maintained to fully support all operations and maintenance activities. A detailed inventory is essential to ensure availability under normal operations and emergency conditions. Specialized equipment or parts may be too costly to keep in stock, so arrangements with vendors and/or contractors may be necessary to ensure availability during non-business hours or during emergencies.

## 4.2 STAFFING RECOMMENDATIONS

Cumberland County is responsible for three wastewater collection systems and one water system: NORCRESS, Overhills, Kelly Hills, and Southpoint Water System. While each of these districts maintains its own operating budget, the Board leadership and operational management is performed solely by Cumberland County. Therefore, in consideration of the typical utility system management and operations and maintenance that is necessary for maintaining each of the systems, McGill has considered all of the four utility systems cumulatively. While each system could be analyzed separately, considering the systems together is more consistent with actual management of the systems.

Typical metrics for analyzing full-time equivalent (FTE, representing quantity full-time workers) are based on either the population served by the system or by miles of utility piping (water main or sewer line) within each system. For reference, Table 8 below summarizes the customers and piping in each of the County’s utility systems.

**Table 8: Utility System Comparison**

DISTRICT	Number of Connections		Paying Avail. Fee	Pipe in System (mi.)
	Water	Sewer		
<b>Southpoint</b>	84		129	2.8
<b>Kelly Hills</b>		102	166	4.5
<b>Overhills</b>		107	318	4.0
<b>NORCRESS</b>		452	666	41.1
<b>TOTALS</b>	<b>84</b>	<b>661</b>	<b>1279</b>	<b>52.4</b>

**Table 9: Typical Population vs. Pipe Length**

<b>Population</b>	<b>Pipe in System (mi.)</b>
0-100	5
101-500	5
501-3300	21
3301-10000	62

The typical sizes of utility systems from a community system EPA study<sup>1</sup> are shown in Table 9, and are generally consistent when compared to the County’s systems. This study was selected as a basis for comparison due to its comprehensive nature, having included water systems nationwide in its breadth. NORCRESS is the exception when compared to Table 9. This is mostly likely indicative of the system serving a more rural population where the connection density is less, and resulting from the length of force main piping in the system that increases the overall length but does not contribute to population density. Overall, these metrics were found to be reasonably consistent with the County’s systems. Similarly, the data is consistent regardless of whether the utility system is a water systems or wastewater collection system.

The objective is to make budget-level staffing recommendations for the County’s utility systems based on what is typical across the industry and other utility systems of comparable size. The EPA study utilized provides typical FTE for the roles of manager, plant operator, distribution (and collection, for our purposes), and administrative functions. All of these were considered applicable to management and operation of the County’s utility systems. Note: while the County is not responsible for plant operation in any system, the lift stations in the NORCRESS and Overhills systems are the County’s responsibility, therefore this metric was used, albeit in a smaller percentage, to account for the management of those resources.

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<sup>1</sup> Analysis conducted using excerpts from US EPA document, “National Characteristics of Drinking Water Systems Serving 10,000 or Fewer People,” published July 2011.

Table 10 shows Further utilizing the EPA statistics as base for typical FTE for each of the positions, based on the system size in terms of miles of pipe main.

**Table 10: Average Community System Statistics**

Employee Category	System Size (miles of Main)		Mean	Cumberland County
	Pop. 500-3300	Pop. 3300-10000		
	21	62	41.5	51.7
<b>Manager FTE</b> per mile	0.6	1.1	0.85	1.06
	0.029	0.018	0.020	0.020
<b>Plant Operator FTE</b> per mile	0.6	1.3	0.95	1.03
	0.029	0.021	0.023	0.023
<b>Distribution FTE</b> per mile	0.8	2.5	1.65	2.06
	0.038	0.040	0.040	0.040
<b>Administrative FTE</b> per mile	0.6	1.5	1.05	1.31
	0.029	0.024	0.025	0.025

The green highlighted cells are the calculated FTEs that were applied to estimate staffing size based on the quantity of pipe across the County’s four utility systems. Those calculated FTEs are based on the size of systems managed by the County and reasonable estimate of staffing needed for these systems.

Each of the FTEs is applied to each respective employee category. McGill utilized wage information from Zip Recruiter and a benefits multiplier of 1.38 from the U.S. Bureau of Labor Statistics to develop the summary shown in Table 11.

**Table 11: Overall Salary Estimates**

Employee Category	Hourly Rate	Annual Salary	Ben. Mult.	Total	Applied FTE	Applied Budget Cost
Manager	\$38.50	\$80,080.00	1.38	\$110,510.40	1.06	\$117,000
Operator	\$24.52	\$51,001.60	1.38	\$70,382.21	1.03	\$72,700
Distribution	\$23.57	\$49,025.60	1.38	\$67,655.33	2.06	\$139,100
Administrative	\$21.33	\$44,366.40	1.38	\$61,225.63	1.31	\$80,100
<b>Total Applied Budget Cost Based FTEs</b>						<b>\$408,900</b>

Utilizing industry metrics and comparing to systems of comparable size, McGill offers the proceeding section as a general staffing recommendation. This section and these budget values are provided for preliminary planning purposes only.

Staffing levels appear to be reasonable based on the District's ability to operate and maintain the system while providing a reliable level service to its customers.

While this budget number is higher than the current budget staffing, consideration should also be given to the cumulative effect cost to the County for contracted operation and distribution support in the NORCRESS and Kelly Hills district.

# **APPENDICES**





## **Appendix A**

### **Manhole Inspection List**

# Kelly Hills Manhole Inspection

**DATE:** January 17th, 2024

<b>FACILITYID</b>	<b>MH ID NO.</b>	<b>CONDITION</b>
115136	SMH027236	Good
115167	SMH027267	Good
115168	SMH027268	Good
115098	SMH027198	Good
115101	SMH027201	Good
115103	SMH027203	Good
115109	SMH027209	Good
115113	SMH027213	Good
115125	SMH027225	Good
115188	SMH027287	Good

## **Appendix B**

### **Smoke Testing Results List**

## Kelly Hills Smoke Testing Manholes

Date: September 21, 28, 2023		
Manhole ID	Status	Notes
SMH027233	Leak	Smoke around lid
SMH027234	Leak	Smoke around lid
SMH027246	Broken	
SMH027248	Seal	Smoke from lid
SMH027258	Seal	Smoke from collar
SMH027259	Seal	Smoke around lid
SMH027264	Leak	From around bottom of mh
SMH027265	Leak	
SMH027197	Leak	Leak around the lid
SMH027198	Seal	Smoke around lid
SMH027203	Leak	Smoke around rim
SMH027209	Seal	Smoke around lid
SMH027214	Leak	Smoking from top
SMH027215	Leak	
SMH027218	Broken	Cracked ring
SMH027219	Leak	
SMH027220	Leak	
SMH027223	Leak	
SMH027226	Leak	
SMH027277	Broken	
SMH027279	Seal	Smoke around concrete collar
SMH027283	Leak	
SMH027284	Leak	
SMH027288	Seal	Smoke around lid

<b>Kelly Hills Smoke Testing Cleanouts</b>		
<b>Date: September 21, 28, 2023</b>		
<b>Facility ID</b>	<b>Status</b>	<b>Notes</b>
33904	Broken	Broken cap
33991	Broken	Broken no cap
34012	Broken	Needs cap 9/28/2023 no cap
33889	Broken	
33908	Broken	
33961	Broken	Both valves broken
33895	Broken	
33990	Broken	cleanout cap repaired
33927	Broken	smoking from sides,burnt
33945	Broken	
34014	Broken	
33972	Broken	Missing lid covers
34029	Broken	
33913	Broken	
33916	Broken	
33985	Broken	broken cap
34033	Broken	Replace whole top
33926	Broken	Broken cap unable to open
33937	Broken	CO broken from bush hogging
34031	Broken	Around lid cracked
33966	Broken	
33976	Broken	CO in yard house
33906	Broken	Repaired
33964	Broken	Vacant lot
33955	Broken	Possible I&I issue.
33901	Broken	No cap repaired
33910	Broken	Broken cap in yard, cap replaced





## **Appendix C**

### **Wastewater Collection System Permit**



Michael F. Easley, Governor  
William G. Ross Jr., Secretary  
North Carolina Department of Environment and Natural Resources  
Alan W. Klimek, P.E. Director  
Division of Water Quality

October 27, 2003

Mr. Joseph Glass  
City of Fayetteville,  
Public Works Commission  
PO Drawer 1089  
Fayetteville, NC 28302

**SUBJECT: Permit No. WQ0023202  
Kelly Hills/Slocomb Road Water & Sewer District  
Wastewater Collection System Extension  
Cumberland County**

Dear Mr. Glass:

In accordance with your application received October 23, 2003, we are forwarding herewith Permit No. WQ0023202, dated October 27, 2003, to the City of Fayetteville, Public Works Commission for the construction and operation of the subject wastewater collection system extension. This permit shall be effective from the date of issuance until rescinded and shall be subject to the conditions and limitations as specified therein. This cover letter shall be considered a part of this permit and is therefore incorporated therein by reference.

Please pay particular attention to Permit Condition 3 which requires that the wastewater collection facilities be properly operated and maintained in accordance with 15A NCAC 2H .0227 or any individual system-wide collection system permit issued to the Permittee.

Permitting of this project does not constitute an acceptance of any part of the project that does not meet 15A NCAC 2H .0200; the Division of Water Quality's (Division) Gravity Sewer Minimum Design Criteria adopted February 12, 1996 as applicable; and the Division's Minimum Design Criteria for the Fast-Track Permitting of Pump Stations and Force Mains adopted June 1, 2000 as applicable, unless specifically mentioned therein. Division approval is based on acceptance of the certification provided by the North Carolina-licensed Professional Engineer named in the application. It shall be the Permittee's responsibility to ensure that the as-constructed project meets the appropriate design criteria and rules. Failure to comply may result in penalties in accordance with North Carolina General Statute § 143-215.6A through § 143-215.6C, construction of additional or replacement wastewater collection facilities, and/or referral of the North Carolina-licensed Professional Engineer to the licensing board.

In accordance with provisions of Article 21 of Chapter 143, General Statutes of North Carolina as amended, and other applicable Laws, Rules, and Regulations, permission is hereby granted to the City of Fayetteville, Public Works Commission for the construction and operation of



Mr. Joseph Glass  
Page 2  
October 27, 2003

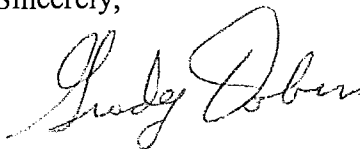
approximately 18,811 linear feet of 8-inch gravity sewer; as well as approximately 1,699 linear feet of 12-inch gravity sewer; as well as approximately 2,664 linear feet of 15-inch gravity sewer; as well as approximately 1,258 linear feet gravity sewer; a 0.1416 mgd, 225 gpm @ 74' TDH pump station with permanent generator; as well as approximately 2,388 linear feet of 6-inch force main to serve 144 three-bedroom residences, 10 three-bedroom mobile homes and 2 two-hundred seat churches as part of the Kelly Hills/Slocumb Road Water & Sewer District project, and the discharge of 56,640 gallons per day of collected domestic wastewater into the City of Fayetteville, Public Works Commission Cross Creek Wastewater Treatment Facility's existing sewerage system, pursuant to the application received October 23, 2003 and in conformity with 15A NCAC 2H .0200; the Division's Gravity Sewer Minimum Design Criteria adopted February 12, 1996 as applicable; the Division's Minimum Design Criteria for the Fast-Track Permitting of Pump Stations and Force Mains adopted June 1, 2000 as applicable; and other supporting data subsequently filed and approved by the Department of Environment and Natural Resources and considered as part of this permit.

The sewage and wastewater collected by this system shall be treated in the City of Fayetteville, Public Works Commission Cross Creek Wastewater Treatment Facility (Permit No. NC0023957) prior to being discharged into the receiving stream.

If any parts, requirements, or limitations contained in this permit are unacceptable, you have the right to request an adjudicatory hearing upon written request within 30 days following receipt of this permit. This request must be in the form of a written petition, conforming to Chapter 150B of North Carolina General Statutes, and filed with the Office of Administrative Hearings, 6714 Mail Service Center, Raleigh, NC 27699-6714. Unless such demands are made, this permit shall be final and binding.

If you need additional information concerning this matter, please contact Grady Dobson at (910) 486-1541 extension 729.

Sincerely,



for Alan W. Klimek, P.E.

cc: Cumberland County Health Department  
Fayetteville Regional Office, Water Quality Section (WWTF Permit No. NC0023957)  
Mr. James M. Kizer, Jr., Moorman, Kizer & Reitzel, Inc.  
Water Quality Central Files  
NDPU

**NORTH CAROLINA**  
**ENVIRONMENTAL MANAGEMENT COMMISSION**  
**DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES**  
**RALEIGH**  
**WASTEWATER COLLECTION SYSTEM EXTENSION PERMIT**

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This permit shall be effective from the date of issuance until rescinded and shall be subject to the following specified conditions and limitations:

1. This permit shall become voidable unless the wastewater collection facilities are constructed in accordance with the conditions of this permit; 15A NCAC 2H .0200; the Division of Water Quality's (Division) Gravity Sewer Minimum Design Criteria adopted February 12, 1996 as applicable; the Division's Minimum Design Criteria for the Fast-Track Permitting of Pump Stations and Force Mains adopted June 1, 2000 as applicable; and other supporting materials unless specifically mentioned herein.
2. This permit shall be effective only with respect to the nature and volume of wastes described in the application and other supporting data.
3. The wastewater collection facilities shall be properly maintained and operated at all times. The Permittee shall maintain compliance with an individual system-wide collection system permit for the operation and maintenance of these facilities as required by 15A NCAC 2H .0227. If an individual permit is not required, the following performance criteria shall be met as provided in 15A NCAC 2H .0227:
  - a. The sewer system shall be effectively maintained and operated at all times to prevent discharge to land or surface waters, and any contravention of the groundwater standards in 15A NCAC 2L .0200 or the surface water standards in 15A NCAC 2B .0200.
  - b. A map of the sewer system shall be developed prior to January 1, 2004 and shall be actively maintained.
  - c. An operation and maintenance plan shall be developed and implemented.
  - d. Pump stations that are not connected to a telemetry system shall be inspected every day (i.e. 365 days per year). Pump stations that are connected to a telemetry system shall be inspected at least once per week.
  - e. High-priority sewer lines shall be inspected at least once per every six-month period of time.
  - f. A general observation of the entire sewer system shall be conducted at least once per year.
  - g. Inspection and maintenance records shall be maintained for a period of at least three years.
  - h. Overflows and bypasses shall be reported to the appropriate Division regional office in accordance with 15A NCAC 2B .0506(a), and public notice shall be provided as required by North Carolina General Statute §143-215.1C.

4. **This permit shall not be transferable.** In the event there is a desire for the wastewater collection facilities to change ownership, or there is a name change of the Permittee, a formal permit request shall be submitted to the Division accompanied by documentation from the parties involved, and other supporting materials as may be appropriate. The approval of this request shall be considered on its merits and may or may not be approved.
5. Construction of the gravity sewers, pump stations, and force mains shall be scheduled so as not to interrupt service by the existing utilities nor result in an overflow or bypass discharge of wastewater to the surface waters of the State.
6. Upon completion of construction and prior to operation of these permitted facilities, a certification, a copy of the construction record drawings, as well as supporting design calculations for any pump stations permitted as part of this project shall be received from a North Carolina-licensed Professional Engineer certifying that the facilities have been installed in accordance with this permit; 15A NCAC 2H .0200; the Division's Gravity Sewer Design Criteria adopted February 12, 1996 as applicable; the Division's Minimum Design Criteria for the Fast-Track Permitting of Pump Station and Force Main adopted June 1, 2000 as applicable; and other supporting materials. If this project is to be completed in phases and partially certified, you shall retain the responsibility to track further construction approved under the same permit, and shall provide a final certificate of completion once the entire project has been completed. A copy of the construction record drawings, indicating the facilities constructed in the phase being certified, shall be submitted with each partial certification. Mail the Engineer's Certification, one copy of the "Construction Record Drawings," and one copy of the supporting design calculations to the Non-Discharge Permitting Unit, 1617 Mail Service Center, Raleigh, NC 27699-1617.
7. A copy of the construction record drawings shall be maintained on file by the Permittee for the life of the wastewater collection facilities.
8. Failure to abide by the conditions and limitations contained in this permit; 15A NCAC 2H .0200; the Division's Gravity Sewer Design Criteria adopted February 12, 1996 as applicable; the Division's Minimum Design Criteria for the Fast-Track Permitting of Pump Station and Force Mains adopted June 1, 2000 as applicable; and other supporting materials may subject the Permittee to an enforcement action by the Division, in accordance with North Carolina General Statutes §143-215.6A through §143-215.6C.
9. In the event that the wastewater collection facilities fail to perform satisfactorily, including the creation of nuisance conditions, the Permittee shall take immediate corrective action, including those as may be required by this Division, such as the construction of additional or replacement facilities.
10. The issuance of this permit shall not exempt the Permittee from complying with any and all statutes, rules, regulations, or ordinances that may be imposed by other government agencies (local, state and federal) which have jurisdiction, including but not limited to applicable river buffer rules in 15A NCAC 2B .0200, erosion and sedimentation control requirements in 15A NCAC Ch. 4 and under the Division's General Permit NCG010000, and any requirements pertaining to wetlands under 15A NCAC 2B .0200 and 15A NCAC 2H .0500.

**11. Noncompliance Notification:**

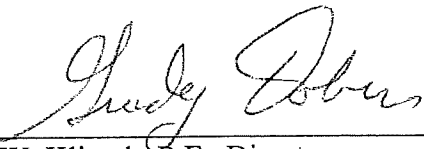
The Permittee shall report by telephone to the Fayetteville Regional Office, telephone number (910) 486-1541, as soon as possible, but in no case more than 24 hours or on the next working day, following the occurrence or first knowledge of the occurrence of either of the following:

- a. Any process unit failure, due to known or unknown reasons, that renders the facility incapable of adequate wastewater transport, such as mechanical or electrical failures of pumps, line blockage or breakage, etc.; or
- b. Any failure of a pumping station or sewer line resulting in a by-pass directly to receiving waters without treatment of all or any portion of the influent to such station or facility.

Persons reporting such occurrences by telephone shall also file a written report in letter form within five days following first knowledge of the occurrence. This report must outline the actions taken or proposed to be taken to ensure that the problem does not recur.

Permit issued this the twenty-seventh day of October 2003

NORTH CAROLINA ENVIRONMENTAL MANAGEMENT COMMISSION



for Alan W. Klimek, P.E., Director  
Division of Water Quality

By Authority of the Environmental Management Commission

**Permit Number WQ0023202**

**Fast Track Engineering Certification**

Permit No. WQ0023202  
October 27, 2003

Complete and submit this form to the permit issuing regional office with the following:

- One copy of the project record drawings (plan & profile views of sewer lines) of the wastewater collection system extension
- supporting design calculations (selected pumps, system curve, operating point, available storage if portable generator(s) or storage greater than longest past three year outage reliability option selected) for any pump stations permitted as part of this project
- Changes to the project should be clearly identified on the record drawings or in written summary form. Permit modifications are required for any changes resulting in non-compliance with this permit, regulations or minimum design criteria.

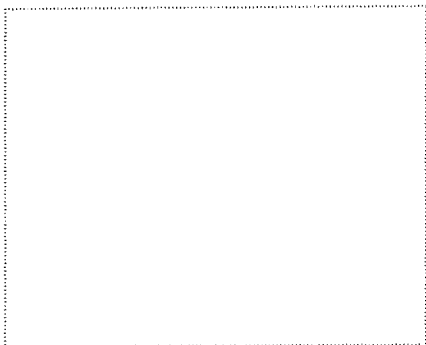
This project shall not be considered complete nor allowed to operate until this Engineer's Certification and all required supporting documentation have been received by the Division. **Therefore, it is highly recommended that this certification be sent in a manner that provides proof of receipt by the Division.**

**ENGINEER'S CERTIFICATION**

Partial                       Final

I, \_\_\_\_\_, as a duly registered Professional Engineer in the State of North Carolina, having been authorized to observe ( periodically,  weekly,  full time) the construction of the Kelly Hills/Slocomb Road Water & Sewer District, Cumberland County project for the Permittee hereby state that, to the best of my abilities, due care and diligence was used in the observation of the construction such that the construction was observed to be built within substantial compliance of this permit; 15A NCAC 2H .0200; the Division of Water Quality's (Division) Gravity Sewer Minimum Design Criteria adopted February 12, 1996 as applicable; the Division's Minimum Design Criteria for the Fast-Track Permitting of Pump Stations and Force Mains adopted June 1, 2000 as applicable; and other supporting materials.

North Carolina Professional Engineer's  
seal, signature, and date:



**SEND THIS FORM & SUPPORTING DOCUMENTATION  
WITH REQUIRED ATTACHMENTS TO THE FOLLOWING ADDRESS**

**FAYETTEVILLE REGIONAL OFFICE  
225 GREEN STREET, SUITE 714  
FAYETTEVILLE NC 28301**

The Permittee is responsible for tracking all partial certifications up until a final certification is received. Any wastewater flow made tributary to the wastewater collection system extension prior to completion of this Engineer's Certification shall be considered a violation of the permit and shall subject the Permittee to appropriate enforcement actions.





## **Appendix D**

### **PWC Agreement**

**STATE OF NORTH CAROLINA  
COUNTY OF CUMBERLAND  
SANITARY SEWER WHOLESALE AGREEMENT**

**THIS AGREEMENT** made and entered into this 24<sup>th</sup> day of September 2014 by and between the City of Fayetteville acting by and through its Public Works Commission of the City of Fayetteville (hereinafter referred to as "Commission" or "PWC") and the County of Cumberland, a North Carolina body politic acting by and through its Kelly Hills/Slocomb Road Water & Sewer District, (hereinafter referred to as "Kelly Hills").

**WITNESSETH**

**THAT, WHEREAS,** Kelly Hills owns and operates a wastewater collection system, as described in Exhibit B, that currently serves approximately 115 customers in the Kelly Hills/Slocomb Road area; and,

**WHEREAS,** Commission owns and operates wastewater treatment facilities (the "Municipal Wastewater System") and provides wholesale wastewater treatment services; and,

**WHEREAS,** Kelly Hills wishes to contract with Commission for PWC to furnish wholesale wastewater treatment service to Kelly Hills for the treatment of Kelly Hills wastewater; and ,

**WHEREAS,** Commission agrees to furnish wastewater treatment service pursuant to the terms of this agreement; and,

**WHEREAS,** Kelly Hills wishes to contract with Commission for PWC to provide operation and maintenance services to Kelly Hills for the Kelly Hills Sanitary Sewer system; and,

**WHEREAS,** Commission agrees to furnish operation and maintenance services to Kelly Hills for the Kelly Hills Sanitary Sewer system pursuant to the terms of this agreement; and,

**WHEREAS,** both parties recognize the Commission must implement and enforce a pretreatment program to control wastewater discharges from Significant Industrial Users ("SIUs") under 40 CFR Part 403 or other dischargers who require issuance of SIU or local permits.

**NOW THEREFORE,** Commission and Kelly Hills agree to the following terms and conditions:

1. Discharge Points:  
As of the Effective Date, wastewater from Kelly Hills existing sanitary sewer collection system will be discharged into the Commission's Municipal Wastewater System at the

existing entry point listed in this Section 1 and thence treated at Commission's plants as deemed appropriate. Existing entry point is PWC Lift station at 355 Bethune Drive. Kelly Hills shall not discharge into Commission's Municipal Wastewater System at any other entry point without prior written approval from the Commission. Exhibit A shows the approved discharge points.

2. Flow Measurement:

Within one hundred and twenty (120) business days from the Effective Date of this agreement, Commission shall install at Kelly Hills' expense a flow measurement device at the Kelly Hills approach main where Kelly Hills discharges wastewater into the Commission's Municipal Wastewater System. Commission at its expense, shall be responsible for maintenance and calibration of the flow measurement device and calibration shall be done annually and shall operate within the accuracy tolerances as specified by the manufacturer. Commission shall provide Kelly Hills a copy of the calibration records of the flow measurement device.

3. Basic Operations and Maintenance

A. The cost of basic operation and maintenance of the sanitary sewer collection system is built into the sanitary sewer rate being charged to Kelly Hills. Basic operation and maintenance includes:

1. Rights-of-way and/or easement maintenance to allow for accessibility to the sanitary sewer collection system.
2. Cleaning of at least 10% of the sanitary sewer collection system each year.
3. A general observation of the entire sanitary sewer collection system throughout the course of every year.
4. Semiannual inspections of all high priority lines (i.e. aerial, sub-waterway crossing, line contacting surface waters, siphon, line positioned parallel to stream banks subject to eroding, or line designated as high priority in a permit if applicable).
5. Point repair to a damaged or broken sanitary sewer main pipe, not to include replacement of multiple pipe joints.
6. Point repair to a damaged or broken sanitary sewer lateral or cleanout, not to include outright renewal of entire lateral.
7. Cleaning and rodding of clogged sanitary sewer mains and laterals.
8. Repair of manholes to include resetting of manhole ring and cover, not to include adjustments to or replacement of manhole or ring and cover; not to include repairs warranted to address I&I or corrosion issues.

- B. Other extraordinary work required or requested by Kelly Hills will be NU billed at the appropriate rate to include applicable overtime and overhead for labor, equipment and materials ( to include an amount for all direct and indirect charges) plus 10%. Examples of extraordinary work are: SSO remediation and post cleaning and inspection, work consider as a capital improvement under Financial Accounting Standards Board (FASB) standards, replacement of multiple joints of sanitary sewer pipe, renewal of a sanitary sewer lateral, installation of a new sanitary sewer lateral, elder valve installation, smokedye testing and CCTV inspection. Kelly Hills shall have the right to install themselves or to hire a contractor(s) to perform this work to PWC standards.
- C. The Commission shall at its discretion exercise the right to decline or subcontract any work required or requested by Kelly Hills that would conflict with the Commission’s responsibilities and requirements for the operation and maintenance of the Commissions’ sanitary sewer collection system.
- D. Commission will provide other services, upon request, but which will be billed separately and not included in the Wholesale Sewer Rate. A partial list of the other services that may be available to Kelly Hills include the following:
1. Promote participation agreements with other benefitted parties;
  2. Participation and administration of utility extension contracts;
  3. Right-of-way acquisition for land and easement requirements to be secured in the name of Kelly Hills within the limits permitted by law but not to include actions in eminent domain;
  4. Inspection services during construction;
  5. Miscellaneous services such as GIS mapping as requested.
- E. Other services requested by Kelly Hills will be NU billed at the appropriate rate to include applicable overtime and overhead for labor, equipment and materials ( to include an amount for all direct and indirect charges) plus 10%.

4. Upsizing Mains

Commission will be responsible for the cost associated with upsizing mains within the delineated Kelly Hills service as may be deemed necessary in order to meet

Commission's existing and future sanitary sewer needs which would not be otherwise required for the sanitary sewer collection system being installed by Kelly Hills pursuant to this Agreement.

5. Ownership of Sewer Lines

A. All sanitary sewer lines installed within the boundaries of the Kelly Hills Sanitary Sewer District shall be owned and operated by Kelly Hills subject to Commission's right to upsize such mains at its expense and to transmit sanitary sewer through such mains to areas beyond the Kelly Hills area.

B. Commission shall own and operate the lift station located at 355 Bethune Drive, Fayetteville, NC and the associated force main.

6. Rights-of-way and encroachments

Kelly Hills will acquire all rights-of-way and/or encroachments as may be needed for construction and maintenance of the sanitary sewer collection system as referenced herein.

7. Extension of Mains Outside Kelly Hills Service Area

Commission reserves the right to extend or continue sanitary sewer mains from such mains as initially constructed by Kelly Hills to points outside of the delineated Kelly Hills service area. Future connections or main extensions that occur outside of the delineated Kelly Hills area are not subject to this Agreement and shall be the property of Commission unless the Kelly Hills boundary is expanded by law to serve development of contiguous properties. If such extensions occur, then the Commission shall install a flow measurement device at its expense to measure all flow being generated by customers outside of the Kelly Hills Service Area. A map of showing the boundaries of the Kelly Hills service is show as Exhibit B.

8. Extension of Mains Within Kelly Hills Service Area

The further extension of or connection to mains within the delineated Kelly Hills service area will be pursuant to applicable extension and connection policies and procedures of Kelly Hills in effect at the time a request for service is made.

9. Compliance with Commission Policies and Procedures

Kelly Hills may by resolution adopt a policy whereby future customers and/or extenders of sanitary sewer infrastructure in the Kelly Hills service area will be subject to the then current applicable Commission Policies and Procedures to simplify the application process for customers with the understanding that such customers remain responsible to Kelly Hills for compliance with such policies and procedures.



10. Notification of Excessive Inflow/Infiltration

Upon notification by Commission that volumes of Kelly Hills wastewater entering Commission's lines, based on flow measuring data, exceed one hundred twenty-five percent (125%) of the average volume of sewer measured at the Discharge Point during any consecutive three-month billing period, Kelly Hills shall initiate an infiltration/inflow study to be conducted or supervised by a professional consulting engineer. Such study will provide Kelly Hills with recommendations designed to reduce infiltration/inflow to acceptable levels as delineated by the United States Environmental Protection Agency. Said study shall be made during the fiscal year immediately following notification. Corrective measures shall be taken by Kelly Hills upon receipt of and based on said infiltration/inflow study. Kelly Hills shall be responsible for all costs associated with any required infiltration/inflow study and corrective measures. Results of any infiltration/inflow study and proposed corrective measures shall be sent to Commission for review and approval.

11. New Laterals

- A. At Kelly Hills request, Commission will install new laterals in the Kelly Hills Sanitary Sewer District at Kelly Hills expense. Commission will NU bill Kelly Hills for such laterals at the appropriate rate to include applicable overtime and overhead for labor, equipment and materials (to include an amount for all direct and indirect charges) plus 10%.
- B. Kelly Hills, at its sole discretion, may install or contract for the installation of new laterals in the Kelly Hills Sanitary Sewer District.
- C. All new laterals will be designed and built to the PWC standards in effect at the time of the design and construction.

12. Monthly Billing:

- A. As of the Effective Date, the flow measuring device at the Kelly Hills connective main will be read, as nearly as practical, at regular monthly intervals. The period of time between device readings shall not be less than twenty-seven (27) days and not more than thirty-three (33) days. If Commission is unable to read the flow measuring device, for any reason, the wastewater flow shall be estimated by Commission on the basis of Kelly Hills wastewater flow for the preceding three billing periods for which readings were obtained. Bills rendered on the basis of such estimates shall be as valid as if made from actual device readings and appropriate adjustment of Kelly Hills bill shall be made at first actual reading of the flow measuring device subsequent to such estimate.
- B. The term "month" or "monthly" refers to the interval(s) transpiring between the previous meter reading date and the current meter reading date, and bills shall be rendered accordingly.



- C. The Commission will submit bills to Kelly Hills on a monthly basis for the prior month's sewer treatment service.
- D. If at the time of this Agreement's Effective Date, the flow measurement device at Kelly Hills approach main is not installed, the parties agree that billing shall continue under the existing arrangement, as specified in the Kelly Hills/Slocomb Road Water & Sewer District Sanitary Sewer Service Agreement as amended October 24, 2005 until such time that the flow measurement device is installed and calibrated.
- E. The Commission will, annually, or such time as shall be determined by Commission, perform a rate analysis to determine the rates which are applicable to serving Commission's various classes of water and sanitary sewer service. Among those classes of service will be wholesale sanitary sewer service classes, a class which includes Kelly Hills.
- F. Commission will use audited balance sheets, income statements, comparable wholesale market rate data, and return on investment financial information as the basis for determining the rates applicable to this Agreement. Commission may at its option, adjust audited financial data for changes to such financial data known or reasonably expected to occur during the period in which the billing rate will be in effect.
- G. Commission will provide at least 30 days' notice to Kelly Hills of any rate changes.
- H. The initial Wholesale Sewer Rate to be charged to Kelly Hills, including the cost of O&M, is \$ 4.1267 per 1,000 gallons, or \$ .0041267 per gallon, the rate effective January 1, 2014. This cost includes the cost of basic operation and maintenance of the sanitary sewer collection system as described in paragraph 3.

13. Capacity Charges

- A. Commission shall receive and treat up to 100,000 gallons per day of Kelly Hills wastewater, representing the projected average daily usage generated from sources within the Kelly Hills Sanitary Sewer District. Kelly Hills has purchased 32,430 gallons per day sanitary sewer treatment capacity using \$ 92,640 of FIF credits. Upon execution of this agreement Kelly Hills will purchase an additional 67,570 gallons per day of sanitary sewer treatment capacity using \$ 201,358.60 of their existing FIF credits that expire in October 2015.

Kelly Hills has the option, in the future, to purchase any or all of the remaining 50,000 gallons per day force main capacity at the then current FIF charge. Such purchases will be made in increments of at least 5% of the then current contract capacity.

- B. Kelly Hills shall, advise Commission of any anticipated growth in number of connections to its sanitary sewer system, population served and anticipated volume of wastewater as Kelly Hills becomes aware of such growth.. Commission does not anticipate any restriction on annual increase in flow from Kelly Hills, if within limits of the contract demand of 100,000 gallons per day. However, flow limits may be imposed if a regulatory agency having jurisdiction over Commission's treatment facilities requires restriction on flow increases on Commission's system.
  - C. Commission shall notify Kelly Hills if the measured average daily usage in gallons per day of wastewater reaches 80% of the contract demand.
  - D. If the measured average daily usage in gallons per day of wastewater from Kelly Hills exceeds 90% of the contract demand, Kelly Hills shall purchase additional contract demand at the current Commission capacity rate in increments of at least 5% of the existing contract demand.
14. Surcharges for Carbonaceous Biochemical Oxygen Demand (CBOD) and Suspended Solids (SS) and Total Kjeldhal Nitrogen (TKN):
- A. A surcharge for CBOD, Suspended Solids or NH<sub>3</sub> will be applied to those customers of Kelly Hills who are issued SIU or local permits ("Industrial Users"). These surcharges will be determined in accordance with the Commission Rate Schedule "Sanitary Sewer Surcharges" currently indexed as 620.05. Such surcharge billing will be determined by testing samples of wastewater from each Industrial Users' discharge at Commission's laboratories pursuant to standard test requirements and procedures of the State and Federal governments. Commission shall bill surcharges directly to the Industrial Users. The additional costs to treat wastewater in excess of limits stated above are determined by the Commission and published annually. The Commission will, from time-to-time, review and revise the surcharge applicable to Industrial Users based on testing.
  - B. Kelly Hills shall terminate sewer service to any Industrial User upon notice from the Commission that said Industrial User has failed to pay surcharges pursuant to Sections 5 or 7 or any additional fees or penalties under the City of Fayetteville's Sewer Use Ordinance.
15. Sewer Use Ordinance Requirement:
- A. The Sanitary Sewer Ordinance of the City of Fayetteville, as amended from time-to-time, shall be applicable to all Kelly Hills customers whose wastewater is discharged to Commission's Municipal Wastewater System.

- B. Kelly Hills shall be responsible for regulation of all customers who discharge wastewater through Kelly Hills system to the Commission's Municipal Wastewater System. Kelly Hills shall be responsible for enforcement of the requirements of the City of Fayetteville's Sanitary Sewer Ordinance.

16. Sewer Use Ordinance, and Pretreatment Requirements and Costs:

- A. The Sanitary Sewer Use Ordinance of the City of Fayetteville and subsequent revisions of such Ordinance to include pretreatment requirements and cost, both incorporated herein by reference, shall be applicable to the effluent of Kelly Hills' sanitary sewer being discharged into the Commission's sanitary sewer system.
- B. Kelly Hills hereby designates Commission as the agent of Kelly Hills for the purposes of implementation and enforcement of the pretreatment requirements of Kelly Hills for industrial users located in Kelly Hills' jurisdiction. Commission hereby accepts the designation of agent of Kelly Hills' jurisdiction for purposes of implementation and enforcement of the pretreatment requirements. If Commission determines the pretreatment requirements are not enforceable by Commission, then Kelly Hills shall provide timely enforcement. Kelly Hills shall continue to enforce all other provisions of the City's Sanitary Sewer Use Ordinance.
- C. Commission, on behalf of and as an agent for Kelly Hills', agrees to perform technical and administrative duties necessary to implement and enforce the pretreatment requirements, including but not limited to the following:
  - 1. Updating industrial waste survey no less than once every five (5) years;
  - 2. Providing technical services such as sampling and analysis;
  - 3. Permitting of Significant Industrial Users (SIU's);
  - 4. Conducting inspection and compliance monitoring at permitted SIU's and certain commercial users; and
  - 5. Performing enforcement activities.

In addition, Kelly Hills authorizes the Commission, as its agent, to take emergency action to stop or prevent any discharge which presents or may present an imminent danger to the health or welfare of humans, reasonably appears to threaten the environment, threatens to interfere with the operation of Commission's sanitary sewer treatment system (including the collection system and its workers' safety), or which could pass through the treatment plant and threaten the integrity of the publicly owned treatment works receiving stream.

- D. Kelly Hills, as with other Commission customers, shall be responsible for additional cost associated with treatment of sanitary sewer in excess of published limits as determined by Commission. Such pretreatment surcharge billing will be determined by testing of samples of sanitary sewer from the Kelly Hills sanitary sewer collection system at Commission's laboratories pursuant to standard test requirements and procedures of the State and Federal governments. The pretreatment surcharge procedure as it applies to commercial industrial customers is described in Commission's Rates and Policies Manual and is incorporated herein by reference.
- E. Kelly Hills shall pay Commission for actual costs incurred by Commission, including all reasonably allocated overhead costs, implementing and enforcing pretreatment requirements on behalf of Kelly Hills'. Commission shall bill Kelly Hills monthly for pretreatment costs incurred by Commission in implementing and enforcing Kelly Hills' pretreatment requirements, which shall be payable within 30 days of date of invoice.

17. Corrosion Control:

Kelly Hills shall be responsible for ensuring compliance with hydrogen sulfide discharge limits at the point(s) of discharge to the Commission's Municipal Wastewater System. The discharge of dissolved sulfide by Kelly Hills to Commission's Municipal Wastewater System at the discharge point(s) identified in Section 1 of this Agreement, are limited to the following: a daily average of 5mg/l in solution and/or 10 ppm in atmosphere and a maximum of 10 mg/l in solution and/or 30 ppm in atmosphere per day. PWC, at its own expense, shall perform all testing and as needed shall coordinate with Kelly Hills. Kelly Hills, at its own expense, shall be responsible for the addition of any chemicals or additional treatment necessary to comply with the hydrogen sulfide limit. Any addition of chemicals to control hydrogen sulfide shall be coordinated with Commission prior to introduction into the system.

18. Indemnity and Responsibilities:

Kelly Hills assumes responsibility for and shall indemnify (or defend at Commission's sole option) Commission, its successors and assigns, and hold it harmless against all injuries, liabilities, claims, damages, losses, costs and expenses, including reasonable attorney's fees and costs, personal injury or property damage, arising out of or related to 1) the construction, maintenance and operation of Kelly Hills sanitary sewer system, 2) Kelly Hill's discharge into the Commission's Municipal Wastewater System, 3) this Agreement, or 4) fines or penalties by any Federal, State or local agency or body.. Kelly Hills will not indemnify PWC for intentional or negligent acts solely attributable to PWC, its employees, agents, or contractors.

19. Suspension or Termination of Sanitary Wastewater Treatment Service:

Commission, in addition to all other legal remedies, may either terminate this Agreement or suspend sanitary sewer treatment service to Kelly Hills for:



- a) Any material default or breach of this Agreement by Kelly Hills; Fraudulent or unauthorized use of the sanitary sewer treatment service or discharge of sanitary sewer in such manner as to circumvent Commission's meter(s) serving Kelly Hills; or,
- b) Failure to pay monthly sanitary sewer bills when due and payable.
- c) No such termination or suspension, however, will be made by Commission without thirty (30) days written notice delivered to Kelly Hills personally or by mail, within which time Kelly Hills may cure any such alleged default or breach or commence in good faith to cure any such default or breach which cannot reasonably be cured within thirty (30) days, except that only seven (7) days' notice need be given under subsection (b) above.
- d) Commission's suspension of sanitary sewer service or termination of this Agreement upon any authorized grounds shall not relieve Kelly Hills of:
  - 1) Liability for the payment of sanitary sewer treatment service to the date of suspension or termination of this Agreement; nor
  - 2) Liability for any actual damages sustained by Commission.

20. Payment:

Monthly bills are payable within thirty (30) days from date thereof at P.O. Box 1089, Fayetteville, North Carolina, 28302, or its successors. A late payment charge in accordance with PWC's Schedule of Deposits, Fees, and Charges shall be applicable to all bills rendered pursuant to this Agreement except when notified within fifteen (15) days by Kelly Hills in writing of an invoice dispute, but Kelly Hills shall pay the undisputed amount pursuant to this contract.

21. Term of Agreement:

The term of this Agreement is for twenty (20) years from September 24, 2014 until September 24, 2034 (the "Initial Term"). This Agreement shall automatically renew at the end of the Initial Term for a period of one (1) year, and shall automatically renew each year thereafter for a period of one year, unless terminated pursuant to the terms of Paragraph 10, or by either party by giving not less than one (1) year written notice to the other party, or upon mutual consent of both parties. Either party may terminate this Agreement during the Initial Term by giving the other party one (1) year written notice.

22. Prior Agreements: This Sanitary Sewer Wholesale Agreement shall replace the Sanitary Sewer Service Agreement by and between the City of Fayetteville acting by and through its Public Works Commission of the City of Fayetteville and the Kelly Hills /Slocomb Road Sanitary Sewer District dated April 19, 2004 and amended October 24, 2005.

23. Continuity of Service:

Commission does not guarantee continuous utility service, but shall use reasonable diligence in providing uninterrupted services. Having used such reasonable diligence, Commission shall not be liable to Kelly Hills or its customers for failure to provide continuous services. The performance of Commission's obligations under this Agreement shall be excused during such times and to the extent such performance is prevented by reason of any event beyond the control of Commission, including without limitation, flood, earthquake, storm, lightning, fire, explosion, war, riot, civil disturbances, terrorist act, strikes, sabotage, or act of God.

24. Dispute Resolution:

Commission and Kelly Hills will attempt in good faith to resolve any dispute or claim arising out of or in relation to this Agreement through direct negotiations between Commission and Kelly Hills' staff. If the dispute is not settled through such negotiations, then Commission and Kelly Hills agree to attend voluntary mediation prior to initiating formal legal proceedings. Said voluntary mediation shall be initiated by either party giving notice of the same, and shall be concluded within 30 days of such notice. Said voluntary mediation shall be conducted pursuant to the North Carolina Rules Implementing Statewide Mediated Settlement Conferences in Superior Court Civil Actions in effect at the time said notice is given. The requirements of this Section 25 shall not apply to emergency situations where the dispute involves potential harm to the Commission's Municipal Wastewater System.

25. Amendment Proceedings:

This Agreement may be amended, changed, modified, altered, or assigned only by written consent of Commission and Kelly Hills.

26. Notices:

All notices hereunder, other than monthly invoices and payment of the same, shall be sent to the following addresses using regular mail unless otherwise specified in writing:

Commission:           General Manager  
                              Public Works Commission  
                              P.O. Box 1089  
                              Fayetteville, NC 28302

Kelly Hills: Chairman, Governing Board  
Kelly Hills/Slocomb Road Water and Sewer District  
P. O. Box 1829  
Fayetteville, NC 28302-1829

27. Binding Effect:

This Agreement shall be binding upon and inure to the benefit of the parties hereto, their heirs, successors and assigns.

28. Entire Agreement:

This Agreement contains the entire Agreement of the parties and there are no representations, inducements, or other provisions other than those expressed in writing.

29. Kelly Hills acknowledges that, in carrying out the terms of this agreement, PWC will disclose certain confidential customer information to Kelly Hills (the "Confidential Information"). Kelly Hills agrees not to disclose the Confidential Information to third parties, except as may be reasonably necessary to carry out the terms of this Agreement. Kelly Hills will advise PWC of any such disclosure prior to disclosure and obtain PWC's consent. In the event Kelly Hills inadvertently discloses Confidential Information, Kelly Hills will immediately notify PWC of such inadvertent disclosure and will take all appropriate actions to prevent further dissemination or disclosure of the Confidential Information.

29. Governing Law:

This Agreement shall be governed by the laws of the State of North Carolina.

30. Severability:

It is hereby declared to be the intention of Commission and Kelly Hills that the paragraphs, sentences, clauses, and phrases of this Agreement are severable. If one or more paragraphs, sections, sentences, clauses, or phrases shall be declared void, invalid, or otherwise unenforceable for any reason by valid and final judgment or decree of any court of competent jurisdiction, such judgment or decree shall not affect the remaining provisions of this Agreement and the same shall continue to be fully effective and enforceable on the basis that said remaining provisions would have been agreed to by Commission and Kelly Hills without the incorporation of such void, invalid, or otherwise unenforceable paragraph, section, sentence, clause, or phrase.


31. Effective Date:

The Effective Date, as that term is used in this Agreement, shall be the date that the Agreement is fully executed by both parties.



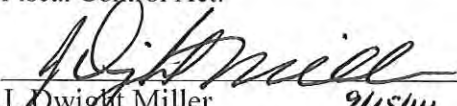
IN WITNESS WHEREOF, the parties hereto, through their duly authorized officers, have executed this contract as to the date and year first above written.

PUBLIC WORKS COMMISSION  
OF THE CITY OF FAYETTEVILLE

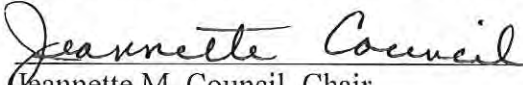
By:   
Michael G. Lallier, Chairman

ATTEST:  
  
Lynne Greene, Secretary

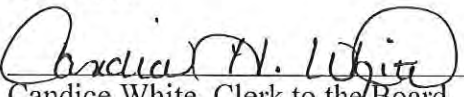
This instrument has been preaudited in the manner required by the Local Government Budget and Fiscal Control Act.

  
J. Dwight Miller *9/15/14*  
PWC Chief Financial Officer

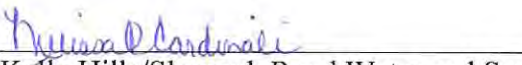
KELLY HILLS/SLOCOMB ROAD WATER AND SEWER DISTRICT

By:   
Jeannette M. Council, Chair



ATTEST:  
  
Candice White, Clerk to the Board

This instrument has been preaudited in the manner required by the Local Government Budget and Fiscal Control Act.

  
Kelly Hills/Slocomb Road Water and Sewer District  
Finance Officer

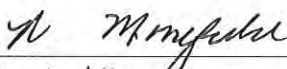
**Legal Review of the Contract between the City of Fayetteville, Acting through its Public Works Commission, and Cumberland County, Acting through its Kelly Hills/Slocumb Road Water & Sewer District, Approved by the Board of Commissioners August 18, 2014**

Section 18 of this agreement is subject to N.C.G.S. § 22B-1. Construction indemnity agreements invalid. That statute states:

Any promise or agreement in, or in connection with, a contract or agreement relative to the design, planning, construction, alteration, repair or maintenance of a building, structure, highway, road, appurtenance or appliance, including moving, demolition and excavating connected therewith, purporting to indemnify or hold harmless the promisee, the promisee's independent contractors, agents, employees, or indemnitees against liability for damages arising out of bodily injury to persons or damage to property proximately caused by or resulting from the negligence, in whole or in part, of the promisee, its independent contractors, agents, employees, or indemnitees, is against public policy and is void and unenforceable.

To the extent that any portion of this indemnity agreement is enforceable, there is no limit on the amount of the obligation that may be incurred.

Subject to proper execution by both parties and the effective dates of the term being inserted into Section 21, this agreement is approved for legal sufficiency for the reason that the Public Works Commission is the sole provider of sewer service for the Kelly Hills Water & Sewer District and the agreement terms were not negotiable.

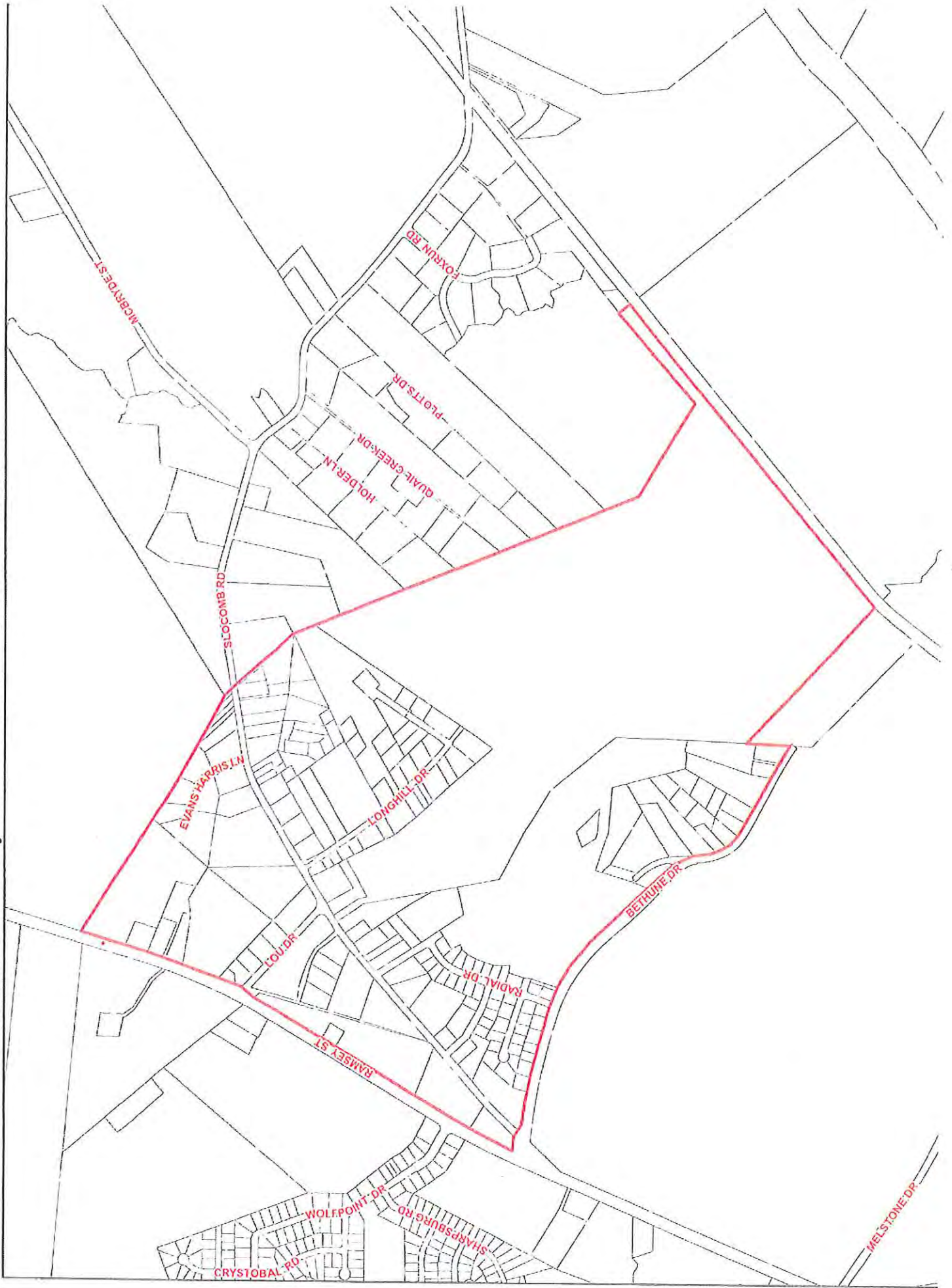
  
\_\_\_\_\_  
County Attorney 8-19-14

## **Exhibit A – Kelly Hills Discharge Points**

The approved discharge point(s) for Kelly Hills are:

1. The flow measurement device at the Kelly Hills force main.

EXHIBIT-B: Kelly Hills Water and Sewer District



**SEWER ASSET MANAGEMENT PLAN**

**NORTHERN CUMBERLAND REGIONAL  
SEWER SYSTEM (NORCRESS) DISTRICT**

**CUMBERLAND COUNTY, NC**



PINEHURST, NORTH CAROLINA



**SEWER ASSET MANAGEMENT PLAN**

**NORTHERN CUMBERLAND REGIONAL  
SEWER SYSTEM (NORCRESS) DISTRICT**

**CUMBERLAND COUNTY, NC**

**MATTHEW JONES, PE**  
matthew.jones@mcgillassociates.com



5 Regional Circle, Suite A  
Pinehurst, NC 28374  
910.295.3159

**AUGUST 2025**

**PROJECT NO. 20.02507**

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**Appendix A – Manhole Inventory List**

**Appendix B – Smoke Testing Results List**

**Appendix C – Rainfall Data**

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## EXECUTIVE SUMMARY

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The purpose of this Asset Management Plan (AMP) is to document the condition of the Northern Cumberland Regional Sewer System (NORCRESS) District's infrastructure to assist the County with becoming more proactive in the management, operation, and financing of its wastewater collection system. The NORCRESS District serves approximately 452 connections in the northeastern area of Cumberland County. Approximately 666 properties within the district are not currently connected and are paying the sewer availability fee. The District's wastewater collection system consists of approximately 26 miles of gravity sewer, four sewer lift stations, 15 miles of force main, and 424 manholes. Collected wastewater is pumped from the Wade 2 Lift Station to Eastover Central Lift Station and then sent to Fayetteville PWC. Flow generated from the district is ultimately treated at the Cross Creek Water Reclamation Facility (NC0023957), which is owned and operated by Fayetteville PWC. A copy of the agreement is included in Appendix F.

This asset inventory and assessment consisted of assembling data on gravity sewer pipe, manholes, and other appurtenances in the collection system. This assessment included performing inspections of selected manholes, performing smoke testing throughout the system, performing flow monitoring at select locations within the system, and reviewing existing data with County Staff. The information was evaluated and is summarized in this document which includes the asset management plan and capital improvements plan. This process resulted in the development of a 10-year Capital Improvements Plan (CIP) to guide the District with scheduling and financing the capital projects and equipment purchases necessary to maintain and improve its wastewater collection system. Through the AMP process, it is estimated that approximately 40% of the manholes in the sewer collection system are in need of rehabilitation due to deterioration.

The CIP includes a focused improvement to components within the sewer system that need rehabilitation or replacement based on existing condition, and on improvements that could improve management of the sewer system for staff. These planned projects will

bring the system into a better position to serve its customers by improving reliability of the collection system. The District should look to its CIP to guide its next projects, and the CIP should be updated regularly as priorities change and as projects are completed. It is noted that many factors may impact the priorities including failures, and funding availability both local and through grant and loan programs. This assessment project provides evidence for the prioritization of manhole rehabilitation and improvement projects in the CIP.

### ***System Evaluation***

The pipe material in the NORCRESS system is primarily PVC pipe. The collection system was first put into service in 2005, therefore the relative age of the system is low. PVC pipe is the most common material used for sewer systems today. The typical useful life for PVC pipe is anywhere from 40 to 60 years. There is some ductile iron pipe (DIP) used at culvert crossings and HDPE used for directional drill of the Falcon and Wade force mains.

As part of the AMP, McGill Associates, PA (McGill) assisted the District with evaluating the condition of its sewer infrastructure to identify projects in line with these goals. The following items were included in the AMP scope:

- Identify areas to conduct smoke testing to locate potential sources of I/I into the sewer system;
- Flow monitoring in select areas (6 sewershed areas within the Towns of Godwin and Falcon)
- Inspect selected sewer manholes within the system to establish overall system condition;
- Identify and evaluate potential sewer system improvements;
- Prioritize sewer system improvements;
- Prepare opinions of probable costs for sewer system improvements; and
- Create a Capital Improvements Plan.

### Flow Monitoring

McGill met with County staff to identify areas of concern within the sewer system and select locations to place flow meters. From these discussions, the NORCRESS wastewater collection system was divided into six total sewersheds between the Towns of Godwin and Falcon, according to the GIS mapping as depicted in Figure 2. These sites were selected to favor areas where County staff suspected I/I and the sewershed was easily able to be isolated within the total system. Overall, flow monitoring revealed that while all sites had sufficient capacity to handle dry weather flow, there was additional flow during dry weather conditions that raises some concern. Falcon Site 2 had peak flows which used around 40% of the estimated capacity during dry weather conditions, and Falcon Site 1 had peak flows over 60% existing capacity. There was only one significant rainfall event during the flow monitoring period, and I/I did seem to be an issue for the system. All six flow monitoring locations logged higher flows immediately following the event.

### Smoke Testing

McGill and the Cumberland County staff smoke tested segments of gravity sewer lines connected to multiple manholes across the system, enabling the full smoke testing of the entire 26 miles of the sewer system. This testing occurred over a period of several days to determine locations where I/I could enter the wastewater collection system. For each segment, McGill and County staff selected a centrally located manhole on which to place the blower based on the manhole's accessibility. The crew recorded smoke emerging from 240 abnormal locations, which divided generally into four categories- broken or uncapped cleanouts, broken lines, unsealed manholes, and unknown defects. All smoke occurrences are recorded in Appendix A and shown in Figure 3.

### Manhole Inspections

All manholes in the NORCRESS system are precast concrete based on information provided by County staff. The results of the selected manhole inspections performed as a part of this inventory were used to develop an assessment of manhole conditions in the

system. Based on the inspections performed, manholes that were inspected were assigned a condition score, and these scores were combined into an overall condition rating for each manhole- excellent, good, fair, or poor. Of the 37 manholes inspected, approximately 34 were in good condition and four were in fair condition. These results are recorded in Figure 7 and included in Appendix A.

### Lift Station Inspections

The NORCRESS System is served by four lift stations: one in Godwin, one in Falcon, and two in Wade. The County previously contracted with Freese and Nichols to perform an analysis and report on the lift stations. Lift station inspection was not included in the scope of this assessment. Analysis of the lift stations was included the NOCRESS Comprehensive Sewer Evaluation study completed by Freese and Nichols in June 2021. For reference, record drawings for the lift stations are included in Appendix G of this report.

### Findings and Recommendations

The system evaluation allowed McGill to assemble a list of general recommendations and high priority projects to guide the County in the next 10 years. General recommendations to the District included establishing its own flow monitoring and smoke testing programs in high priority areas to determine sewer rehabilitation needs and inspecting sewer lines and manholes with CCTV equipment during routine cleanings to track the condition of these items. McGill also recommended the County begin rehabilitation and/or replacement of existing manholes within the collection system in order to reduce the risk of I/I.

Data and field investigation reporting were utilized to identify the priority projects within the collection system, focusing on manhole rehabilitation.

Table 1 summarizes projects identified during this assessment, centering around additional flow monitoring, flow meters, and manhole rehabilitation projects. A project to

install flow monitors is included to give greater control and understanding of flows from the collection system.



**Table 1: Summary of Capital Improvements Projects**

<b>No.</b>	<b>Project Name</b>	<b>Cost</b>
1	Flow Monitoring Study	\$25,440.00
2	Manhole Rehabilitation Project 1	\$118,600.00
3	Flow Monitoring Improvements	\$203,900.00
4	Manhole Rehabilitation Project 2	\$118,600.00
5	Manhole Rehabilitation Project 3	\$118,600.00
6	Manhole Rehabilitation Project 4	\$118,600.00
7	New Generators All Lift Stations	\$640,000.00
8	Upgrade SCADA	\$240,000.00
9	Falcon Force Main-Inspect, Clean, and Replace ARVs	\$80,000.00
<b>10-Year CIP Total Project Cost</b>		<b>\$1,714,620.00</b>

***Capital Improvements Plan***

The purpose of this asset inventory and assessment was to document the condition of the District’s inventoried infrastructure to assist the County with becoming proactive in the management of its wastewater system, to include capital project planning. The County does not currently have a Capital Improvements Plan (CIP) for its wastewater system. The CIP being developed from this current assessment will guide the County through its planning for projects within the 10-year window. The CIP will remain a living document and be updated in the future so that it remains current to the Districts’ highest priorities and provides accurate cost estimates. The CIP included in this assessment includes projects focused on rehabilitation of existing manholes, which have been identified to be potential sources for I/I into the system. Through discussion with County staff, field investigation and review of existing system data, the specific defects and general problematic areas within the wastewater system have been summarized. These results were used to update the CIP and formulate a ten-year plan.

The complete asset inventory and assessment task consisted of five parts culminating in the development of the NORCRESS Water and Sewer District’s CIP. McGill developed

cost estimates for all projects based on current 2024 materials and construction costs. The updated CIP is intended to be adopted by the County to guide its selection of sewer system improvement projects over the next decade. This plan also includes a budget-level recommendation for staffing associated with system operations and maintenance for all County utility districts.

**1.1 BACKGROUND**

The NORCRESS District is located in Cumberland County, North Carolina, and is owned and operated by Cumberland County. The District includes a wastewater collection system that currently serves 452 customers. A summary of customer type based on use is provided in Table 2. The collection system consists of approximately four and a half miles of gravity sewer mains that are 8-inch, 12-inch, 15-inch, and 16-inch in diameter. These gravity sewer mains are constructed of PVC and Ductile Iron pipe and are all 15 years old. Figure 1 shows the existing sewer collection system.

Developing a Capital Improvements Plan (CIP) will allow the District to update its current rate setting model to better estimate future revenue and expenses, capital outlay, indebtedness, and overall health of the sewer system enterprise fund reserves. A model of this nature would continue to balance revenues and expenditures with a longer-term approach to rate setting and establish a financially sound framework for the District to follow.

The District has experienced the degradation of manholes within its sewer collection system due to the age of the system and resulting from wear over time.

Even with the relatively young age of the NORCRESS system, County staff remains cognizant that infiltration and inflow (I/I) is always a concern, particularly in a scenario where the County's operation costs are based on the gallons of flow that enter into the existing lift station. The County is also aware that during dry weather there tend to be excessive flows in Godwin and Falcon (and therefore Wade, where flows are pumped from both Towns). Therefore, the top challenges for the NORCRESS system are mitigating I/I that results from deteriorated infrastructure and identifying the source of any additional flows into the collection system that do not first enter via water connection and are therefore billable. This additional information will help the County anticipate typical flows and assist with operations and maintenance planning. The information collected

throughout this assessment project will help identify system deficiencies and develop improvement projects to reach these goals.

This process resulted in the development of a 10-year Capital Improvements Plan (CIP) to guide the District with scheduling and financing the capital projects and equipment purchases necessary to restore its wastewater collection system. Through the AMP process, the McGill and County staff have estimated that approximately eighty-four (84) manholes would benefit from rehabilitation due to their poor condition.

The purpose of this Asset Management Plan (AMP) is to document the condition of the Districts' inventoried infrastructure to assist the District with becoming more viable and proactive in the management and financing of its wastewater system. The District continues to look to its CIP to guide its next projects; therefore, it is vital that the CIP remains current to the Districts' highest priorities and provides accurate cost estimates. This assessment project was utilized for the prioritization of replacement lines and improvements projects in the CIP.

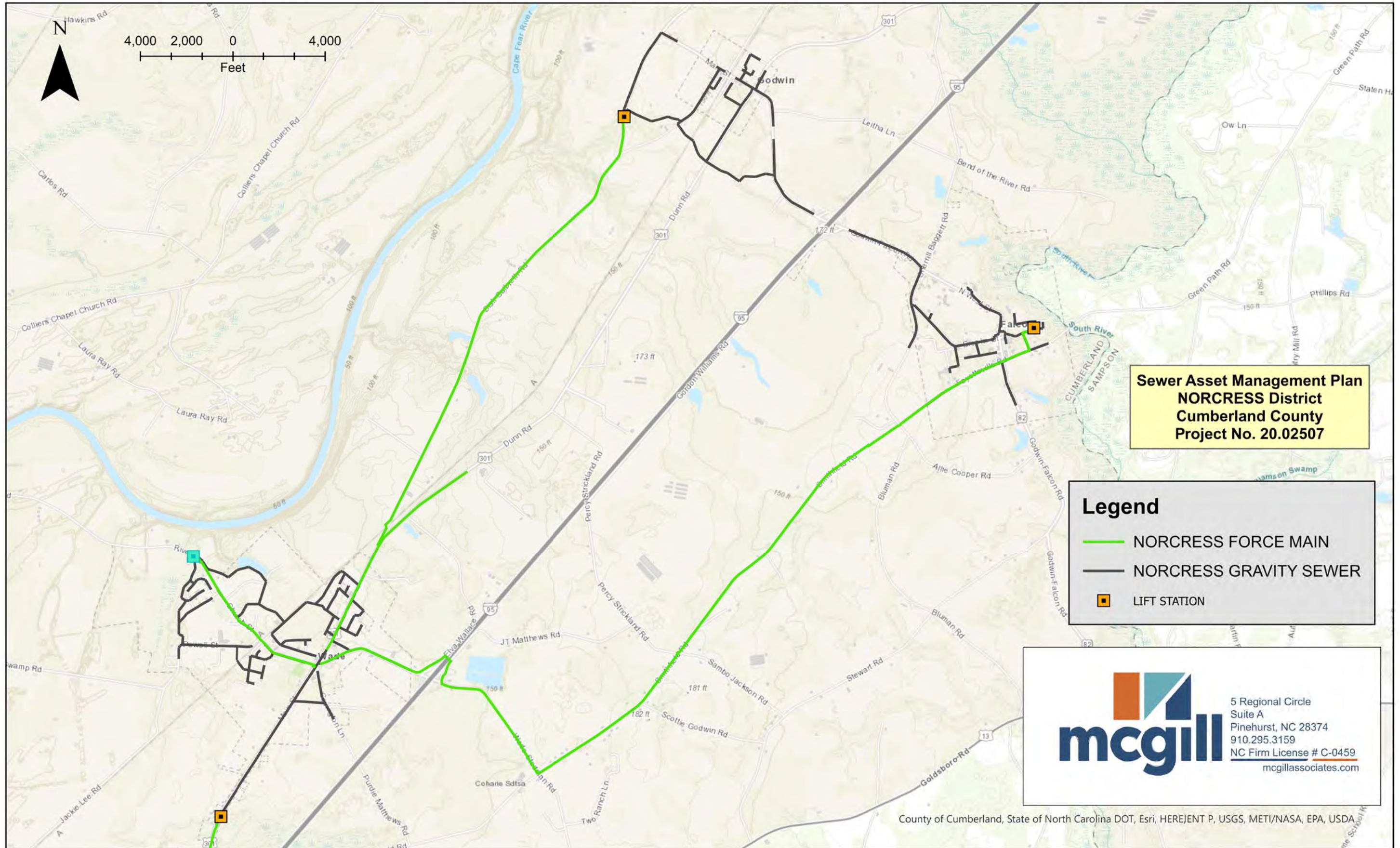
**Table 2: Summary of Customers by Use**

<b>Diameter</b>	<b>Total</b>	<b>% of System</b>
<b>Residential</b>	<b>394</b>	<b>87.1%</b>
<b>Commercial</b>	<b>50</b>	<b>11.1%</b>
<b>Industrial</b>	<b>3</b>	<b>0.7%</b>
<b>Flat Rate</b>	<b>5</b>	<b>1.1%</b>
<b>Total LF</b>	<b>452</b>	<b>100%</b>



# NORCRESS Overall System Map

## Figure 1



**Sewer Asset Management Plan**  
**NORCRESS District**  
**Cumberland County**  
**Project No. 20.02507**

**Legend**

- NORCRESS FORCE MAIN
- NORCRESS GRAVITY SEWER
- LIFT STATION



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County of Cumberland, State of North Carolina DOT, Esri, HERE/JENT P, USGS, METI/NASA, EPA, USDA



## 2.1 FLOW MONITORING

### 2.1.1 Overview

The purpose of flow monitoring was to determine the capacity, average daily flow, and wet-weather flows within areas of the NORCRESS system. This information reveals locations where significant Infiltration and Inflow (I/I) enters the system causing a reduction in available capacity and potential for overflows and sewer backups in the system. Infiltration and Inflow have similar impacts but are contributed to by different sources and can be located and/or resolved using different methods.

Infiltration is water, besides wastewater, that seeps into the sewer system through the ground. Typical infiltration sources include broken pipes, defective pipe joints, damaged manhole walls, and broken service connections. Infiltration typically enters a system slowly and may remain evident in the sewer system for several days following a rainfall event. Although infiltration generally does not produce high peak flows, infiltration regularly results in large volumes if I/I.

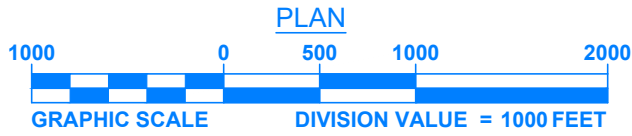
Inflow is water, besides wastewater, that enters the sewer system directly. Typical inflow sources include storm/sewer cross-connections, roof leader connections to sewers, vented manhole covers, and missing cleanout caps. Inflow produces rapid flow increases and often causes sewer system surcharging and overflows during rainfall events. Inflow regularly results in peak I/I flow and high peaking factors.

### 2.1.2 Investigation

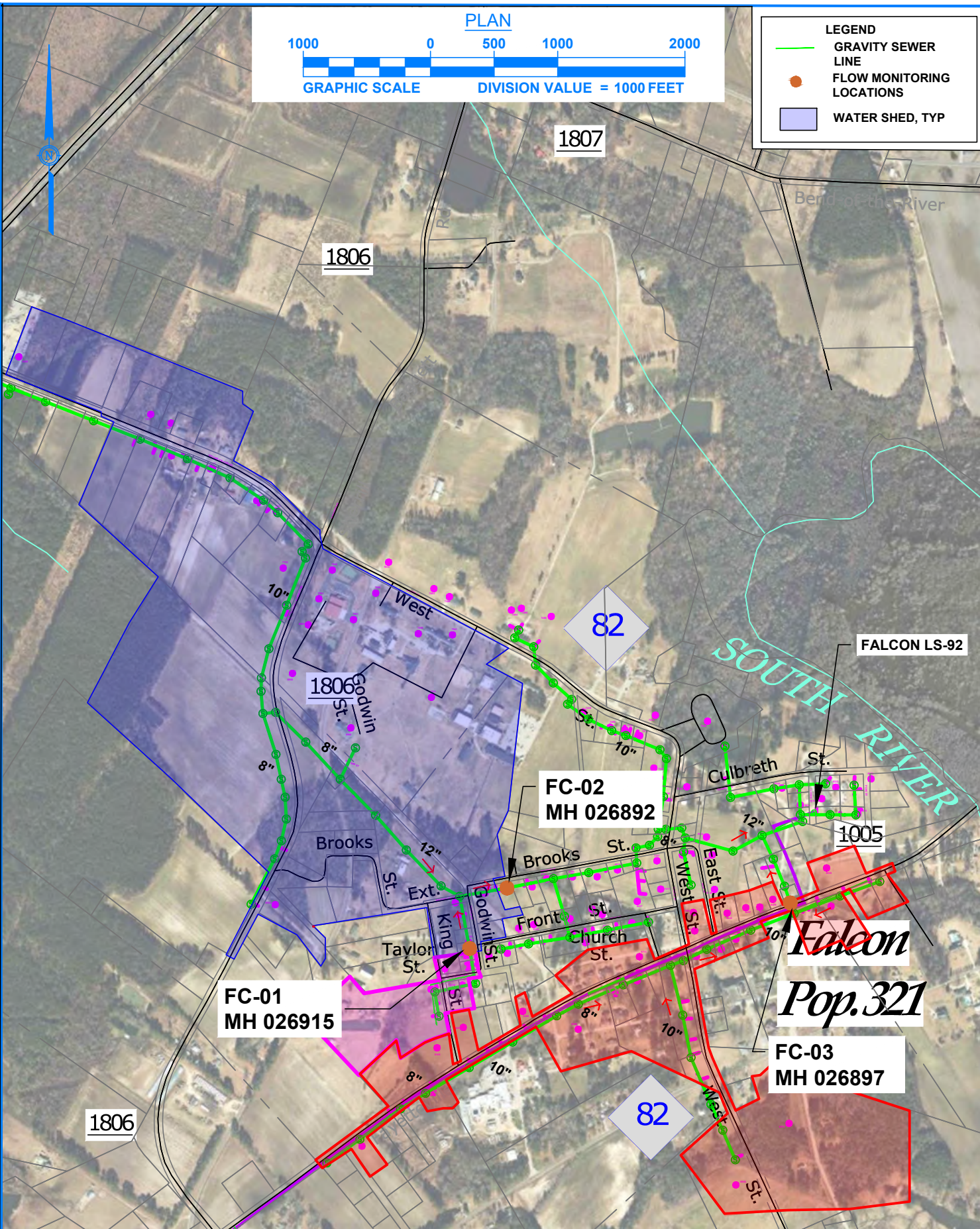
Meetings were held with County staff to identify areas of concern within the sewer system and select locations to place flow meters. McGill reviewed the results of the 2021 Freese and Nichols NORCRESS Study, in which the recommendation was to further monitor the flow in Godwin and Falcon. Both of those Towns produced higher than anticipated flow during the period of monitoring during that study. From discussions with County staff, it

was determined that flow monitors would be placed within the Towns of Godwin and Falcon. Three sewersheds were developed for each Town, resulting in the placement of three flow monitors in each Town. Utilizing staff from KRG Utility, McGill owned flow monitors were installed and flow was monitored from October 18 through November 28, 2023. A map of both Towns and the sewersheds and monitoring locations is shown in Figure 2 and Figure 3. The shaded areas denote the sewersheds for each site.





LEGEND	
	GRAVITY SEWER LINE
	FLOW MONITORING LOCATIONS
	WATER SHED, TYP



P:\2020\20.02507-CUMBERLAND-ENGINEERING\DRAWINGS\FIGURES\20.02507 FLOW MONITORING FIGURE.DWG PLOT DATE 3/21/2024 3:52 PM DEMI WATKINS

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DATE	OCTOBER 2023
PROJECT #	20.02507
PROJECT MANAGER	M. JONES

ASSET MANAGEMENT PLAN  
CUMBERLAND COUNTY PUBLIC UTILITIES  
CUMBERLAND COUNTY, NORTH CAROLINA

SHEET	NORCRESS FLOW MONITORING IN FALCON
FIG 2	

SHEET  
FIG 2







### 2.1.3 Methodology

Average dry-weather flows provide the basis for capacity and wet-weather flow analyses. To develop the average dry-weather flows, McGill averaged the flows for each day with typical flow (no rain events or evidence of silt/debris). Several days that fit this criterion were used in the calculation to acquire the dry-weather flow each respective meter. If present, daily groundwater infiltration into the sewer system is included in the reported average daily flows.

During the flow monitoring period, rain events were recorded on October 21, Nov 11-13, and November 23 based on rainfall data recorded at the Fayetteville Regional Airport (provided in Appendix C). The flows at each of the six flow monitoring devices were recorded during these events. The rainfall event on October 21 was less than 0.5 inches and did not cause I/I based on the monitoring data. The events from November 11-13 and November 22 recorded over 2 inches of rainfall and did contribute I/I into the system. Anticipated flows for each basin were estimated based on the dwellings served. The range represents the estimated value based on usage of 225 gpd/dwelling, which is the updated estimate from 360 gpd/dwelling based on NCAC 02T rules. Dry weather flows were approximated based on the flow seen between rain events at the meter. Actual average daily flow recorded by the meters is also noted.

**Table 3: Summary of Flow Monitoring Drainage Areas**

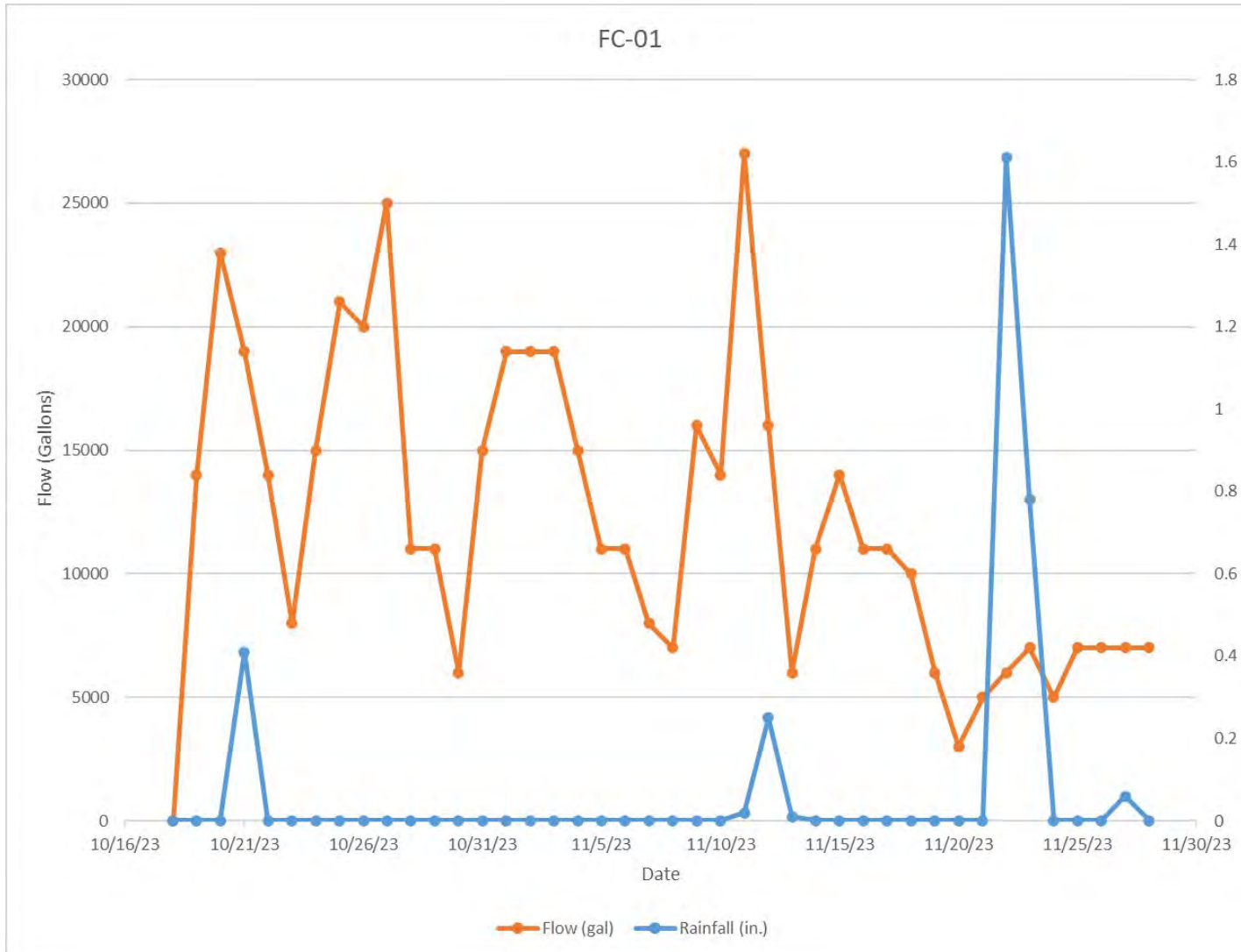
Site	Flow Meter Location	Structures/Dwellings	Area (acres)	Estimated Flow (gpd)	Dry Average Flow (gpd)	Total Average Flow (gpd)
FC-01	Godwin St	5	14.4	22,925*	11,970	12,070
FC-02	Brooks St	22	224.3	16,050*	23,170	24,970
FC-03	Fayetteville Rd	22	88.9	4,950	1,660	1,625
GW-01	Burnette Rd	17	111.8	6120	7,800	7,930
GW-02	Dunn Rd	21	84.1	7560	7,875	7,290
GW-03	Dunn Rd	13	95.0	4680	4,560	4,340

\*FC-01 and FC-02 Expected Flows include estimated average daily flows for Martins Meats and the Falcon Children’s home. These two entities represent the largest water users in the system.

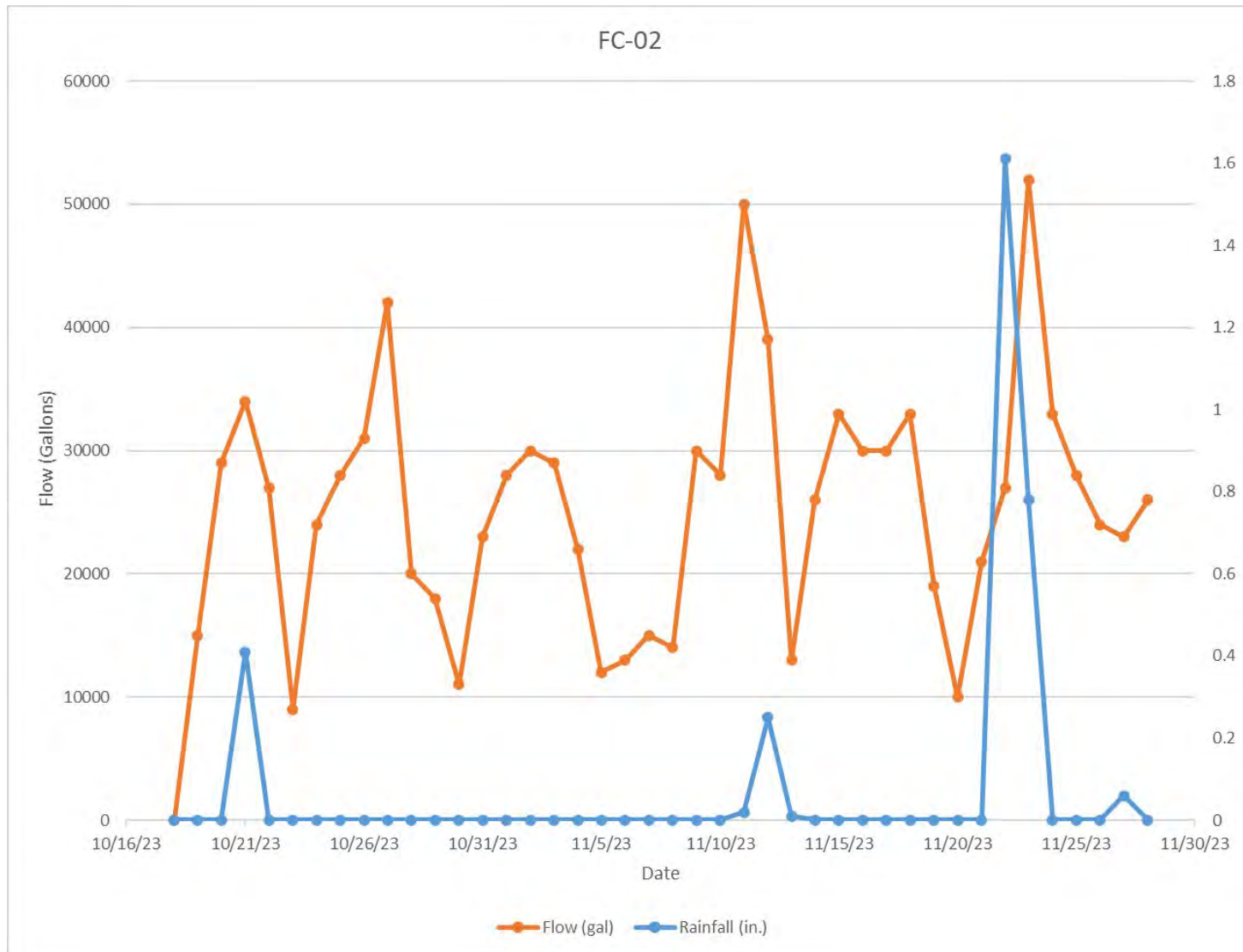
**Table 4: Summary of Large Users In Falcon**

	<b>Total Water Usage (gal)</b>	<b>Total Sewer flow (gal)</b>	<b>Notes</b>
<b>Martins (Accts: 562,665,808)</b>			
October	736,630	202,000	<i>Sewer Flow monitored 10/18-10/31</i>
November	573,810	305,000	<i>Sewer Flow monitored 11/1-11/28</i>
Avg Flow (gpd)	21,840.67		
<b>Falcon Children's Home (Accts: 96,97,98,101,102,103,208,209,210,211,213,328,378,495,585,913,914,915,982,1052)</b>			
October	406,750	109,000	<i>Sewer Flow monitored 10/18-10/31</i>
November	258,500	433,000	<i>Sewer Flow monitored 11/1-11/28</i>
Avg Flow (gpd)	11,087.50		

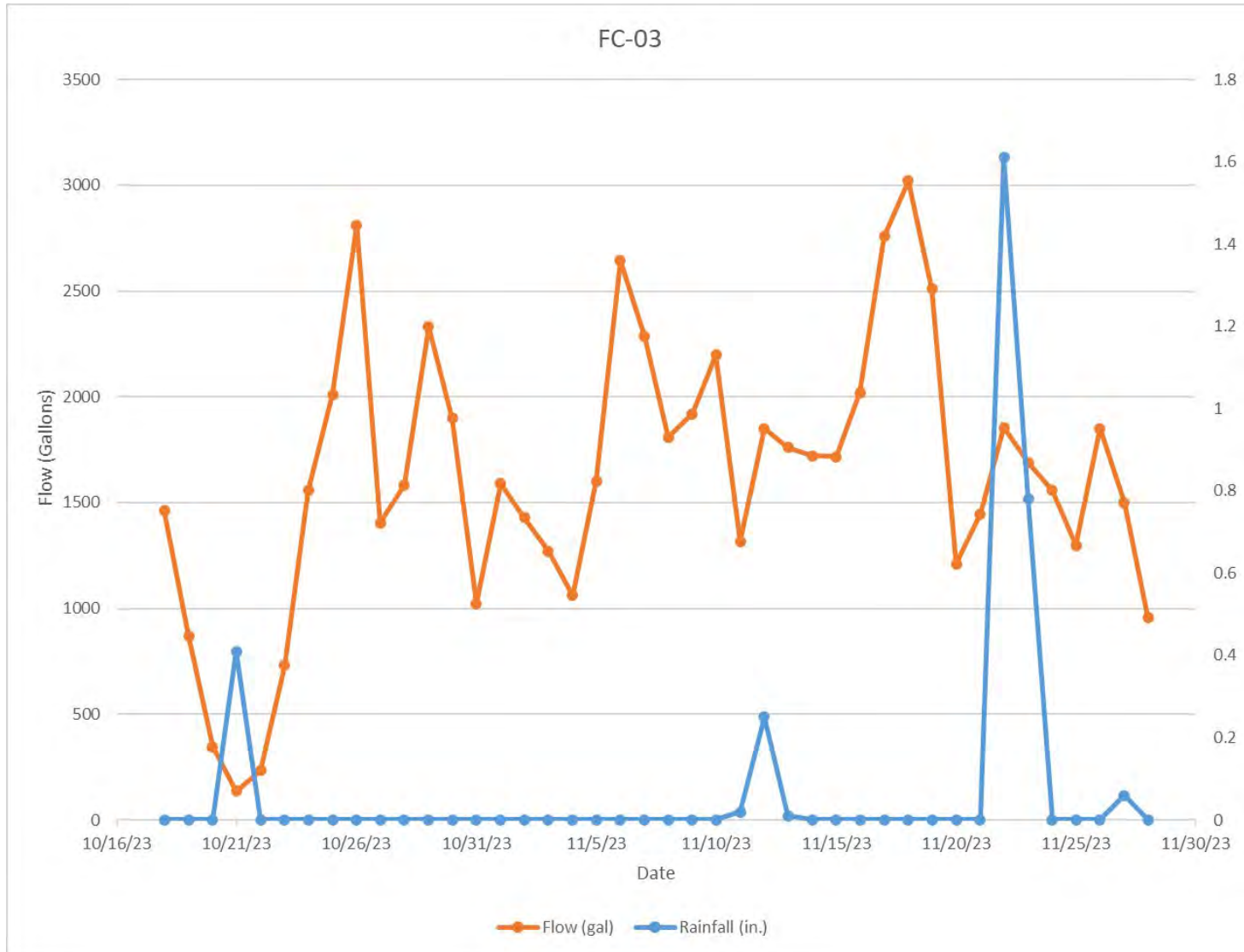
**Graph 1: Falcon Location 01, Daily Flow vs. Rainfall**



**Graph 2: Falcon Location 02, Daily Flow vs. Rainfall**

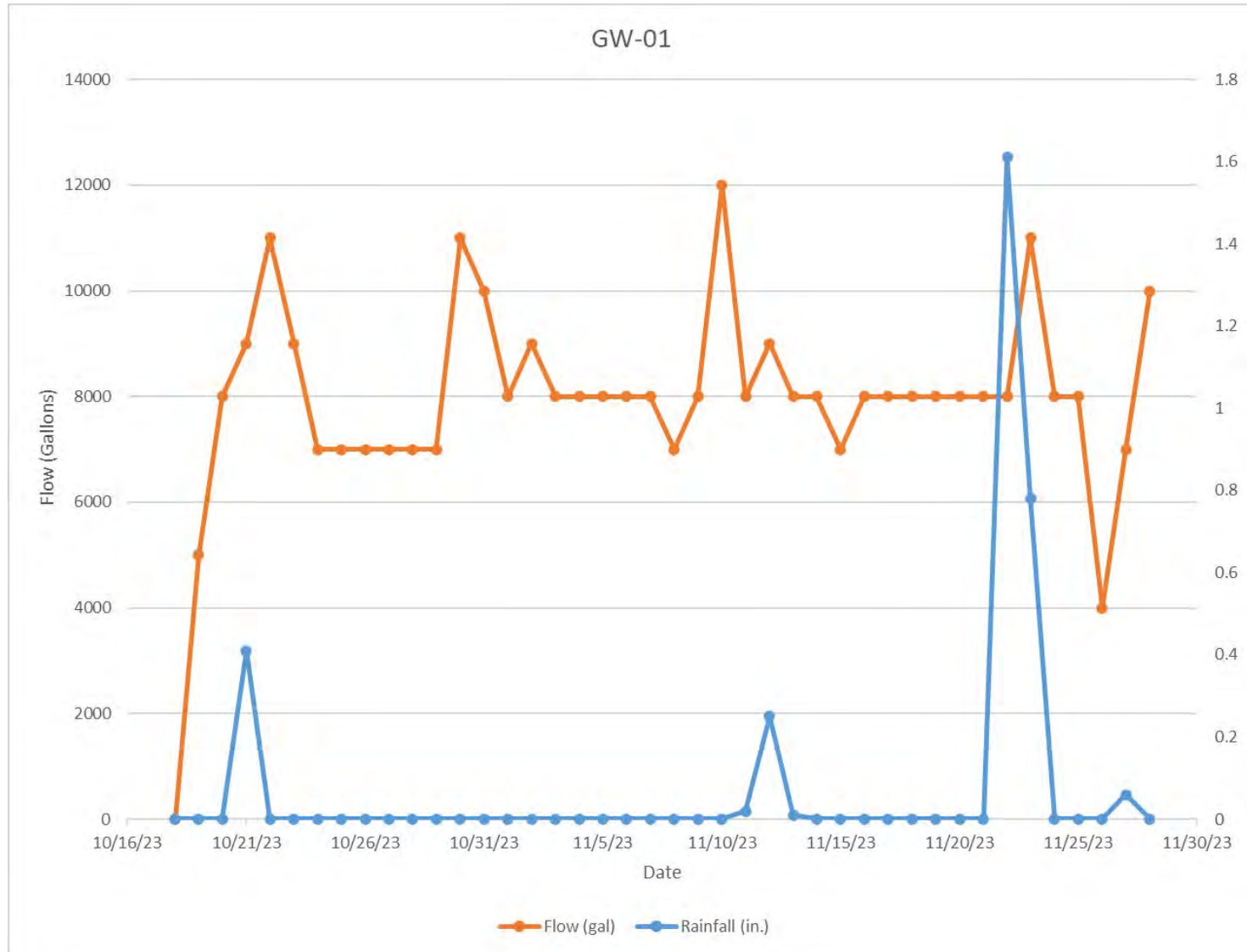


**Graph 3: Falcon Location 03, Daily Flow vs. Rainfall**

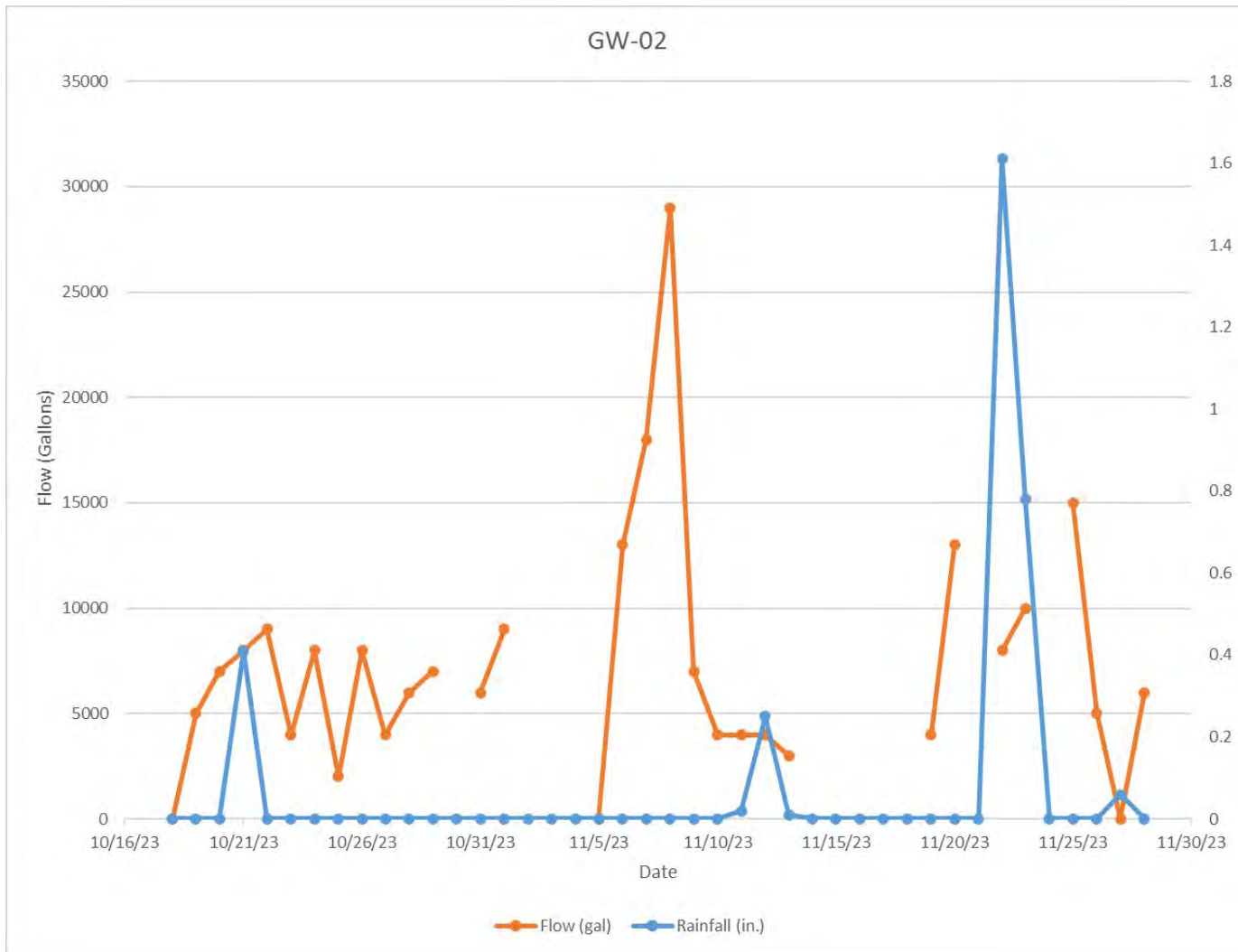




**Graph 4: Godwin Location 01, Daily Flow vs. Rainfall**

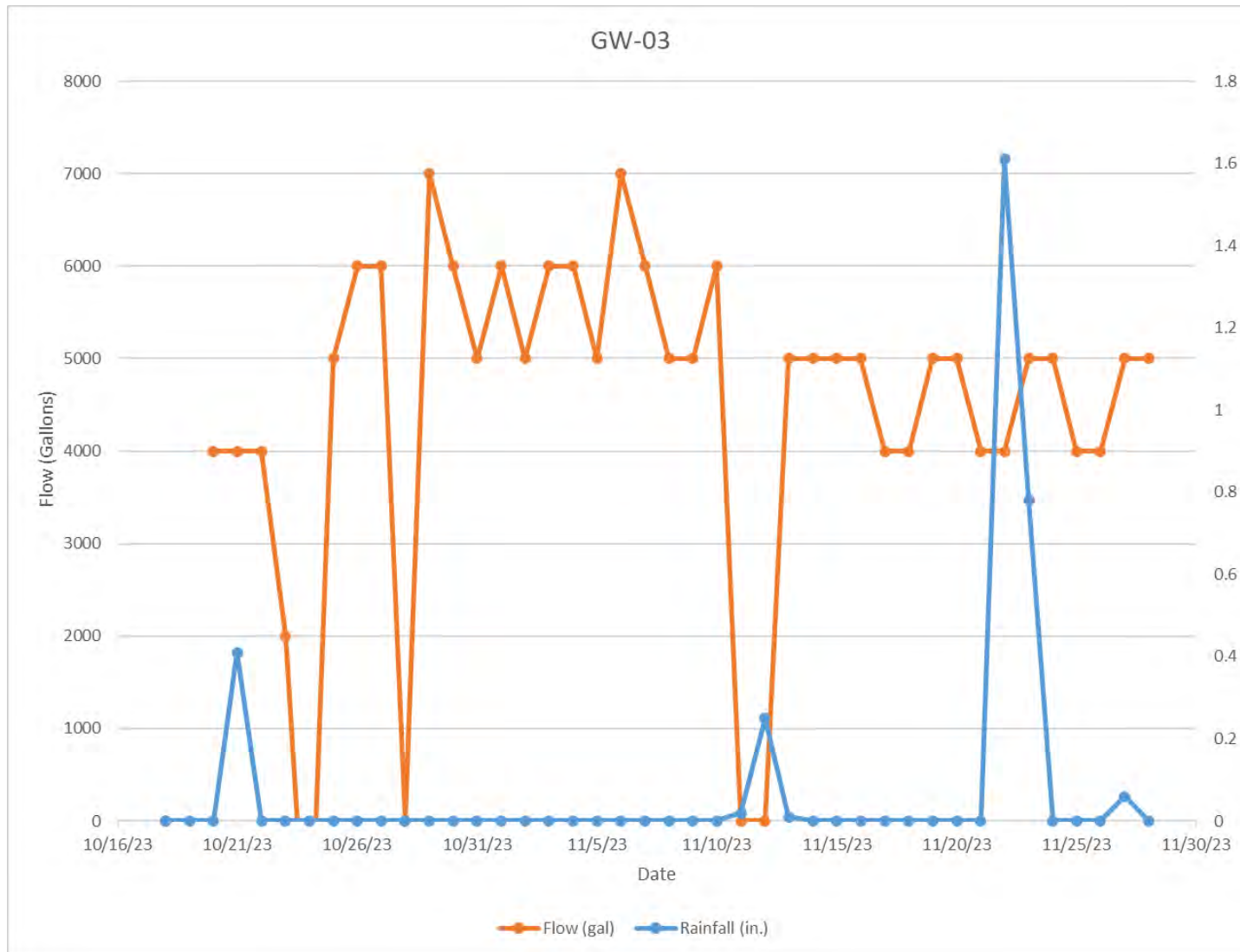


**Graph 5: Godwin Location 02, Daily Flow vs. Rainfall**



Note: Several segments on the graphed flow line show no recorded flow as a result of a negative recorded reading for total flow during the day. There was evidence in the manhole of flow backing up to the mounted meter during this period.

**Graph 6: Godwin Location 03, Daily Flow vs. Rainfall**



#### **2.1.4 Results**

The purpose of the flow monitoring was to determine which locations in the NORCRESS wastewater collection system were the best candidates for further field testing to uncover sources of I/I and other issues. Flow monitoring revealed the following behaviors for the sites/sewersheds depicted in Figure 1:

- All sites had sufficient capacity to handle current dry-weather flow.
- No locations exhibited significant I/I indicators
- Location FC-02 had evidence of inflow as the flow spiked during rain event but then returned quickly.
- Most of the locations monitored showed flows following events that were typical based on dry weather conditions.
- Flow from Martin's Meats do not appear to exceed water usage based on FC-01.
- Flow from Falcon Children's Home does appear to exceed water usage based on FC-02.

The County experiences frequent issues with increased flow from the NORCRESS system that exceeds water usage in the system. Given the results of flow monitoring, it is recommended that additional flow monitoring be performed in Falcon. Additionally, further investigation of possible groundwater or other sources of flow into the system from the Falcon Children's Home property.

In terms of additional monitoring, McGill recommends mid-term flow monitoring of the Falcon area (and any other areas where I/I or unaccounted flow is suspected). Duration would be for a year to begin with, in order to have 12-months of data to review against rainfall and water usage.

## **2.2 SMOKE TESTING**

### **2.2.1 Overview**

Smoke testing is one of the most cost-effective ways to locate defects in sewer mains and laterals. In this process, artificially produced non-harmful smoke is injected into the sewer line via a blower placed over a selected manhole. The pressurized smoke travels up and down the sewer line and connections and emerges at openings in the system. This visual aide allows test crews to easily identify, record, and mark locations where defects are present. If the sewer is in good condition, one should only see smoke rising from manhole lids and house roof vents. If the line has defects, such as breaks or illegal connections, the smoke will emerge at these points.

### **2.2.2 Investigation**

McGill met with County staff to identify areas that would benefit most from smoke testing. Based on the size of the NORCRESS District and having the use of the County's team and equipment in addition to McGill, it was determined that the entire system could be smoke tested. McGill prepared a detailed map of the areas based on the County's GIS database. The Fire Department and customers along the route were alerted to the upcoming testing.

### **2.2.3 Methodology**

McGill and County staff smoke tested all 26 miles of gravity sewer lines over a period of three days to determine locations where I/I enter the wastewater collection system. For each line to be tested, County staff recommended a centrally-located manhole on which to place the blower based on the manhole's accessibility and avoidance of traffic. The manhole nomenclature used by the County was utilized and the location, configuration and condition of each one was recorded.

At each location, the following procedure was executed.

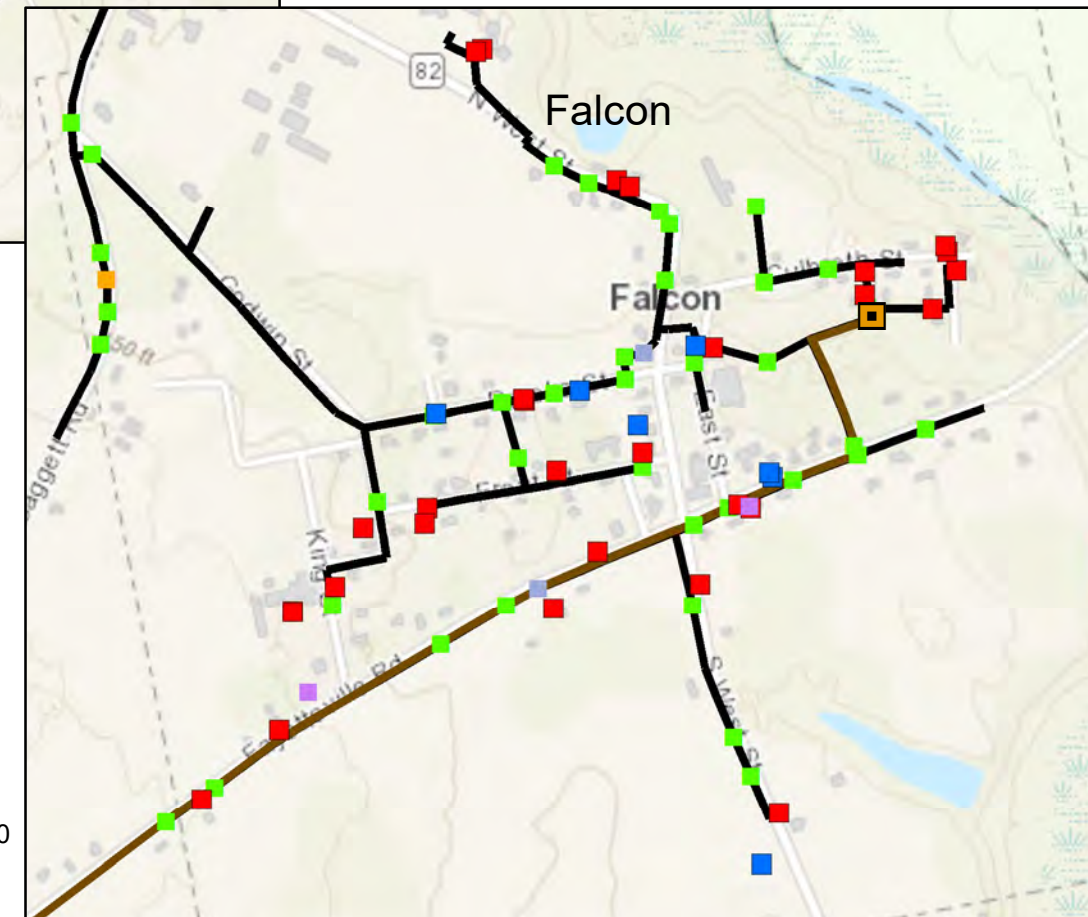
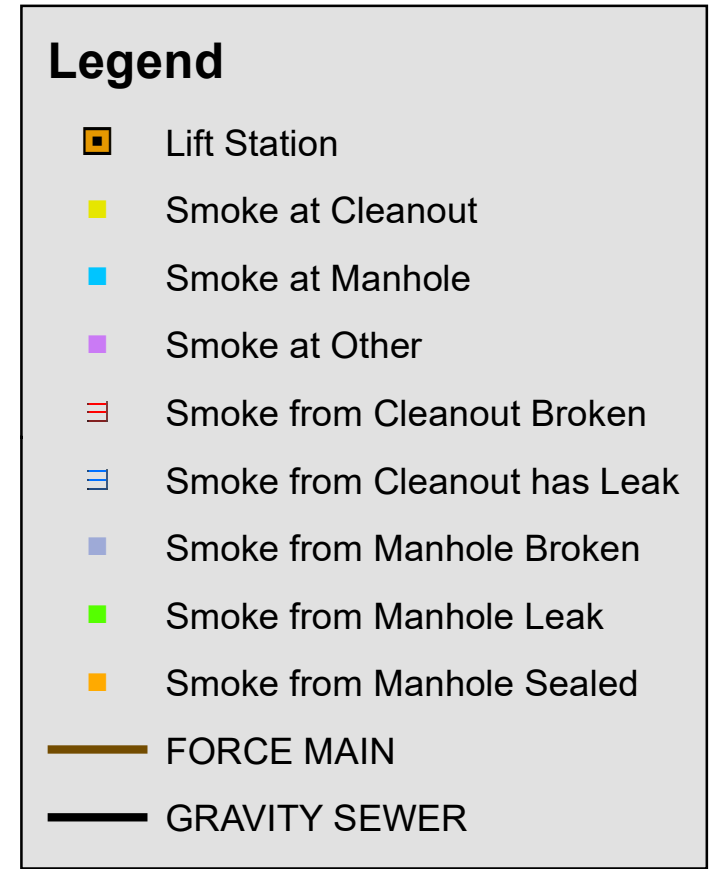
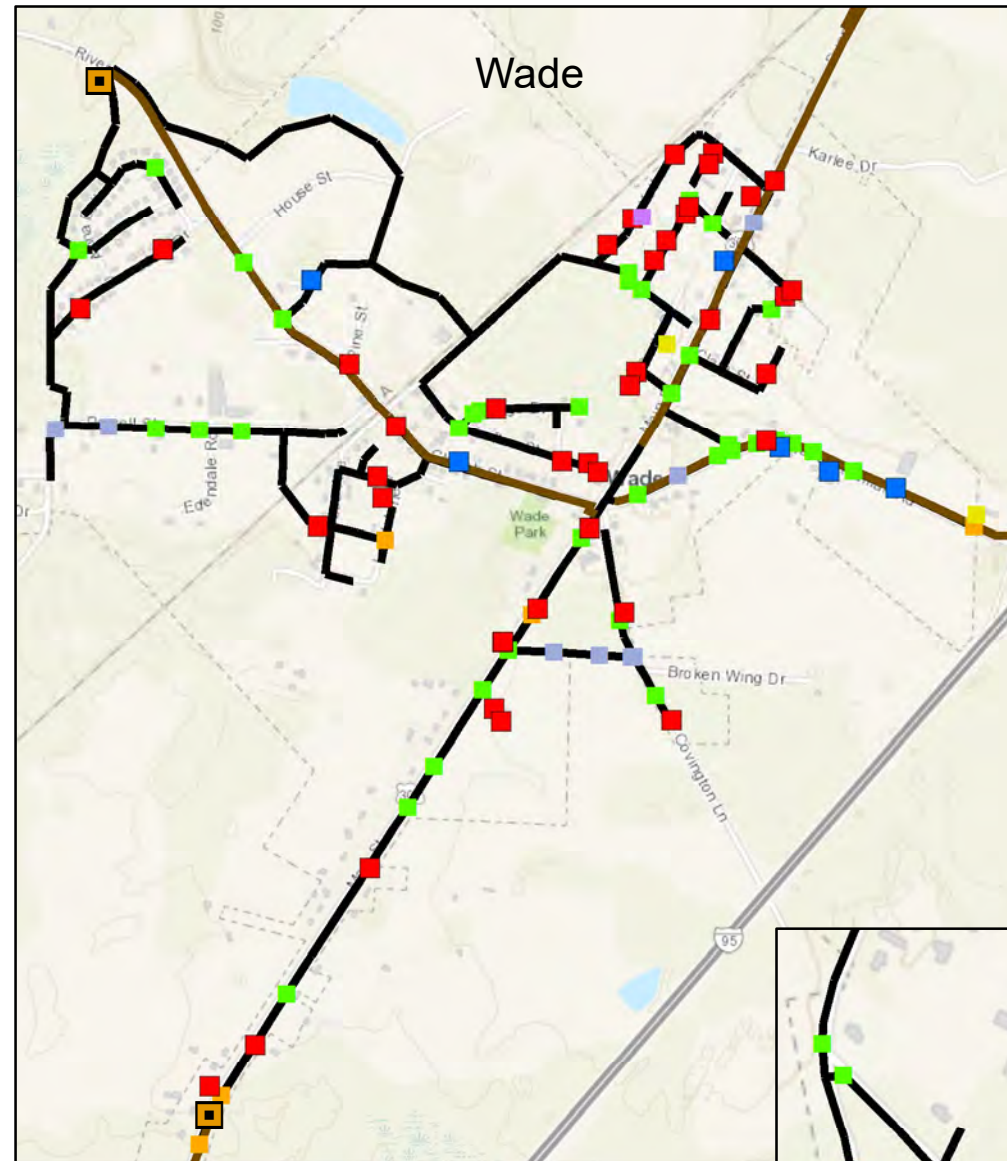
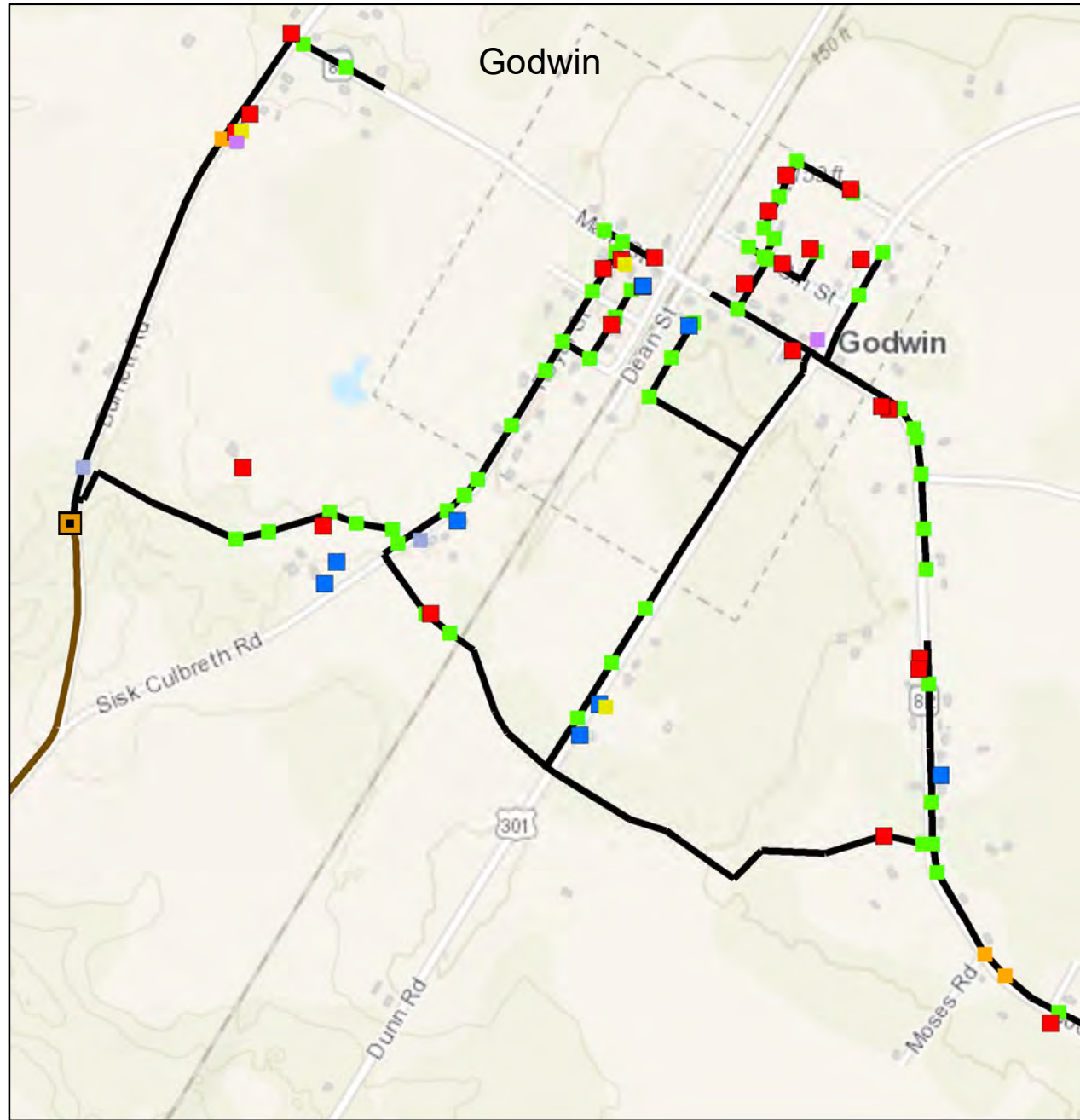
1. Place the blower on the manhole (with the rubber seal, if necessary).
2. Fill smoke pump up to  $\frac{3}{4}$  with liquid smoke.
3. Close all smoke pump valves.
4. Start blower and allow to warm up.
5. Open smoke pump valves.
6. Pressurize smoke pump by pumping the canister manually.
7. Once smoke begins emerging from roof vents, begin surveying for smoke emergencies indicating defects or problem areas in the pipeline.
8. For each defect, record the opening type, address, manhole identifier, and notes.
9. Additionally, mark each defect with paint.

This process continued until all visible defects were marked and recorded. Figure 4 shows some problematic system openings.



# NORCRESS Smoke Testing Map

## Figure 4

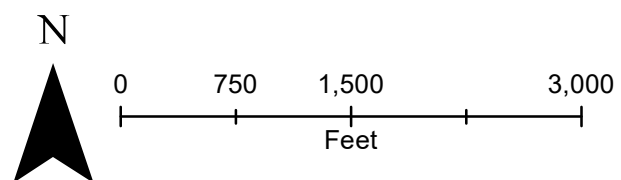


**Sewer Asset Management Plan**  
**NORCRESS District**  
**Cumberland County**  
**Project No. 20.02507**



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### **2.2.4 Results**

The crew recorded 240 abnormal smoke outlets, which divided generally into five categories.

1. Broken or uncapped cleanouts: Several cleanout caps were missing or broken. The cumulative number of broken cleanouts in the District can contribute to significant I/I. County staff had repair caps on hand during the testing and was able to install new caps where needed.
2. Ground Smoke: Ground smoke can be the result of broken lines, joint separation, etc. Any of these problems can cause significant I/I.
3. Unsealed manholes: Some manholes emitted excess smoke indicating cracked concrete or offset rings. Manholes located in ditches are most likely to contribute I/I.
4. Connected storm drains and culverts: Storm drains and culverts connected to the sanitary sewer systems contribute significant amounts of I/I into the system. These connections are good candidates for video testing.
5. Unknown: Some smoke occurrences require further investigation to determine the type of opening.

A spreadsheet describing all smoke occurrences can be found in Appendix A and all locations were documented in the mapping information in ArcGIS for the County staff to use.

## **2.3 SEWER MAINS**

### **2.3.1 Overview**

NORCESS sewer mains consist of polyvinyl chloride (PVC) and ductile iron pipe. The District's existing sewer lines range from 8-16 inches in diameter. The age of the system and system materials were confirmed by the County based records from construction of the system in 2005. Condition was determined based on visual inspection of select manholes and smoke testing of the system.

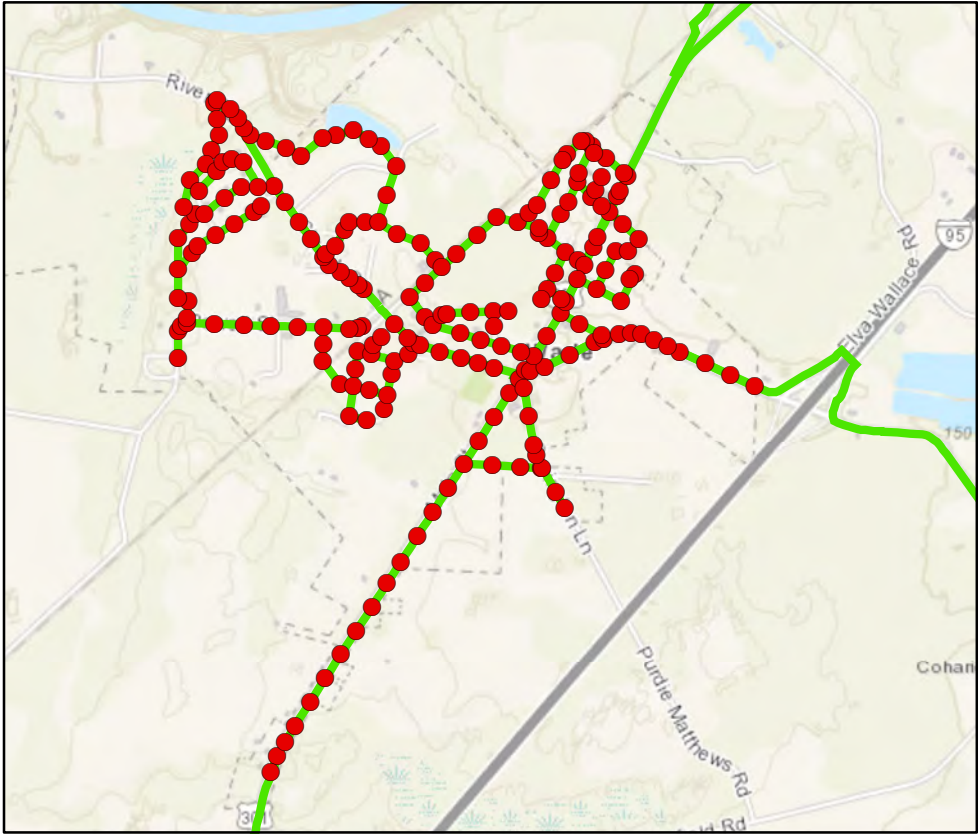
### **2.3.2 Investigation**

With County input, McGill has reviewed the District's data on sewer mains throughout the collection system. The sewer main material and diameters were verified by the County and updated according to GIS records. Figure 5 shows the sewer line materials in the system, and Figure 6 shows the sewer line diameter throughout the system.

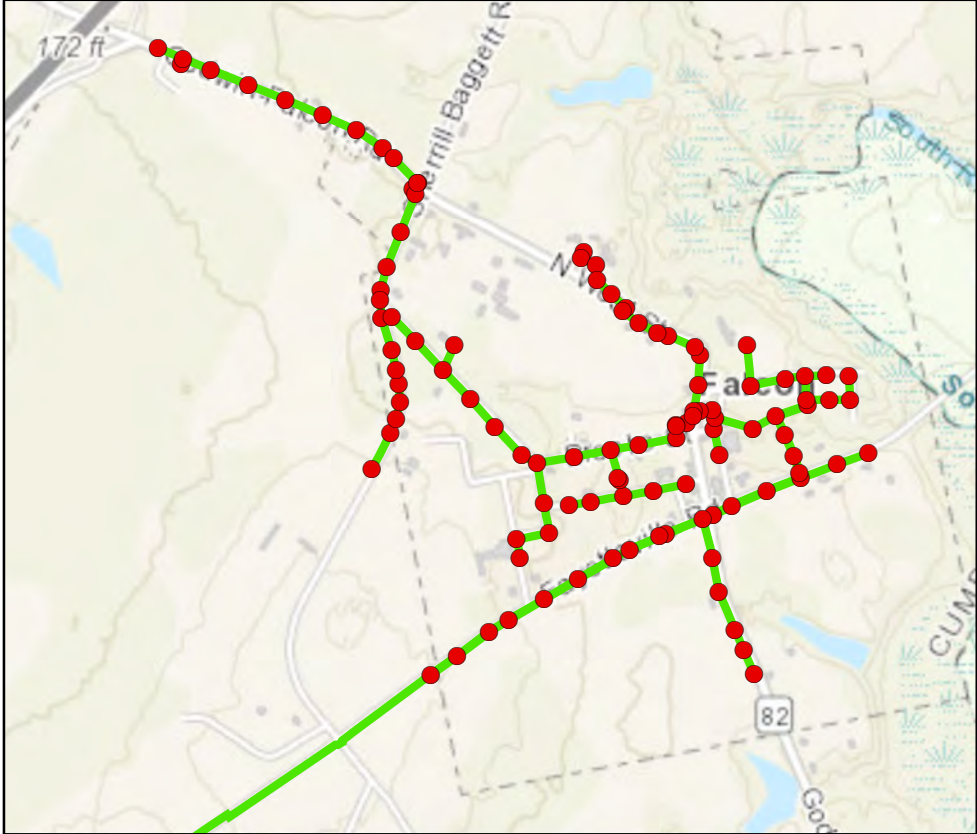
The purpose of this portion of the assessment was to create a working system inventory and then review which areas of the NORCESS District have system components in need of replacement or rehabilitation.

# Norcross Line Material Map Figure 5

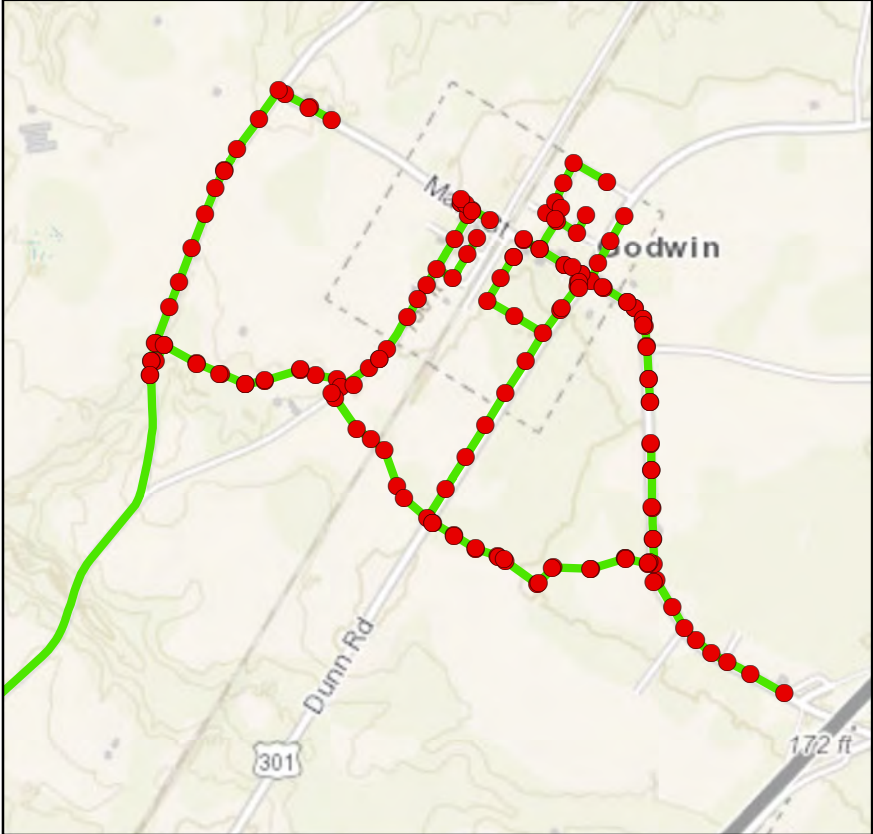
Wade



Falcon



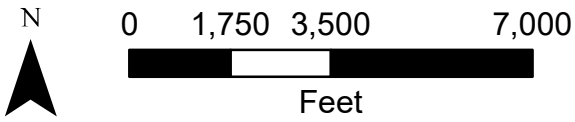
Godwin



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**Legend**

- PVC
- Norcross Manholes




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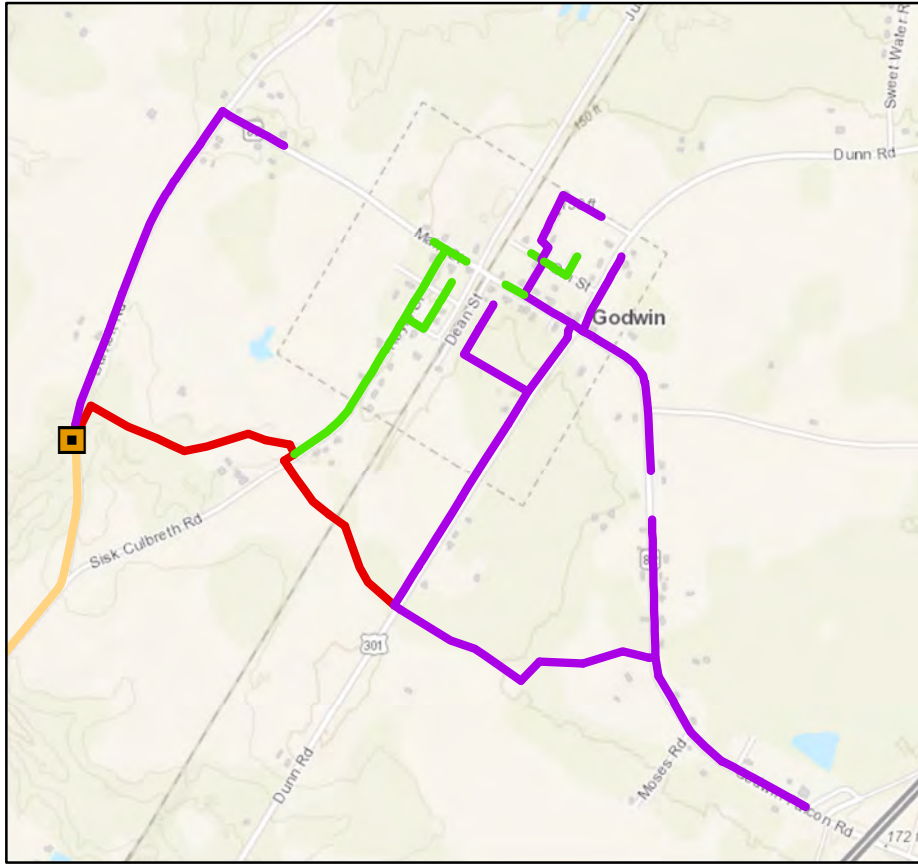
Service Layer Credits: Sources: Esri, HERE,



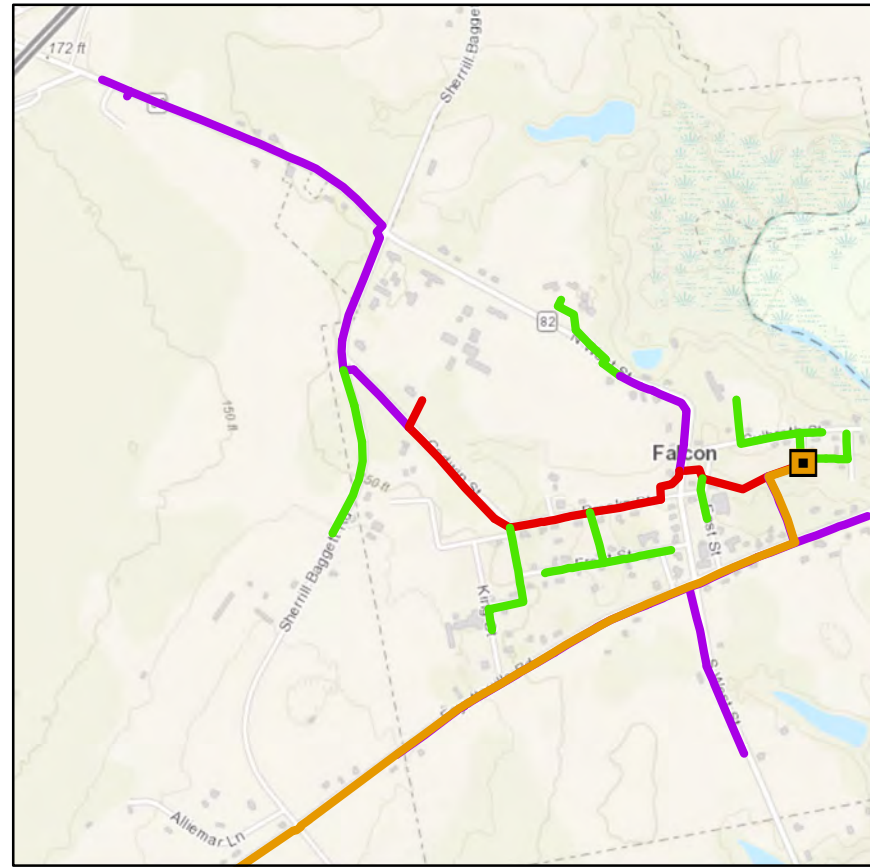
# NORCRESS Sewer Line Diameter Map

## Figure 6

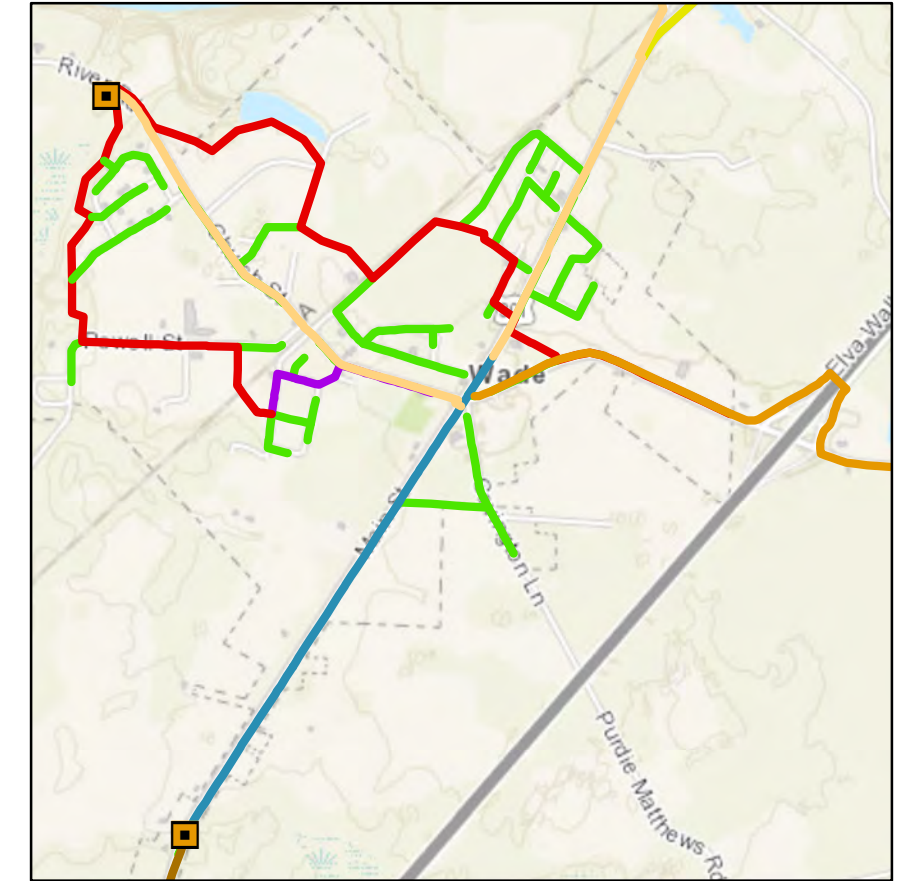
Godwin



Falcon



Wade



### Legend

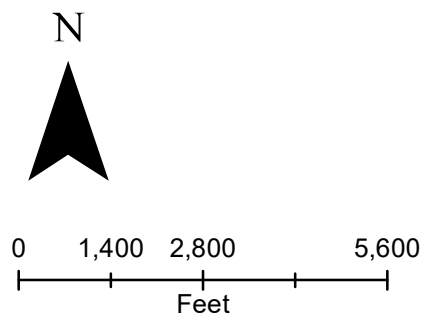
#### GRAVITY SEWER DIAMETER

- 8"
- 10"
- 12"
- 15"

#### FORCE MAIN DIAMETER

- 3"
- 6"
- 8"
- 10"

Lift Station



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**Cumberland County**  
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\*PVC Material throughout Norcross System



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### 2.3.3 Methodology

McGill reviewed the County's GIS data for the sewer collection system. County staff provided information on manholes where deterioration was suspected. Flow monitoring and smoke testing were performed throughout the system. The County's GIS mapping was utilized to create maps that document the collection system by material and by diameter.

### 2.3.4 Results

The existing gravity sewer pipe in the sewer system ranges from 8-inch to 16-inch in diameter based on County records. All pipe diameters therefore do meet current NCDEQ minimum design standards. Based on the age of the system, the PVC and ductile iron pipe installed in 2005 have not exceeded its useful life, and therefore replacement is not recommended outright. Recommendations will include planned CCTV inspections by the County of the existing piping in order to verify existing condition and provide future updates to this AMP/CIP. Based on the age of the pipes and no documented issues from County staff, pipe in the system has been noted to be in good/excellent condition. Tables 5 through 9 show the assessment based on material and then broken out by diameter and age.

**Table 5: Summary of Gravity Sewer Main by Material**

<b>Material</b>	<b>Diameters (in)</b>	<b>Total LF</b>	<b>% of System</b>
<b>Polyvinyl Chloride</b>	<i>8, 12, 15</i>	<b>134,275</b>	<b>97.2%</b>
<b>Ductile Iron</b>	<i>8, 16</i>	<b>3,907</b>	<b>2.8%</b>
<b>Total LF</b>	<b>N/A</b>	<b>138,182</b>	<b>100%</b>

**Table 6: Summary of Gravity Main Sewer Main by Diameter**

Diameter	Total LF	% of System
8"	85,144	37.71%
10"	23,235	27.29%
12"	22,720	26.68%
15"	7,083	8.32%
<b>Total LF</b>	<b>138,182</b>	<b>100%</b>

**Table 7: Summary of Force Main by Material**

Material	Diameters (in)	Total LF	% of System
Polyvinyl Chloride	8, 12, 15	73,650	93.6%
Ductile Iron	8, 16	4,015	5.1%
HDPE	8	1,013	1.3%
<b>Total LF</b>	<b>N/A</b>	<b>78,678</b>	<b>100%</b>

**Table 8: Summary of Force Main Sewer Main by Diameter**

Diameter	Total LF	% of System
3"	4,082	5.2%
6"	28,123	35.7%
8"	35,364	45.0%
10"	11,109	14.1%
<b>Total LF</b>	<b>78,678</b>	<b>100%</b>

**Table 9: Summary of Pipe Condition by Age**

Year Put Into Service	Type	Total LF	% of System
2005	Gravity	138,182	64%
2005	Force Main	78,678	36%
<b>Total LF</b>		<b>216,860</b>	<b>100%</b>

## **2.4 MANHOLE INSPECTIONS**

### **2.4.1 Overview**

Manholes are the primary access points to the sanitary sewer system and are essential for its operation and maintenance. As they allow personnel access to the sewer system, manholes are also likely culprits for allowing I/I to enter the sewer system. Manholes in low-lying areas with improperly sealed lids, manhole joints, and poor connection practices can all be sources of I/I. Storm drains or the presence of manholes in ditches and low-lying areas in NORCRESS frequently allow standing water to remain for hours or days after a storm event which can exacerbate inflow through manhole lids.

One of the most cost-effective practices for managing this intrusion is visual manhole inspections, where the various components of the manhole are rated according to their condition. Some examples of noticeable deficiencies are benches which have deteriorated from abrasion and corrosion and rings which can be moved by traffic, soil, and the freeze/thaw cycle. Defects in any aspect of the manhole can lead to I/I, structural instability, and manhole failure.

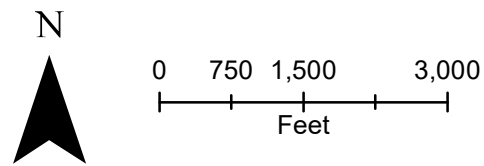
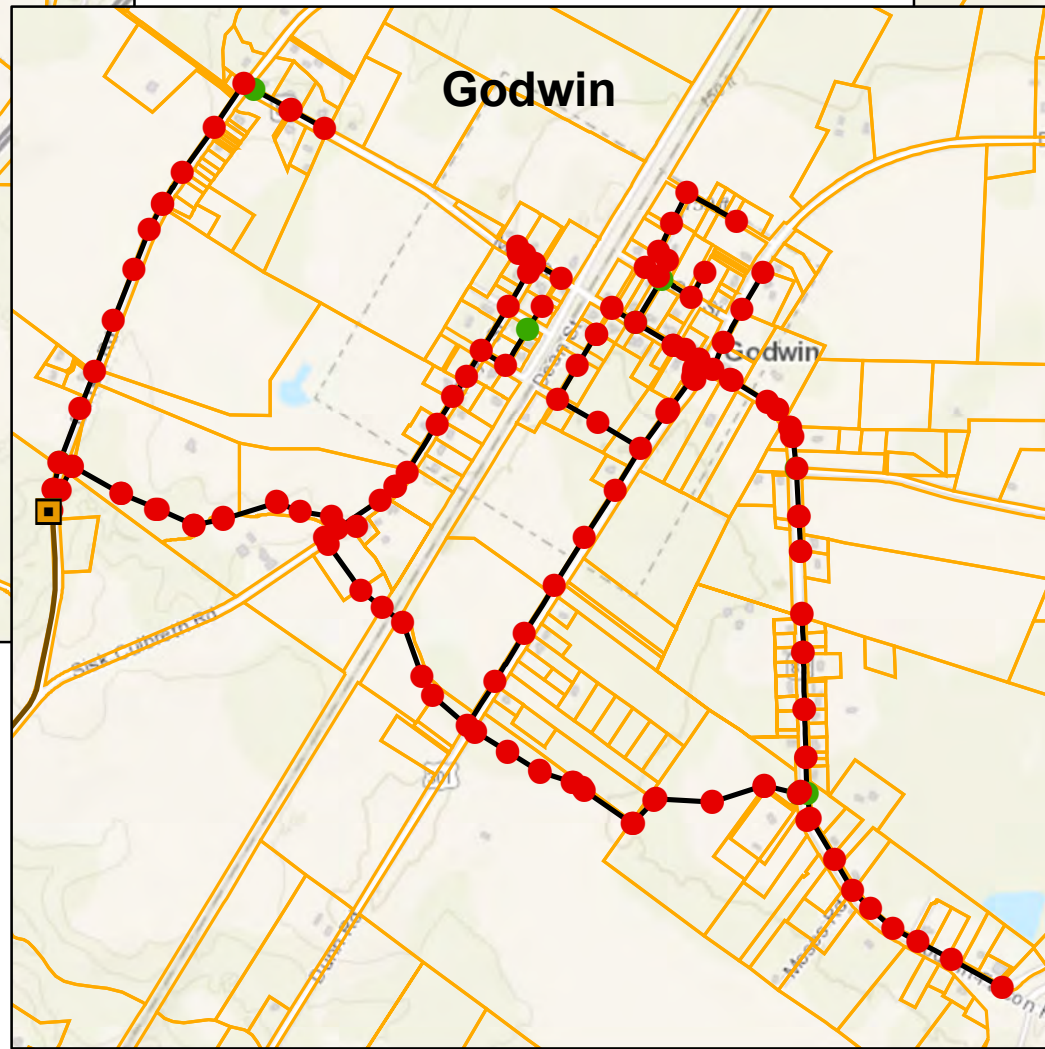
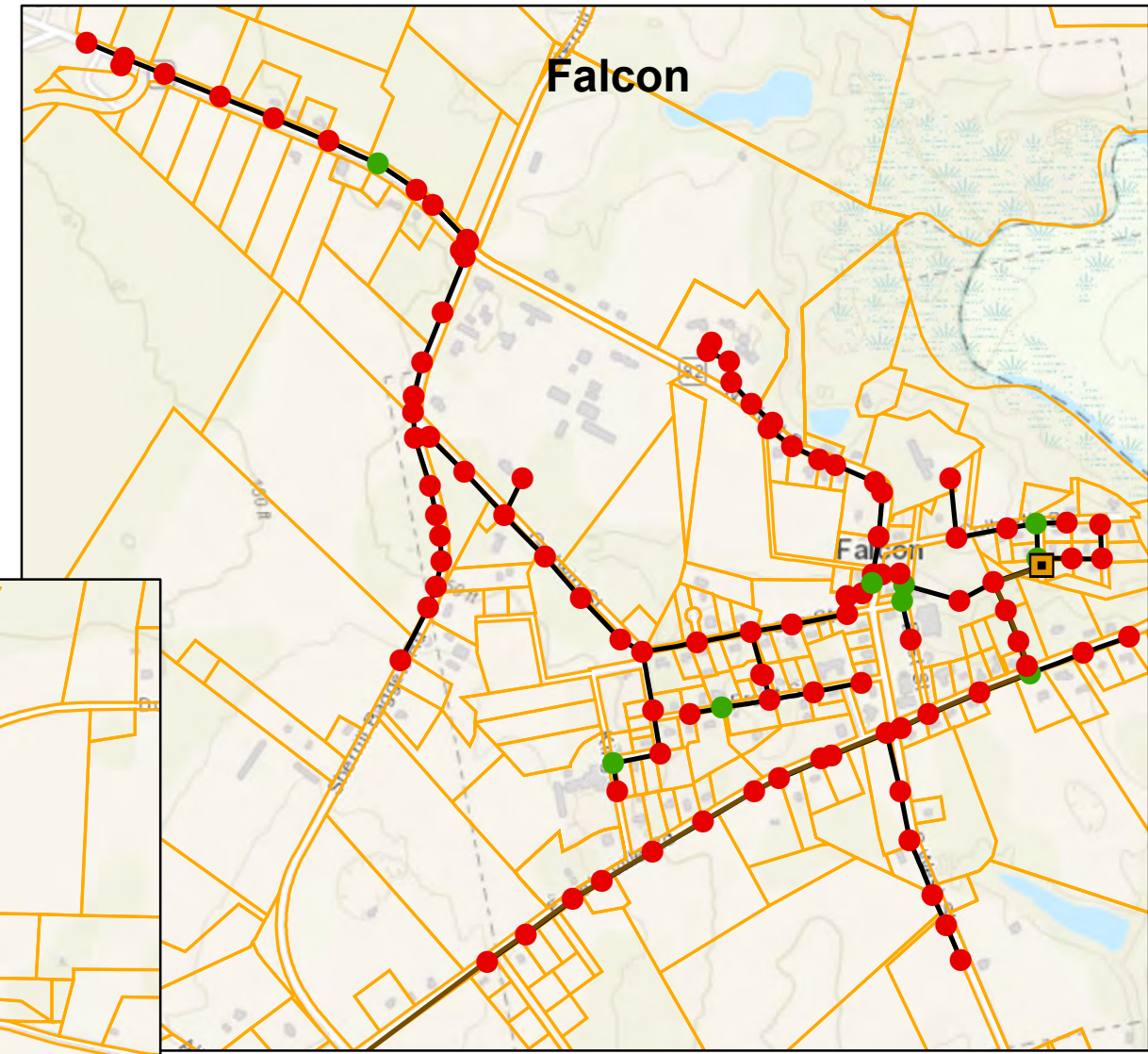
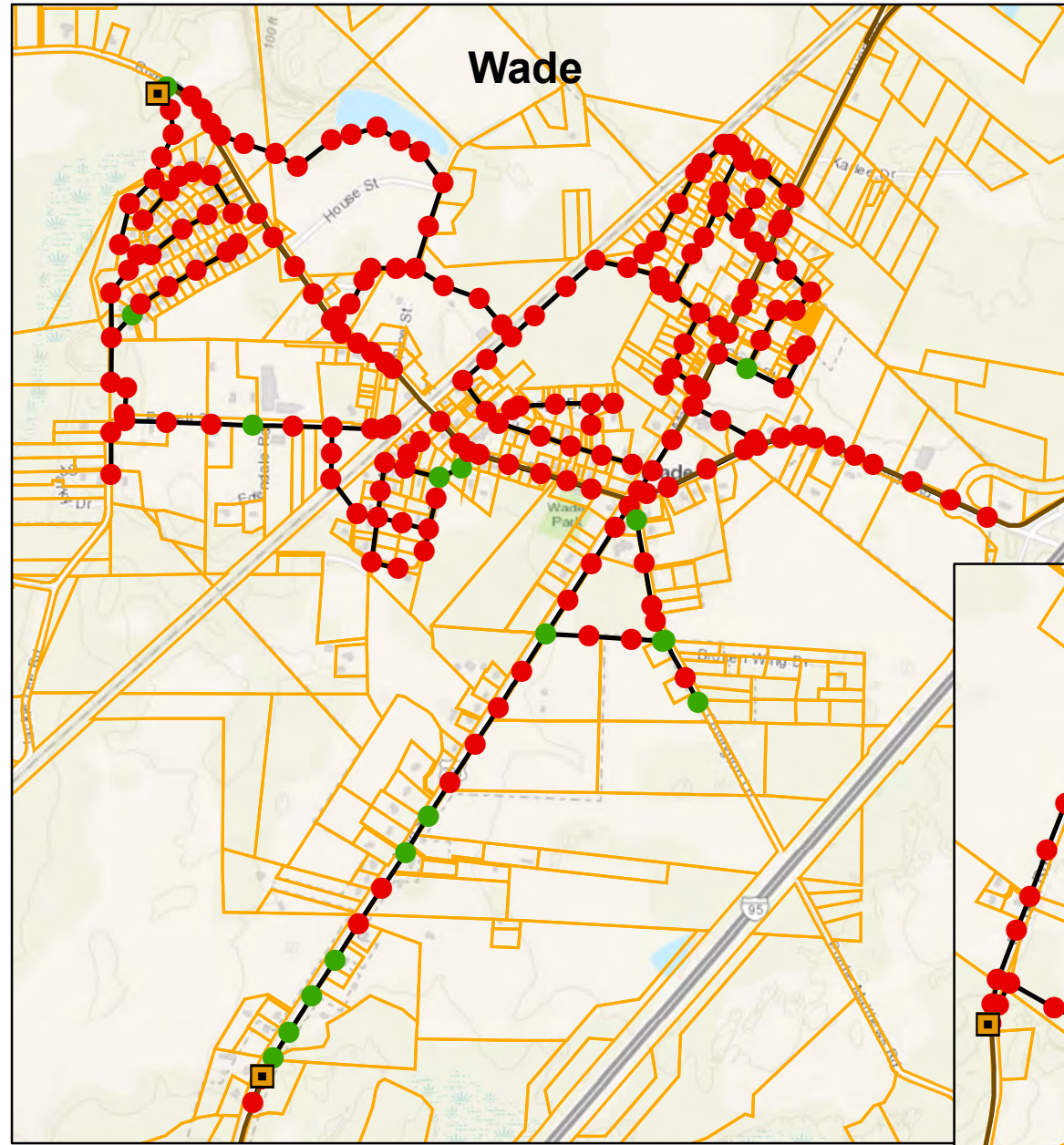
### **2.4.2 Investigation**

After the NORCRESS system was put into service, the GIS record was created in 2006. The purpose of this portion of the assessment was to perform field inspections of select manholes within the system to develop an overall system assessment. A total of 424 manholes are currently inventoried by the District. Approximately 37 manholes were inspected as a part of this inventory and assessment. The map including all manholes that were inspected is shown in Figure 7.



# NORCRESS Manhole Inspection Map

## Figure 7



**Legend**

**Manholes**

**Condition**

- Not Visited
- Good
- NORCRESS FORCE MAIN
- NORCRESS SEWER MAIN
- Lift Station
- Tax Parcels



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**Cumberland County**  
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### **2.4.3 Methodology**

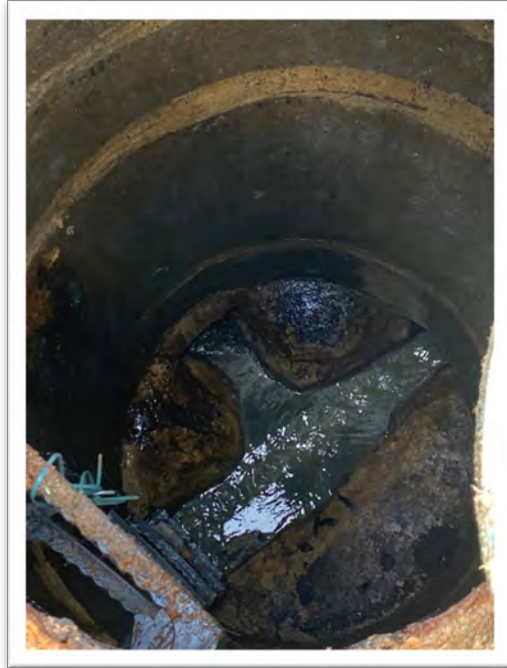
The NORCRESS District sewer collection system contains 424 sewer manholes. Working with County staff, McGill inspected selected manholes within the sewer system to obtain a representative condition sampling. County staff determined which manholes to inspect in each area based on manhole location and orientation. Manholes prioritized for inspection include those located in existing ditches or low-lying areas where the manhole would be susceptible to degradation and inflow from surface water. At each manhole, the inspector recorded the manhole's location, dimensions, material, and condition of its various components. All information including photographs of the interior of the manhole and top area were uploaded into the GIS mapping.

Some typical distresses include:

- Wear and asphalt paving on the cover;
- Corrosion and mud seepage on the ring and frame;
- Gas residue, corrosion, seepage, and deteriorating concrete on the cone and riser;
- Wetness, silt, root intrusion, and deteriorating concrete on the barrel;
- Dirt and corrosion on the rungs;
- Silt accumulation on the bench; and
- Misaligned pipes, obstructions, trough deteriorating, standing water, and no flow in the channel.

Based on the recorded comments, each component was assigned a condition score, and these scores were combined into an overall condition rating for each manhole- excellent, good, fair, or poor. The images below depict the interiors of various condition manholes.





*SMH 028208, River Road in Wade. Manhole shows minor corrosion over time.*



*SMH 028044, Main Street in Wade. Rehabilitated manhole with lining, some corrosion on frame.*



*SMH 027930, Main Street in Godwin. Manhole in good condition.*



*SMH 026913, King Street in Falcon. Manhole in good condition.*

#### 2.4.4 Results

All of the 37 inspected manholes were precast manholes. Due to the relative low age of the system, County staff confirmed that all of the existing manholes in NORCRESS are precast sewer manholes. Of the manholes observed, a majority were noted as good condition, and others observed were described as poor condition. Based on the condition of those observed, it is suspected that the remaining manholes not inspected would have similar condition to those observed. Tables 10 and 11 summarize the manhole materials and condition.

**Table 10: Summary of Manholes by Material**

<b>Material</b>	<b>Total</b>
<b>Precast Concrete</b>	<b>424</b>
	<b>424</b>

**Table 11: Summary of Manholes by Condition**

<b>Material</b>	<b>Total</b>
<b>Excellent-Good</b>	<b>33</b>
<b>Fair-Poor</b>	<b>4</b>
<b>Unknown</b>	<b>387</b>
	<b>424</b>

The County maintains its collection system using the ESRI platform and includes the attribute data for each manhole. A spreadsheet including condition comments for each manhole can be found in Appendix A.

## 2.5 LIFT STATIONS

### 2.5.1 Overview

The NORCRESS Lift Station is owned and operated by Fayetteville PWC. The station includes a flow meter that is used for recording flow generated by the NORCRESS Sewer Collection System. The capacities of each lift station are listed below.

Falcon Lift Station #92:

Lift Station Design Capacity	70,000 GPD
------------------------------	------------

Wade Lift Station #89:

Lift Station Design Capacity	45,000 GPD
------------------------------	------------

Wade Lift Station #90:

Lift Station Design Capacity	125,000 GPD
------------------------------	-------------

Godwin Lift Station # 91:

Lift Station Design Capacity	10,000 GPD
------------------------------	------------

\*Lift Station Design Capacity information is from the Freese and Nichols report called Northern Cumberland Regional Sewer System Comprehensive Sewer Evaluation.

## 3.0

## CAPITAL IMPROVEMENTS PLAN

---

Recommendations for various sewer system improvements to include the gravity sewer pipe and manholes in the collection system include general recommendations, high priority projects (within 10-years) and future projects (past the 10-year planning window). General recommendations are typically less costly and can be implemented more quickly, whereas high priority projects may require financial assistance and be undertaken in phases.

### 3.1 GENERAL RECOMMENDATIONS

#### 3.1.1 *Smoke Testing*

Smoke testing is a valuable tool that can be used to locate broken pipe, cleanouts, or manholes that need repair. Any of these issues can be a source for the inflow and infiltration (I&I) of surface water into the sewer collection system. It is recommended that the District perform comprehensive smoke testing of the entire system at least every other year. Additionally, the District should utilize smoke testing on an “as needed” basis to troubleshoot possible problem areas. The most common repairs that would result from smoke testing include replacing missing or broken cleanout caps and removing buildup from manholes. Other repairs that can be performed at this time are patching the exterior concrete or replacing the rings/lids of manholes identified to be leaking during smoke testing. These may be contributing significant I/I into the wastewater collection system. Similarly, line breaks in flooded areas should also be addressed promptly. It is also recommended that the District continue to perform regular smoke testing to monitor the system’s ongoing wear and identify specific areas for improvement.

#### 3.1.2 *Video Evaluations*

Based on information provided from the County, video evaluations were performed by Hydrostructures. Hydrostructures cleaned and provided CCTV inspections of the gravity lines in 2016 as part of the system inventory. It is recommended that the District plan to



perform video evaluation of the system every 5 years as a part of O&M in order to stay vigilant concerning potential issues within the collection system.

### **3.1.3 Manhole Inspections**

Manhole inspections uncovered some infrastructure deficiencies which can be repaired immediately to improve the condition and function of the wastewater collection system. The full list of manholes and their field assessment is included in Appendix A. Manhole rehabilitation and replacement is the priority work that is targeted by the CIP. The proposed projects are divided out over an annual basis in order to include the improvements as a reasonable component of annual budgeting.

### **3.1.4 Flow Monitoring**

The County and McGill have discussed that additional flow monitoring would be beneficial to the County in this system. It is recommended that the County perform flow monitoring at a frequency of every 3 to 5 years to monitor I/I within the system. Initially, we recommend focusing the monitoring in the Town of Falcon.

Additionally, should the County begin to suspect the presence of I&I at specific locations within the system, they will engage in flow monitoring to verify as needed. The PWC Lift Station does provide for metering of flow received within the district. It is recommended within the CIP that the County install an in-line flow meter within the collection system just upstream of the lift station, in order to assist with recording of data and calibration with the PWC maintained lift station.

## **3.2 PRIORITY PROJECTS**

### **3.2.1 Manhole Rehabilitation Projects**

In these projects, manholes will be repaired and lined where possible, unless replacement is needed. The projects are scoped to be undertaken every three years. Each project is priority targeting any manhole deficiencies or evidence of I/I observed during manhole inspections. There are a range of issues from broken risers to cracks in the frame of the manhole that warrant various repairs. To reduce the amount of I/I that enters the system it is imperative to repair these manholes. The project will be ongoing as to spread out the cost for the County over a 10-year period. There are 424 manholes in the system, and based on inspections and smoke testing, it is estimated that approximately 20% of the manholes would benefit from rehabilitation and lining. In order to fit a reasonable budgeting target, the rehabilitation of 84 manholes is broken into 4 projects, which are included in the CIP separately, but can be combined or modified as needed given annual budgetary considerations.

This project is recommended to be pursued with a manhole rehabilitation specialty company with scopes large enough to get competitive pricing for each mobilization. The manholes proposed for rehabilitation or replacement range in depth, therefore an average depth of seven vertical feet (VF) was used per manhole for estimating purposes. The capital improvements plan breaks this project into 4 phases with a budget of approximately \$118,600 every three years over a 10-year span, as outlined in Table 12. The total cost of the manhole rehabilitation projects is estimated to be \$474,400.

**Table 12: Preliminary Opinion of Probable Cost for Manhole Rehab Projects**

Item	Description	Units	Quantity	Unit Price	Total Cost
1	Mobilization	LS	3%	N/A	\$ 2,800
2	Rehabilitate Existing Manhole	VF	147	\$ 500	\$ 73,500
3	Additional Manhole Repairs	LS	1	\$ 10,000	\$ 10,000
4	Asphalt Surface Restoration	LS	1	\$ 12,500	\$ 12,500
<b>Construction Subtotal</b>					<b>\$ 98,800</b>
Contingency (15%)					\$ 14,800
Engineering Coordination					\$ 5,000
<b>Total Base Project Cost</b>					<b>\$ 118,600</b>

*\*Cost estimates are based on the knowledge of a professional engineer based on 2024 construction costs and are subject to change due to bidding environment and other factors.*

**3.2.2 Flow Meter Project**

This project includes installing four in-line flow meters on the existing gravity lines upstream of the four lift stations the sewer system. These devices will allow the County to monitor its own sewer flow. This data can be utilized by staff for planning and budgeting purposes.

The project includes two 8-inch electromagnetic flow meters in a precast underground bypass vault with associated piping and appurtenances. The meters will be installed on the County’s gravity sewer lines outside of the existing lift stations. The preliminary cost estimate for this project is \$203,900 as outlined in Table 13 below.

**Table 13: Preliminary Opinion of Probable Cost for Flow Meter Project**

Item	Description	Units	Quantity	Unit Price	Total Cost
1	Mobilization	LS	3%	N/A	\$ 4,900
2	8-inch Mag Meter	EA	4	\$ 25,000	\$ 100,000
3	Precast Concrete Valve Vault	EA	4	\$ 8,000	\$ 32,000
4	Piping, Valves, Fittings	LS	1	\$ 30,000	\$ 30,000
<b>Construction Subtotal</b>					<b>\$ 166,900</b>
Construction Contingency (15%)					\$ 25,000
Engineering Coordination					\$ 12,000
<b>Total Base Project Cost</b>					<b>\$ 203,900</b>

*\*Cost estimates are based on the knowledge of a professional engineer based on 2024 construction costs and are subject to change due to bidding environment and other factors.*

**3.2.3 Flow Monitoring Study**

This project includes the rental of four non-contact flow monitors. These devices will give the County the ability to develop a database of real-time sewer flow data in the collection system in order to pinpoint potential sources for I/I and uncaptured flow. Additionally, the budget includes utilizing the Flow Works software, a cloud-based data management program that will put flow monitoring and rainfall data into usable format for tracking and reporting. This data can be utilized by staff for planning and budgeting purposes.

The project includes rental of four Hach Flo-Dar Area/Velocity Flow Meter Sensors with wireless data transmission. The monitors are designed to be installed above the flow, therefore can typically be installed from the surface without the need for confined-space entry permit. The project also includes the purchase of a rain gauge with RTU. The project is quoted for 2-months of monitoring with the FlowWorks Software. Longer duration and the option for flow monitoring equipment purchase can be further explored. The preliminary cost estimate for this project is \$25,440 as outlined in Table 14 below.

**Table 14: Preliminary Opinion of Probable Cost for Flow Monitoring Study**

Item	Description	Units	Quantity	Unit Price	Total Cost
1	Hach Flo-Dar Rental	EA	8	\$ 1,925	\$ 15,400
2	Device Data Hosting	EA	4	\$ 555	\$ 2,220
3	FlowWorks Device Monthly	EA	8	\$ 100	\$ 800
4	FlowWorks Device Setup	EA	4	\$ 180	\$ 720
5	Rain Guage with RTU	EA	1	\$ 3,000	\$ 3,000
<b>Construction Subtotal</b>					<b>\$ 22,140</b>
Construction Contingency (15%)					\$ 3,300
<b>Total Base Project Cost</b>					<b>\$ 25,440</b>

*\*Cost estimates are based on the knowledge of a professional engineer based on 2024 construction costs and are subject to change due to bidding environment and other factors.*

**3.2.4 Air Release Valve Replacement and Ice Pigging**

This project includes replacement of existing air release valves along the 8-inches force main that extends from the Falcon lift station to a sewer manhole in the Town of Wade. These devices will give improvement performance of force main by more adequately allowing for release of built up air within the over seven miles of existing force main.

**Table 155: Preliminary Opinion of Probable Cost for ARV and Ice Pigging**

Item	Description	Units	Quantity	Unit Price	Total Cost
1	Mobilization	LS	3%	N/A	\$ 2,400
2	2" Combination Air Release Valve	EA	8	\$ 10,000	\$ 80,000
3	Install Pigging Stations and Perform Ice Pigging on Force Main	LS	1	\$ 150,000	\$ 150,000
<b>Construction Subtotal</b>					<b>\$ 232,400</b>
Construction Contingency (15%)					\$ 34,900
<b>Total Base Project Cost</b>					<b>\$ 267,300</b>

### **3.3 CIP PROJECTS SUMMARY**

The purpose of this asset management plan was to document the condition of the NORCRESS sewer infrastructure to assist the County with becoming more viable and proactive in the management and financing of its wastewater system. The County intends to look to its CIP to guide its next projects; therefore, it is vital that the CIP be established as an accurate depiction of current conditions and reflect the District's highest priorities with accurate cost estimates. The development of this AMP will serve as a positive step towards ensuring that the District can maintain its level of service agreement.

Sewer manhole rehabilitation was evaluated based on current staff input and the results of the field inspections. The existing manholes were divided into projects recommended for the next 10 years.

McGill prepared cost estimates for all projects based on current materials and construction costs. The 10-year CIP is intended to be adopted by the District to guide its selection of sewer system improvement projects over the next two decades. The cost summary for the 10-year CIP is shown below in Table 16.



**Table 16: CIP Projects Cost Summary**

Year <sup>1</sup>	Flow Monitoring Study	Manhole Rehabilitation Project 1	Flow Meter Project	Manhole Rehabilitation Project 2	Manhole Rehabilitation Project 3	Manhole Rehabilitation Project 4	New Generators- All Lift Stations <sup>2</sup>	Upgrade SCADA <sup>2</sup>	Falcon Force Main- Inspect, Clean, Replace ARVs <sup>2</sup>	TOTAL COST
1	\$ 25,440.00						\$ 640,000.00			\$ 665,440.00
2		\$ 118,600.00						\$ 240,000.00		\$ 358,600.00
3			\$ 203,900.00						\$ 80,000.00	\$ 283,900.00
4				\$ 118,600.00						\$ 118,600.00
5	\$ 25,440.00									\$ 25,440.00
6										\$ -
7					\$ 118,600.00					\$ 118,600.00
8										\$ -
9										\$ -
10	\$ 25,440.00					\$ 118,600.00				\$ 144,040.00
<b>TOTAL ESTIMATED CIP COST</b>										<b>\$ 1,714,620.00</b>

**Notes:**

- 1: Considering the timeline for adoption of this plan and County budget planning cycle, Year 1 is anticipated to be FY 2026
- 2: Project was previously included in a Capital Improvements Plan developed by Freese and Nichols for the NORCRESS District.

**4.1 GENERAL RECOMMENDATIONS**

The purpose of an Operations and Maintenance (O&M) Program is to provide an organized and cost-effective approach to ongoing maintenance, repair and replacement activities that will maintain the sewer collection system, so it performs as intended and meets the requirements of the sewer utility's System-Wide Collection System Permit, issued under North Carolina General Statutes Article 21 of Chapter 143.

This section provides a general description of proactive O&M, that can be defined as scheduled maintenance activities (preventive maintenance), performed on a regular basis in order to achieve the highest level of system performance using available resources and minimizing failures that can result in Sewer System Overflows (SSOs)

Developing an O&M Program begins with accurate records of infrastructure inventory, asset locations and physical condition. Coupled with work records and system performance history, preventive maintenance schedules can be developed to efficiently address general system needs, from cleaning and debris removal to site-specific maintenance work such as cutting and repair work.

The following elements provide the foundation for an effective O&M program:

- Maintain up-to-date wastewater treatment plant equipment documentation, sewer collection system maps and related work history and operational data.
- Develop a routine preventive O&M program and activities for staff and contractors maintaining the sewer collection system and a system to document scheduled activities
- Develop a rehabilitation and replacement plan identifying and prioritizing system deficiencies and implement short- and long-term actions to address the deficiencies
- Develop and implement training programs to build technical competence and emergency preparedness.
- Develop and provide equipment and replacement part inventories, including critical replacement parts

## **Sewer System Mapping**

Sewer system maps and related databases are typically managed using a Geographic Information System (GIS). The NORCRESS District currently utilizes ESRI as the GIS platform from which to manage the utility systems. This GIS mapping is supported by a database that records sewer main size, material types, and locations of manholes and clean-out connections. The platform has the ability to store more information that is currently being utilized by the County, including invert and rim elevations and other attributes of system appurtenances. If the County intends to utilize the GIS platform for managing and recording maintenance performed and planned, it is recommended that the County investigate alternative software to ensure that they are utilizing a software that meets their needs with respect to budget.

The GIS database should be updated on a regular basis. Software applications such as work order systems are available to allow field staff to update GIS data as inspection and maintenance activities are completed. Other applications can also allow staff to update and edit maps. Field information that was gathered by McGill and County staff as a part of this assessment is now included in the County's GIS system database for future reference.

GIS can organize work history along with operational data, inspection records and images to provide managers, operations staff and engineers with powerful data sets to track current resource allocations and forecast short and long-term operational and capital needs. Outcomes of detailed analysis such as recommended sewer main rehabilitation work versus sewer overflows can be mapped to present the relationship visually for ease of understanding.

## **Preventive Operation and Maintenance (O&M)**

Preventive maintenance is performing routine and scheduled maintenance activities before wastewater treatment plant and lift station equipment or buried infrastructure fails, for the purpose of extending useful life, reducing overall operating costs, and increasing system reliability. This proactive approach to maintenance work is more efficient and cost effective than reactive and curative operations. Preventive maintenance activities will also help operations staff to better understand the lift station equipment, and collection system components and how they work under various conditions. This knowledge is essential to setting maintenance priorities and developing the scope and timing of long-term rehabilitation and replacement projects.

## **Scheduled Cleaning of Sewers**

EPA recommends, at a minimum, that 100% of sewer mains should be cleaned every 5-years, or 20% of the system annually. The sewer utility's Collection System Operating Permit requires 10% of the gravity sewers to be cleaned annually. High pressure jetting is the most common approach using various spray nozzles for general cleaning and debris removal. Mechanical cutters are used to address root intrusion and cleaning agents can be added to help remove fats, oils, and grease (FOG).

More frequent cleaning is scheduled for areas with a history of heavy debris, grease buildup and roots. CCTV inspections are also used to identify areas to clean more often, such as sections with minor defects such as offset joints and service taps protruding into the main line. Sewer sections near siphons are cleaned more frequently to ensure continuous and uninterrupted operation.

As part of the O&M Program, a master list of cleaning operations, priority locations and scheduling can be incorporated into GIS. Maps can be produced to define work areas, schedule resources, including contracted services, track progress and task completion. Updating GIS maintenance operations data (partial blockages found, debris quantity, etc.)

will help managers adjust cleaning frequency and area boundaries as needed to increase program efficiency, reduce sewer blockages, and avoid SSOs.

## **Routine Visual Inspections**

Routine inspections are used to assess the condition of lift stations, manholes and surface facilities, recording general conditions and evidence of possible structural problems or failures (offset structures, etc.), corrosion, surcharging, overflows and excessive Inflow and Infiltration (I&I). Work orders are generated based on inspection records to effect operational adjustments, scheduling more detailed inspections and/or making necessary repairs.

## **Manhole Inspection Program**

Manhole inspections keep the asset inventory up-to-date and are used not only to update collection system maps, but to determine structural condition. During manhole inspections, a complete inventory is taken of each manhole including construction materials, ring size, depth to invert, flow conditions and evidence of problems. The National Association of Sewer Service Companies (NASSCO) Manhole Assessment and Certification Program (MACP) may be adopted or used as a guide to ensure consistency and reliability of evaluation and ranking methodology.

The results from routine manhole inspections and monitoring are used to prioritize areas needing CCTV inspections to assess pipe condition such as manholes with evidence of slow flow or surcharging. Information is recorded and used to schedule maintenance and repairs.

## **CCTV Inspection Program**

While routine cleaning and visual inspection are used to assess the condition of surface facilities and manholes, CCTV video inspections are the primary method used to assess the condition of the sewer pipes. Using conventional defect criteria is highly recommended to provide standardization and consistency in sewer pipe condition

assessment and ranking. The NASSCO Pipeline Assessment and Certification Program (PACP) may be adopted or used as a guide to ensure consistency and reliability of evaluation and ranking methodology.

## **Maintenance Activity Records**

Detailed records and daily logs of O&M work provide valuable information to help managers evaluate the effectiveness of maintenance activities and make adjustments to optimize the use of limited resources. Equipment, manpower and other resources are tracked along with detailed descriptions of defects and/or obstructions encountered including debris, FOG, structural failures, etc. Maintenance work resulting in system modifications or extensions is required to be incorporated into record drawings and system maps. Scheduled testing of emergency and standby equipment is also a requirement of the collection system permit.

These records are required to be reviewed periodically to identify problems that cannot be resolved in a short period of time in order to develop a plan to address the problem(s). Maintaining these records for an extended period of time (5-years or more) will also provide accurate reference points of maintenance investments made over time that will track the effectiveness of operation and maintenance activities.

In the event of a sewer spill or system overflow, maintenance records will need to provide sufficient detail to satisfy reporting requirements for the event, including location(s), volume of wastewater, corrective actions, etc. This data may also be integrated into GIS to allow mapping of these events over time in order to identify patterns and/or trends that will assist with scheduling maintenance and planning rehabilitation and other capital improvements.

## **Resolution of Customer Complaints**

Customer complaints are primarily about sewer backups and odors. Sewer backups require an immediate response to diagnose and resolve the problem. These complaints can occur outside normal business hours, significantly escalating costs. Detailed records of the problems found, and the resources needed to address the failed condition, provide valuable feedback for making adjustments to the preventive maintenance program that can reduce these types of calls and help lower overall maintenance costs.

These records can also identify areas where private service laterals frequently fail. Notifying customers in these areas will allow them the opportunity to address deficiencies proactively, which will also help reduce customer “emergency” calls.

## **Capital Improvements Plan**

A Capital Improvements Plan (CIP) is required by the collection system permit to identify rehabilitation, replacement and expansion needs of the system. The CIP is required to address the short and long-term needs of the system, covering at least a 3 to 5-year planning period, and must include the estimated cost of each capital project.

CIP development incorporates maintenance activity, cleaning and inspection records, and system performance data that may include flow monitoring and hydraulic modeling to evaluate the existing system and to recommend improvements needed to correct existing deficiencies, and ensure adequate capacity is maintained throughout the system.

Capital planning includes consideration of on-going funding for rehabilitation and replacement of the collection system as it wears out, and potential upgrades for expansion as needed.



## **Training Program**

Training programs provide a mechanism for educating employees and establishing their technical competence to perform operations, maintenance, and emergency responses safely and effectively. A combination of in-house skill training and specialized training purchased or provided through state and national associations, conferences and vendor training programs are typically used to build and enhance skills for performing daily work duties. Periodic training reinforces previous efforts, as people often overlook things that are used infrequently. It also provides an opportunity to train new staff and learn about new problems, new techniques, and changes in equipment.

Emergency training educates system personnel about emergency situations and resulting effects on the wastewater system, public health, and environmental impacts. It also provides an opportunity to practice responses. Good record keeping ensures personnel are properly trained and prepared to effectively operate and maintain the collection system under any given circumstance. Regular review of training records is essential for keeping content up-to-date and maintaining proper employee awareness.

## **Equipment and Replacement Parts**

A reasonable supply of equipment and replacement parts should be maintained to fully support all operations and maintenance activities. A detailed inventory is essential to ensure availability under normal operations and emergency conditions. Specialized equipment or parts may be too costly to keep in stock, so arrangements with vendors and/or contractors may be necessary to ensure availability during non-business hours or during emergencies.

## 4.2 STAFFING RECOMMENDATIONS

Cumberland County is responsible for three wastewater collection systems and one water system: NORCRESS, Overhills, Kelly Hills, and Southpoint Water System. While each of these districts maintains its own operating budget, the Board leadership and operational management is performed solely by Cumberland County. Therefore, in consideration of the typical utility system management and operations and maintenance that is necessary for maintaining each of the systems, McGill has considered all of the four (4) utility systems cumulatively. While each system could be analyzed separately, considering the systems together is more consistent with actual management of the systems.

Typical metrics for analyzing full-time equivalent (FTE, representing quantity full-time workers) are based on either the population served by the system or by miles of utility piping (water main or sewer line) within each system. For reference, Table 17 below summarizes the customers and piping in each of the County’s utility systems.

**Table 17: Utility System Comparison**

DISTRICT	Number of Connections		Paying Avail. Fee	Pipe in System (mi.)
	Water	Sewer		
<b>Southpoint</b>	84		129	2.8
<b>Kelly Hills</b>		102	166	4.5
<b>Overhills</b>		107	318	4.0
<b>NORCRESS</b>		452	666	41.1
<b>TOTALS</b>	<b>84</b>	<b>661</b>	<b>1279</b>	<b>52.4</b>

**Table 18: Typical Population vs. Pipe Length**

<b>Population</b>	<b>Pipe in System (mi.)</b>
0-100	5
101-500	5
501-3300	21
3301-10000	62

The typical sizes of utility systems from a community system EPA study<sup>1</sup> are shown in Table 18, and are generally consistent when compared to the County's systems. This study was selected as a basis for comparison due to its comprehensive nature, having included water systems nationwide in its breadth. NORCRESS is the exception when compared to Table 18. This is mostly likely indicative of the system serving a more rural population where the connection density is less, and resulting from the length of force main piping in the system that increases the overall length but does not contribute to population density. Overall, these metrics were found to be reasonably consistent with the County's systems. Similarly, the data is consistent regardless of whether the utility system is a water systems or wastewater collection system.

The objective is to make budget-level staffing recommendations for the County's utility systems based on what is typical across the industry and other utility systems of comparable size. The EPA study utilized provides typical FTE for the roles of manager, plant operator, distribution (and collection, for our purposes), and administrative functions. All of these were considered applicable to management and operation of the County's utility systems. Note: while the County is not responsible for plant operation in any system, the lift stations in the NORCRESS and Overhills systems are the County's responsibility, therefore this metric was used, albeit in a smaller percentage, to account for the management of those resources.

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<sup>1</sup> Analysis conducted using excerpts from US EPA document, "National Characteristics of Drinking Water Systems Serving 10,000 or Fewer People," published July 2011.

Table 19 shows Further utilizing the EPA statistics as base for typical FTE for each of the positions, based on the system size in terms of miles of pipe main.

**Table 19: Average Community System Statistics**

Employee Category	System Size (miles of Main)		Mean	Cumberland County
	Pop. 500-3300	Pop. 3300-10000		
	21	62	41.5	51.7
<b>Manager FTE</b> per mile	0.6	1.1	0.85	1.06
	0.029	0.018	0.020	0.020
<b>Plant Operator FTE</b> per mile	0.6	1.3	0.95	1.03
	0.029	0.021	0.023	0.023
<b>Distribution FTE</b> per mile	0.8	2.5	1.65	2.06
	0.038	0.040	0.040	0.040
<b>Administrative FTE</b> per mile	0.6	1.5	1.05	1.31
	0.029	0.024	0.025	0.025

The green highlighted cells are the calculated FTEs that were applied to estimate staffing size based on the quantity of pipe across the County’s four utility systems. Those calculated FTEs are based on the size of systems managed by the County and reasonable estimate of staffing needed for these systems.

Each of the FTEs is applied to each respective employee category. McGill utilized wage information from Zip Recruiter and a benefits multiplier of 1.38 from the U.S. Bureau of Labor Statistics to develop the summary shown in Table 20.

**Table 20: Overall Salary Estimates**

Employee Category	Hourly Rate	Annual Salary	Ben. Mult.	Total	Applied FTE	Applied Budget Cost
Manager	\$38.50	\$80,080.00	1.38	\$110,510.40	1.06	\$117,000
Operator	\$24.52	\$51,001.60	1.38	\$70,382.21	1.03	\$72,700
Distribution	\$23.57	\$49,025.60	1.38	\$67,655.33	2.06	\$139,100
Administrative	\$21.33	\$44,366.40	1.38	\$61,225.63	1.31	\$80,100
<b>Total Applied Budget Cost Based FTEs</b>						<b>\$408,900</b>

Utilizing industry metrics and comparing to systems of comparable size, McGill offers the proceeding section as a general staffing recommendation. This section and these budget values are provided for preliminary planning purposes only.

Staffing levels appear to be reasonable based on the District's ability to operate and maintain the system while providing a reliable level service to its customers.

While this budget number is higher than the current budget staffing, consideration should also be given to the cumulative effect cost to the County for contracted operation and distribution support in the NORCRESS and Kelly Hills district.

# **APPENDICES**





# **Appendix A**

## **Manhole Inspection List**



<b>Norcross Manhole Inspection</b>		
<b>Date:</b>	<b>Nov. 28 and 30, 2023, Feb. 5, 2024</b>	
<b>Manhole ID</b>	<b>Condition</b>	<b>Notes</b>
SMH028220	Poor	Crack on interior from being hit by mower
SMH028209	Poor	
SMH026946	Poor	Black inside manhole and corrosion around collar
SMH028208	Good	
SMH028215	Good	
SMH029390	Good	
SMH028093	Good	
SMH027974	Good	
SMH027985	Good	
SMH028003	Good	
SMH028033	Good	
SMH028025	Good	
SMH028026	Good	
SMH027171	Good	
SMH026913	Good	Outside of Martin's Meats
SMH026927	Good	
SMH026896	Good	
SMH026879	Good	
SMH026880	Good	
SMH026933	Good	
SMH026934	Good	
SMH027941	Good	
SMH027930	Good	
SMH028067	Good	
SMH028038	Good	
SMH028039	Good	
SMH028054	Good	
SMH028053	Good	
SMH028040	Good	
SMH028061	Good	
SMH028045	Good	
SMH028050	Good	
SMH028041	Good	
SMH028044	Good	Ring very rusted
SMH028146	Good	
SMH028145	Good	
SMH026946	Poor	Black inside manhole and corrosion around collar



## **Appendix B**

### **Smoke Testing Results List**

# Norcross Smoke Testing Manholes

Date: October 24-26th 2023		
Manhole ID	Smoke Status	Notes in the field
SMH026878	Leak	
SMH026879	Leak	Smoke around concrete
SMH026880	Leak	Cracked ring
SMH026885	Broken	smoke
SMH026886	Leak	
SMH026887	Leak	Smoking from edges
SMH026887	Leak	Smoking from edges
SMH026892	Leak	Smoking from edges
SMH026895	Leak	Smoking from edges
SMH026896	Leak	Small amount of smoke
SMH026897	Leak	
SMH026900	Leak	Smoking from edges
SMH026901	Leak	Small amount of smoke
SMH026904	Broken	concrete collar broken
SMH026905	Leak	Rim broken
SMH026906	Leak	
SMH026906	Leak	
SMH026911	Leak	
SMH026912	Leak	Buried in front of Martin's
SMH026915	Leak	Smoking
SMH026916	Leak	smoking
SMH026918	Leak	Smoking
SMH026919	Leak	Small amount of smoke
SMH026921	Leak	
SMH026922	Leak	
SMH026923	Leak	
SMH026925	Leak	Smoke around lid
SMH026929	Leak	
SMH026930	Leak	
SMH026931	Leak	
SMH026932	Leak	
SMH026934	Leak	
SMH026941	Leak	Smoking
SMH026942	Leak	Small amount of smoke
SMH026944	Leak	Cracked concrete smoke around lid and collar
SMH026945	Leak	
SMH027168	Leak	
SMH027170	Leak	Smoking from edges
SMH027172	Leak	
SMH027173	Leak	
SMH027174	Leak	
SMH027175	Leak	

SMH027176	Leak	
SMH027179	Leak	smoking
SMH027180	Leak	smoking
SMH027183	Leak	smoke around lid
SMH027184	Leak	smoking
SMH027185	Seal	smoking around sealed lid
SMH027188	Leak	
SMH027441	Leak	
SMH027929	Leak	
SMH027930	Leak	
SMH027933	Broken	Lid removed, possible dumping
SMH027941	Broken	Lid missing, possible dumping
SMH027947	Leak	smoking from lid edges
SMH027948	Leak	
SMH027950	Leak	
SMH027951	Leak	
SMH027952	Leak	smoking from edges
SMH027955	Leak	Smoking from edges
SMH027956	Leak	Smoking from edges
SMH027963	Leak	
SMH027964	Leak	
SMH027965	Leak	
SMH027966	Leak	
SMH027967	Leak	
SMH027968	Leak	Smoking from edges
SMH027969	Leak	Smoking from edges
SMH027970	Leak	
SMH027971	Leak	
SMH027972	Leak	
SMH027973	Leak	Smoking from edges
SMH027974	Leak	Smoking from edges
SMH027975	Leak	
SMH027976	Leak	
SMH027985	Leak	Smoking from edges
SMH027987	Leak	
SMH027988	Leak	
SMH027989	Leak	
SMH027993	Leak	
SMH027994	Leak	
SMH027995	Leak	
SMH027996	Leak	
SMH027997	Leak	
SMH027998	Leak	
SMH027999	Leak	Smoke around lid and ground
SMH028000	Leak	smoke around lid



SMH028002	Leak	
SMH028003	Leak	
SMH028004	Leak	
SMH028006	Leak	
SMH028007	Leak	Smoking from edges
SMH028008	Leak	
SMH028018	Leak	Riser is shifted
SMH028019	Leak	Smoke around lid
SMH028021	Seal	smoking
SMH028022	Seal	smoking
SMH028024	Leak	
SMH028025	Leak	
SMH028026	Leak	
SMH028027	Leak	
SMH028029	Leak	
SMH028031	Leak	smoke around ground and concrete
SMH028032	Leak	
SMH028033	Leak	
SMH028034	Leak	
SMH028035	Leak	
SMH028036	Leak	
SMH028038	Seal	smoke around rim
SMH028041	Leak	
SMH028046	Leak	
SMH028047	Leak	Smoking from edges
SMH028048	Leak	
SMH028049	Leak	
SMH028050	Leak	Smoking from edges
SMH028051	Broken	smoke from collar
SMH028052	Broken	smoke from collar
SMH028053	Broken	smoke from collar
SMH028054	Broken	collar busted
SMH028056	Leak	
SMH028057	Seal	
SMH028059	Leak	Smoking from edges
SMH028073	Broken	Concrete cracked around mh
SMH028074	Leak	
SMH028075	Leak	
SMH028076	Leak	
SMH028077	Leak	
SMH028078	Leak	
SMH028079	Leak	
SMH028080	Leak	
SMH028081	Leak	
SMH028084	Leak	

SMH028092	Leak	Smoking from edges
SMH028099	Leak	Smoking from top sides of mh
SMH028104	Leak	Small amount of smoke from edges of mh. Concrete base is cracked
SMH028105	Leak	Smoking from edges of mh and ground around it
SMH028106	Leak	Small amount of smoke come from edges. Looks like holes in top from missing screw or bolt
SMH028113	Leak	Small amount of smoke coming from sides of mh
SMH028114	Leak	Smoking from mh and ground around it
SMH028117	Broken	
SMH028129	Seal	Smoking from mh
SMH028142	Seal	Broken around concrete
SMH028160	Leak	Small amount of smoke from edges of mh
SMH028164	Leak	Very small amount of smoke coming from mh
SMH028165	Leak	Smoking from edges of mh
SMH028169	Leak	Small amount of smoke coming from edges of mh
SMH028181	Leak	
SMH028189	Leak	Small amount of smoke coming from edges of mh
SMH028214	Leak	
SMH028215	Leak	
SMH028216	Leak	
SMH028217	Broken	Smoke coming up around the ground near manhole
SMH028230	Seal	Smoke around seal
SMH029404	Leak	Small amount of smoke from edges of mh

## Norcross Smoke Testing Cleanouts

Date: October 24-26th 2023

Facility ID	Smoke Status	Notes in the field
32849	Leak	Smoking from c/o and house
32851	Leak	Leaking from broken cap
32853	Broken	
32855	Leak	
32866	Broken	
32867	Broken	
32870	Broken	
32871	Broken	
32874	Broken	
32877	Broken	Busted pipe
32878	Broken	Busted pipe
32900	Broken	Stack
32901	Leak	
32905	Leak	
32907	Broken	
32909	Broken	Smoking
32915	Broken	
32918	Broken	Busted pipe
32930	Broken	
32943	Broken	
32964	Leak	Small amount of smoke
32967	Broken	Missing cap broken sides on c/o
36922	Broken	
36925	Broken	Broken off cap
36926	Broken	
36934	Broken	Pipe busted
36935	Broken	Pipe busted
36946	Broken	Broken stack
36947	Broken	Stack broke no cap
36948	Broken	
36949	Broken	Broken needs cap
36955	Broken	Needs cap
36964	Leak	
36990	Broken	
36991	Broken	
36999	Broken	Pipe busted
37003	Broken	Pipe broken
37005	Broken	
37009	Broken	
37018	Broken	
37019	Broken	
37020	Broken	

37023	Broken	
37023	Broken	
37025	Broken	
37236	Broken	
37238	Broken	
37265	Broken	
37266	Broken	Smoking from house, c/o and ground
37272	Broken	
37058	Broken	
37070	Broken	Broken cap but fixed in field
37078	Broken	Pipe broken
37079	Broken	Pipe broken
37080	Broken	Broken ring and cap
37091	Broken	Cap broken
37138	Leak	Small amount of smoke coming from c/o
37145	Broken	Cap missing
37149	Broken	
37169	Broken	
37172	Broken	Vacant lot near manhole
37181	Leak	
37202	Broken	
37219	Broken	
37222	Broken	
37225	Broken	
37277	Leak	Smoking from cap and ground around c/o
37284	Broken	
37287	Broken	
37291	Broken	Stack cracked
37292	Broken	Broken cap
37307	Broken	
37314	Broken	
41110	Leak	
41695	Broken	
41712	Broken	
43878	Broken	
42156	Leak	
46282	Broken	Smoke coming from holes in cap
54547	Broken	Busted pipe
59583	Broken	
62262	Leak	
32864	Leak	
32865	Broken	
32882	Leak	No cap
32883	Broken	Pipe busted



## **Appendix C**

### **Rainfall Data**





Daily Precipitation from Fayetteville Regional Airport  
Cumberland County 20.02507

<b>Time</b>	<b>Precipitation (in)</b>
Day	Total
18-Oct	0
19-Oct	0
20-Oct	0
21-Oct	0.41
22-Oct	0
23-Oct	0
24-Oct	0
25-Oct	0
26-Oct	0
27-Oct	0
28-Oct	0
29-Oct	0
30-Oct	0
31-Oct	0
1-Nov	0
2-Nov	0
3-Nov	0
4-Nov	0
5-Nov	0
6-Nov	0
7-Nov	0
8-Nov	0
9-Nov	0
10-Nov	0
11-Nov	0.02
12-Nov	0.25
13-Nov	0.01
14-Nov	0
15-Nov	0
16-Nov	0
17-Nov	0
18-Nov	0
19-Nov	0
20-Nov	0
21-Nov	0
22-Nov	1.61
23-Nov	0.78
24-Nov	0
25-Nov	0
26-Nov	0
27-Nov	0.06
28-Nov	0
29-Nov	0
	<b>3.14</b>

Source: <https://www.wunderground.com/history/weekly/us/nc/fayetteville/KFAY/date>

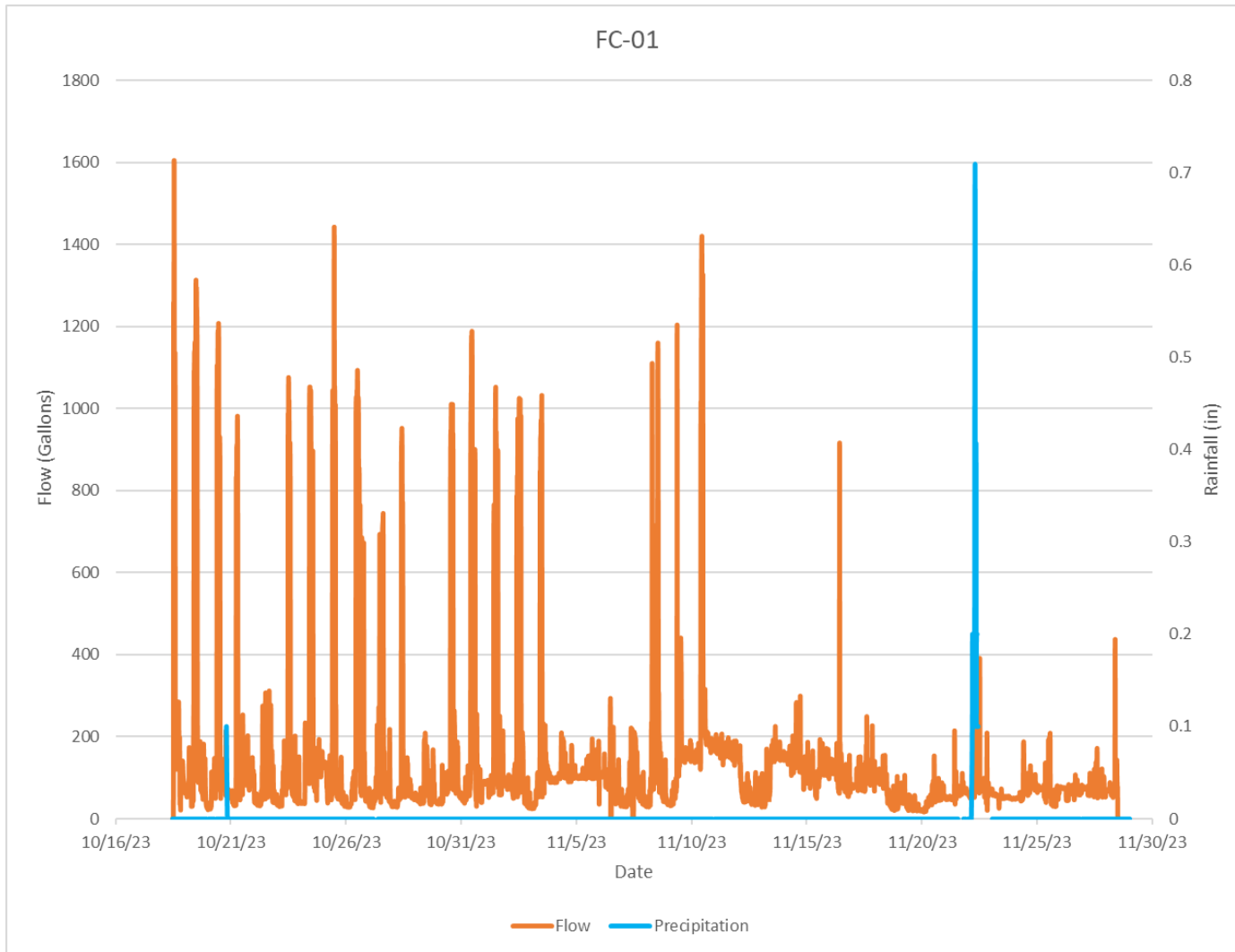


## **Appendix D**

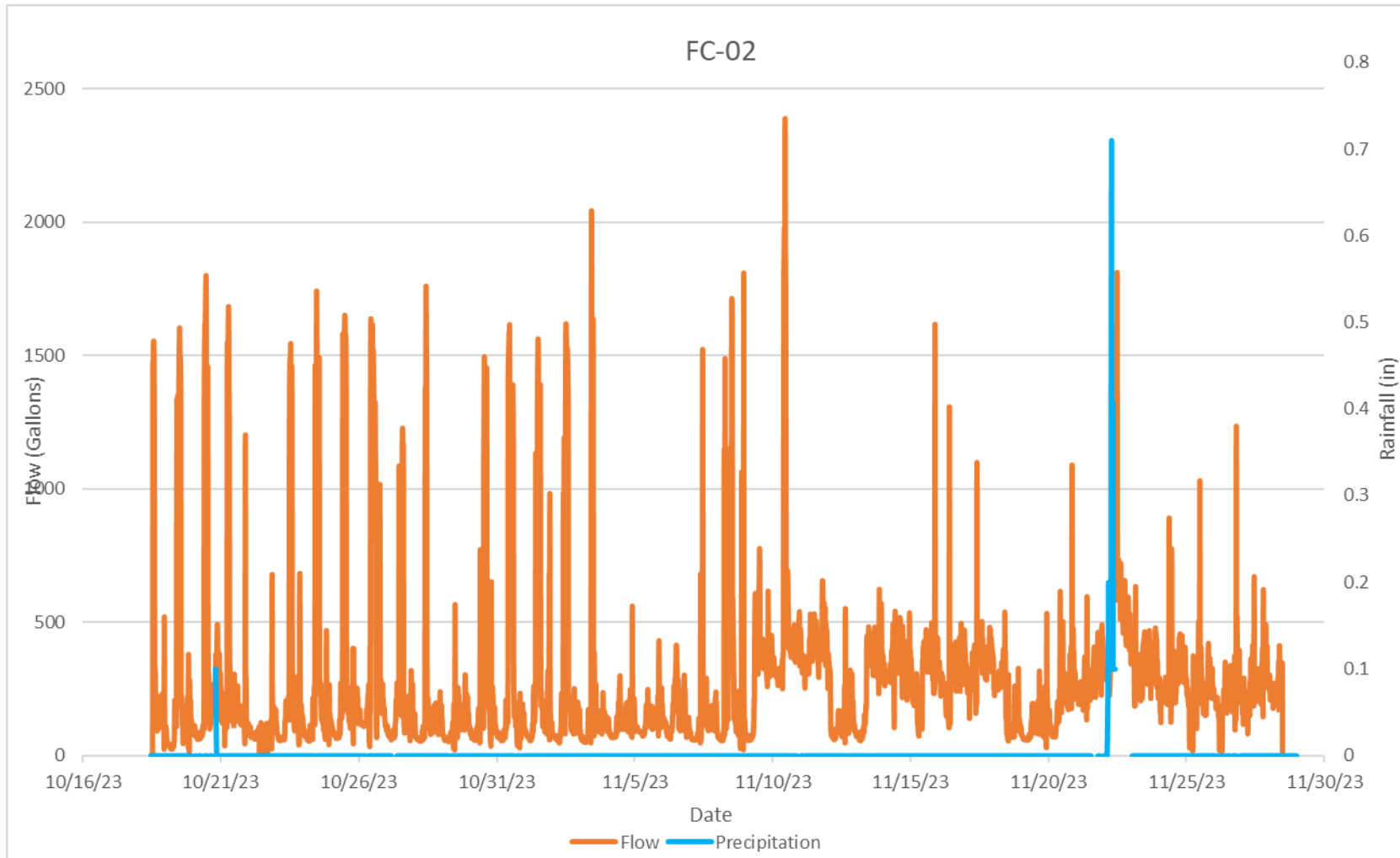
### **Flow Monitoring Data, Hourly Graphs**



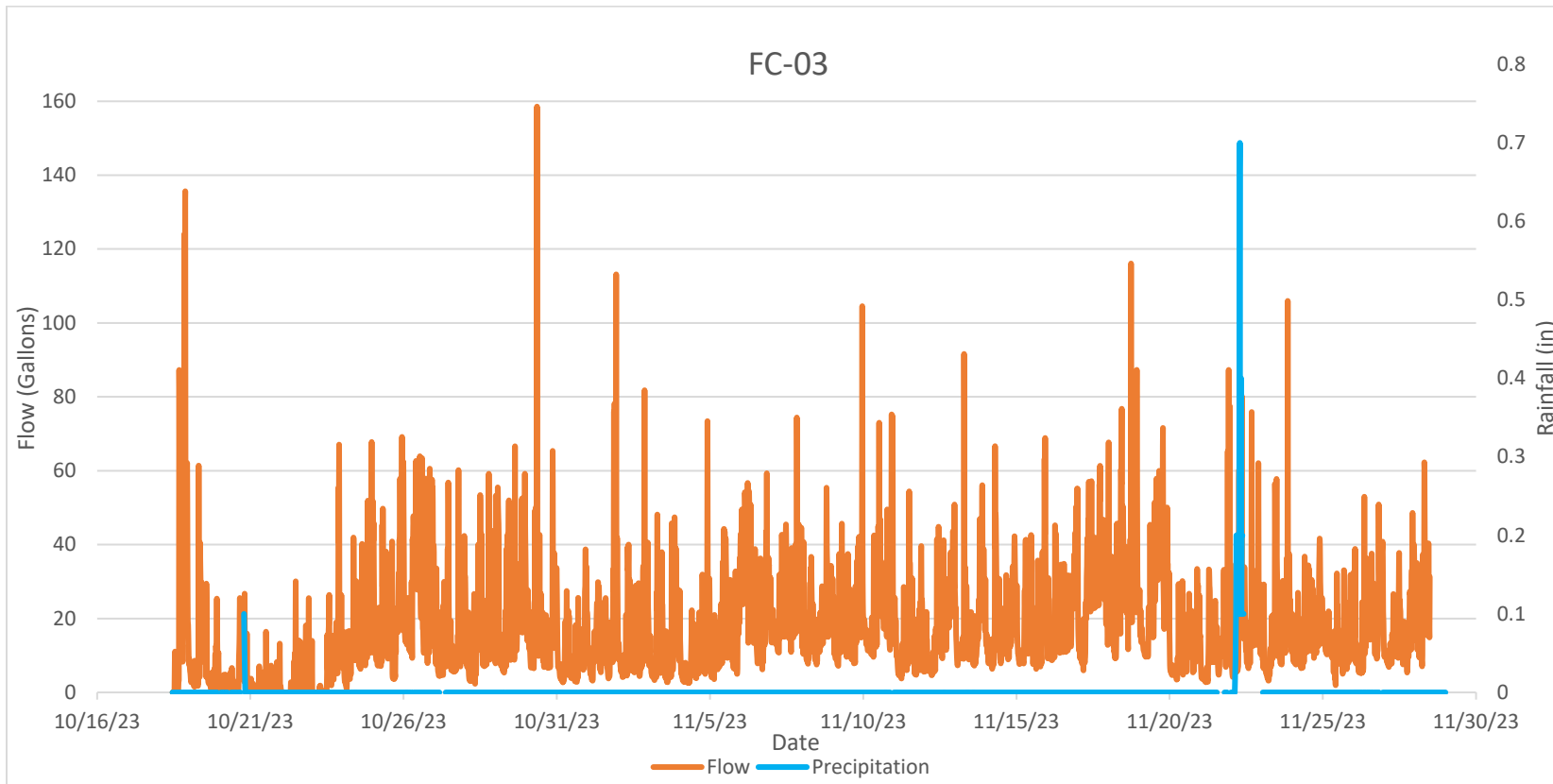
**Graph 1A: Falcon Location 01, Hourly Flow vs. Rainfall**



**Graph 2A: Falcon Location 02, Hourly Flow vs. Rainfall**

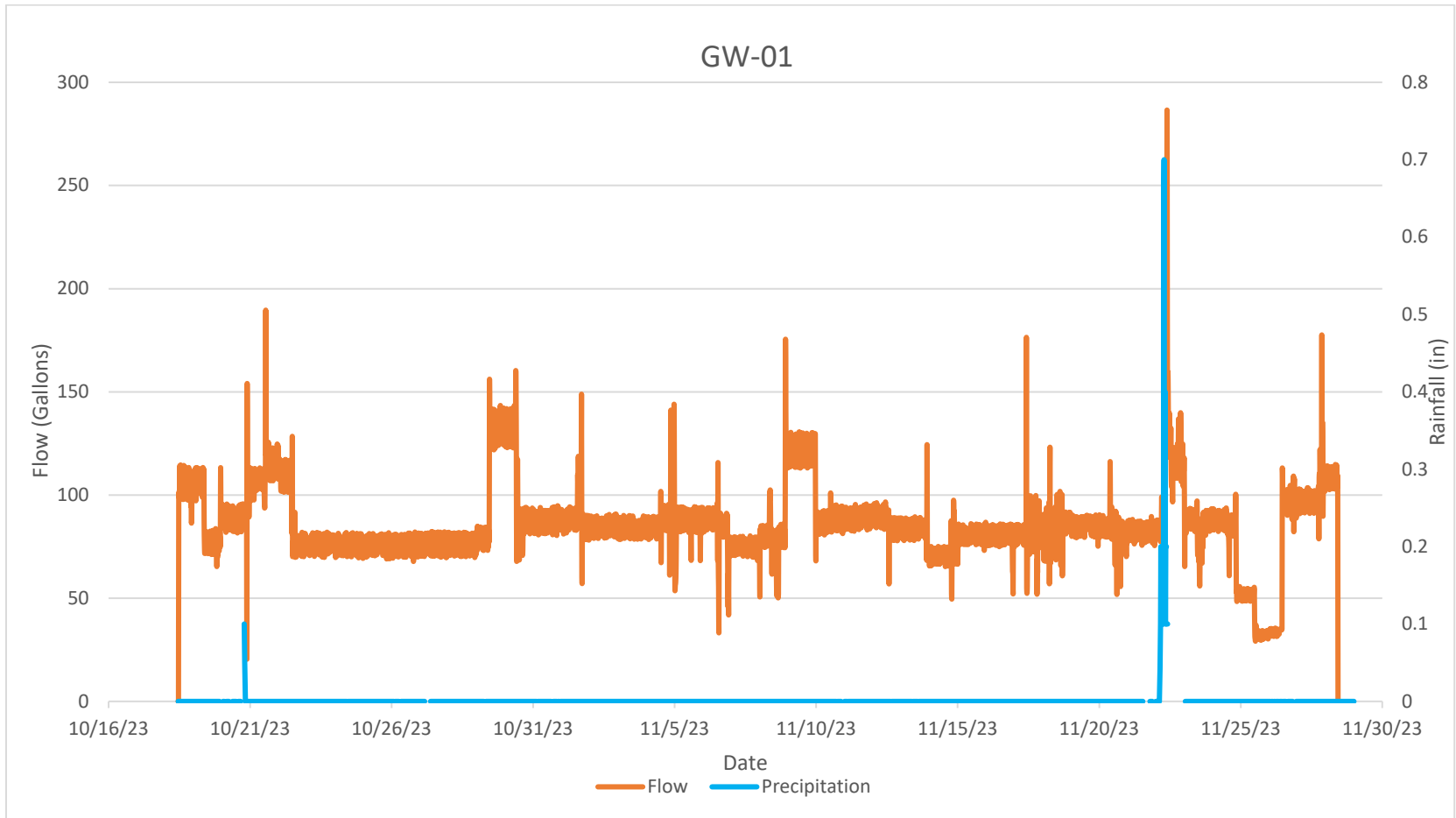


**Graph 3A: Falcon Location 03, Hourly Flow vs. Rainfall**

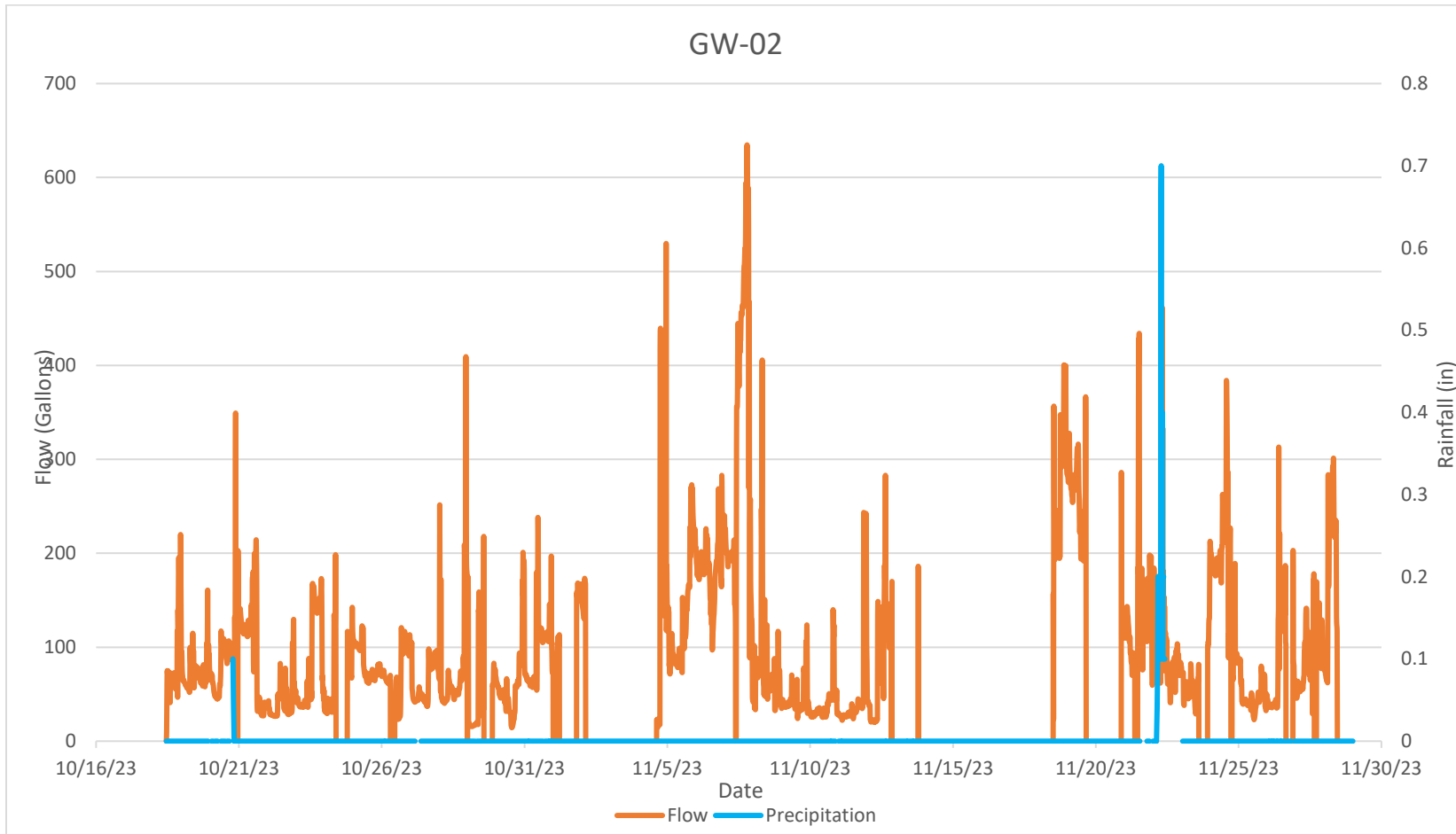




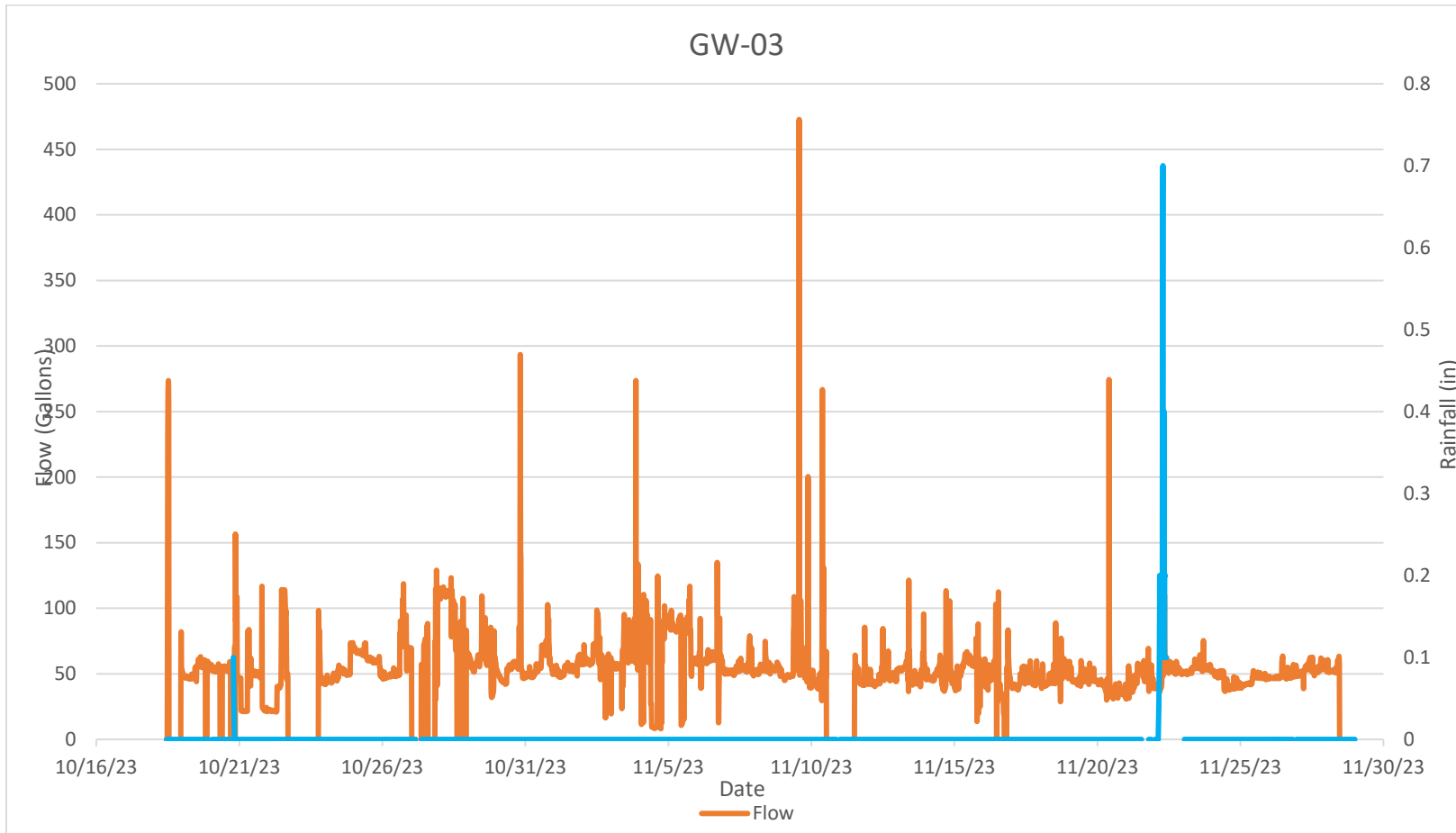
**Graph 4A: Godwin Location 01, Hourly Flow vs. Rainfall**



**Graph 5A: Godwin Location 02, Hourly Flow vs. Rainfall**



**Graph 6A: Godwin Location 03, Hourly Flow vs. Rainfall**



## **Appendix E**

### **Capital Improvement Project Product Data**



# HACH FL900 SERIES FLOW LOGGER -WIRELESS

**The wireless Hach FL900 Series Flow Logger revolutionizes open channel flow monitoring by providing reliable, innovative solutions for any sewer flow measurement challenge.**



## Applications

- Wastewater
- Collection Systems
- Industrial Water

From wireless communication with free data hosting to longer battery life, the FL900 is designed to reduce monitoring costs, increase efficiency, and provide better data 24/7 with less hassle than you ever thought possible. When combined with any of our full array of smart sensors, the FL900 wireless flow monitoring system will provide reliable flow data for any wastewater flow monitoring application. And with the FL900's included software tool, *fsDATA*® Online Data Manager, site time is reduced dramatically, allowing for increased time for data analysis and proactive actions for solving any flow related issue.

## Plug and Play Sensor Ports

The FL900 is available with 1, 2 or 4 sensor ports. The sensor ports are "plug and play"; the logger auto detects the type of sensor connected to allow customers maximum flexibility for their Hach flow sensor inventories.

Compatible FL900 Flow Logger sensors include:

- *FLO-DAR*® AV Sensor with optional Surcharge Velocity Sensor
- *FLO-TOTE*® 3 AV Sensor
- *Sigma Submerged AV Sensor*
- *Hach US9001 Down-Looking Ultrasonic Sensor*
- *Hach US9003 In-Pipe Ultrasonic Sensor*

## Quick Installation/On-Site Confirmation

Not only is the FL900 easy to install with a variety of mounting options, it also includes an LED status light so that you know it's fully functional before leaving the site.

## Affordable Alarming Capabilities

User-selectable alarms can be sent by email or text (SMS) to specified recipients to keep you continuously informed on your monitoring sites. Up to 16 channel alarms can be selected, as well as alarms for low battery, low RTC battery, low slate memory, slate memory full, sensor timeout, sensor ID error or missed call.

## Wireless Data Available 24/7 with *fsDATA*

Eliminate risk and make smarter, more-timely decisions with your sewer flow data. The *fsDATA* Online Data Manager provides secure 24/7 access to your flow data and wireless meter from the comfort of the internet. With *fsDATA*, site visits to collect flow data or to adjust meter settings are eliminated, decreasing maintenance costs. Set alarms and view sensor diagnostics remotely to maximize uptime. Multiple users can be granted different data access levels based on job function.

## Redundant-Level Flow Monitoring

With FL900 Series plug-and-play flow meters, you can pair a Sigma Submerged AV Sensor with a Hach US9003 In-Pipe Ultrasonic Sensor for integrated redundant-level flow monitoring.



## Specifications\*

### Portable DC Powered Electronics (Includes Models FL901, FL902 & FL904)

<b>Dimensions (W x D x H)</b>	25.4 x 22 x 40 cm (10.0 x 8.7 x 16.0 in.)
<b>Enclosure</b>	PC/ABS structural foam
<b>Environmental Rating</b>	NEMA 6P (IP68)
<b>Weight (Using Model FL900)</b>	4.5 kg (10 lb)—no batteries; 6.3 kg (14 lb)—2 batteries; 8.2 kg (18 lb)—4 batteries
<b>Operating Temperature</b>	-18 to 60°C (0 to 140°F) at 95% RH
<b>Storage Temperature</b>	-40 to 60°C (-40 to 140°F)
<b>Power Requirements</b>	8 to 18 Vdc from batteries or external power source, 2.5W max.

#### Battery Life

Varies with sensor type, logging intervals, telemetry and environment.

For a 15-minute logging interval, 60 minute call frequency, four 6 V lantern batteries at room temperature:  
130 days with 4 lantern batteries and a FLO-DAR sensor  
180 days with 4 lantern batteries and a FLO-TOTE 3 sensor  
160 days with 4 lantern batteries and a Sigma Submerged AV sensor with AV9000 Analyzer  
200 days with 4 lantern batteries and Ultrasonic Down-Looking or In-Pipe sensor

The optional long life alkaline battery pack can be used to extend battery life, if the Flow Logger is ordered with the external power option connector.

#### LED Status Indicator

- Green Flashes every 3 seconds during normal operation.  
Flashes every 15 seconds during sleep mode.
- Red Flashes when an attached sensor does not agree with the logger program, when an expected sensor is not found or the sensor is not working properly.

#### LED Modem Indicator

- Stays green during a call to the server. Goes blank after the call is successfully completed and terminated.
- Flashes red if the call to the server failed.

**Sensor Ports** 1, 2 or 4 ports

**Connectors** Stainless steel connectors

**Datalog Channels** 16 maximum

#### Alarms

Maximum of 16 channel alarms including high/high, high, low, low/low and system alarms including low battery, low RTC battery, low slate memory, slate memory full, sensor timeout, sensor ID error.

#### Alarm Actions

Trigger sampler, change logging interval, change call interval, send an e-mail, or send text message (SMS).

#### Call Monitor

Sends a message by e-mail or text (SMS) if a logger has not called the server within an user-defined amount of time.

#### Logging Intervals

1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30 or 60 minutes  
Primary and secondary intervals for dynamic logging.

#### Data Storage

Event Log: 1,000 events maximum in non-volatile flash memory  
Sample History: 2,000 sample events maximum in non-volatile flash memory  
Datalog: 325,000 data points; 1128 days for 3 channels at 15-minute log intervals

#### Data Storage

Event Log: 1,000 events maximum in non-volatile flash memory  
Sample History: 2,000 sample events maximum in non-volatile flash memory  
Datalog: 325,000 data points; 1128 days for 3 channels at 15-minute log intervals

#### Local Communication

USB  
RS232 (Baud rates: 9600, 19200, 38400, 57600, 115200)

#### Remote Communication

Wireless modem; CDMA or GPRS technology with a mobile provider.

#### Protocols

Local Modbus RTU

#### Timebase Accuracy

±0.002%, synchronized every 24 hours with server software and modem

#### Supported Sensors

FLO-TOTE 3, FLO-DAR, FLO-DAR with SVS, Sigma Submerged AV Sensor†, Sigma 950†, and Rain Gauge

#### Sampler Interface

Compatible with Sigma 900 Standard, Sigma 900MAX, Sigma SD900 to support set-point sampling, flow pacing, and logging sample history.

#### Desktop Software

FLO-WARE software is required for programming the logger and can be used for data management and report generation. It is compatible with desktop/laptop computers utilizing Windows operating system. Minimum resolution needed is 1024x768.

#### Internet Application Software

FSDATA web-based software for flow meter programming, data management and report generation for wireless flow meters.

#### Certifications

Logger: CE; optional AC power supply: UL/CSA/CE

#### Warranty

1 year



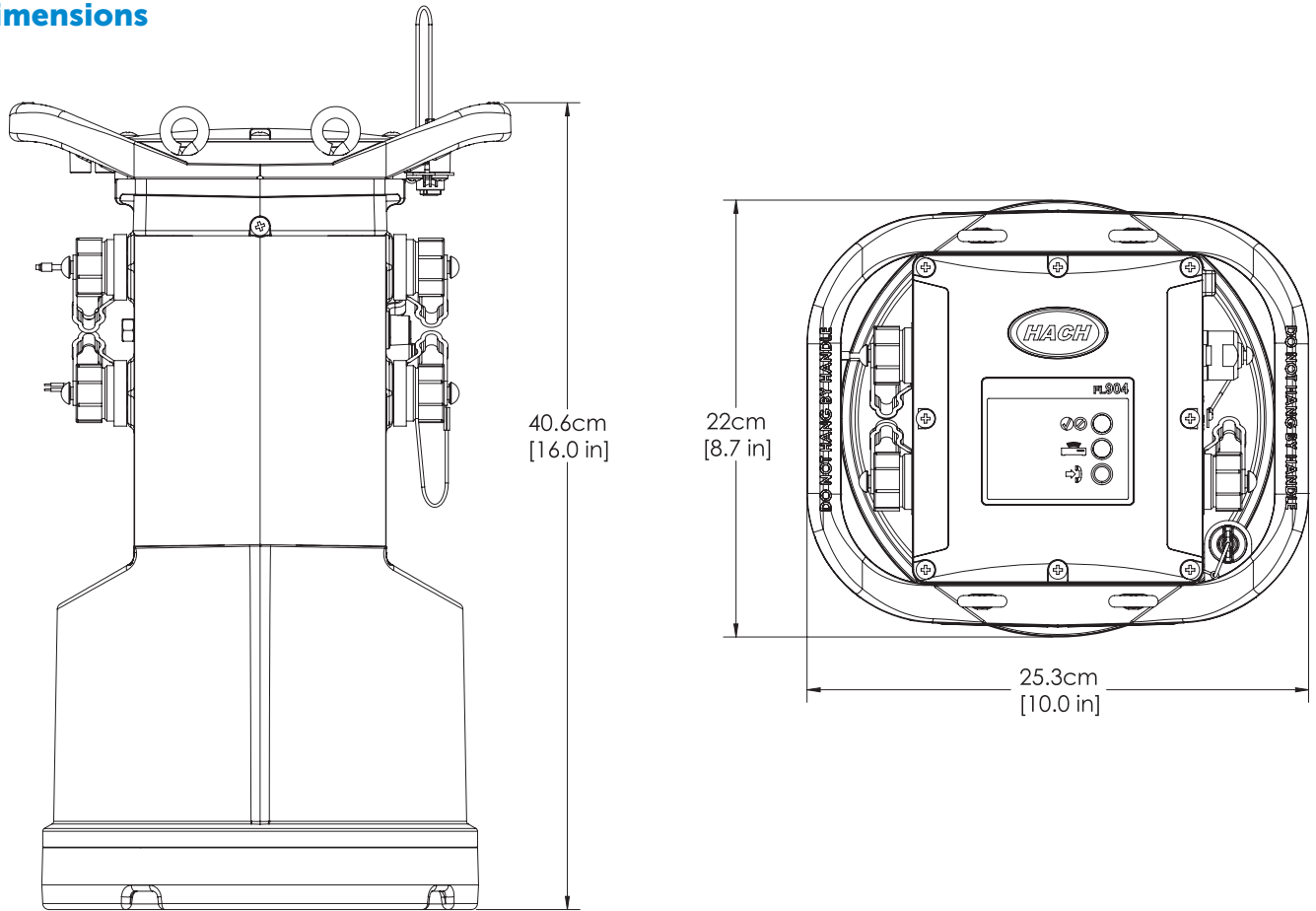
The FL900 Series Loggers meet CE requirements.

†Requires external module.

\*Subject to change without notice.



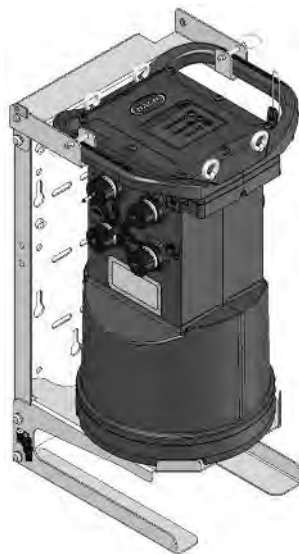
### Dimensions



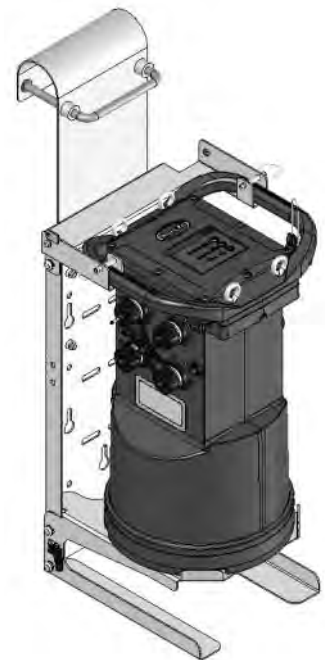
### Installation/Mounting Options



*Flow Logger Suspension Cable with Carabiner (Standard)*



*Flow Logger Wall Mount Prod. No. 8542700 (Optional)*



*Flow Logger Ladder Rung Mount Prod. No. 8544500 (Optional)*

## Ordering Information

		Sensor Connector(s)	Country Code	Modem	Rain Gauge
<b>FL90X Electronics (Flow Logger)</b>	<b>Model FL90</b>	—	97	—	—
1 Sensor Connector		1			
2 Sensor Connectors		2			
4 Sensor Connectors		4			
None				X	
AT&T (Activated)				A	
GPRS no SIM				G	
Sprint (Inactive)				R	
Sprint (Activated)				S	
Verizon (Inactive)				U	
Verizon (Activated)				V	
No Rain Gauge Connector					X
With Rain Gauge Connector					R

### External Modules

- 8531300** AV9000 Area Velocity Analyzer module (required to attach a Sigma Sub AV sensor)
- 8549800** IM9001 Interface module (required to attach a Sigma 950 flow meter)

### Cables

- 8528700** Cable, External power, 2 wire, 9 ft.
- 8528200** Cable, Communication, RS232
- 8528300** Cable, Communication, USB
- 8528400** Cable, Aux, 7pin MIL 5015 (Connect to Sigma Sampler), 9 ft.
- 8528401** Cable, Aux, 7pin MIL 5015 (Connect to Sigma Sampler), 25 ft

### Software

- Model T200-900** FLO-WARE Desktop Software
- FS-HOSTING** Monthly data hosting service for FS-DATA
- FS-DATAFR** Monthly wireless service

### Mounting Hardware

- 8543800** Wall mount bracket (304 Stainless)
- 8545600** Wall mount bracket with ladder hanger (304 Stainless)
- 8542700** Wall mount bracket with AC Power Supply shelf (304 Stainless)
- 8544500** Wall mount bracket with AC Power Supply Shelf with ladder hanger (304 Stainless)

### Replacement Parts

- 8755500** Desiccant refill beads, Bulk 1.5 lb
- 11013M** Battery, 6V lantern
- 8542900** Battery, long-life alkaline
- 8543000** Battery pack top cap adaptor and cable (for long-life alkaline battery pack 800017701)
- 8542800** Rain Gauge with 100 ft. cable

For additional information on products mentioned in this data sheet, request the following data sheets:

**FS-DATA® Online Data Manager (LIT2707)**

**FLO-DAR® AV Sensor (LIT2708)**

**FLO-TOTE® 3 AV Sensor (LIT2712)**

**HACH US9000 Ultrasonic Sensors (LIT2804)**

**HACH Redundant Flow Monitoring System (LIT2805)**

**HACH Wireless Level Alarming System (LIT2806)**

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In the interest of improving and updating its equipment,

Hach Company reserves the right to alter specifications to equipment at any time.



Be Right™

# Marsh-McBirney FLO-DAR® Area/Velocity Radar Flow Meter Sensor



*The Flo-Dar Sensor provides an ideal solution for non-contact, maintenance-free portable or permanent sewer flow monitoring.*

## Features and Benefits

The Flo-Dar Area/Velocity Radar Flow Meter provides a revolutionary approach to open channel flow monitoring. The sensor combines advanced Digital Doppler Radar velocity sensing technology with ultrasonic pulse echo depth sensing to remotely measure open channel flow. Use with FL900 Series Flow Logger or Flo-Logger/Logger XT for portable monitoring; for permanent monitoring sites, the Flo-Dar can be connected to the Flo-Station which displays flow rate, velocity, and level. (See Lit. No. 2709 [standard] or Lit. No. 2711 [wireless] for Flow Logger product information, or Lit. No. 2616 for Flo-Station product information). Intrinsically safe models available.

### Accurate Flow Measurement

Flo-Dar provides the user with highly accurate flow measurements under a wide range of flows and site conditions. By measuring the velocity of the fluid from above, Flo-Dar eliminates accuracy problems inherent with submerged sensors including sensor disturbances, high solids content and distribution of reflectors.

### Non-Contact Sensor Eliminates Lost Data

No lost data with non-contact, above the flow sensor that is unaffected by fouling due to debris and grease.

### Easy Installation and Maintenance

As the sensor is mounted above the flow, personnel have little or no contact with the flow during installation. Future sensor removal can be done without the need for confined space entry.

### Independent Accuracy / Long-Term Stability Verification

Flo-Dar sensor accuracy and long-term stability (up to 3 years without need for site calibration) from low flow depths up to surcharge conditions has been independently verified

many times over the years including a formal evaluation by the Alden Research Laboratory, Inc. and recent field evaluations done by municipalities and consulting engineering firms.

### Perfect Solution for Difficult Flow Conditions

Operates in the most difficult conditions including flows with high solids content, high temperature, shallow and caustic flows, large man-made channels, and high velocities up to 20 ft/s.

### Optional Surcharge Velocity Sensor

During surcharge events Flo-Dar's optional electromagnetic sensor will continue to provide uninterrupted and accurate flow monitoring through dry and wet weather flows without the need for routine sensor cleaning or maintenance.

### Applications

#### Municipal

- Sanitary Sewer Evaluation Studies
- Collection Systems
- Capacity Studies
- Combined Sewer Overflows
- Inflow and Infiltration (I&I) Studies
- Billing / Custody Transfer
- Plant Influent and Effluent

#### Industrial

- Process Waste
- Plant Influent
- Plant Effluent
- Non-contact Cooling Water
- Stormwater Monitoring and Compliance

DW = drinking water WW = wastewater municipal PW = pure water / power  
IW = industrial water E = environmental C = collections FB = food and beverage



Be Right™

WW

IW

C

## Specifications\*

### FLO-DAR SENSOR

#### Enclosure

IP68 Waterproof rating, Polystyrene

#### Dimensions

160.5 W x 432.2 L x 297 D mm (6.32 x 16.66 x 11.7 in.), with SVS, D = 387 mm (15.2 in.)

#### Weight

4.8 kg (10.5 lbs.)

#### Operating Temperature

-10 to 50°C (14 to 122°F)

#### Storage Temperature

-40 to 60°C (-40 to 140°F)

#### Power Requirements

Supplied by FL900 Flow Logger, Flo-Logger, or Flo-Station

#### Interconnecting Cable

**-Disconnectable at both sensor and logger or Flo-Station**

Polyurethane, 0.400 (±0.015) in. diameter; IP68  
Standard length 9M (30 ft), maximum 305 m (1000 ft)

Cables are available in two styles:

- connectors both ends
- connector from sensor with open leads to desiccant hub, desiccant hub with connector to logger. A potting/sealant kit will be included. This can be used to run the cable through conduit.

Important Note: The sensor cable assembly with desiccant hub is compatible with either the Marsh-McBirney Flo-Logger/Logger XT or the Hach FL900 Series Flow Loggers. When using this cable assembly with the Marsh-McBirney Flo-Logger, do not disconnect the desiccant cartridge that is attached to the Flo-Logger itself. It is important to keep the air tube plugged.

If using Flo-Dar cable with Flo-Station, the cable will have bare leads to the Flo-Station (30 to 1000 ft. lengths) and there will be no desiccant hub, as the air tube terminates inside of the Flo-Station housing.

#### Warranty

1 year

#### Set-up/Data Retrieval

Flo-Ware for Windows software is the user on-site set-up, data management, and report generation software. It is compatible with desktop/laptop computers utilizing Windows operating system.

#### Certification

The Flo-Dar Transmitter is certified to the following requirements:

- Transmitter type: Field Disturbance Sensor
- Frequency: 24.125 GHz - Doppler pulse
- Maximum rated power output: 128 dbuV (ave) @ 3 meters

Certified to: FCC Part 15.245: FCC ID: VIC-FLODAR24  
Industry Canada Spec. RSS210. v7: IC No.: 6149A-FLODAR24

Use of this device is subject to the following conditions:

1. There are no used serviceable items inside this device.
2. The user must install this device in accordance with the supplied installation instructions and must not modify the device in any manner whatsoever.
3. Any service involving the transmitter must only be performed by Hach Company.
4. The user must ensure that no one is within 20 cm of the face of the transmitter when operating.

### SURCHARGE DEPTH MEASUREMENT

Auto zero function maintains zero error below 0.5 cm (0.2 in.)

#### Method

Piezo-resistive pressure transducer with stainless steel diaphragm

#### Range

3.5 m (138 in.), overpressure rating 2.5 x full scale

### VELOCITY MEASUREMENT

#### Method

Radar

#### Range

0.23 to 6.10 m/s (0.75 to 20 ft/s)

#### Frequency Range

24.075 to 24.175 G-Hz, 15.2mW (max.)

#### Accuracy

±0.5%; ±0.03 m/s (±0.1 ft/s)

### DEPTH MEASUREMENT

#### Method

Ultrasonic

#### Standard Operating Range from Flo-Dar Housing to Liquid

0 to 152.4 cm (0 to 60 in.)

#### Optional Extended Level Operating Range from Transducer Face to Liquid

0 to 6.1 m (0 to 20 ft.) with 43.18 cm (17 in.) dead band, temperature compensated.

#### Accuracy

±1%; ±0.25 cm (±0.1 in.)

### FLOW MEASUREMENT

#### Method

Based on Continuity Equation

#### Accuracy

±5% of reading typical where flow is in a channel with uniform flow conditions and is not surcharged, ±1% full scale max.

### SURCHARGE CONDITIONS DEPTH/VELOCITY

#### DEPTH (Std with Flo-Dar Sensor)

Surcharge depth supplied by Flo-Dar sensor.

#### VELOCITY (Optional Surcharge Velocity Sensor)

#### Method

Electromagnetic

#### Range

±4.8 m/s (±16 ft/s)

#### Accuracy

±0.15 ft/s or 4% of reading, whichever is greater.

#### Zero Stability

> ±0.05 ft/s

### CERTIFICATION INTRINSICALLY SAFE

The Flo-Dar and Surcharge Velocity Sensors are certified to Class I, Zone 1 Standards. They conform to ANSI/UL 60079-11 and are certified to CAN/CSA E60079-11 and EN 60079-11 standards.

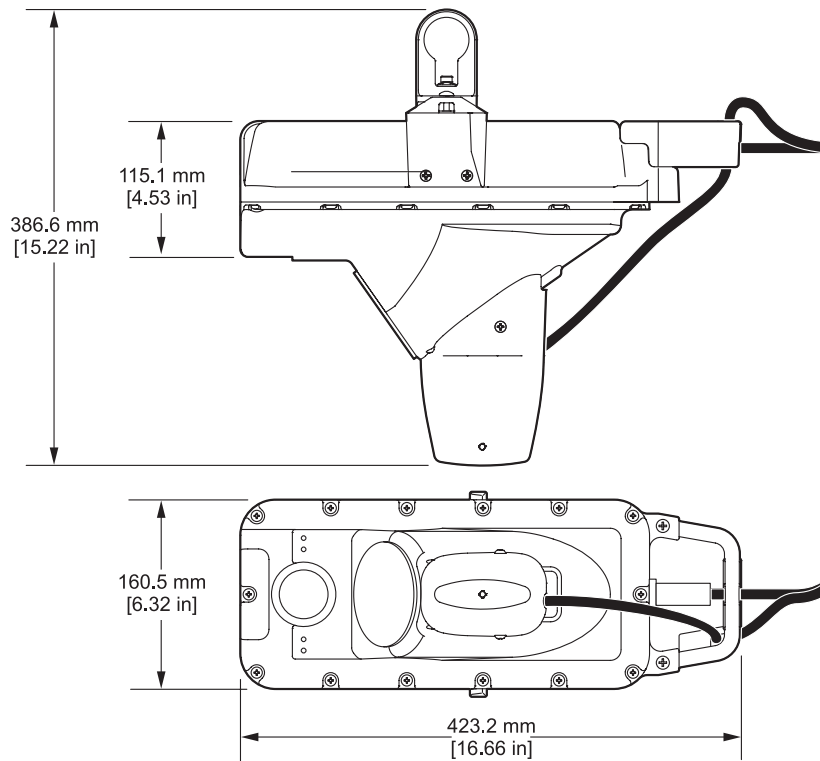


The Flo-Dar sensor meets CE requirements.

## Engineering Specifications

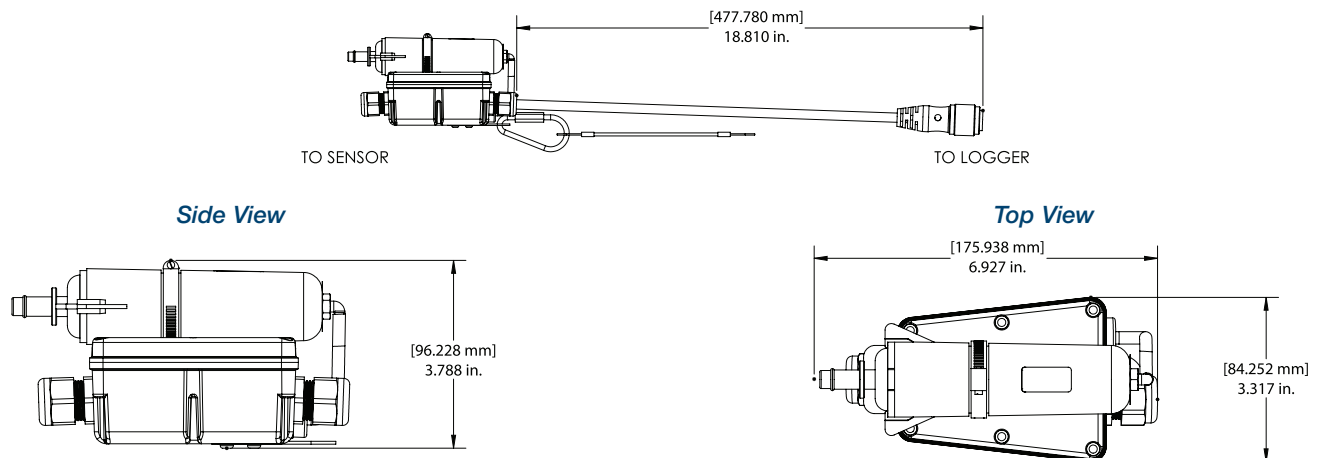
- The flow meter shall be capable of measuring level, average velocity and surcharge depth.
- The method of velocity measurement shall be Doppler radar.
- The sensor shall combine advanced Doppler Radar velocity sensing technology with ultrasonic pulse echo depth sensing to remotely measure open channel flow.
- Flow shall be calculated based on the Continuity Equation ( $Q=V \times A$ ), where  $Q$ =Flow,  $V$ =Average Velocity and  $A$ =Area.
- The range of velocity measurement shall be 0.23 to 6.10 m/s (0.75 to 20 ft/s).
- The method of depth measurement shall be ultrasonic.
- The standard operating range for depth measurement shall be 0 to 152.4 cm (0 to 60 in.) with an optional operating range of 0 to 6.1 m (0 to 20 ft.) with 43.18 cm (17 in.) deadband, temperature compensated.
- The flow meter shall have a surcharge condition velocity sensor option.
- Exterior dimensions of the sensor shall not exceed 160.5 W x 432.2 L x 297 D mm (6.32 W x 16.66 L x 11.7 D in.) or 160.5 W x 432.2 L x 387 D mm (6.32 W x 16.66 L x 15.2 D in.) with Surcharge Velocity option.
- The sensor shall be able to measure bi-directional surcharge flow.
- Optional Intrinsically Safe models available for flow monitoring in hazardous locations.
- The model shall be the Marsh-McBirney Flo-Dar Open Channel Flow Meter Sensor.

## Dimensions



*Flo-Dar Area/Velocity Radar Flow Meter*

The desiccant hub assembly includes a junction box to connect sensor cable to the desiccant and subsequently to the FL900 Logger. The desiccant can easily be replaced without need to purchase a separate desiccant module.



*Desiccant Hub Assemblies for use with portable FL900 Series Loggers and Flo-Logger.  
(Sensor cable for use with Flo-Station will not contain a desiccant hub and will have bare wires on cable end.)*



## Ordering Information

### Configure FLO-DAR Sensor to Logger (Portable)

Flo-Dar Sensor	Model 4000	-	4	X	X
<b>Flo-Dar Sensor with specified cable length</b> (need to add cable as separate line item)			4		
<b>Non Intrinsically Safe</b> <b>Surcharge Velocity Sensor Option</b> (IMPORTANT NOTE: SVS cable length MUST MATCH FloDar Sensor Cable length)				0 3	
<b>Non Extended Range</b> <b>Extended Range Option</b> —Allows use in flow depths up to 18 feet. Allow for 18" deadband. Standard unit max depth is 60". SVS Option requires Remote Extended Range below. <b>Remote Extended Range Option with 6' sensor cable</b> —Flow depths up to 18 feet. Allow for 18" deadband. Standard unit max depth is 60".					0 1 2

### Configure FLO-DAR Sensor to Flo-Station (Permanent)

Flo-Dar Sensor	Model 4000	-	9	X	X
<b>Flo-Dar Sensor with specified cable length</b> (need to add cable as separate line item)			9		
<b>Non Intrinsically Safe</b> <b>Surcharge Velocity Sensor Option</b> (IMPORTANT NOTE: SVS cable length MUST MATCH Flo-Dar Sensor Cable length)				0 3	
<b>Non Extended Range</b> <b>Extended Range Option</b> —Allows use in flow depths up to 18 feet. Allow for 18" deadband. Standard unit max depth is 60". SVS Option requires Remote Extended Range below. <b>Remote Extended Range Option with 6' sensor cable</b> —Flow depths up to 18 feet. Allow for 18" deadband. Standard unit max depth is 60".					0 1 2

### Cables

<b>FD9000CBL-XXX*</b>	FL900 Series Logger to Flo-Dar sensor. Cable w/two connectors.
<b>FDJCTBOXCBL-XXX*</b>	FL900 Series Logger to Flo-Dar sensor. Cable with connector to sensor, open end to desiccant hub, desiccant hub with connector to sensor. Includes finishing kit for potting/sealing desiccant hub. For use with conduit.
<b>6000062XX*</b>	SVS Sensor with connector for use with FL900 Series Logger.
<b>570011800-XXX*</b> <b>Model 4000-9</b>	Flo-Station to Flo-Dar sensor Cable with one connector and bare leads.
<b>6000059XX*</b>	SVS Sensor with bare leads for use with Flo-Station. *Contact customer service for product numbers.
Available Cable Lengths (in feet)	
30	125 225 400 700
60	150 250 450 800
75	175 300 500 900
100	200 350 600 1000

See Lit. No. 2709 (standard models) and Lit. No. 2711 (wireless models) for FL900 Series Flow Logger ordering information. See Lit. No. 2616 for Flo-Station ordering information.

### Mounting Hardware

<b>800016701</b>	Permanent Sensor Mount—Includes sensor frame & all mounting hardware. Portable Sensor Mounts Available (Sizes 34-107") Contact Sales.
------------------	---

### Accessories & Spares

<b>245000501</b>	Sensor Retrieval Pole - Used to place and retrieve sensor from mounting bracket. Pole extends to 7.3 m (21 ft.)
<b>510012701</b>	Sensor Retrieval Hook - Used with Sensor Retrieval Pole
<b>570011401</b>	Grounding Strap (required with Retrieval Pole and Hook when used with IS units)
<b>8755500</b>	Bulk desiccant beads (1.5 pounds)

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In the interest of improving and updating its equipment, Hach Company reserves the right to alter specifications to equipment at any time.



*At Hach, it's about learning from our customers and providing the right answers. It's more than ensuring the quality of water—it's about ensuring the quality of life. When it comes to the things that touch our lives...*

*Keep it pure.*

*Make it simple.*

*Be right.*

*For current price information, technical support, and ordering assistance, contact the Hach office or distributor serving your area.*

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HACH COMPANY  
4539 Metropolitan Court  
Frederick, MD 21704-9452, U.S.A.  
Telephone: 800-368-2723  
Fax: 301-874-8459  
E-mail: hachflowsales@hach.com  
[www.hachflow.com](http://www.hachflow.com)

*In Europe contact:*

Flow-Tronic  
Rue J.H. Cool 19a  
B-4840 Welkenraedt Belgium  
Telephone: +32-87-899799  
Fax: +32-87-899790  
E-mail: site@flow-tronic.com  
[www.flow-tronic.com](http://www.flow-tronic.com)



**Be Right™**

# US3 Rain Gauge

## Rain Gauge Tipping Bucket With Leaf Filter



The US3 Rain Gauge tipping bucket uses a standard tipping bucket mechanism that allows for straightforward and effective rainfall measurement. The geometry and material selection of the bucket, along with the inclusion of a leaf filter, help minimize contamination and errors in the measurement process.

The rain gauge features a 8" (200mm) diameter collector funnel. The tipping bucket device is divided into two compartments to enable the measurement of rainfall in fixed increments. The bucket is pivoted at its center and has a preset calibration to tip for a specific amount of rainfall, either 0.5 mm or 1 mm. The tipping action of the bucket magnetically opens and closes a reed switch. When the bucket is full and tips, it triggers the reed switch, generating a pulse signal. The pulse signal from the reed switch is sent to a data logger or RTU.

### Ordering information

**Code**            **US3-RGTB**

### Applications

- Water management
- Rain Measurement
- Flood Control Monitoring
- Environmental telemetry
- Intelligent Irrigation systems
- Integrates with Most Loggers/PLCs

### Technical characteristics

Item	Specification
Measurement object	Rain
Measured rainfall intensity	0-9.5 inch/hour
Sample interval	1s
Resolution	0.004 inch
Accuracy(0.08 inch/min)	±4%
Power consumption	1.6W
Supply	7-24VDC
Output	RS485, RS232, SDI-12 optional
Operating temperature	-40-+176F -40-+80°C
Main material	SS+ABS
Weight (unpacked)	1.4 lbs (0.65kg)





## **Appendix F**

### **PWC Agreement**

THIS AGREEMENT, made this 2nd day of FEBRUARY, 2004 by and between the NORCRESS WATER AND SEWER DISTRICT (hereinafter referred to as "NORCRESS"); and the PUBLIC WORKS COMMISSION of the City of Fayetteville, North Carolina (hereinafter referred to as "COMMISSION").

WITNESSETH THAT

WHEREAS, NORCRESS has contracted with COMMISSION to furnish sanitary sewer treatment service to NORCRESS as per an agreement dated October 14, 2002; and

WHEREAS, both COMMISSION and NORCRESS recognize the complexity of providing sanitary sewer utility service; and

WHEREAS, NORCRESS requests that COMMISSION operate and maintain NORCRESS's proposed sanitary sewer collection system; and

WHEREAS, COMMISSION agrees to operate and maintain said sanitary sewer collection system.

NOW THEREFORE, and in consideration of the benefits each shall derive, the parties mutually agree as follows:

I. COMMISSION will provide the following services:

A. Basic Operation and System Maintenance, to include:

- (1) Repairing damaged, deteriorated, or broken sanitary sewer mains, not to include outright system replacement of large segments (more than 500') of the sanitary sewer collection system which cannot be repaired due to structural failure, natural or manmade disasters, or were not installed with COMMISSION approved plans and specifications;
- (2) Repairing damaged, deteriorated, or broken sanitary sewer service laterals from the main to edge of road right-of-way or easement;
- (3) Routine maintenance and repair of pump station equipment, if any, not to include replacement of major components (parts and/or equipment valued over \$1,000);
- (4) Cleaning and rodding of clogged sewer mains;
- (5) Repairing of manholes, including rings and covers;
- (6) Other routine maintenance and repairs as needed;

- (7) Administrative and engineering support of above, as required;
- (8) 24 hours, 7 days per week on-call dispatch with appropriate response forces;
- (9) Responding to inquiries by existing and potential users of sanitary sewer service;
- (10) Investigating and working to resolve complaint issues;
- (11) Keeping NORCRESS abreast of changes in regulations concerning sanitary sewer utility services;
- (12) Maintaining metered electric service at pumping stations as well as chemicals associated with pump station operation. The cost of metered electric service shall be a recoverable expense to be included in the monthly billing statement;
- (13) Plan review by COMMISSION engineering staff of NORCRESS's plans and/or plans submitted to NORCRESS by others to ensure utility extensions are designed to meet COMMISSION specifications and are compatible with NORCRESS's goals and objectives for meeting overall system needs.

B. COMMISSION will provide other services, upon request, but which will be billed separately and not included in the monthly basic operation and maintenance billing. A partial list of the "other services" that may be available to NORCRESS include the following:

- (1) Sanitary sewer service lateral installation;
- (2) Promote participation agreements with other benefited parties;
- (3) Preparation and administration of utility extension contracts;
- (4) Right-of-way acquisition services for land and easement requirements to be secured in the name of NORCRESS within the limits permitted by law but not to include actions in eminent domain;
- (5) Inspection services during construction;
- (6) Meter reading and billing;
- (7) Miscellaneous services such as GIS mapping as requested.

II. OPERATION AND MAINTENANCE COST – COMMISSION shall render accurate monthly bills to NORCRESS. Such bills shall be computed by multiplying NORCRESS's sewer flow, expressed in thousand (M) gallons, by the applicable rate per thousand (M) gallons for this customer class. The rate per thousand (M) gallons shall be subject to change annually. In addition, COMMISSION shall submit an itemized statement monthly for the



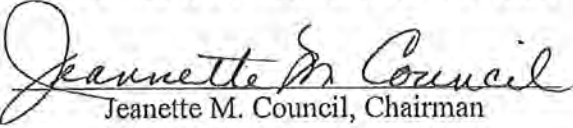
actual cost associated with metered electric service and "other services" as set forth in Paragraph I-B performed by COMMISSION, reflecting the appropriate regular hourly or overtime rate for labor, equipment, and materials (to include an amount for all direct and indirect charges plus profit at 10%).

- III. REPAIRS - COMMISSION shall not be financially responsible for any repairs or cost of repairs needed to the sanitary sewer collection system unless such repairs are due to negligence of COMMISSION or its employees. However, COMMISSION will repair or arrange for all repair services. If not covered under Basic Operation and Maintenance (Paragraph I-A), COMMISSION will seek prior approval from NORCRESS if the anticipated cost of such repairs exceeds \$1,000, unless delay in making repairs could create or prolong discontinuance of sanitary sewer utility services, or create unsafe conditions for customers, COMMISSION's employees or other persons, or create an environmental hazard.
- IV. PAYMENT - Monthly bills rendered for services as provided hereunder are payable within 10 days from their date, at COMMISSION's office, Robert C. Williams Business Center, 201 Hay Street, (28301) P.O. Box 7000, Fayetteville, NC 28302. A late charge of one percent per month from final payment date shall apply to all such bills.
- V. TERM OF AGREEMENT - NORCRESS and COMMISSION mutually agree that the term of this Agreement shall be ten years from the date of COMMISSION's execution thereof, and continuing annually thereafter until terminated by either party's written notice at least three months prior to the end of any such annual term.
- VI. TERMINATION OF AGREEMENT - If NORCRESS or COMMISSION fails to fulfill in a timely and proper manner the obligations under this Agreement, either party shall have the right to terminate this Agreement by specifying the reason for termination in written notice to the other party at least 60 days prior to the date of termination.
- VII. AMENDMENTS - This Agreement shall not be modified, amended, or changed in any respect except in a writing, duly signed by the parties hereto. Each party hereby waives any right to amend the Agreement in any other manner.
- VIII. ASSIGNMENT - This Agreement shall be binding upon and shall inure to the benefit of NORCRESS and its successors and assigns. COMMISSION may only assign this agreement with the written consent of NORCRESS.
- IX. LIABILITY - COMMISSION shall not be liable for injury or damage to NORCRESS or

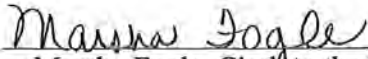
persons or property, unless such injury or damage was caused by the negligence or willful misconduct by COMMISSION or its employees. COMMISSION shall not be responsible for any injuries or damages resulting from acts, omissions, or occurrences, which occurred prior to the date COMMISSION, began operations pursuant to this Agreement. NORCRESS shall indemnify, defend, and save COMMISSION harmless against other/all liability, claims, judgments, losses, costs and expenses for injury, loss, or damage to persons or property, including fines by any federal or state agency, and also including personal injury or property damage to NORCRESS, its employees, sanitary sewer customers, and citizens on account of operation and maintenance of NORCRESS's sanitary sewer system, including any defective construction (other than by COMMISSION or its agents) or equipment of NORCRESS's sanitary sewer system, on NORCRESS's side of the point of delivery from COMMISSION's facilities or on its sanitary sewer customers' side of the service lateral. COMMISSION assumes responsibility for and shall indemnify, defend, and save NORCRESS harmless against all liability, claims, judgments, losses, costs and expenses for injury loss, or damage to persons or property, including fines by any federal or state agency, and also including personal injury or property damage to sanitary sewer customers and citizens on account of operation of NORCRESS's sanitary sewer system on the NORCRESS's side of the point of delivery of sanitary sewer service (metering point) due to the negligence or willful misconduct of COMMISSION.

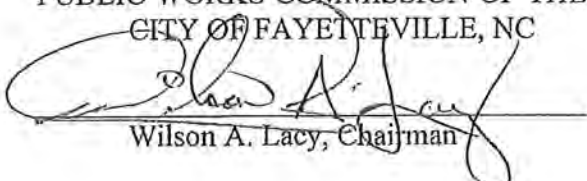
- X. ENTIRE AGREEMENT - This writing embodies the entire Agreement and understanding between the parties hereto and there are no other agreements or understandings, oral or written, with reference to the subject matter hereof that are not merged herein and superseded hereby.

IN TESTIMONY WHEREOF, NORCRESS has executed this instrument by its Chairman and COMMISSION has executed this instrument by its Chairman, each being duly authorized to execute this Agreement.

NORCRESS WATER & SEWER DISTRICT  
  
Jeanette M. Council, Chairman

ATTEST:

  
Marsha Fogle, Clerk to the Board

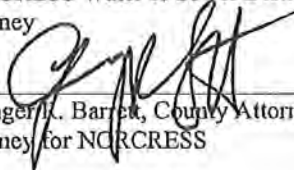
PUBLIC WORKS COMMISSION OF THE  
CITY OF FAYETTEVILLE, NC  
  
Wilson A. Lacy, Chairman

ATTEST:


  
Terri Union, Secretary

NORCRESS:

APPROVED for Legal Sufficiency  
NORCRESS Water & Sewer District  
Attorney

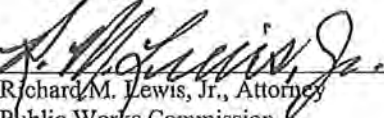
  
Grainger L. Barrett, County Attorney  
Attorney for NORCRESS

This instrument has been pre-audited in the manner  
required by the Local Government Budget and Fiscal  
Control Act.

  
Amy H. Cannon, Assistant County Manager  
Finance Officer for NORCRESS

COMMISSION:

APPROVED as to form this 14<sup>th</sup> day of  
MAY, 2004

  
Richard M. Lewis, Jr., Attorney  
Public Works Commission

This instrument has been pre-audited in the manner  
required by the Local Government Budget and Fiscal  
Control Act.

  
Dwight Miller, Chief Financial Officer  
Public Works Commission



---

NORTH CAROLINA – CUMBERLAND COUNTY

I, Anna L. Hymes, a Notary Public of said County and State do hereby certify that Marsha Fogle personally appeared before me this day and acknowledged that he/she is Clerk of NORCRESS Water and Sewer District, and that the authority duly given and as the act of said, the foregoing instrument was signed in its name by its Chairman, sealed with its corporate seal, and attested by himself/herself as its Clerk.

WITNESS my hand and Notarial Seal, this the 2nd day of Feb., 2004.

My COMMISSION Expires: 8-13-08

Anna L. Hymes  
Notary Public

---

NORTH CAROLINA - CUMBERLAND COUNTY

I, Joan D. Starling, a Notary Public of said County and State do hereby certify that TERRI WATSON, personally appeared before me this day and acknowledged that he is Secretary of The Public Works Commission, an agency of the City of Fayetteville, North Carolina, and that the authority duly given and as the act of the agency, the foregoing instrument was signed in its name by its Chairman, sealed with its seal, and attested by himself as its Secretary.  
herself

WITNESS my hand and Notarial Seal, this the 26 day of May, 2004.

My COMMISSION Expires: April 1, 2007

Joan D. Starling  
Notary Public



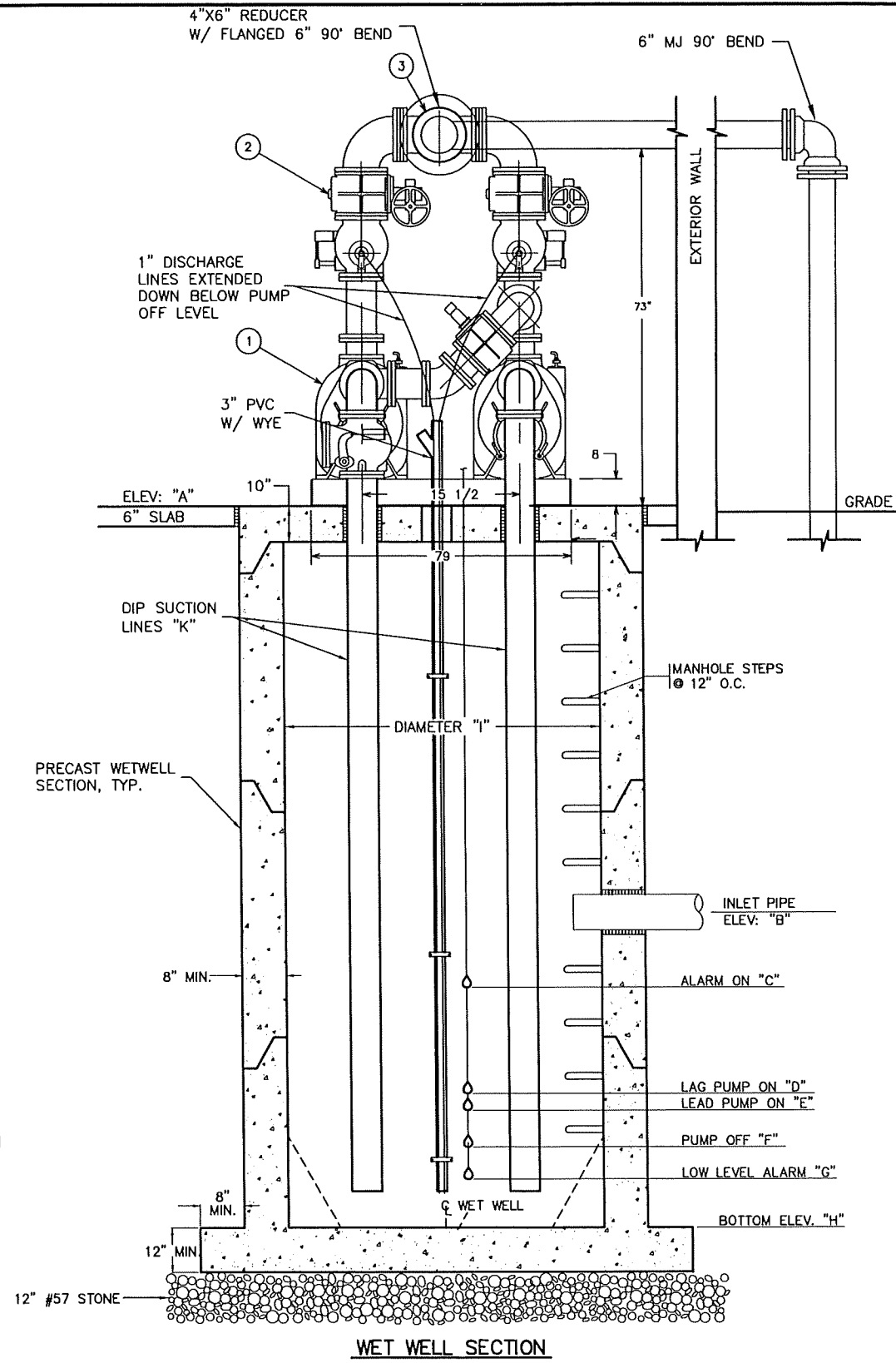
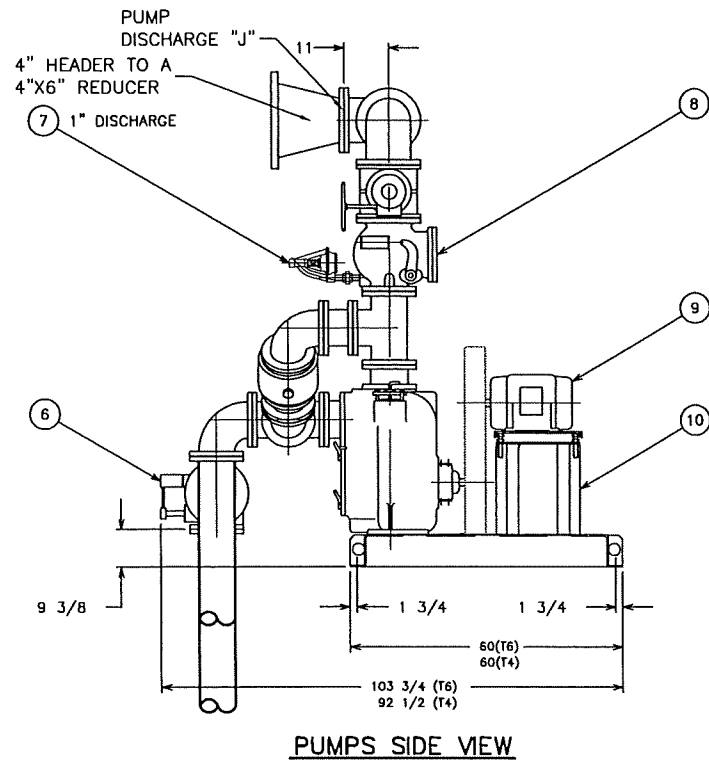
## **Appendix G**

### **Lift Station Record Drawings**



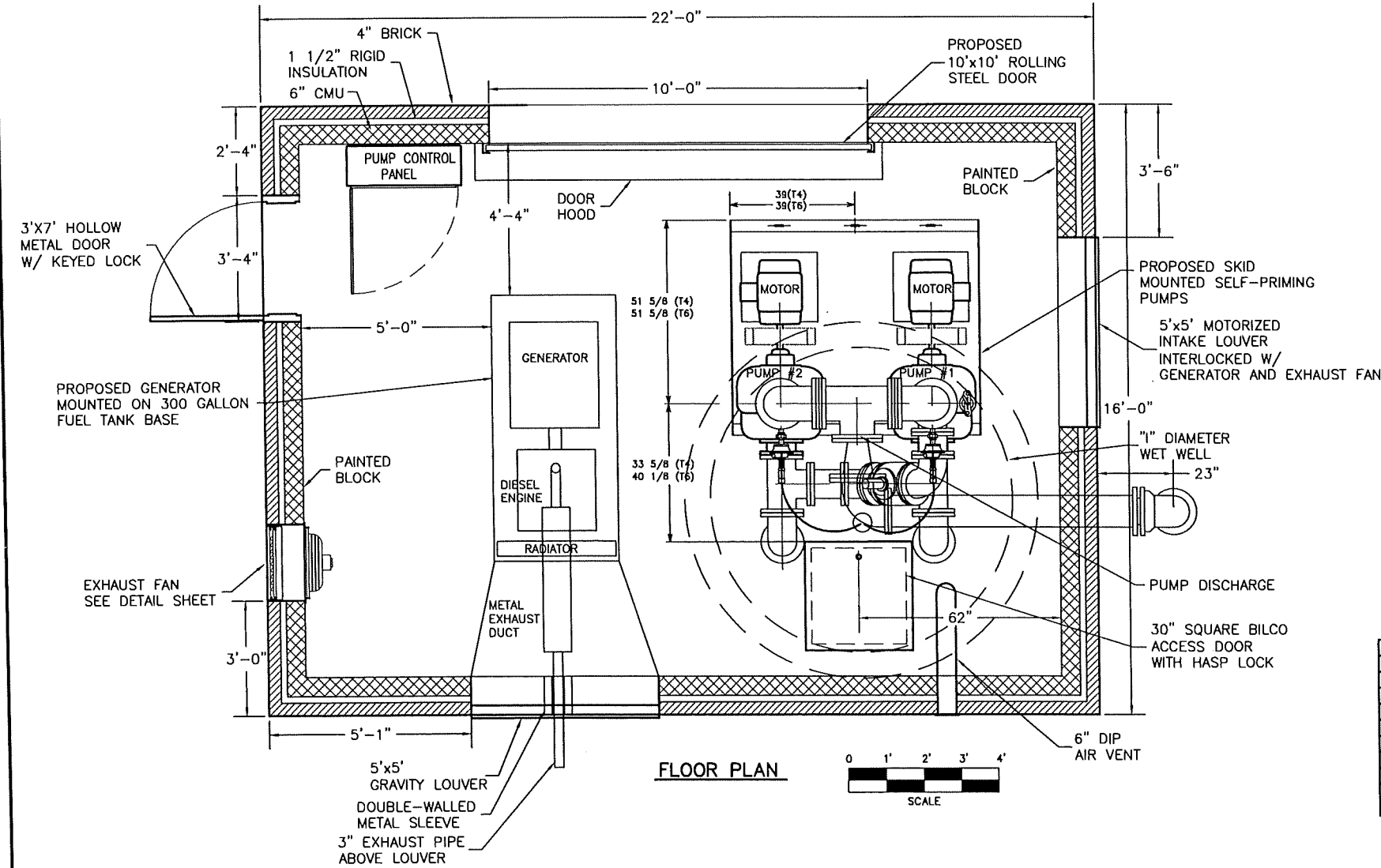


BASE BID-SELF PRIMING PUMP STATION DATA	
	PUMP STATION F-1
DESIGN FLOW	70,000 GPD
PUMP CAPACITY	350 GPM
TDH	108
FM SIZE	8 IN
FM EFFECTIVE LENGTH	18,225
FM HIGH POINT	175.5
VEL. @ PUMP RATE	2.24 FT/SEC
PUMP ON TIME	2.63 MIN
PUMP OFF TIME	16.31 MIN
SELECTED PUMP (OR EQUAL)	GORMAN RUPP T4A-B
RPM	1950
MIN HORSEPOWER	30
MIN EFFICIENCY	44%
IMPELLER	9.75
DISCHARGE	4 IN
WET WELL DIMENSIONS:	
A-RIM	125.28
B-INLET PIPE/ INVERT	EL 116.11 FT
C-HIGH WATER ALARM	EL 115.1 FT
D-LAG PUMP ON	EL 114.8 FT
E-LEAD PUMP ON	EL 113.8 FT
F-LEAD PUMP OFF	EL 111.80 FT
G-LOW LEVEL ALARM	EL 111.10 FT
H-BOTTOM WET WELL	EL 109.80 FT
I-DIAM WET WELL	8 FT
J-DISCHARGE PIPING	6 IN
K-SUCTION PIPING	6 IN

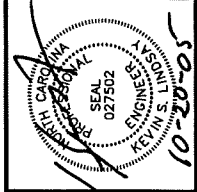


ITEM	DESCRIPTION	MATERIAL
1	PUMP	CAST IRON
2	DISCHARGE PLUG VALVE	CAST IRON
3	DISCHARGE TEE	CAST IRON
4	INTERCONNECT PLUG VALVE	CAST IRON
5	BELT GUARD ASSY	STEEL
6	SUCTION CHECK VALVE	CAST IRON
7	AIR RELEASE VALVE	CAST IRON 1" (SHIPPED LOOSE)
8	DISCHARGE CHECK VALVE	CAST IRON
9	MOTOR	CAST IRON
10	PUMP & MOTOR BASE ASSY	STEEL

**NOTE:**  
CONTROL PANELS PROVIDED BY OWNER  
ALONG WITH TELEMETRY CONTROL  
UNIT, REMOTE TERMINAL UNIT  
WITH ANTENNA, FLOATS AND  
FLOAT SUPPORTS.



REVISIONS	DATE	BY
SYMBOL	DESCRIPTION	DATE
	REVISED WITH	2011-23-04
		DFW



**Hobbs, Upchurch & Associates, P.A.**  
Consulting Engineers  
SOUTHERN PINES, NC - CHARLOTTE, NC  
MAGS HEAD, NC - RALEIGH, NC  
MYRTLE BEACH, SC - BEAUFORT, SC  
300 S.W. Broad Street, Southern Pines, North Carolina 28387  
Phone: (910) 692-5616 - Fax: (910) 692-4795



PUMP STATIONS  
FOR THE  
NORCROSS WATER AND SEWER DISTRICT  
CUMBERLAND COUNTY, NORTH CAROLINA  
SELF PRIMING PUMP STATION F1

DATE:	JAN., 2004
DESIGNED:	DFW
DRAWN:	DFW
CHECKED:	KSL
SCALE:	SCALE
SHEET NO.	58
OF:	68

H:\CU10103-95\PUMP\BLOG\001\PPBLDGSrev.dwg, FLOORPLAN-FALCON, 10/20/2005 9:12:45 AM, DWG, \\exchange\HPLJ5000, 1,2

# LEGEND

- GFI 20A, 120V, DUPLEX RECEPT, GFI
- WP WEATHERPROOF
- J JUNCTION BOX
- S 20A, 120V, SINGLE POLE SWITCH
- DISCONNECT RATING AS SHOWN
- POWER PANEL
- AUTOMATIC TRANSFER SW
- FLOW TRANSMITTER

PANEL TYPE: SQ D I-LINE TYPE HCM  
 VOLTS: 120/240  
 PHASE: 3 PHASE, 4 WIRE  
 30 KAIC

250 AMP MLO  
**"MDP"**

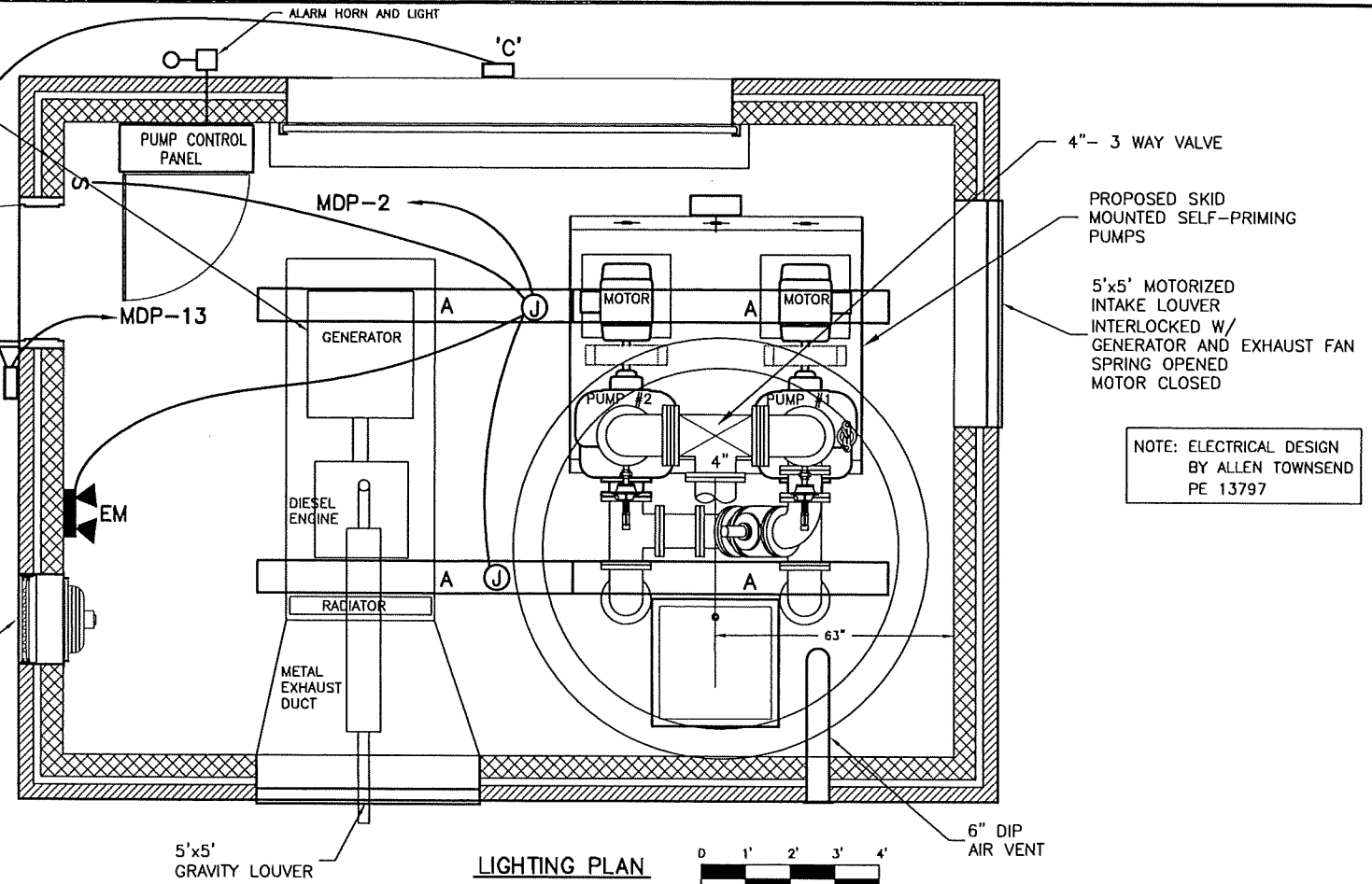
PROVIDE GROUND BAR  
 NEMA 1 ENCLOSURE

W	LOAD DESCRIPTION	WIRE SIZE	BKR. SIZE	CKT. NO.	L1 L2 L3	CKT. NO.	BKR. SIZE	WIRE SIZE	LOAD DESCRIPTION	W
980	EXHAUST FAN / LOUVER	12	20	1		2		4/0	PUMP CONTROL PANEL	26600
984	LIGHTS	12	20	3		4	200	4/0	PUMP CONTROL PANEL	26600
3000	RECEPTACLES	12	20	5		6	3	4/0	PUMP CONTROL PANEL	26600
1500	GEN. BLOCK HEATER	12	20	7		8		10	UNIT HEATER	1666
400	GEN. BATTERY CHARGER	12	20	9		10	30	10	UNIT HEATER	1666
800	SCADA PANEL	12	20	11		12	3	10	UNIT HEATER	1666
300	EXTERIOR LIGHTS	12	20	13		14			SPACE	
				15		16			SPACE	
				17		18			SPACE	
				19		20			SPACE	

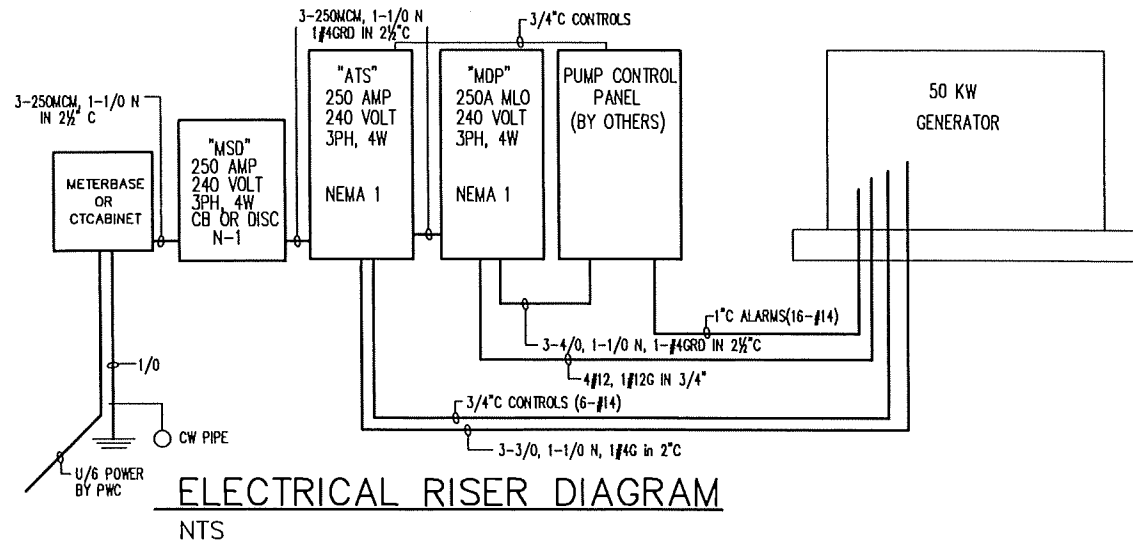
PROPOSED GENERATOR MOUNTED ON 300 GALLON FUEL TANK BASE

PROVIDE PHOTOCELL B IN THIS LIGHT TO CONTROL BOTH OUTSIDE LIGHT FIXTURES

EXHAUST FAN SEE DETAIL SHEET

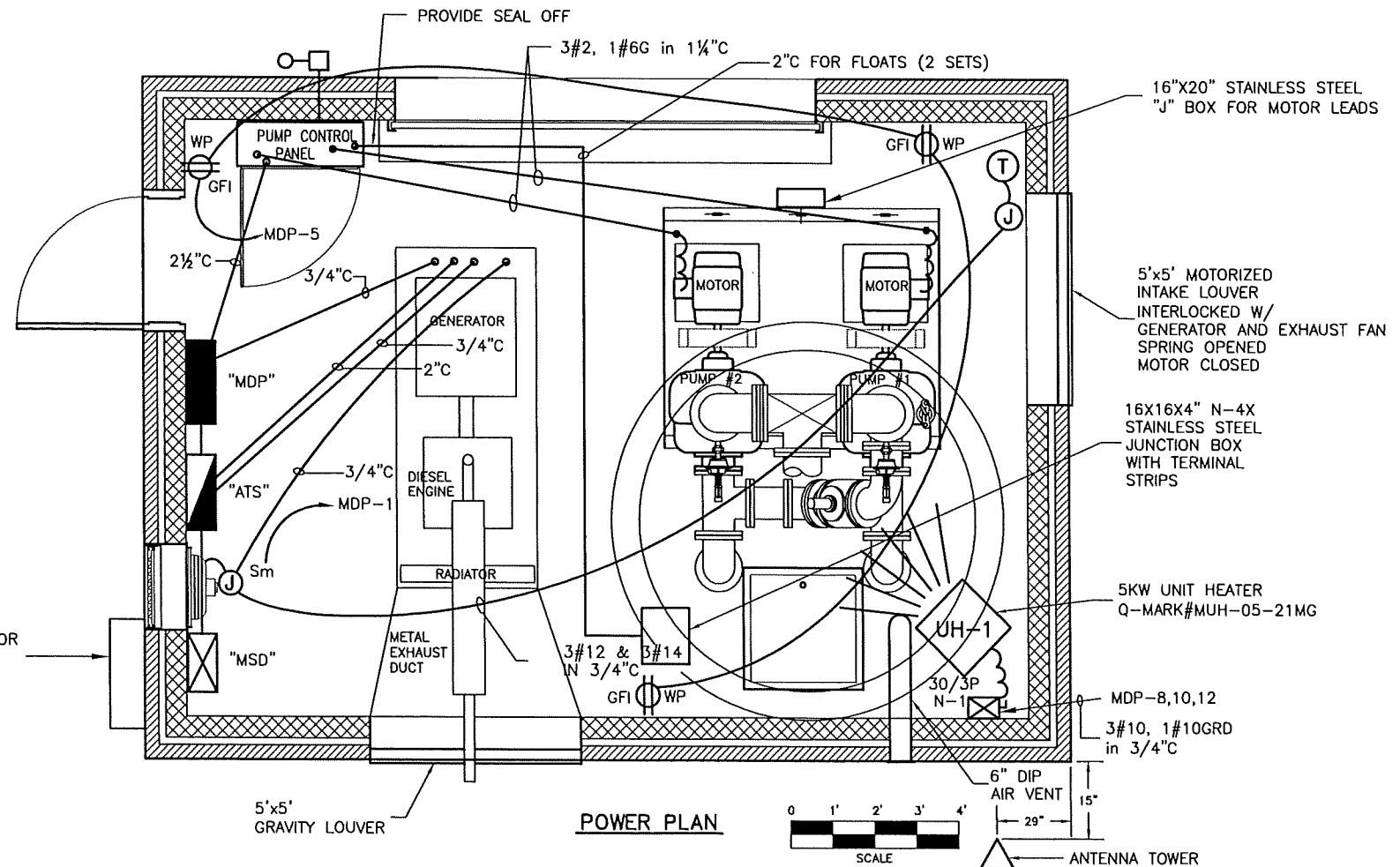


NOTE: ELECTRICAL DESIGN BY ALLEN TOWNSEND PE 13797



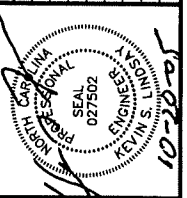
ELECTRICAL RISER DIAGRAM  
 NTS

FIXTURE SCHEDULE				
SYMBOL	MANUF.	CAT NO.	LAMPS	REMARKS
A	COLUMBIA	LU8-296HO-120	2-F96T12HO (110 WATT)	PROVIDE SPACER BETWEEN LIGHT & CEILING
B	SPAULDING	WGS1-M100PS-MT	1-100WMH	MOUNT 10'0" AFG
C	SPAULDING	WGST-M175-MT	1-175MH	MOUNT OVER DOOR 12'0" AFG
EM	PRESCOLITE	LMP-16	2-7.2W	MOUNT 10'0" AFF



POWER PLAN

REVISIONS	DATE	DESCRIPTION
1	11-23-04	DFW



**Hobbs, Upchurch & Associates, P.A.**  
 Consulting Engineers  
 SOUTHERN PINES, NC - CHARLOTTE, NC  
 MAYS HEAD, NC - RALEIGH, NC  
 MYRTLE BEACH, SC - BEAUFORT, SC  
 300 S.W. Broad Street, Southern Pines, North Carolina 28387  
 Phone: (910) 692-5616 - Fax: (910) 692-4795



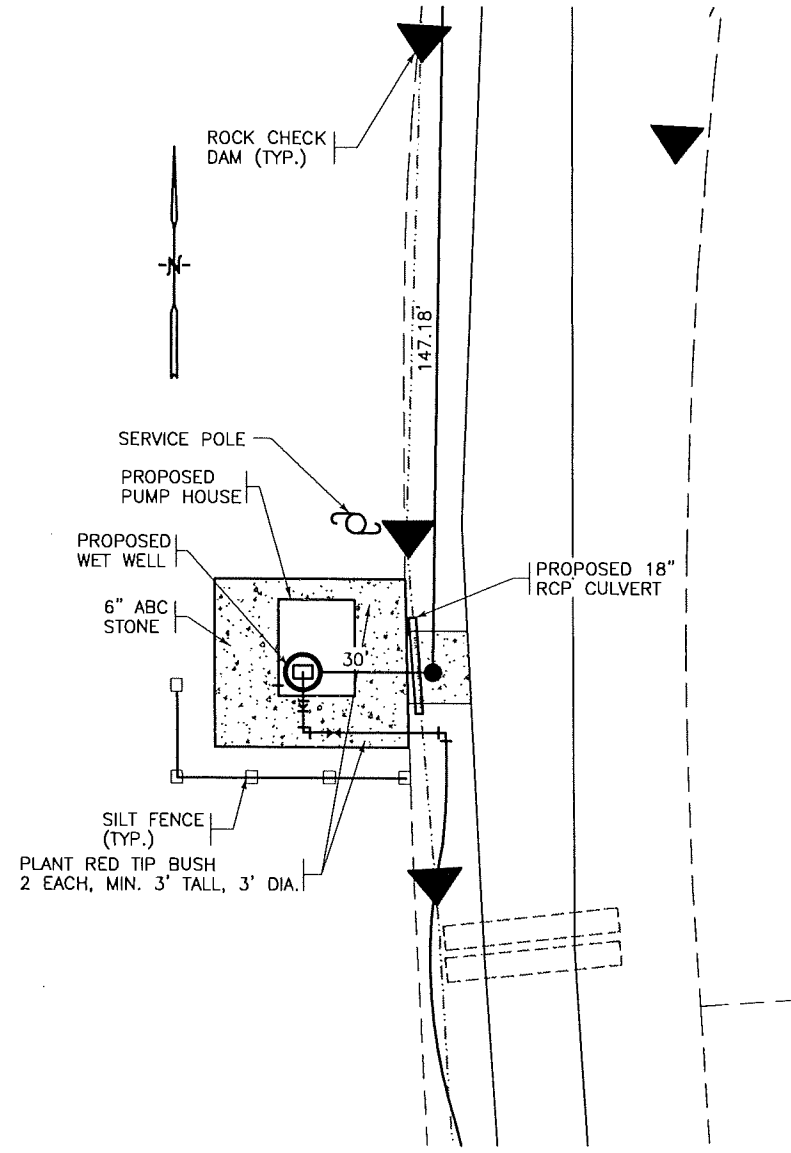
PUMP STATIONS FOR THE  
 NORCRESS WATER AND SEWER DISTRICT  
 CUMBERLAND COUNTY, NORTH CAROLINA  
 PUMP STATION F-1 POWER  
 AND LIGHTING PLANS

DATE:	DEC., 2003
DESIGNED:	DFW
DRAWN:	DFW
CHECKED:	KSL
SCALE:	SCALE
SHEET NO.:	E1

H:\CUI03\PUMPELECTRICAL.dwg, ELECTRICAL-FALCON, 10/20/2005 9:14:24 AM, DWG, V:\exchange\HPLJ5000, 1:3



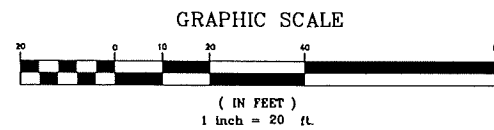
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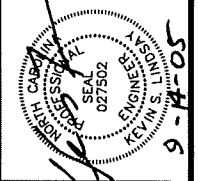
NOTE:  
CONTRACT 3 INCLUDES  
MANHOLE AND 5' STUBOUT  
FOR PUMP STATION

PROPOSED PUMP STATION G-1  
SITE PLAN

SITE ELEVATION 127.67'



SY. NO.	REVISIONS DESCRIPTION	DATE	BY



**Hobbs, Upchurch & Associates, P.A.**  
Consulting Engineers  
SOUTHERN PINES, NC - CHARLOTTE, NC  
MAYS HEAD, NC - RALEIGH, NC  
MYRTLE BEACH, SC - BEAUFORT, SC

300 S.W. Broad Street, Southern Pines, North Carolina 28387  
Phone: (910) 692-5616 - Fax: (910) 692-4795

TOWN OF GODWIN SANITARY SEWER SYSTEM  
FOR THE  
NORCROSS WATER AND SEWER DISTRICT  
CUMBERLAND COUNTY, NORTH CAROLINA

LAYOUT PUMP STATION G-1

DATE:	DECEMBER, 2002
DESIGNED:	KSL
DRAWN:	HMW3
CHECKED:	KSL
SCALE:	AS SHOWN
SHEET NO.	48
OF:	59



# LEGEND

- GFI 20A, 120V, DUPLEX RECEPT, GFI
- WP WEATHERPROOF
- JUNCTION BOX
- S 20A, 120V, SINGLE POLE SWITCH
- DISCONNECT RATING AS SHOWN
- POWER PANEL
- AUTOMATIC TRANSFER SW
- FLOW TRANSMITTER

PANEL TYPE: SQ D I-LINE TYPE HCM  
 VOLTS: 120/240  
 PHASE: 3 PHASE, 4 WIRE  
 30 KAIC

225 AMP MLO  
**"MDP"**

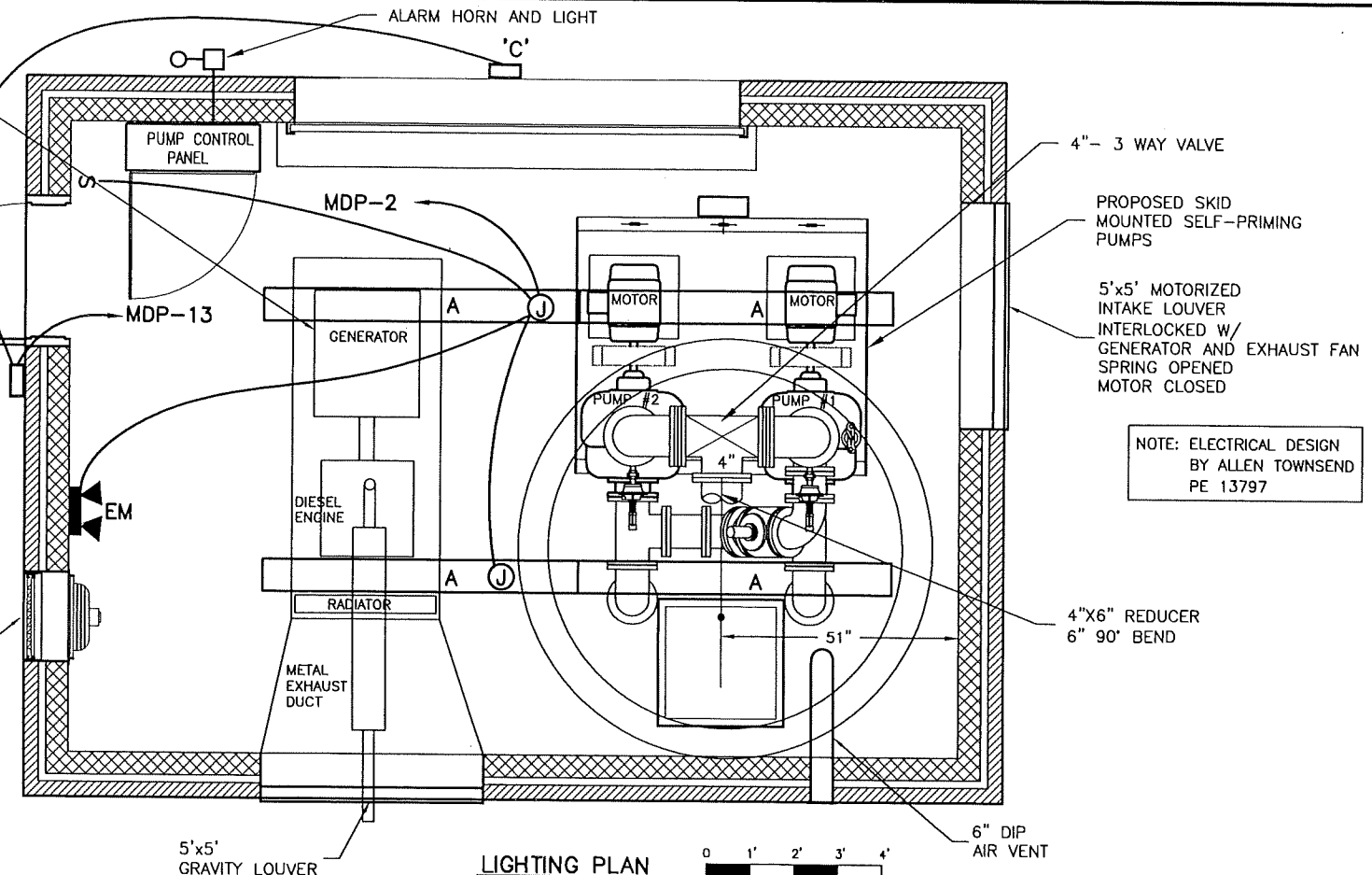
PROVIDE GROUND BAR  
 NEMA 1 ENCLOSURE

W	LOAD DESCRIPTION	WIRE SIZE	BKR. SIZE	CKT. NO.	L1	L2	L3	CKT. NO.	BKR. SIZE	WIRE SIZE	LOAD DESCRIPTION	W
980	EXHAUST FAN / LOUVER	12	20	1				2		3/0	PUMP CONTROL PANEL	22900
984	LIGHTS	12	20	3				4	175	3/0	PUMP CONTROL PANEL	22900
3000	RECEPTACLES	12	20	5				6		3/0	PUMP CONTROL PANEL	22900
1500	GEN. BLOCK HEATER	12	20	7				8		10	UNIT HEATER	1666
400	GEN. BATTERY CHARGER	12	20	9				10	30	10	UNIT HEATER	1666
800	SCADA PANEL	12	20	11				12		10	UNIT HEATER	1666
300	EXTERIOR LIGHTS	12	20	13				14				
				15				16				
				17				18				
				19				20				

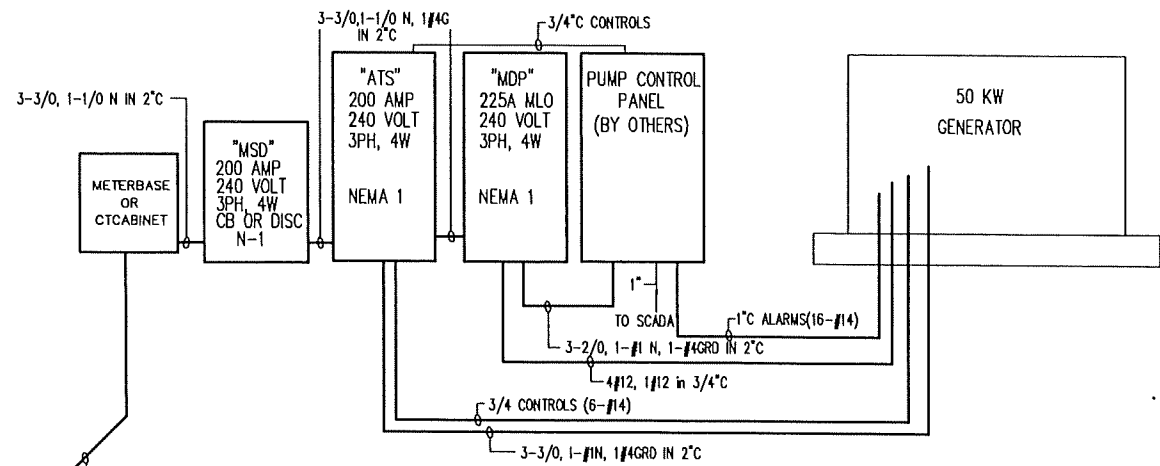
PROPOSED GENERATOR MOUNTED ON 300 GALLON FUEL TANK BASE

PROVIDE PHOTOCELL B IN THIS LIGHT TO CONTROL BOTH OUTSIDE LIGHT FIXTURES

EXHAUST FAN SEE DETAIL SHEET



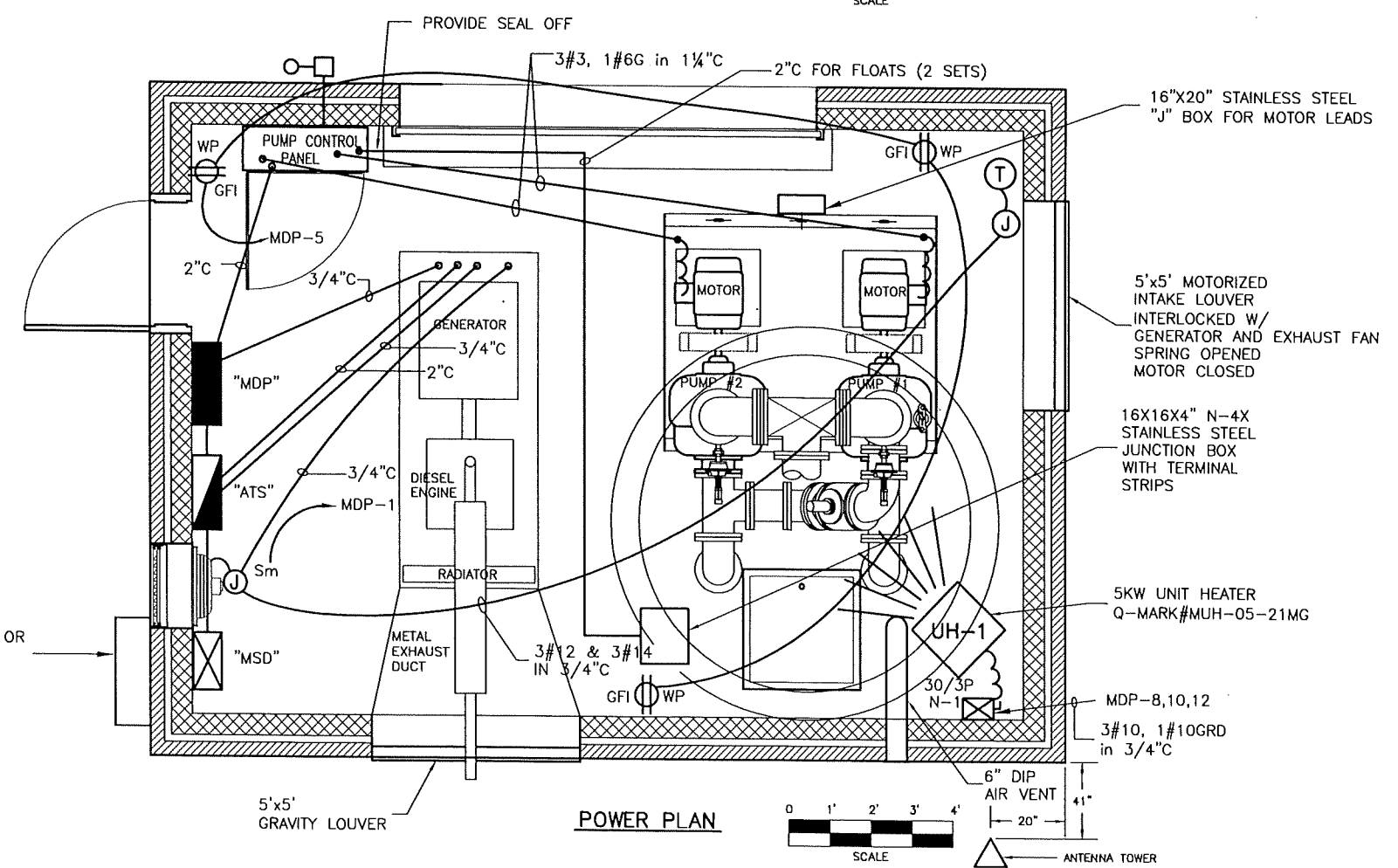
NOTE: ELECTRICAL DESIGN BY ALLEN TOWNSEND PE 13797



ELECTRICAL RISER DIAGRAM  
 NTS

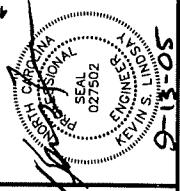
### FIXTURE SCHEDULE

SYMBOL	MANUF.	CAT NO.	LAMPS	REMARKS
A	COLUMBIA	LUB-296HO-120	2-F96T12HO (110 WATT)	PROVIDE SPACER BETWEEN LIGHT & CEILING
B	SPAULDING	WCSI-M100PS-MT	1-100WMH	MOUNT 10'0" AFG
C	SPAULDING	WGSI-M175-MT	1-175MH	MOUNT OVER DOOR 12'0" AFG
EM	PRESCOLITE	LMP-16	2-7.2W	MOUNT 10'0" AFF



POWER PLAN

REVISIONS	DATE	BY
SYMBOL	DESCRIPTION	DATE
	REVISED WITH 20' TO 22'	1-23-04 DFW



**Hobbs, Upchurch & Associates, P.A.**  
 Consulting Engineers  
 SOUTHERN PINES, NC - CHARLOTTE, NC  
 NAGS HEAD, NC - RALEIGH, NC  
 MYRTLE BEACH, SC - BEAUFORT, SC  
 300 S.W. Broad Street, Southern Pines, North Carolina 28387  
 Phone: (910) 692-5616 - Fax: (910) 692-4795



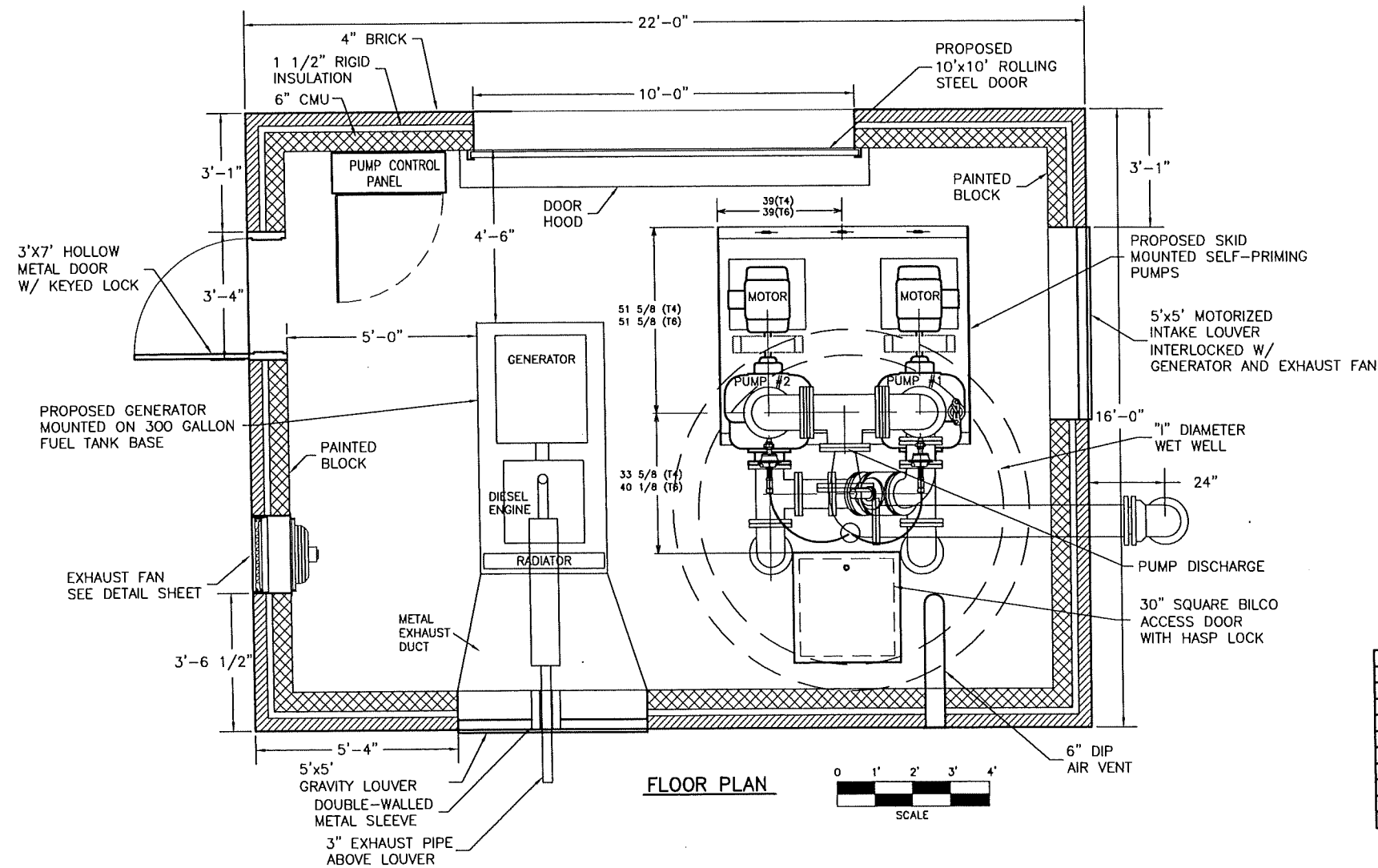
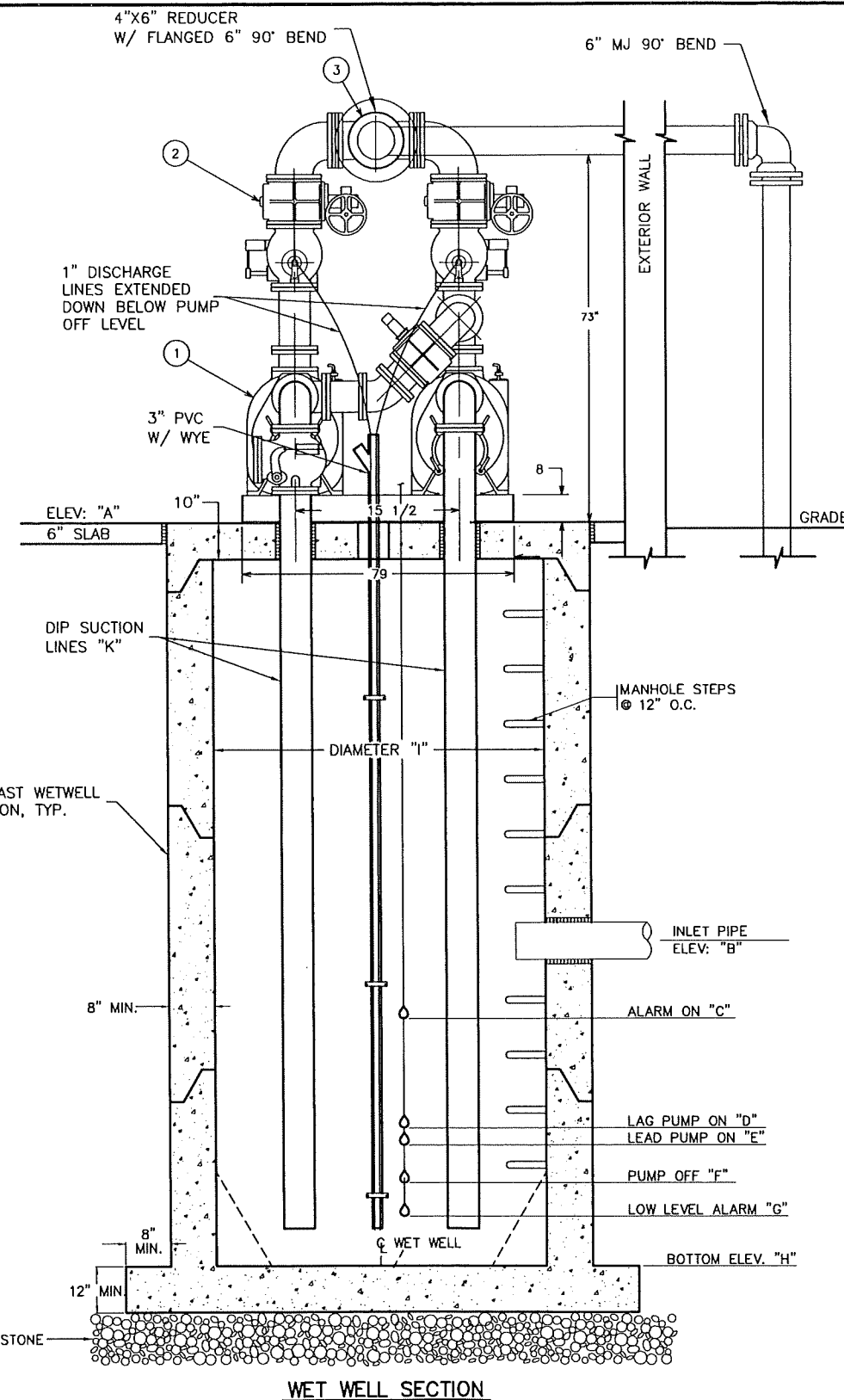
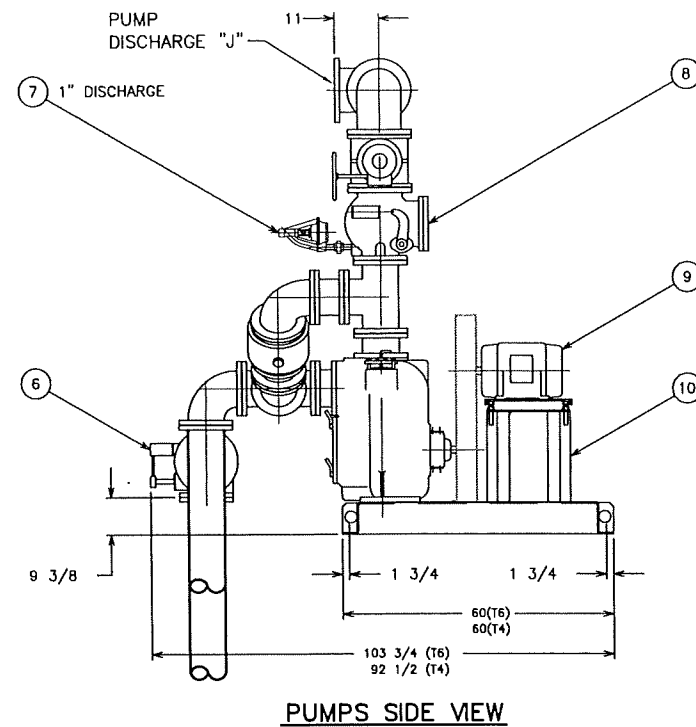
PUMP STATIONS FOR THE  
 NORCRESS WATER AND SEWER DISTRICT  
 CUMBERLAND COUNTY, NORTH CAROLINA  
 PUMP STATION G-1 POWER  
 AND LIGHTING PLANS

DATE:	DEC., 2003
DESIGNED:	DFW
DRAWN:	DFW
CHECKED:	KSL
SCALE:	SCALE
SHEET NO.	E1

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BASE BID--SELF PRIMING PUMP STATION DATA		
	PUMP STATION W-1	PUMP STATION W-2
DESIGN FLOW	45,000 GPD	125,000 GPD
PUMP CAPACITY	200 GPM	700 GPM
TDH	87 FT	82 FT
FM SIZE	6 IN	10 IN
FM LENGTH	6,081 FT	17,941 FT
FM HIGH POINT	147.5 FT	140.5 FT
VEL. @ PUMP RATE	2.27 FT/SEC	2.86 FT/SEC
PUMP ON TIME	2.23 MIN	1.84 MIN
PUMP OFF TIME	12.03 MIN	12.99 MIN
SELECTED PUMP (OR EQUAL)	GORMAN RUPP T4A3S-B	GORMAN RUPP T6A3S-B
RPM	1700	1400
MIN HORSEPOWER	20	40
MIN EFFICIENCY	35%	55%
IMPELLER	9.75 IN	12.375 IN
DISCHARGE	4 IN	6 IN
WET WELL DIMENSIONS:		
A-RIM	103.57	124.56
B-INLET PIPE/INVERT	12 INCH, @ EL. 91.30 FT	15 INCH, @ EL. 118.30 FT
C-HIGH WATER ALARM	EL. 90.0 FT	EL. 116.5 FT
D-LAG PUMP ON	EL. 89.5 FT	EL. 115.5 FT
E-LEAD PUMP ON	EL. 89.0 FT	EL. 115.0 FT
F-LEAD PUMP OFF	EL. 86.5 FT	EL. 112.5 FT
G-LOW LEVEL ALARM	EL. 85.5 FT	EL. 111.5 FT
H-BOTTOM WET WELL	EL. 84.5 FT	EL. 110.5 FT
I-DIAM WET WELL	8 FT	8 FT
J-DISCHARGE PIPING	4 IN	6 IN

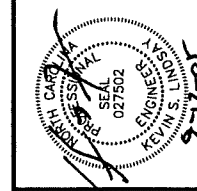


SELF PRIMING PUMPS WITH PARALLEL SERIES PIPING

ITEM	DESCRIPTION	MATERIAL
1	PUMP	CAST IRON
2	DISCHARGE PLUG VALVE	CAST IRON
3	DISCHARGE TEE	CAST IRON
4	INTERCONNECT PLUG VALVE	CAST IRON
5	BELT GUARD ASSY	STEEL
6	SUCTION CHECK VALVE	CAST IRON
7	AIR RELEASE VALVE	CAST IRON 1" (SHIPPED LOOSE)
8	DISCHARGE CHECK VALVE	CAST IRON
9	MOTOR	CAST IRON
10	PUMP & MOTOR BASE ASSY	STEEL

**NOTE:**  
CONTROL PANELS PROVIDED BY OWNER  
ALONG WITH TELEMETRY CONTROL  
UNIT, REMOTE TERMINAL UNIT  
WITH ANTENNA, FLOATS AND  
FLOAT SUPPORTS.

SY. NO.	DESCRIPTION	DATE	BY
1	REVISED WIDTH 30" TO 22"	1-23-04	DFW



**Hobbs, Upchurch & Associates, P.A.**  
Consulting Engineers  
SOUTHERN PINES, NC - CHARLOTTE, NC  
WAGS HEAD, NC - RALEIGH, NC  
MYRTLE BEACH, SC - BEAUFORT, SC  
300 S.W. Broad Street, Southern Pines, North Carolina 28387  
Phone: (910) 692-5616 - Fax: (910) 692-4795

PUMP STATIONS FOR THE  
NORCROSS WATER AND SEWER DISTRICT  
CUMBERLAND COUNTY, NORTH CAROLINA  
SELF PRIMING PUMP STATION W1, W2

DATE:	JAN., 2004
DESIGNED:	DFW
DRAWN:	DFW
CHECKED:	KSL
SCALE:	SCALE
SHEET NO.:	77
OF:	89

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# LEGEND

- GFI 20A, 120V, DUPLEX RECEPT, GFI
- WP WEATHERPROOF
- JUNCTION BOX
- S 20A, 120V, SINGLE POLE SWITCH
- DISCONNECT RATING AS SHOWN
- POWER PANEL
- AUTOMATIC TRANSFER SW
- FLOW TRANSMITTER

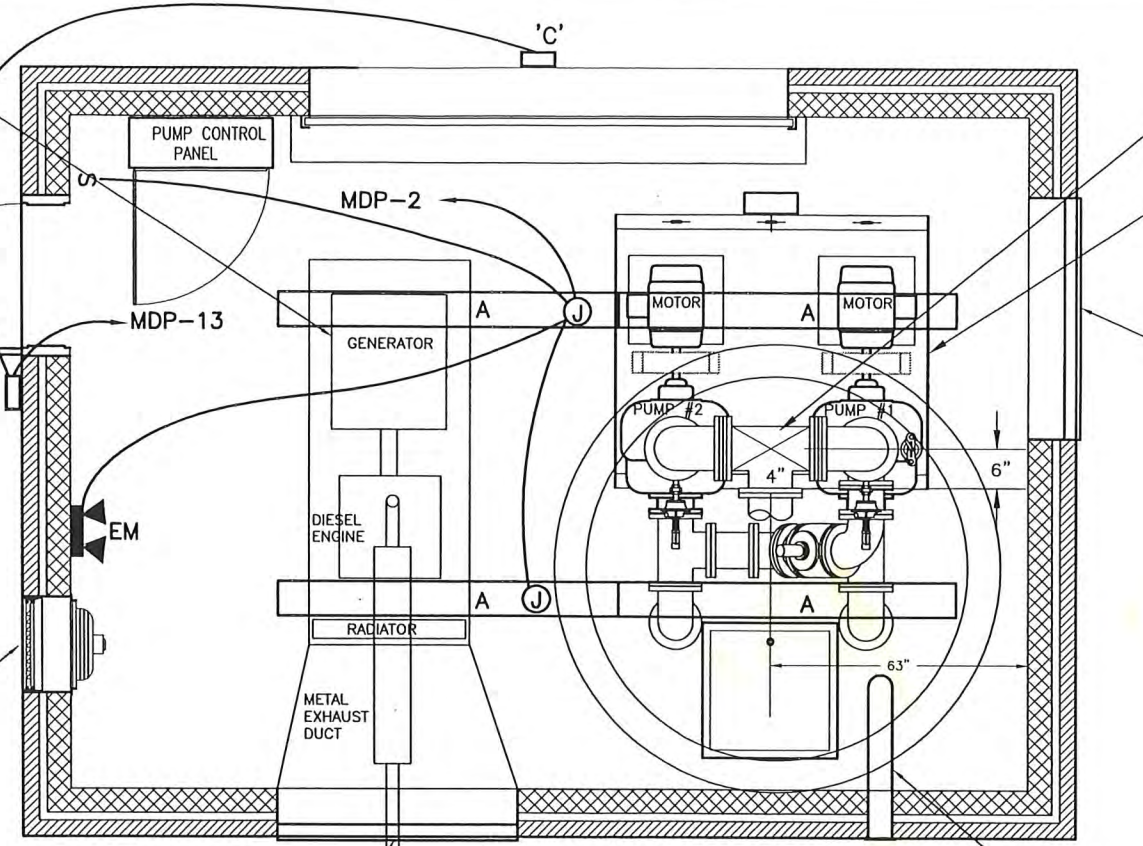
PANEL TYPE: SQ D I-LINE TYPE HCM 225 AMP MLO PROVIDE GROUND BAR  
 VOLTS: 120/240 "MDP" NEMA 1 ENCLOSURE  
 PHASE: 3 PHASE, 4 WIRE 30 KAIC

W	LOAD DESCRIPTION	WIRE SIZE	BKR. SIZE	CKT. NO.	L1	L2	L3	CKT. NO.	BKR. SIZE	WIRE SIZE	LOAD DESCRIPTION	W
980	EXHAUST FAN / LOUVER	12	20	1				2	2/0	2/0	PUMP CONTROL PANEL	18600
984	LIGHTS	12	20	3				4	2/0	2/0	PUMP CONTROL PANEL	18600
3000	RECEPTACLES	12	20	5				6	2/0	2/0	PUMP CONTROL PANEL	18600
1500	GEN. BLOCK HEATER	12	20	7				8	10	10	UNIT HEATER	1666
400	GEN. BATTERY CHARGER	12	20	9				10	3/0	10	UNIT HEATER	1666
800	SCADA PANEL	12	20	11				12	10	10	UNIT HEATER	1666
300	EXTERIOR LIGHTS	12	20	13				14			SPACE	
	SPACE							16			SPACE	
	SPACE							18			SPACE	
	SPACE							20			SPACE	

PROPOSED GENERATOR MOUNTED ON 300 GALLON FUEL TANK BASE

PROVIDE PHOTOCELL B IN THIS LIGHT TO CONTROL BOTH OUTSIDE LIGHT FIXTURES

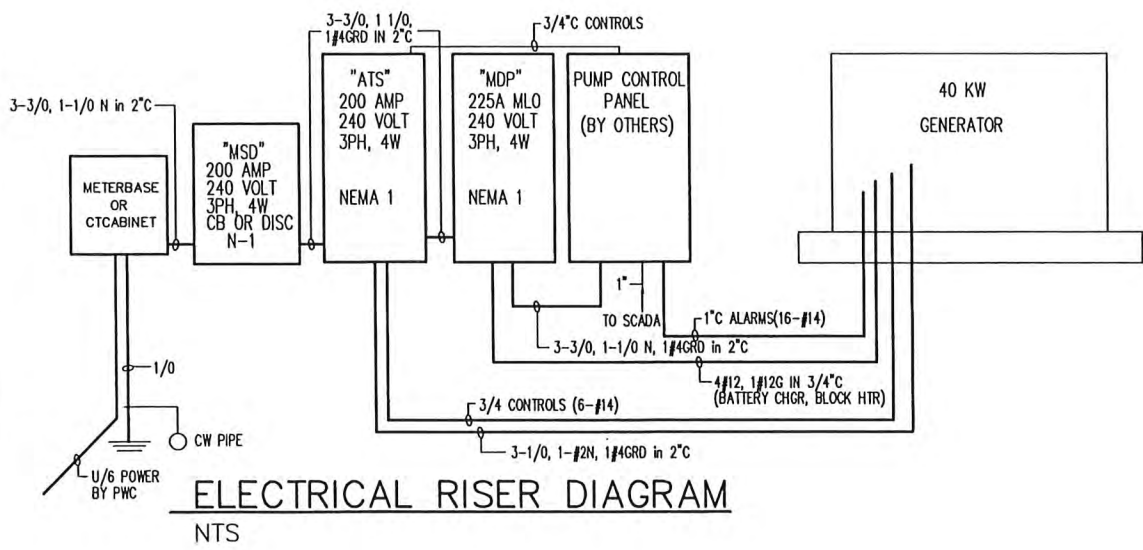
EXHAUST FAN SEE DETAIL SHEET



LIGHTING PLAN



NOTE: ELECTRICAL DESIGN BY ALLEN TOWNSEND PE 13797

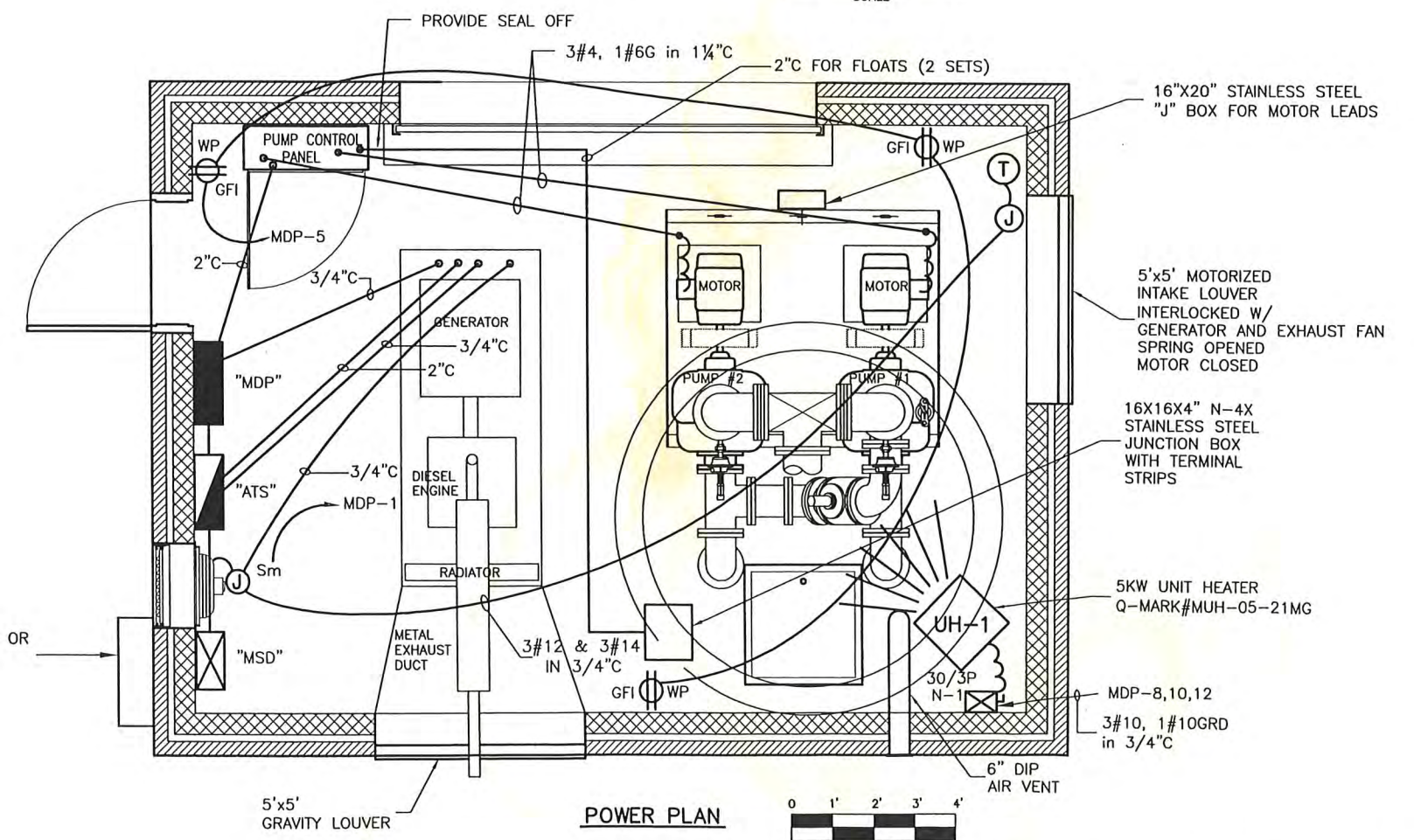


ELECTRICAL RISER DIAGRAM

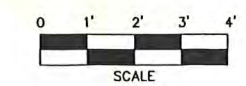
NTS

### FIXTURE SCHEDULE

SYMBOL	MANUF.	CAT NO.	LAMPS	REMARKS
A	COLUMBIA	LUB-296HO-120	2-F96T12HO (110 WATT)	PROVIDE SPACER BETWEEN LIGHT & CEILING
B	SPAULDING	WGS1-M100PS-MT	1-100WMH	MOUNT 10'0" AFG
C	SPAULDING	WGST-M175-MT	1-175MH	MOUNT OVER DOOR 12'0" AFG
EM	PRESCOLITE	LMP-16	2-7.2W	MOUNT 10'0" AFF



POWER PLAN



NO.	DESCRIPTION	DATE	BY
1	REVISED WITH 20 TO 22	11-23-04	DFW

**Hobbs, Upchurch & Associates, P.A.**  
 Consulting Engineers  
 SOUTHERN PINES, NC - CHARLOTTE, NC  
 NACS HEAD, NC - RALEIGH, NC  
 MYRTLE BEACH, SC - BEAUFORT, SC

300 S.W. Broad Street, Southern Pines, North Carolina 28387  
 Phone: (910) 692-5616 - Fax: (910) 692-4795

PUMP STATIONS FOR THE NORCROSS WATER AND SEWER DISTRICT CUMBERLAND COUNTY, NORTH CAROLINA

PUMP STATION W-1 POWER AND LIGHTING PLANS

DATE:	DEC., 2003
DESIGNED:	DFW
DRAWN:	DFW
CHECKED:	KSL
SCALE:	SCALE
SHEET NO.	E1

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# LEGEND

- GFI 20A, 120V, DUPLEX RECEPT, GFI
- WP WEATHERPROOF
- J JUNCTION BOX
- S 20A, 120V, SINGLE POLE SWITCH
- DISCONNECT RATING AS SHOWN
- POWER PANEL
- AUTOMATIC TRANSFER SW
- FLOW TRANSMITTER

PANEL TYPE: SQ D I-LINE TYPE HCM		400 AMP MLO		PROVIDE GROUND BAR	
VOLTS: 120/240		<b>"MDP"</b>		NEMA 1 ENCLOSURE	
PHASE: 3 PHASE, 4 WIRE					
		42 KAIC			

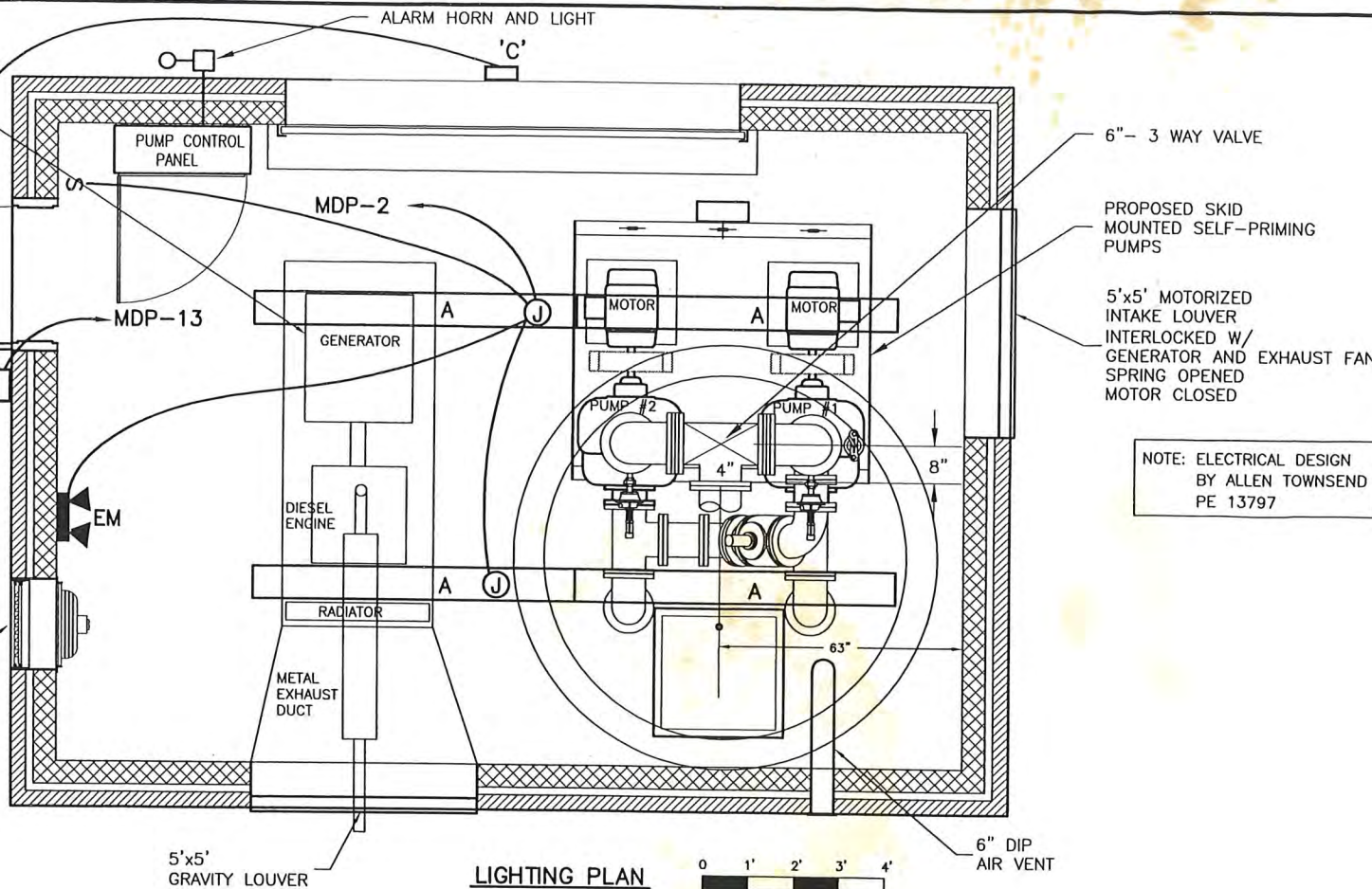
  

W	LOAD DESCRIPTION	WIRE SIZE	BKR. SIZE	CKT. NO.	L1	L2	L3	CKT. NO.	BKR. SIZE	WIRE SIZE	LOAD DESCRIPTION	W
980	EXHAUST FAN / LOUVER	12	20	1				2	250	250	PUMP CONTROL PANEL	34100
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400	GEN. BATTERY CHARGER	12	20	9				10	30/3	10	UNIT HEATER	1666
800	SCADA PANEL	12	20	11				12	10	10	UNIT HEATER	1666
300	EXTERIOR LIGHTS	12	20	13				14	20	12	FLOWMETER	50
	SPACE			15				16			SPACE	
	SPACE			17				18			SPACE	
				19				20			SPACE	

PROPOSED GENERATOR MOUNTED ON 300 GALLON FUEL TANK BASE

PROVIDE PHOTOCELL B IN THIS LIGHT TO CONTROL BOTH OUTSIDE LIGHT FIXTURES

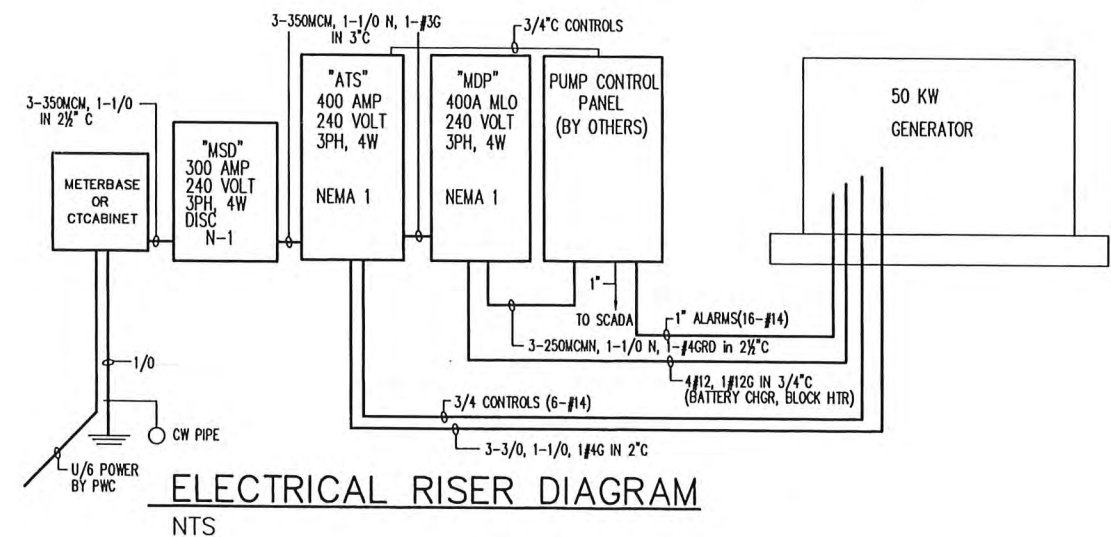
EXHAUST FAN SEE DETAIL SHEET



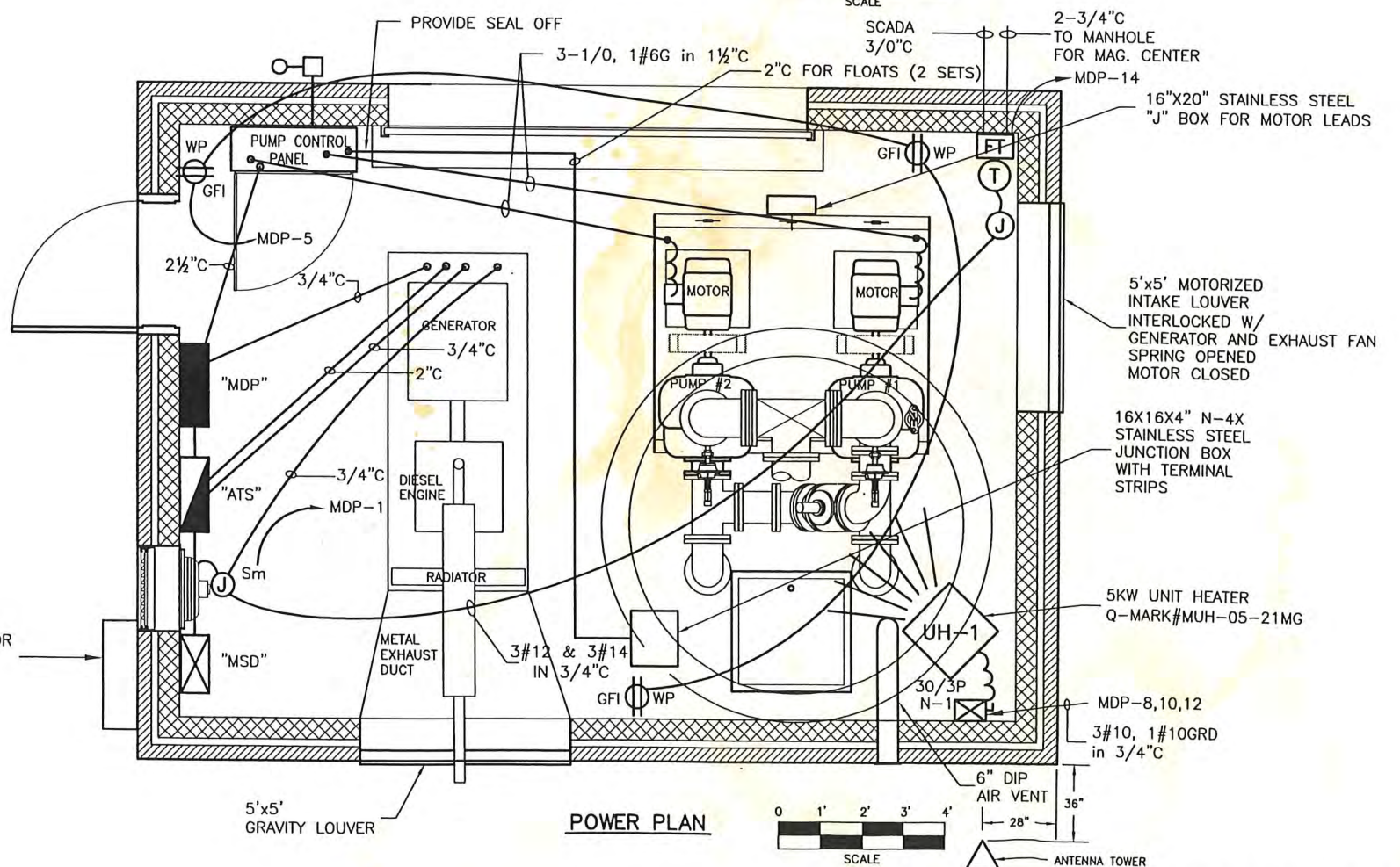
NOTE: ELECTRICAL DESIGN BY ALLEN TOWNSEND PE 13797

SYMBOL	DESCRIPTION	DATE	BY
	REVISED WIDTH 20' TO 22'	11-23-04	DFW

**Hobbs, Upchurch & Associates, P.A.**  
 Consulting Engineers  
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 NAGS HEAD, NC - RALEIGH, NC  
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FIXTURE SCHEDULE				
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EM	PRESCOLITE	LMP-16	2-7.2W	MOUNT 10'0" AFF



PUMP STATIONS FOR THE  
 NORCRESS WATER AND SEWER DISTRICT  
 CUMBERLAND COUNTY, NORTH CAROLINA  
 PUMP STATION W-2 POWER AND LIGHTING PLANS

DATE:	DEC., 2003
DESIGNED:	DFW
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SHEET NO.	E2



**SEWER ASSET MANAGEMENT PLAN**

**OVERHILLS  
WATER AND SEWER DISTRICT**

**CUMBERLAND COUNTY, NC**



PINEHURST, NORTH CAROLINA

**SEWER ASSET MANAGEMENT PLAN**

**OVERHILLS  
WATER AND SEWER DISTRICT**

**CUMBERLAND COUNTY, NC**

**MATTHEW JONES, PE**  
matthew.jones@mcgillassociates.com



5 Regional Circle, Suite A  
Pinehurst, North Carolina 28374  
910.295.3159

**AUGUST 2025**

**PROJECT NO. 20.02507**

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- Appendix A – Smoke Testing Results List**
- Appendix B – Manhole Inspection List**
- Appendix C – Overhills Spring Lake Agreement**
- Appendix D – Lift Station Record Drawings**

## **EXECUTIVE SUMMARY**

---

The purpose of this Asset Management Plan (AMP) is to document the condition of the Overhills District sewer system infrastructure to assist the County with becoming more proactive in the management and financing of its sewer collection system. The Overhills Sewer District serves approximately 107 residential connections in the northern area of Cumberland County. There are 318 properties within the district are not currently connected and are paying the sewer availability fee. The District's wastewater collection system consists of approximately three miles of gravity sewer and force main with 119 manholes. Collected wastewater is pumped from the Collingwood Street Lift Station and the Brinkley Drive Lift Station, both of which are owned by Cumberland County and operated by the Town of Spring Lake. Flow generated from the district is ultimately treated at the Spring Lake Wastewater Treatment Plant (NC0030970), which is owned and operated by the Town of Spring Lake.

This asset inventory and assessment consisted of assembling data on sewer pipes, manholes, and other appurtenances in the collection system. This assessment included performing inspections of selected manholes, performing smoke testing throughout the system, and reviewing existing data with County Staff. This information was evaluated and is summarized in this document which includes the asset management plan and capital improvements plan. This process resulted in the development of a 10-year Capital Improvements Plan (CIP) to guide the District with scheduling and financing the capital projects and equipment purchases necessary to maintain and improve its wastewater collection system. Through the AMP process, no significant rehabilitation is currently needed, but additional monitoring and investigation is recommended.

The CIP includes a focused improvement to critical components within the sewer system that need rehabilitation or replacement based on existing condition, and on improvements that could improve management of the sewer system for staff. These planned projects will bring the County into a better position to serve its customers by improving the reliability of the collection system. The County should look to its CIP to guide its next

projects, and the CIP should be updated regularly as priorities change and as projects are completed. It is noted that many factors may impact the priorities including failures, and funding availability both locally and through grant and loan programs. This assessment project provides evidence for the prioritization of manhole rehabilitation and improvement projects in the CIP.

### ***System Evaluation***

All of the pipe material in the Overhills system is PVC and Ductile pipe. The collection system was first put into service in 2019, therefore the relative age of the system is low. All the piping in this system is SDR-26 PVC pipe, which is the most common material used for sewer systems today. The typical useful life for PVC pipe is anywhere from 40 to 60 years.

As part of the AMP, McGill Associates, PA (McGill) assisted the District with evaluating the condition of its sewer infrastructure to identify projects in line with these goals. The following items were included in the AMP scope:

- Identify areas to conduct smoke testing to identify potential sources of I/I into the sewer system;
- Review and analyze County-provided information for the Overhills lift station;
- Inspect selected sewer manholes within the system to establish overall system condition;
- Identify and evaluate potential sewer system improvements;
- Prioritize sewer system improvements;
- Prepare opinions of probable costs for sewer system improvements; and
- Create a Capital Improvements Plan;

### **Manhole Inspections**

All manholes in the Overhills sewer system are precast concrete based on information provided by County staff. The results of the selected manhole inspections performed as a part of this inventory were used to develop an assessment of manhole conditions in the

system. Based on the inspections performed, manholes that were inspected were assigned a condition score, and these scores were combined into an overall condition rating for each manhole- excellent, good, fair, or poor. The results of manhole inspections are summarized in Figures 8 and 9, and the full inventor is included in Appendix A.

### Lift Station Inspection

All sewer flow from the Overhills District is pumped through one of two lift stations to the Town of Spring Lake. The lift stations are on Brinkley Drive and Collingwood Street. Full inspection and assessment of the stations were not included as a part of this assessment.

### Findings and Recommendations

The system evaluation allowed McGill to assemble a list of general recommendations and high priority projects to guide the County in the next 10 years. General recommendations to the District included establishing its own flow monitoring and smoke testing programs in high priority areas to determine sewer rehabilitation needs and inspecting sewer lines and manholes with CCTV equipment during routine cleanings to track the condition of these items. McGill also recommended the County begin rehabilitation of existing manholes within the collection system in order to reduce the risk of I/I. Additionally, we made recommendations for improving the performance of the existing pumps at the Brinkley Road lift station.

Data and field investigation reporting were utilized to identify the priority projects within the collection system, focusing on manhole rehabilitation.

Table 1 summarizes projects identified during this assessment, centering around manhole rehabilitation projects. A project to install flow monitors is included to give greater control and understanding of flows from the collection system.



**Table 1: Summary of Capital Improvements Projects**

No.	Project Name	Cost
1	Manhole Rehabilitation Project 1	\$84,100.00
2	Brinkley Lift Station Improvements	\$33,100.00
3	Manhole Rehabilitation Project 2	\$84,100.00
3	Manhole Rehabilitation Project 3	\$84,100.00
<b>10-Year CIP Total Project Cost</b>		<b>\$285,400.00</b>

***Capital Improvements Plan***

The purpose of this asset inventory and assessment was to document the condition of the District’s inventoried infrastructure to assist the County with becoming proactive in the management of its wastewater system, to include capital project planning. The County does not currently have a Capital Improvements Plan (CIP) for its wastewater system. The CIP being developed from this current assessment will guide the County through its planning for projects within the 10-year window. The CIP will remain a living document and be updated in the future so that it remains current to the Districts’ highest priorities and provides accurate cost estimates. The CIP included in this assessment includes projects focused on rehabilitation of existing manholes, which have been identified to be potential sources for I/I into the system. Through discussion with County staff, field investigation, and review of existing system data, the specific defects and general problematic areas within the wastewater system have been summarized. These results were used to develop the CIP and formulate a ten-year plan.

The complete asset inventory and assessment task consisted of five parts culminating in the development of the Overhills Water and Sewer District’s CIP.

McGill developed cost estimates for all projects based on current 2024 materials and construction costs. The updated CIP is intended to be adopted by the County to guide its selection of sewer system improvement projects over the next decade. This plan also includes a budget-level recommendation for staffing associated with system operations and maintenance for all County utility districts.

### 1.1 BACKGROUND

The Overhills District is located on E. Manchester Road, just outside of the Town of Spring Lake municipal limits in Cumberland County, North Carolina. It is owned by Cumberland County and maintained by the Town of Spring Lake. The District includes a wastewater collection system that currently serves 107 residential customers as of August 2025. The collection system consists of approximately three miles of gravity sewer mains that are 8-inch in diameter and force main that is 6-inch in diameter. These gravity and force main sewer lines are constructed of PVC and were constructed in 2019. Figure 1 shows the existing sewer collection system.

Creating a Capital Improvements Plan (CIP) will allow the County to update its current rate setting model to better estimate future revenue and expenses, capital outlay, indebtedness, and overall health of the sewer system enterprise fund reserves. A model of this nature would continue to balance revenues and expenditures with a longer-term approach to rate setting and establish a financially sound framework for the County to follow.

Even with the relatively young age of the Overhills system, County staff remains cognizant that infiltration and inflow (I/I) is always a concern, particularly in a scenario where the County's operation costs are based on the gallons of flow that enter into the existing lift station. Therefore, the top challenges for the Overhills sewer system are mitigating I/I that results from deteriorating infrastructure and collecting reliable data on existing sewer flows for operations and maintenance planning. The information collected through this assessment project will help identify system deficiencies and develop improvement projects to reach these goals.

This process resulted in the development of a 10-year CIP to guide the County with scheduling and financing the capital projects and equipment purchases necessary to restore its wastewater collection system.

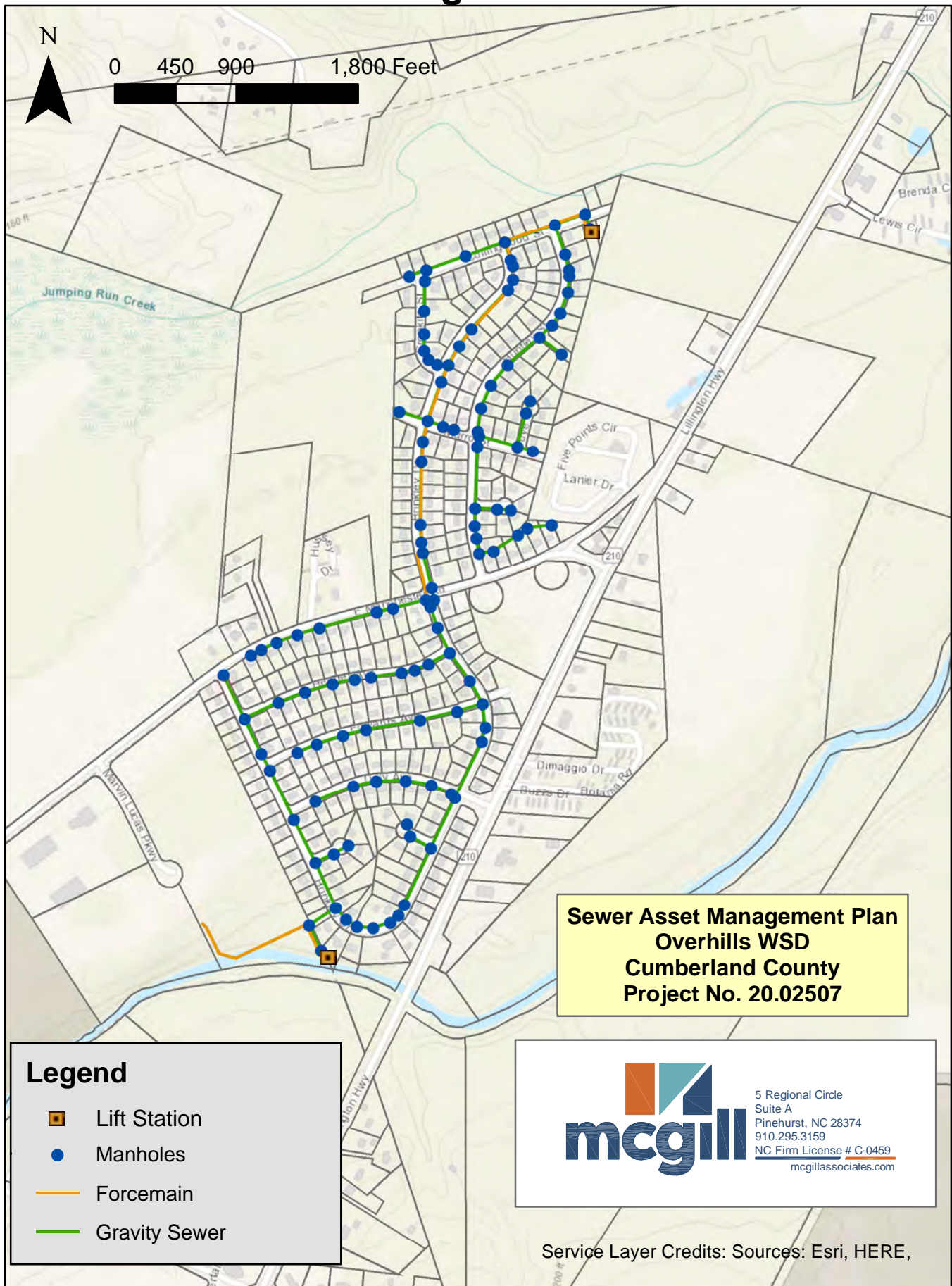
The purpose of this Asset Management Plan (AMP) is to document the condition of the Districts' inventoried infrastructure to assist the District with becoming more viable and proactive in the management and financing of its wastewater system. The District continues to look to its CIP to guide its next projects; therefore, it is vital that the CIP remains current to the Districts' highest priorities and provides accurate cost estimates. This assessment project was utilized for the prioritization of replacement of lines and improvement projects in the CIP.

**Table 2: Summary of Customers by Use**

<b>Diameter</b>	<b>Total</b>	<b>% of System</b>
<b>Flat Rate</b>	<b>107</b>	<b>100%</b>
<b>Total LF</b>	<b>107</b>	<b>100%</b>

# Overhills Overall System Map

## Figure 1



## 2.1 SMOKE TESTING

### 2.1.1 Overview

Smoke testing is one of the most cost-effective ways to locate defects in sewer mains and laterals. In this process, artificially produced non-harmful smoke is injected into the sewer line via a blower placed over a selected manhole. The pressurized smoke travels up and down the sewer line and connections and emerges at openings in the system. This visual aide allows test crews to easily identify, record, and mark locations where defects are present. If the sewer is in good condition, one should only see smoke rising from manhole lids and house roof vents. If the line has defects, such as breaks or illegal connections, the smoke will emerge at these points.

### 2.1.2 Investigation

McGill met with County staff to identify areas that would benefit most from smoke testing. Based on the size of the Overhills District, it was determined that the entire system could be smoke tested. McGill prepared a detailed map of the area based on the County's GIS database. The Fire Department and customers along the route were alerted to the upcoming testing.

### **2.1.3 Methodology**

McGill and County staff smoke tested all three miles of gravity sewer lines over a period of two days to determine locations where I/I enter the wastewater collection system. For each line to be tested, County staff recommended a centrally located manhole on which to place the blower based on the manhole's accessibility and avoidance of traffic. The manhole nomenclature used by the County was utilized and the location, configuration, and condition of each one was recorded.

At each location, the following procedure was executed.

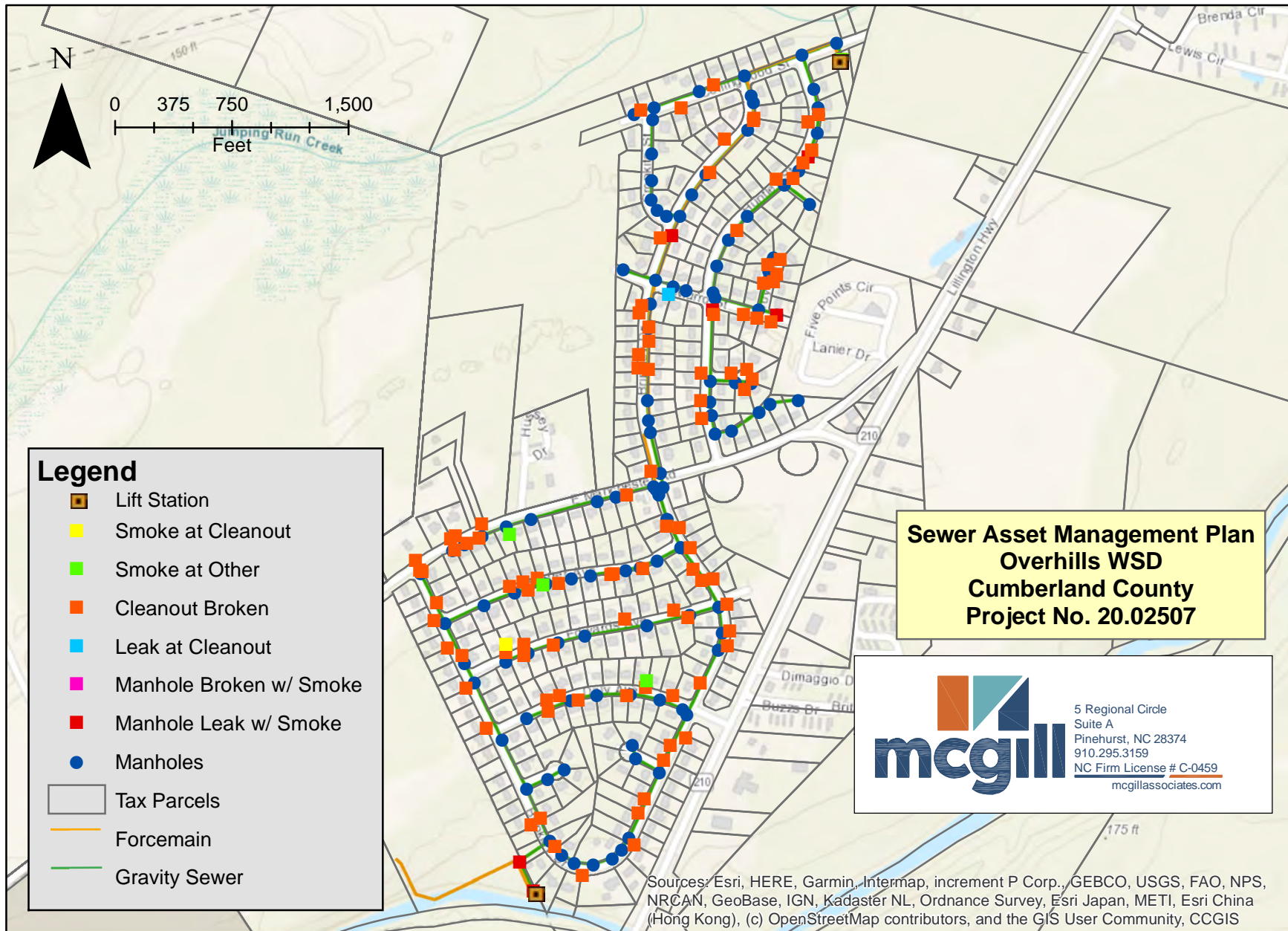
1. Place the blower on the manhole (with the rubber seal, if necessary).
2. Fill smoke pump up to  $\frac{3}{4}$  with liquid smoke.
3. Close all smoke pump valves.
4. Start blower and allow to warm up.
5. Open smoke pump valves.
6. Pressurize smoke pump by pumping the canister manually.
7. Once smoke begins emerging from roof vents, begin surveying for smoke emergencies indicating defects or problem areas in the pipeline.
8. For each defect, record the opening type, address, manhole identifier, and notes.
9. Additionally, mark each defect with paint.

This process continued until all visible defects were marked and recorded. Figure 2 shows some problematic system openings.



# Overhills Smoke Testing Map

## Figure 2





### **2.1.4 Results**

The crew recorded 107 abnormal smoke outlets, which divided generally into four categories.

1. **Uncapped cleanouts or elder valves:** Several cleanout and elder valve caps were missing or broken. The cumulative number of broken cleanouts in the District can contribute to significant I/I. County staff had repair caps on hand during the testing and were able to install new caps where needed. Some caps on cleanouts and elder valves were unscrewed and were able to be re-affixed during the testing.
2. **Broken Cleanouts:** Ground smoke was detected adjacent to the cleanout, which appeared to be damaged or below grade. Replacement of the cleanout assembly will be needed.
3. **Ground Smoke:** Ground smoke can be the result of broken lines, joint separation, etc. Any of these problems can cause significant I/I.
4. **Unsealed manholes:** Some manholes emitted excess smoke indicating cracked concrete or offset rings. Manholes located in ditches are the most likely to contribute I/I.

A spreadsheet describing all smoke occurrences can be found in Appendix A and all locations were documented in the mapping information in ArcGIS for the County staff's use.

## **2.2 SEWER MAINS**

### **2.2.1 Overview**

Overhills sewer mains consist of polyvinyl chloride (PVC) and ductile iron pipe. The District's existing sewer lines are 8-inches in diameter. The age of the system and system materials were confirmed by the County based on records from construction of the system in 2019. Condition was determined based on visual inspection of select manholes and smoke testing of the system.

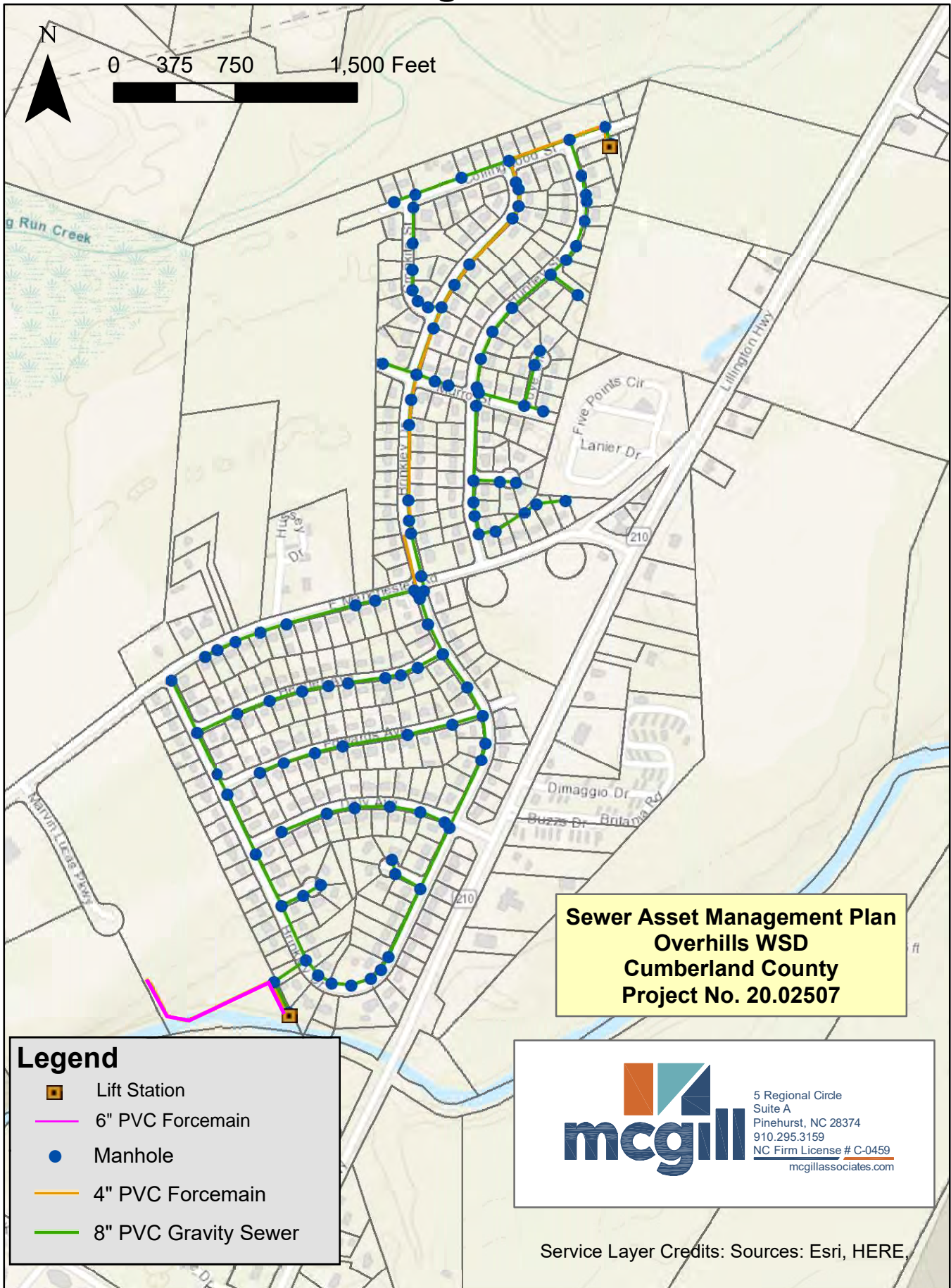
### **2.2.2 Investigation**

With District input from County staff, McGill has reviewed the district's data on the sewer mains throughout the District's collection system. The sewer main material and diameters were verified by the County and updated according to GIS records. Figure 3 shows the sewer line diameter and material in the system.

The purpose of this portion of the assessment was to create a working system inventory and then review which areas of Overhills District have system components in need of replacement or rehabilitation.

# Overhills Sewer Line Diameter Map

## Figure 3



### 2.2.3 Methodology

McGill reviewed the District's GIS data for the sewer collection system. County staff provided information on manholes where deterioration was suspected. Smoke testing was performed throughout the system. The County's GIS mapping was utilized to create maps that document the collection system by material and by diameter.

### 2.2.4 Results

The existing gravity sewer pipe in the sewer system is 8-inch in diameter based on Record Drawings for the system. All pipe diameters therefore do meet current NCDEQ minimum design standards. Based on the young age of the system, the PVC pipe installed in 2019 has not exceeded its useful life, and therefore replacement is not recommended outright. Recommendations will include planned CCTV inspections by the County of the existing piping in order to verify existing conditions and provide future updates to this AMP/CIP. Based on the age of the pipes and no documented issues from County staff, pipe in the system has been noted to be in good/excellent condition. Tables 3 through 6 show the assessment based on material and then broken out by diameter.

**Table 3: Summary of Gravity Sewer Main by Material**

<b>Material</b>	<b>Diameter Range (in)</b>	<b>Total LF</b>	<b>% of GS</b>
<b>Polyvinyl Chloride Pipe</b>	8	<b>17,420</b>	<b>100%</b>
<b>Total LF</b>	<i>N/A</i>	<b>17,420</b>	<b>100%</b>

**Table 4: Summary of Gravity Sewer Main by Diameter**

<b>Diameter</b>	<b>Total LF</b>	<b>% of System</b>
<b>8"</b>	<b>17,420</b>	<b>100%</b>
<b>Total LF</b>	<b>17,420</b>	<b>100%</b>

**Table 5: Summary of Force Main by Material**

<b>Material</b>	<b>Diameters (in)</b>	<b>Total LF</b>	<b>% of System</b>
<b>Polyvinyl Chloride</b>	<b>4, 6</b>	<b>3,948</b>	<b>100%</b>
<b>Total LF</b>	<b>N/A</b>	<b>N/A</b>	<b>100%</b>

**Table 6: Summary of Force Main Sewer Main by Diameter**

<b>Diameter</b>	<b>Total LF</b>	<b>% of System</b>
<b>4"</b>	<b>2,994</b>	<b>76%</b>
<b>6"</b>	<b>954</b>	<b>24%</b>
<b>Total LF</b>	<b>3,948</b>	<b>100%</b>

**Table 7: Summary of Force Main Sewer Main Conditions by Age**

<b>Year Put Into Service</b>	<b>Total LF</b>	<b>% of GS</b>
<b>2019</b>	<b>3,948</b>	<b>100%</b>
<b>Total LF</b>	<b>3,948</b>	<b>100%</b>

## **2.3 MANHOLE INSPECTIONS**

### **2.3.1 Overview**

Manholes are the primary access points to the sanitary sewer system and are essential for its operation and maintenance. As they allow personnel access to the sewer system, manholes are also likely culprits for allowing I/I to enter the sewer system. Manholes in low-lying areas with improperly sealed lids, manhole joints, and poor connection practices can all be sources of I/I. Storm drains or the presence of manholes in ditches and low-lying areas in Overhills frequently allow standing water to remain for hours or days after a storm event which can exacerbate inflow through manhole lids. Reports from construction of the sewer system noted that the existing water lines in the Overhills neighborhood experienced several breaks due to asbestos cement (AC) water lines that are heavily deteriorated in some areas. Additionally, during construction I/I was observed from either groundwater or leaking water lines into various manholes and wetwells in the project area.

One of the most cost-effective practices for managing this intrusion is visual manhole inspections, where the various components of the manhole are rated according to their condition. Some examples of noticeable deficiencies are benches which have deteriorated from abrasion and corrosion and rings which can be moved by traffic, soil, and the freeze/thaw cycle. Defects in any aspect of the manhole can lead to I/I, structural instability, and manhole failure.

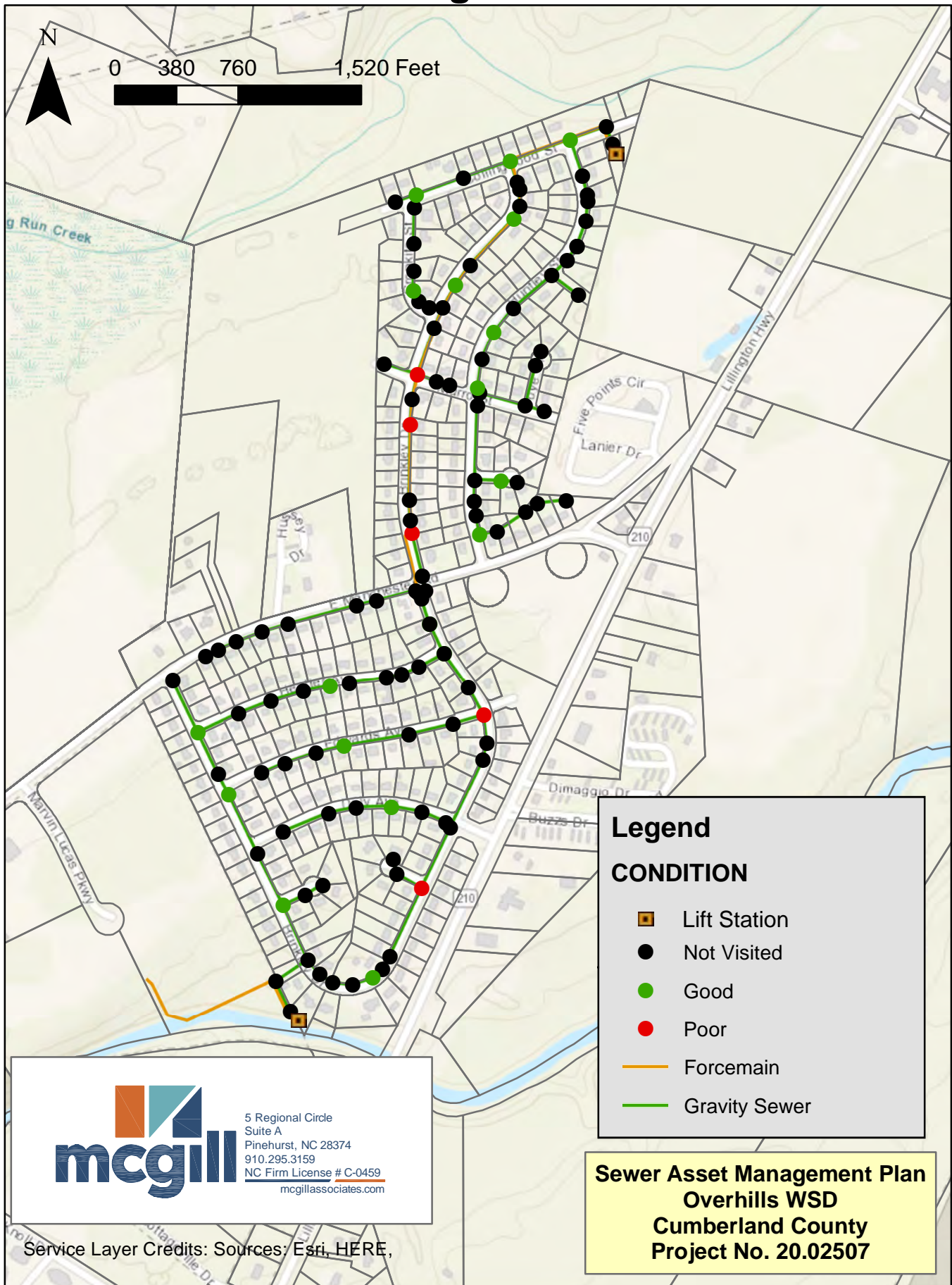
### **2.3.2 Investigation**

After the Overhills system was put into service, the GIS record was created in 2019. The purpose of this portion of the assessment was to perform selected field inspections to determine an overall system assessment. A total of one hundred and nineteen (119) manholes are currently inventoried by the District. A total of 23 manholes were inspected as a part of this inventory and assessment. The map showing which manholes were inspected is shown in Figure 4.









# Overhills Manhole Inspection Map

## Figure 4



**Legend**

**CONDITION**

-  Lift Station
-  Not Visited
-  Good
-  Poor
-  Forcemain
-  Gravity Sewer



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**Sewer Asset Management Plan**  
**Overhills WSD**  
**Cumberland County**  
**Project No. 20.02507**

Service Layer Credits: Sources: Esri, HERE,



### **2.3.3 Methodology**

The District of Overhills sewer collection system contains 119 sewer manholes. Working with County staff, McGill inspected selected manholes within the sewer system to obtain a representative condition sampling. County staff determined which manholes to inspect in each area based on manhole location and orientation. Manholes prioritized for inspection include those located in existing ditches or low-lying areas where the manhole would be susceptible to degradation and inflow from surface water. At each manhole, the inspector recorded the manhole's location, dimensions, material, and condition of its various components. All information including photographs of the interior of the manhole and top area were uploaded into the GIS mapping.

Some typical distresses include:

- Wear and asphalt paving on the cover;
- Corrosion and mud seepage on the ring and frame;
- Gas residue, corrosion, seepage, and deteriorating concrete on the cone and riser;
- Wetness, silt, root intrusion, and deteriorating concrete on the barrel;
- Dirt and corrosion on the rings;
- Silt accumulation on the bench; and
- Misaligned pipes, obstructions, trough deteriorating, standing water, and no flow in the channel.

Based on the recorded comments, each component was assigned a condition score, and these scores were combined into an overall condition rating for each manhole- excellent, good, fair, or poor. The images below depict the interiors of various condition manholes.



MH FID 30, BRINKLEY DRIVE, GOOD.



MH FID 43, BRINKLEY DRIVE, POOR.

### 2.3.4 Results

All of the 23 inspected manholes are precast manholes. Due to the relative low age of the system, County staff confirmed that all the existing manholes in Overhills are precast sewer manholes. The manholes observed were noted as poor or good to excellent condition, which is to be expected based on their age. However, evidence of I/I was observed in several manholes. Based on the condition of those observed, it is suspected that the remaining manholes not inspected would have similar condition to those observed. Tables 8 and 9 summarize the manhole materials and condition.

**Table 8: Summary of Manholes by Material**

<b>Material</b>	<b>Total</b>
<b>Precast Concrete</b>	<b>119</b>
	<b>119</b>

**Table 9: Summary of Manholes by Condition**

<b>Material</b>	<b>Total</b>
<b>Good/Excellent</b>	<b>18</b>
<b>Poor</b>	<b>5</b>
	<b>23</b>

The County maintains its collection system using the ESRI platform and includes the attribute data for each manhole. A spreadsheet including condition comments for each manhole can be found in Appendix B.

## 2.4 LIFT STATION

### 2.4.1 Overview

The Overhills sewer system includes two lift stations, one on Collingwood Street and the other on Brinkley Drive. The Collingwood Lift Station collections flow from the area north of Manchester Road and pumps to a manhole on the south side of Manchester. The Brinkley Lift Station receives all flow for the Overhills system and pumps to an manhole inside of the Spring Lake Sewer Collection System in an existing sewer easement off of Marvin Lucas Parkway.

Both lift stations include flow meters that are used for monitoring and recording flow generated by the Overhills sewer system. The monthly records from the Brinkley station are used for billing and have been used to calculate the average use per user for the system.

Collingwood Street Lift Station:

Lift Station Design Capacity	216,000 GPD
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Brinkley Drive Lift Station:

Lift Station Design Capacity	367,200 GPD
------------------------------	-------------

Overhills Sewer System:

FY 2025 Estimated Average Daily Use per User*	165 GPD
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\*Note: Estimated based on FY 2025 monthly usage, metered at Brinkley Lift Station and data provided to Cumberland County by Town of Spring Lake. Average GPD for Overhills System is 17,606 GPD, with 107 customers as of June 2025.

Recommendations for various sewer system improvements to include the gravity sewer pipe and manholes in the collection system include general recommendations, high priority projects (within 10-years) and future projects (past the 10-year planning window). General recommendations are typically less costly and can be implemented more quickly, whereas high priority projects may require financial assistance and be undertaken in phases.

### **3.1 GENERAL RECOMMENDATIONS**

#### **3.1.1 *Smoke Testing***

Smoke testing is a valuable tool that can be used to locate broken pipe, cleanouts, or manholes that need repair. Any of these issues can be a source for the inflow and infiltration (I&I) of surface water into the sewer collection system. The most common repairs that result from smoke testing include replacing missing or broken cleanout caps and removing buildup from manholes. Other repairs that can be performed at this time are patching the exterior concrete or replacing the rings/lids of manholes identified to be leaking during smoke testing. These may be contributing significant I/I into the wastewater collection system. Similarly, line breaks in flooded areas should also be addressed promptly. It is also recommended that the District continue to perform regular smoke testing to monitor the system's ongoing wear and identify specific areas for improvement. However, if there is a suspected problem in a specific area the District should utilize smoke testing on a more "as needed" basis to troubleshoot possible problem areas.

#### **3.1.2 *Video Evaluations***

Based on information provided by the County, video evaluations were not performed as part of the system inventory. County staff reports that no video evaluations have been performed on the collection system to date. It is recommended that the County plan to perform video evaluation of the system as a part of O&M in order to stay vigilant concerning potential issues within the collection system.

### **3.1.3 Manhole Inspections**

Manhole inspections uncovered some infrastructure deficiencies which can be repaired immediately to improve the condition and function of the wastewater collection system. The full list of manholes and their field assessment is included in Appendix A. Manhole rehabilitation and replacement is the priority work that is targeted by the CIP. The proposed projects are divided out on an annual basis in order to include the improvements as a reasonable component of annual budgeting.

### **3.1.4 Flow Monitoring**

The District and McGill have discussed that flow monitoring is not needed at this time. Should the County begin to suspect the presence of significant I&I, they will engage with a subcontractor to perform flow monitoring to verify as needed. Both existing lift stations have 8-inch flow meters on the lift station discharge, which provide metering of flow received within the district. The flow recorded from these meters are utilized by the County to determine the monthly quantity of wastewater sent for treatment to the Town of Spring Lake.

## **3.2 PRIORITY PROJECTS**

### ***3.2.1 Manhole Rehabilitation Projects***

In these projects for the Overhills system, manholes will be lined where possible, unless a significant amount of deterioration has occurred that would necessitate replacement. The projects are scoped to be undertaken every 2 years. Each project is priority targeting any manhole deficiencies based on the results of the smoke testing performed. There are a range of issues from broken risers to cracks in the frame of the manhole that warrant various repairs. To reduce the amount of I/I that enters the system it is imperative to repair these manholes. The project will be ongoing to spread out the cost for the County over a ten-year period. With 119 manholes in the system, it is estimated that approximately 40% of the manholes in the system would benefit from rehabilitation through lining. As a result, manhole rehabilitation is broken into three projects, which are included in the CIP separately, but can be combined or modified as needed given annual budgetary considerations. The projects also include replacement of existing cleanout assemblies for select residences. The results of the smoke testing identified that some cleanouts were damaged below grade, therefore replacement of the assembly would be necessary.

This project is recommended to be pursued with a manhole rehabilitation specialty company with scopes large enough to get competitive pricing for each mobilization. The manholes proposed for rehabilitation or replacement range in depth; therefore, an average depth of 7 vertical feet (VF) was used per manhole for estimating purposes. The capital improvements plan breaks this project into 3 projects with a budget of approximately \$84,100 every 3 years over a 10-year span, as outlined in Table 10. A preliminary cost estimate for a single project is included in Table 8. The total cost of the manhole rehabilitation/replacement projects is estimated to be \$252,300.



**Table 10: Preliminary Opinion of Probable Cost for Manhole Rehabilitation Projects**

<b>Item</b>	<b>Description</b>	<b>Units</b>	<b>Quantity</b>	<b>Unit Price</b>	<b>Total Cost</b>
1	Mobilization	LS	3%	N/A	\$1,900
2	Rehabilitate Existing Manhole	VF	112	\$500	\$56,000
3	Additional Manhole Repairs	LS	1	\$10,000	\$10,000
<b>Construction Subtotal</b>					<b>\$ 67,900</b>
Construction Contingency (15%)					\$ 10,200
Engineering Assistance (If needed)					\$ 6,000
<b>Total Base Project Cost</b>					<b>\$ 84,100</b>

*\*Cost estimates are based on the knowledge of a professional engineer based on 2024 construction costs and are subject to change due to bidding environment and other factors.*

### 3.2.2 Brinkley Lift Station Improvements Project

This project includes installing a p-trap on the discharge force main line to help allow the pumps to maintain prime with consistent downstream head. The work would involve installing a 4-inch p-trap in the existing force main, as well as a ¾-inch water service line to the trap to provide a drip supply to the trap to keep it full.

The project includes one 4-inch p-trap connected to the existing force main with associated excavation, compaction and backfill. The trap will be installed on the existing force main on the current lift station site. The preliminary cost estimate for this project is \$33,100 as outlined in Table 11 below.

**Table 11: Preliminary Opinion of Probable Cost for Brinkley LS Improvements**

Item	Description	Units	Quantity	Unit Price	Total Cost
1	Mobilization	LS	3%	N/A	\$ 800
2	4-inch P-Trap	LS	1	12,000	\$ 12,000
3	¾" Service Line and Tap	LS	1	16,000	\$ 16,000
<b>Construction Subtotal</b>					<b>\$ 28,800</b>
Construction Contingency (15%)					\$ 4,300
<b>Total Base Project Cost</b>					<b>\$ 33,100</b>

*\*Cost estimates are based on the knowledge of a professional engineer based on 2024 construction costs and are subject to change due to bidding environment and other factors.*

### **3.3 CIP PROJECTS SUMMARY**

The purpose of this asset management plan was to document the condition of the Overhills sewer infrastructure to assist the County with becoming more viable and proactive in the management and financing of its wastewater system. The County intends to look to its CIP to guide its next project; therefore, it is vital that the CIP be established as an accurate depiction of current conditions and reflect the Districts' highest priorities with accurate cost estimates. The development of this AMP will serve as a positive step towards ensuring that the District can maintain its level of service agreement.

Sewer manhole rehabilitation and cleanout replacement was evaluated based on current staff input and the results of the field inspections. The existing manholes and cleanouts were divided into projects recommended for the next 10 years.

McGill prepared cost estimates for all projects based on current materials and construction costs. The 10-year CIP is intended to be adopted by the District to guide its selection of sewer system improvement projects over the next two decades. The cost summary for the 10-year CIP is shown below in Table 12.

**Table 12: CIP Cost Summary**

<b>Year<sup>1</sup></b>	<b>Manhole Rehabilitation Project 1</b>	<b>Brinkley Lift Station Improvements</b>	<b>Manhole Rehabilitation Project 2</b>	<b>Manhole Rehabilitation Project 3</b>	<b>TOTAL COST</b>
1	\$ -	\$ 33,100.00	\$ -	\$ -	\$ 33,100.00
2	\$ 84,100.00	\$ -	\$ -	\$ -	\$ 84,100.00
3	\$ -	\$ -	\$ -	\$ -	\$ -
4	\$ -	\$ -	\$ -	\$ -	\$ -
5	\$ -	\$ -	\$ 84,100.00	\$ -	\$ 84,100.00
6	\$ -	\$ -	\$ -	\$ -	\$ -
7	\$ -	\$ -	\$ -	\$ -	\$ -
8	\$ -	\$ -	\$ -	\$ 84,100.00	\$ 84,100.00
9	\$ -	\$ -	\$ -	\$ -	\$ -
10	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL ESTIMATED CIP COST<sup>2</sup></b>					<b>\$ 285,400.00</b>

*Notes:*

- 1: Considering timeline for adoption of this plan and County budget planning cycle, Year 1 is anticipated to be FY 2026
- 2: Cost estimates are based on the knowledge of a professional engineer based on 2025 construction costs and are subject to change due to bidding environment and other factors

## 4.0

## OPERATIONS AND MAINTENANCE PLAN

### 4.1 GENERAL RECOMMENDATIONS

The purpose of an Operations and Maintenance (O&M) Program is to provide an organized and cost-effective approach to ongoing maintenance, repair and replacement activities that will maintain the sewer collection system, so it performs as intended and meets the requirements of the sewer utility's System-Wide Collection System Permit, issued under North Carolina General Statutes Article 21 of Chapter 143.

This section provides a general description of proactive O&M, which can be defined as scheduled maintenance activities (preventive maintenance), performed on a regular basis in order to achieve the highest level of system performance using available resources and minimizing failures that can result in Sewer System Overflows (SSOs)

Developing an O&M Program begins with accurate records of infrastructure inventory, asset locations, and physical condition. Coupled with work records and system performance history, preventive maintenance schedules can be developed to efficiently address general system needs, from cleaning and debris removal to site-specific maintenance work such as cutting and repair work.

The following elements provide the foundation for an effective O&M program:

- Maintain up-to-date wastewater treatment plant equipment documentation, sewer collection system maps and related work history and operational data.
- Develop a routine preventive O&M program and activities for staff and contractors maintaining the sewer collection system and a system to document scheduled activities.
- Develop a rehabilitation and replacement plan identifying and prioritizing system deficiencies and implement short- and long-term actions to address the deficiencies.
- Develop and implement training programs to build technical competence and emergency preparedness.
- Develop and provide equipment and replacement part inventories, including critical replacement parts.

## **Sewer System Mapping**

Sewer system maps and related databases are typically managed using a Geographic Information System (GIS). The District currently utilizes ESRI as the GIS platform from which to manage the utility systems. This GIS mapping is supported by a database that records sewer main size, material types, and locations of manholes and clean-out connections. The platform has the ability to store more information that is currently being utilized by the County, including invert and rim elevations and other attributes of system appurtenances. If County intends to utilize the GIS platform for managing and recording maintenance performed and planned, it is recommended that the County investigate alternative software to ensure that they are utilizing a software that meets their needs with respect to budget.

The GIS database should be updated on a regular basis. Software applications such as work order systems are available to allow field staff to update GIS data as inspection and maintenance activities are completed. Other applications can also allow staff to update and edit maps. Field information that was gathered by McGill and County staff as a part of this assessment is now included in the County's GIS system database for future reference.

GIS can organize work history along with operational data, inspection records and images to provide managers, operations staff and engineers with powerful data sets to track current resource allocations and forecast short and long-term operational and capital needs. Outcomes of detailed analysis such as recommended sewer main rehabilitation work versus sewer overflows can be mapped to present the relationship visually for ease of understanding.

## **Preventive Operation and Maintenance (O&M)**

Preventive maintenance is performing routine and scheduled maintenance activities before wastewater treatment plant and lift station equipment or buried infrastructure fails, for the purpose of extending useful life, reducing overall operating costs, and increasing system reliability. This proactive approach to maintenance work is more efficient and cost effective than reactive and curative operations. Preventive maintenance activities will also help operations staff to better understand the wastewater treatment plant equipment, lift station equipment, and collection system components and how they work under various conditions. This knowledge is essential to setting maintenance priorities and developing the scope and timing of long-term rehabilitation and replacement projects.

## **Scheduled Cleaning of Sewers**

EPA recommends, at a minimum, 100% of sewer mains should be cleaned every 5 years, or 20% of the system annually. The sewer utility's Collection System Operating Permit requires 10% of the gravity sewers to be cleaned annually. High pressure jetting is the most common approach using various spray nozzles for general cleaning and debris removal. Mechanical cutters are used to address root intrusion and cleaning agents can be added to help remove fats, oils, and grease (FOG).

More frequent cleaning is scheduled for areas with a history of heavy debris, grease buildup and roots. CCTV inspections are also used to identify areas to clean more often, such as sections with minor defects such as offset joints and service taps protruding into the main line. Sewer sections near siphons are cleaned more frequently to ensure continuous and uninterrupted operation.

As part of the O&M Program, a master list of cleaning operations, priority locations and scheduling can be incorporated into GIS. Maps can be produced to define work areas, schedule resources, including contracted services, track progress and task completion. Updating GIS maintenance operations data (partial blockages found, debris quantity, etc.)



will help managers adjust cleaning frequency and area boundaries as needed to increase program efficiency, reduce sewer blockages, and avoid SSOs.

## **Routine Visual Inspections**

Routine inspections are used to assess the condition of lift stations, manholes and surface facilities, recording general conditions and evidence of possible structural problems or failures (offset structures, etc.), corrosion, surcharging, overflows and excessive Inflow and Infiltration (I&I). Work orders are generated based on inspection records to effect operational adjustments, scheduling more detailed inspections and/or making necessary repairs.

## **Manhole Inspection Program**

Manhole inspections keep the asset inventory up-to-date and are used not only to update collection system maps, but to determine structural condition. During manhole inspections, a complete inventory is taken of each manhole including construction materials, ring size, depth to invert, flow conditions and evidence of problems. The National Association of Sewer Service Companies (NASSCO) Manhole Assessment and Certification Program (MACP) may be adopted or used as a guide to ensure consistency and reliability of evaluation and ranking methodology.

The results from routine manhole inspections and monitoring are used to prioritize areas needing CCTV inspections to assess pipe condition such as manholes with evidence of slow flow or surcharging. Information is recorded and used to schedule maintenance and repairs.

## **CCTV Inspection Program**

While routine cleaning and visual inspection are used to assess the condition of surface facilities and manholes, CCTV video inspections are the primary method used to assess the condition of the sewer pipes. Using conventional defect criteria is highly recommended to provide standardization and consistency in sewer pipe condition

assessment and ranking. The NASSCO Pipeline Assessment and Certification Program (PACP) may be adopted or used as a guide to ensure consistency and reliability of evaluation and ranking methodology.

## **Maintenance Activity Records**

Detailed records and daily logs of O&M work provide valuable information to help managers evaluate the effectiveness of maintenance activities and make adjustments to optimize the use of limited resources. Equipment, manpower and other resources are tracked along with detailed descriptions of defects and/or obstructions encountered including debris, FOG, structural failures, etc. Maintenance work resulting in system modifications or extensions is required to be incorporated into record drawings and system maps. Scheduled testing of emergency and standby equipment is also a requirement of the collection system permit.

These records are required to be reviewed periodically to identify problems that cannot be resolved in a short period of time in order to develop a plan to address the problem(s). Maintaining these records for an extended period of time (5-years or more) will also provide accurate reference points of maintenance investments made over time that will track the effectiveness of operation and maintenance activities.

In the event of a sewer spill or system overflow, maintenance records will need to provide sufficient detail to satisfy reporting requirements for the event, including location(s), volume of wastewater, corrective actions, etc. This data may also be integrated into GIS to allow mapping of these events over time in order to identify patterns and/or trends that will assist with scheduling maintenance and planning rehabilitation and other capital improvements.

## **Resolution of Customer Complaints**

Customer complaints are primarily for sewer backups and odors. Sewer backups require an immediate response to diagnose and resolve the problem. These complaints can occur outside normal business hours, significantly escalating costs. Detailed records of the problems found, and the resources needed to address the failed condition, provide valuable feedback for making adjustments to the preventive maintenance program that can reduce these types of calls and help lower overall maintenance costs.

These records can also identify areas where private service laterals frequently fail. Notifying customers in these areas will allow them the opportunity to address deficiencies proactively, which will also help reduce customer “emergency” calls.

## **Capital Improvements Plan**

A Capital Improvements Plan (CIP) is required by the collection system permit to identify rehabilitation, replacement and expansion needs of the system. The CIP is required to address the short and long-term needs of the system, covering at least a 3 to 5-year planning period, and must include the estimated cost of each capital project.

CIP development incorporates maintenance activity, cleaning and inspection records, and system performance data that may include flow monitoring and hydraulic modeling to evaluate the existing system and to recommend improvements needed to correct existing deficiencies, and ensure adequate capacity is maintained throughout the system.

Capital planning includes consideration of on-going funding for rehabilitation and replacement of the collection system as it wears out, and potential upgrades for expansion as needed.

## **Training Program**

Training programs provide a mechanism for educating employees and establishing their technical competence to perform operations, maintenance, and emergency responses safely and effectively. A combination of in-house skill training and specialized training purchased or provided through state and national associations, conferences and vendor training programs are typically used to build and enhance skills for performing daily work duties. Periodic training reinforces previous efforts, as people often overlook things that are used infrequently. It also provides an opportunity to train new staff and learn about new problems, new techniques, and changes in equipment.

Emergency training educates system personnel about emergency situations and resulting effects on the wastewater system, public health, and environmental impacts. It also provides an opportunity to practice responses. Good record keeping ensures personnel are properly trained and prepared to effectively operate and maintain the collection system under any given circumstance. Regular review of training records is essential for keeping content up-to-date and maintaining proper employee awareness.

## **Equipment and Replacement Parts**

A reasonable supply of equipment and replacement parts should be maintained to fully support all operations and maintenance activities. A detailed inventory is essential to ensure availability under normal operations and emergency conditions. Specialized equipment or parts may be too costly to keep in stock, so arrangements with vendors and/or contractors may be necessary to ensure availability during non-business hours or during emergencies.

## 4.2 STAFFING RECOMMENDATIONS

Cumberland County is responsible for three wastewater collection systems and one water system: NORCRESS, Overhills, Kelly Hills, and Southpoint Water System. While each of these districts maintains its own operating budget, the Board leadership and operational management is performed solely by Cumberland County. Therefore, in consideration of the typical utility system management and operations and maintenance that is necessary for maintaining each of the systems, McGill has considered all of the four (4) utility systems cumulatively. While each system could be analyzed separately, considering the systems together is more consistent with actual management of the systems.

Typical metrics for analyzing full-time equivalent (FTE, representing quantity full-time workers) are based on either the population served by the system or by miles of utility piping (water main or sewer line) within each system. For reference, Table 13 below summarizes the customers and piping in each of the County’s utility systems.

**Table 13: Utility System Comparison**

DISTRICT	Number of Connections		Paying Avail. Fee	Pipe in System (mi.)
	Water	Sewer		
<b>Southpoint</b>	84		129	2.8
<b>Kelly Hills</b>		102	166	4.5
<b>Overhills</b>		107	318	4.0
<b>NORCRESS</b>		452	666	41.1
<b>TOTALS</b>	<b>84</b>	<b>661</b>	<b>1279</b>	<b>52.4</b>

**Table 14: Typical Population vs. Pipe Length**

<b>Population</b>	<b>Pipe in System (mi.)</b>
0-100	5
101-500	5
501-3300	21
3301-10000	62

The typical sizes of utility systems from a community system EPA study<sup>1</sup> are shown in Table 14, and are generally consistent when compared to the County’s systems. This study was selected as a basis for comparison due to its comprehensive nature, having included water systems nationwide in its breadth. NORCRESS is the exception when compared to Table 14. This is mostly likely indicative of the system serving a more rural population where the connection density is less, and resulting from the length of force main piping in the system that increases the overall length but does not contribute to population density. Overall, these metrics were found to be reasonably consistent with the County’s systems. Similarly, the data is consistent regardless of whether the utility system is a water systems or wastewater collection system.

The objective is to make budget-level staffing recommendations for the County’s utility systems based on what is typical across the industry and other utility systems of comparable size. The EPA study utilized provides typical FTE for the roles of manager, plant operator, distribution (and collection, for our purposes), and administrative functions. All of these were considered applicable to management and operation of the County’s utility systems. Note: while the County is not responsible for plant operation in any system, the lift stations in the NORCRESS and Overhills systems are the County’s responsibility, therefore this metric was used, albeit in a smaller percentage, to account for the management of those resources.

---

<sup>1</sup> Analysis conducted using excerpts from US EPA document, “National Characteristics of Drinking Water Systems Serving 10,000 or Fewer People,” published July 2011.

Table 15 shows Further utilizing the EPA statistics as base for typical FTE for each of the positions, based on the system size in terms of miles of pipe main.

**Table 15: Average Community System Statistics**

Employee Category	System Size (miles of Main)		Mean	Cumberland County
	Pop. 500-3300	Pop. 3300-10000		
	21	62	41.5	51.7
<b>Manager FTE</b> per mile	0.6	1.1	0.85	1.06
	0.029	0.018	0.020	0.020
<b>Plant Operator FTE</b> per mile	0.6	1.3	0.95	1.03
	0.029	0.021	0.023	0.023
<b>Distribution FTE</b> per mile	0.8	2.5	1.65	2.06
	0.038	0.040	0.040	0.040
<b>Administrative FTE</b> per mile	0.6	1.5	1.05	1.31
	0.029	0.024	0.025	0.025

The green highlighted cells are the calculated FTEs that were applied to estimate staffing size based on the quantity of pipe across the County’s four utility systems. Those calculated FTEs are based on the size of systems managed by the County and reasonable estimate of staffing needed for these systems.

Each of the FTEs is applied to each respective employee category. McGill utilized wage information from Zip Recruiter and a benefits multiplier of 1.38 from the U.S. Bureau of Labor Statistics to develop the summary shown in Table 16.

**Table 16: Overall Salary Estimates**

Employee Category	Hourly Rate	Annual Salary	Ben. Mult.	Total	Applied FTE	Applied Budget Cost
Manager	\$38.50	\$80,080.00	1.38	\$110,510.40	1.06	\$117,000
Operator	\$24.52	\$51,001.60	1.38	\$70,382.21	1.03	\$72,700
Distribution	\$23.57	\$49,025.60	1.38	\$67,655.33	2.06	\$139,100
Administrative	\$21.33	\$44,366.40	1.38	\$61,225.63	1.31	\$80,100
<b>Total Applied Budget Cost Based FTEs</b>						<b>\$408,900</b>

Utilizing industry metrics and comparing to systems of comparable size, McGill offers the proceeding section as a general staffing recommendation. This section and these budget values are provided for preliminary planning purposes only.



Staffing levels appear to be reasonable based on the District's ability to operate and maintain the system while providing a reliable level service to its customers.

While this budget number is higher than the current budget staffing, consideration should also be given to the cumulative effect cost to the County for contracted operation and distribution support in the NORCRESS and Kelly Hills district.



# **APPENDICES**



## **Appendix A**

### **Smoke Testing Results List**



**Overhills Smoke Testing Cleanouts**

Date:		September 19th, 2024	
Facility ID	Status	Notes	
2	Broken		
3	Broken	Cap replaced	
5	Broken		
13	Broken	Smoking from c/o	
15	Broken	Smoking from c/o	
18	Broken		
23	Broken		
26	Broken	Smoking from c/o	
28	Broken		
29	Broken		
42	Broken		
48	Broken		
50	Broken		
10	Broken	No smoke but lid is broken	
53	Broken	Smoking lid needs to be replaced	
	Broken	Lateral broken, smoke around elder valve and ground	
58	Broken		
59	Broken		
66	Broken	Missing elder valve cap	
68	Broken	Both valves smoking and house	
69	Broken		
70	Broken	Cap missing on elder valve	
74	Broken	Smoking from valve	
79	Broken	Elder valve missing cap	
80	Broken		
82	Broken	Lid unscrewed	
87	Broken	Smoking, Replaced on site	
89	Broken	Smoking from c/o	
92	Broken		
94	Broken		
96	Broken	Smoking from c/o	
96	Broken		
97	Broken		
100	Broken	Smoking from valve	
101	Broken	Smoking from c/o	
107	Broken		
116	Broken	Smoking from valve and house	
119	Broken		
121	Broken	Valve and house smoking	
	Broken	Multiple clean outs smoking in yard and from house	
125	Broken		
127	Broken	Smoking from valve	
128	Broken	Smoking from valve	
129	Broken		
136	Broken	Smoking from valve and ground	
139	Broken	Smoking from house and valve	
142	Broken		
143	Broken	Smoking from c/o	
149	Broken		
150	Broken		
152	Broken	Smoking from c/o	
154	Broken	No smoke but cap broken	
157	Broken	Missing cap	
159	Broken	Cap broken no smoke	
160	Broken	Broken	
162	Broken	Broken	
163	Broken		
164	Broken	Broken valve smoking	
165	Broken		
168	Broken	Elder valve cap missing	
169	Broken		
170	Broken		
172	Broken	Lid bent	
175	Broken		
177	Broken	Lid unscrewed	
178	Broken		
180	Broken		
181	Broken		
183	Broken		
184	Broken		
187	Broken		
188	Broken		
201	Broken	Smoking from ground/co	
204	Broken		
206	Broken		
	Broken	Smoking, C/o broken and filled w/trash	
207	Broken		
208	Broken	C/o smoking	
210	Broken		
220	Broken		
225	Broken		
226	Broken	Elder valve lid	
235	Broken	Elder valve cap	
240	Broken		
243	Broken		
247	Broken	Lid loose	
260	Broken	Elder valve	
246	Broken		
266	Broken	Smoking c/o	
264	Broken		
267	Broken		
270	Broken	Smoking	
272	Broken		
273	Broken	Smoking c/o	
285	Broken	Smoking c/o replaced on site	
286	Broken	Cap missing	
317	Broken		
1112	Broken		
1512	Broken		
1513	Broken		
1514	Broken		
2712	Broken		
2713	Broken		



Overhills Smoke Testing Manholes		
Date:		September 19th, 2024
Facility ID	Status	Notes
53	Leak	
54	Leak	Smoking from MH and underneath lift station
62	Leak	
64	Leak	
73	Leak	
99	Leak	MH smoking (inside fence w/ lift station fence locked)
120	Leak	

## **Appendix B**

### **Manhole Inspection List**



# Overhills Manhole Inspection

Date: April 10th, 2024

Manhole/Facility ID	Condition	Notes
7	Good	
11	Good	
16	Good	
17	Good	
21	Good	
25	Good	
26	Good	
30	Good	
35	Poor	
43	Poor	
52	Poor	
56	Good	
60	Poor	
68	Poor	
74	Good	
80	Good	
81	Good	
86	Good	
94	Good	
96	Good	
101	Good	
104	Good	
110	Good	

Total Manhole Inspected	23
Total Good Comdition	18
Total Poor Condition	5



## **Appendix C**

### **Overhills Spring Lake Agreement**





THIS AGREEMENT made and entered into this 8<sup>th</sup> day of September, 2014 by and between the Town of Spring Lake, a North Carolina municipal corporation, (hereinafter referred to as "Spring Lake"), and the County of Cumberland, a North Carolina Body Politic, acting by and through its Overhills Park Water & Sewer District, (hereinafter referred to as "Overhills").

WITNESSETH

THAT WHEREAS, Overhills wishes to contract with Spring Lake to furnish sanitary sewer treatment and provide for the operation and maintenance of the Overhills Park Water & Sewer District in an area as shown on Exhibit "A" attached hereto; and

WHEREAS, Spring Lake has agreed to treat sanitary sewer for Overhills to include operation and maintenance of the sanitary sewer collection system installed by Overhills within the delineated service area according to the following terms and conditions:

1. The sanitary sewer collection system being constructed by Overhills shall be built in accordance with engineering plans and specifications and constructed by a contractor licensed to perform utility construction in North Carolina.

2. Overhills will be responsible for the cost of constructing the sanitary sewer collection system as sized accordingly to serve the delineated service area as approved by USDA with Spring Lake being responsible for upgrades, in materials and line sizing as it may deem necessary.

3. The cost of operation and maintenance of the sanitary sewer collection system is built into the sanitary sewer rate being charged to Overhills as shown on Exhibit "B". Spring Lake shall render accurate monthly bills to Overhills. Such bills shall be computed by multiplying Overhills' sewer flow, expressed in thousand (M) gallons, by the applicable rate per thousand (M) gallons for this customer class. The rate per thousand (M) gallons shall be subject to change annually. Routine operation and maintenance includes: (1) Repair damaged, deteriorated, or broken sewer mains; (2) Repair damaged, deteriorated, or broken sewer service laterals from the main to edge of road right-of-way or easement; (3) Routine maintenance and repair of pump station equipment; (4) Cleaning and rodding of clogged sewer mains; (5) Repair of manholes to include rings and covers; and (6) Other routine maintenance and repairs as needed; (7) Administrative and engineering support of above, as required; (8) 24 hours, 7 days per week on-call dispatch with appropriate response forces; (9) Responding to inquiries by existing and potential users of sanitary sewer service; (10) Investigating and working to resolve complaint issues; (11) Maintaining metered electric service at pumping stations, as well as, chemicals associated with pump station operation.

4. Monthly bills rendered for services as provided hereunder are payable within 30 days from their date, at Spring Lake's office, Town of Spring Lake, P.O. Box 617, Spring Lake, NC 28390.

5. Spring Lake will be responsible for the cost associated with upsizing mains within the delineated Overhills service as may be deemed necessary in order to meet Spring Lake's existing and future sanitary sewer needs which would not be otherwise required for the sanitary sewer collection system being installed by Overhills pursuant to this Agreement.

6. All sanitary sewer lines installed by Overhills that are funded with USDA loan and/or grant funds will not be charged a capacity or impact fee and shall be owned and operated by Overhills subject to Spring Lake's right to upsize such mains at its expense and to transmit sanitary sewer through such mains to areas beyond the Overhills area.

7. Overhills will acquire all rights-of-way and/or encroachments as may be needed for construction of the sanitary sewer collection system as referenced herein. Spring Lake currently controls an existing easement that was dedicated to the Town of Spring Lake for the sole purpose of constructing a lift station to serve the Overhills Park Subdivision. The Town of Spring Lake will not charge Overhills any fees for the use of the easement and Overhills will own the lift station.

8. Spring Lake reserves the right to extend or continue sanitary sewer mains from such mains as initially constructed by Overhills to points outside of the delineated Overhills service area. Future connections or main extensions that occur outside of the delineated Overhills area are not subject to this Agreement and shall be the property of Spring Lake unless the Overhills boundary is expanded by mutual agreement of the parties herein in order to serve development of contiguous properties.

9. The further extension of or connection to mains within the delineated Overhills service area will be pursuant to applicable extension and connection policies and procedures of Overhills in effect at the time a request for service is made.

10. Overhills may by resolution adopt a policy whereby future customers and/or extenders of sanitary sewer infrastructure in the Overhills service area will be subject to the then current applicable Spring Lake Policies and Procedures to simplify the application process for customers with the understanding that such customers remain responsible to Overhills for compliance with such policies and procedures.

11. Laterals not installed during the initial sanitary sewer collection system as constructed by Overhills will be subject to the applicable lateral charge and facility investment fee charged by Spring Lake. Overhills customers will not be charged a main charge by Spring Lake if located within the Overhills service area on mains installed by Overhills.

12. Annual Notification of Anticipated Usage and Restriction: (a) Spring Lake reserves the right and authority to limit the annual increase in usage by Overhills to an amount not greater than 20% of the previous calendar year's usage. However, additional limits may be imposed if an outside agency having jurisdiction over the treatment facilities requires restrictions on increases in usage on the Spring Lake's system. Consideration will be given on a case-by-case basis to address anticipated sanitary sewer needs in excess of the above stated 20% increase; (b) any limitations or restrictions on sanitary sewer usage due to situations beyond Spring Lake's control will also apply to Overhills. Overhills will be responsible to ensure the individual sanitary sewer customers on its system comply with these restrictions or limitations.

13. The term of this Agreement may be amended by written agreement between Spring Lake and Overhills. The term of this Agreement is for five years from Sept. 8, 2014, and at the end of each anniversary date of this Agreement, the termination date of the term of this Agreement shall automatically extend for an additional period of one year unless terminated by said parties giving not less than two years written notice to the other party including the initial term or by mutual consent of both parties.

14. *Severability*: It is hereby declared to be the intention of Spring Lake and Overhills that the paragraphs, sentences, clauses and phrases of this Agreement are severable. If one or more paragraphs, sections, sentences, clauses or phrases shall be declared void, invalid or otherwise unenforceable for any reason by valid and final judgment or decree of any court of competent jurisdiction, such judgment or decree shall not affect the remaining provisions of this Agreement and the same shall continue to be fully effective and enforceable on the basis that said remaining provisions would have been agreed to by Spring Lake and Overhills without the incorporation of such void, invalid or otherwise unenforceable paragraph, section, sentence, clause or phrase.

15. *Notices:* Whenever written notices are required under this Agreement, said notice shall be in writing and shall be delivered personally or shall be sent by prepaid registered or certified mail. If notice is mailed to Spring Lake, it should be addressed as follows:

Mayor, Town of Spring Lake  
P.O. Box 617  
Spring Lake, NC 28390

If notice is mailed to Overhills, it should be addressed as follows:

Chairman, Board of Governors  
Overhills Park Water & Sewer District  
P.O. Box 1829  
Fayetteville, NC 28302-1829

Either party may change its mailing address by giving written notice of the new address. Unless so changed, the addresses set forth above shall apply.

18. *Binding Effect:* This contract shall be binding upon and inure to the benefit of the parties hereto, their heirs, successors and assigns.

19. *Entire Agreement:* This contract contains the entire agreement of the parties and there are no representations, inducements or other provisions other than those expressed in writing.

20. *Governing Law:* This contract shall be governed by the laws of the State of North Carolina.



IN WITNESS WHEREOF, the parties hereto through their duly authorized officers has executed this contract as to the date and year first above written.

OVERHILLS PARK WATER & SEWER DISTRICT



By: *Jeannette M. Council*  
Jeannette M. Council, Chair

ATTEST:

*Candice White*  
Candice White, Clerk to the Board

APPROVED for Legal Sufficiency  
OVERHILLS PARK Water & Sewer District  
Attorney

*Rick L. Moorefield*  
Rick L. Moorefield, County Attorney  
Attorney for OVERHILLS PARK  
*it properly executed*

This instrument has been pre-audited in the manner required by the Local Government Budget and Fiscal Control Act.

*Melissa Cardinali*  
Melissa Cardinali, Finance Director  
Finance Officer for OVERHILLS PARK

THE TOWN OF SPRING LAKE



By: *Chris V. Rey*  
Chris V. Rey, Mayor

ATTEST:

*Rhonda Webb*  
Rhonda Webb, Town Clerk

APPROVED, as to form this 8<sup>th</sup> day of September, 2014.

*Robert A. Buzzard*  
Robert A. Buzzard  
Spring Lake Attorney

This instrument has been preaudited in the manner required by the Local Government Budget and Fiscal Control Act.

*Tina J. West*  
Allen L. Coats, Finance Director  
Financial Officer for Spring Lake  
Tina J. West, Interim Finance Director

NORTH CAROLINA - CUMBERLAND COUNTY

I, \_\_\_\_\_, a Notary Public of said County and State do hereby certify that \_\_\_\_\_ personally appeared before me this day and acknowledged that he/she is the Clerk to the Board of the OVERHILLS PARK Water and Sewer District, and that the authority duly given and as the act of said, the foregoing instrument was signed in its name by its Chairman, sealed with its corporate seal and attested by himself/herself as its \_\_\_\_\_.

WITNESS my hand and Notarial Seal, this the \_\_\_\_ day of \_\_\_\_\_, 2014.

My Commission Expires: \_\_\_\_\_

\_\_\_\_\_  
Notary Public

NORTH CAROLINA - CUMBERLAND COUNTY

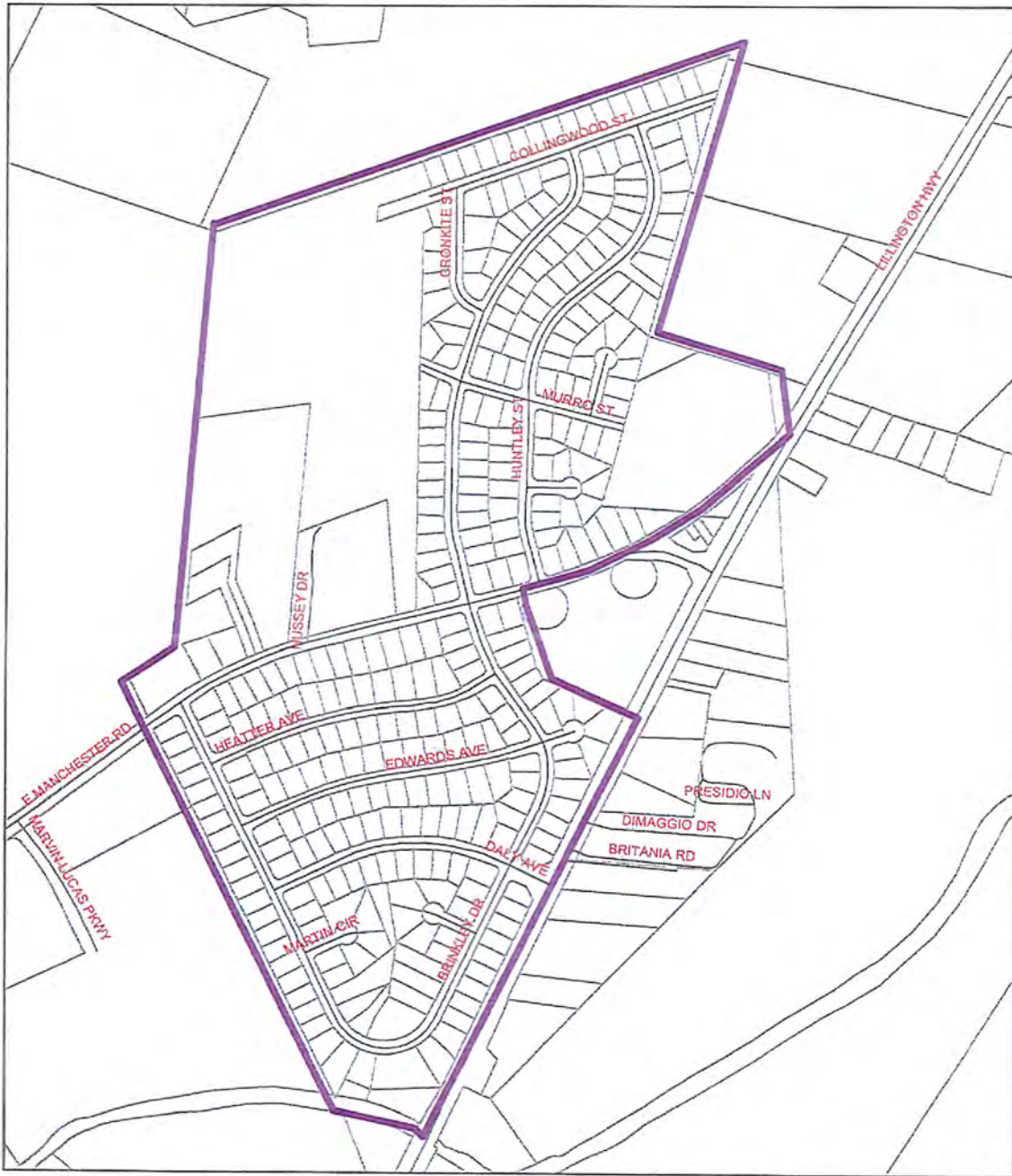
I, Patricia M. Hickman, a Notary Public of said County and State do hereby certify that Khonda D. Webb, personally appeared before me this day and acknowledged that she is Clerk of The Town of Spring Lake, North Carolina, and that the authority duly given and as the act of the agency, the foregoing instrument was signed in its name by its Mayor, sealed with its seal and attested by himself/herself as the Town Clerk.

WITNESS my hand and Notarial Seal, this the 8<sup>th</sup> day of September, 2014.

My Commission Expires:  
November 26, 2016

Patricia M. Hickman  
Notary Public  


Exhibit A



OVERHILLS PARK WATER & SEWER DISTRICT

## Exhibit B

### Rate Schedule

\$4.00 per thousand gallons

\$9.25 per tap



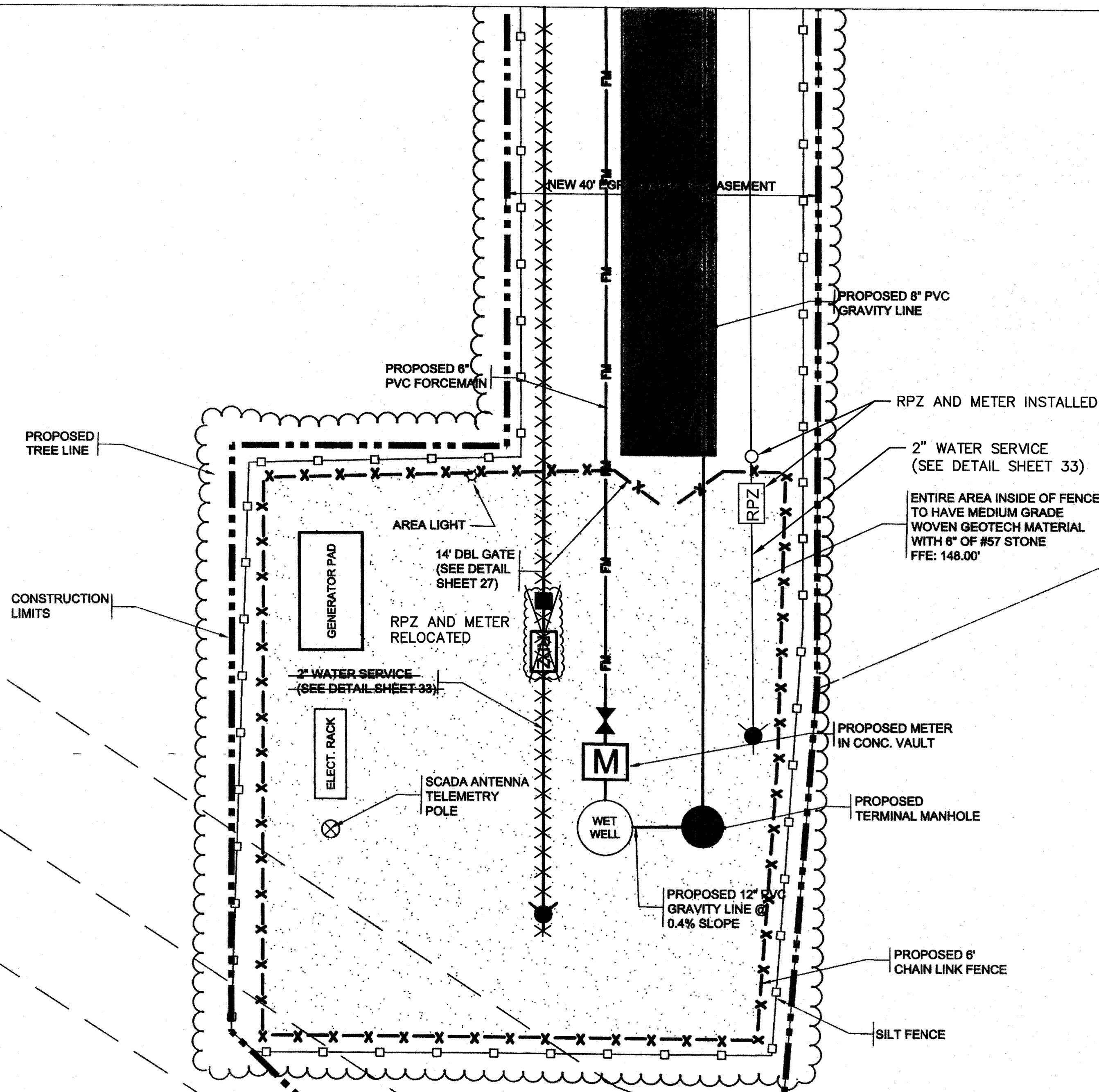


## **Appendix D**

### **Lift Station Record Drawings**



2412  
148.5±



**LEGEND**

	NEW FORCE MAIN		WETLANDS
	NEW GRAVITY LINE		NEW ACCESS ROAD
	EASEMENT LINE		NEW 6" #57 STONE
	PROPERTY LINE		EXIST. ROAD
	WETLANDS BUFFER		NEW MANHOLE
	EXIST. WATER LINE		
	CHAIN LINK FENCE		
	NEW CONTOUR		
	EXIST. CONTOUR		

NOT A CERTIFIED DOCUMENT AS TO THE ORIGINAL DOCUMENT BUT ONLY AS TO THE REVISIONS. THIS DOCUMENT ORIGINALLY ISSUED AND SEALED BY CHARLES MCGOUGAN, PE 025942, ON AUGUST 12, 2015. THIS DOCUMENT IS ONLY CERTIFIED AS TO THE REVISIONS.

**RECORD DRAWING**

This Drawing has been modified to reflect changes made during construction based upon information provided by the Contractor and construction observations made by the Owner's Authorized Representative (McGill Associates).

By *Michael S. Apple* Date *8/2/19*

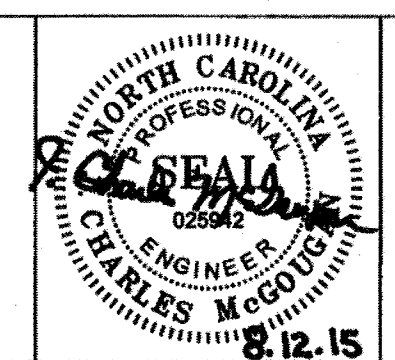
**McGill ASSOCIATES**  
ENGINEERING · PLANNING · FINANCE  
5 REGIONAL CIRCLE, SUITE A PINEHURST, NC 28374 PH. (910) 295-3159 FIRM # C-0459

*Professional Engineer Seal: Michael S. Apple, No. 27394, State of North Carolina*

PS-1  
**BRINKLEY DRIVE PUMP STATION**  
**SITE PLAN**  
SCALE: 1"=10'

**REVISIONS**

BY	DATE	DESCRIPTION	SYM.
JCM	6/15/15	ADDED CONST. LIMITS/CONST. ENTR. NOTES	



**MOBID**  
CONSULTING ENGINEERS, P.A.  
P.O. BOX 4428  
ASHEBORO, NC 27204  
Phone: (336) 629-3931  
Fax: (336) 629-3932  
NC License No. C-644

**BRINKLEY DRIVE PUMP STATION**  
**SITE PLAN**

**OVERHILLS SUBDIVISION**  
**WASTEWATER SERVICE**  
Cumberland County, North Carolina

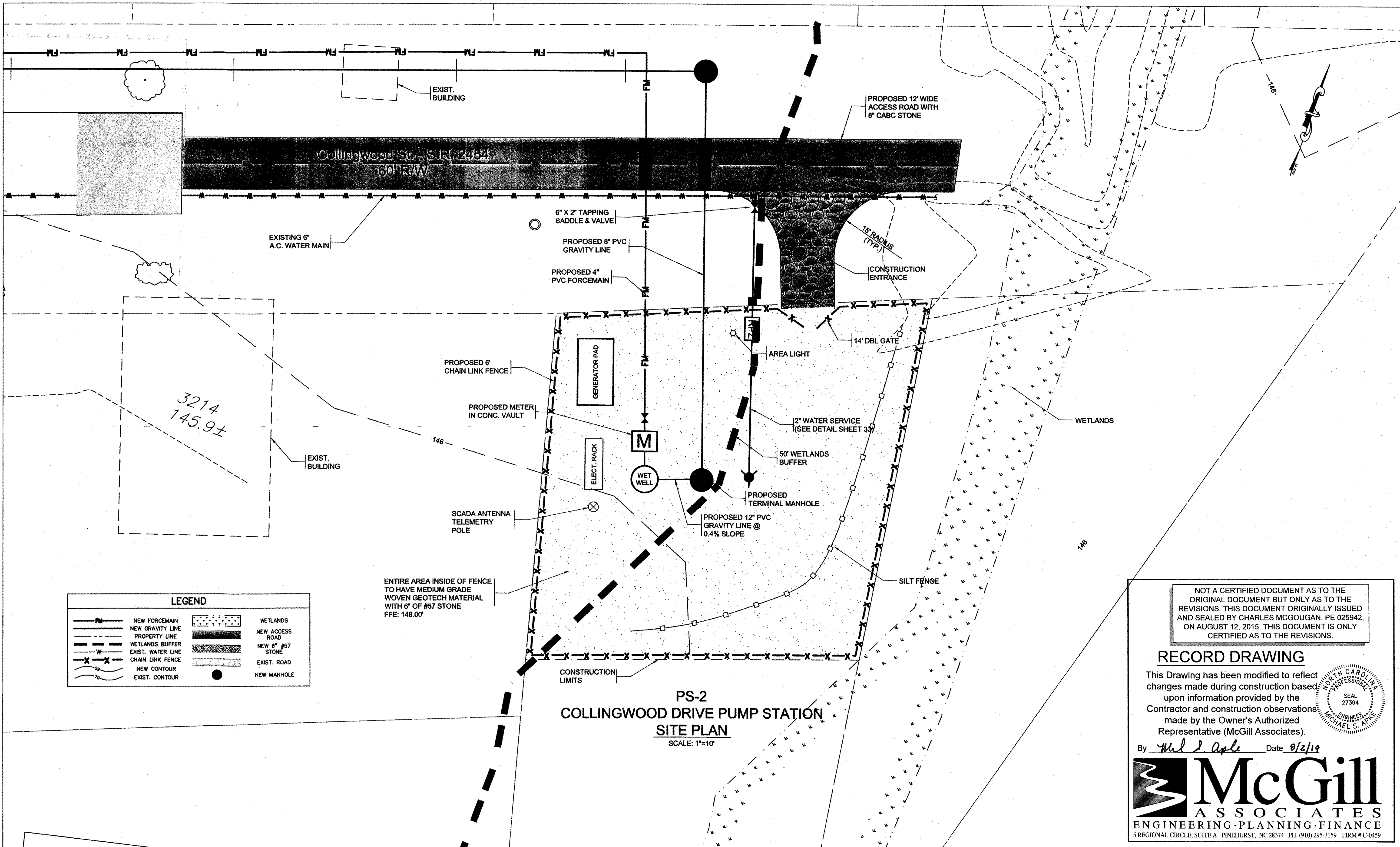
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Date: AUG. 2015	3
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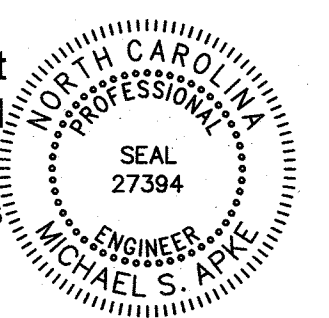
**LEGEND**

	NEW FORCEMAIN		WETLANDS
	NEW GRAVITY LINE		NEW ACCESS ROAD
	PROPERTY LINE		NEW 6\"/>
	WETLANDS BUFFER		EXIST. ROAD
	EXIST. WATER LINE		NEW MANHOLE
	CHAIN LINK FENCE		
	NEW CONTOUR		
	EXIST. CONTOUR		

NOT A CERTIFIED DOCUMENT AS TO THE ORIGINAL DOCUMENT BUT ONLY AS TO THE REVISIONS. THIS DOCUMENT ORIGINALLY ISSUED AND SEALED BY CHARLES MCGOUGAN, PE 025942, ON AUGUST 12, 2015. THIS DOCUMENT IS ONLY CERTIFIED AS TO THE REVISIONS.

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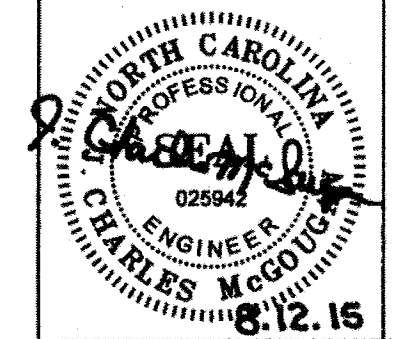


By *Michael S. Apple* Date *8/2/19*

**McGill ASSOCIATES**  
 ENGINEERING · PLANNING · FINANCE  
 5 REGIONAL CIRCLE, SUITE A, PINEHURST, NC 28374 PH. (910) 295-3159 FIRM # C-0459

**REVISIONS**

BY	DATE	DESCRIPTION	SYM.
JCM	6/15/15	ADDED CONST. LIMITS/CONST. ENTR. NOTES	SYM.



**MOB**  
 CONSULTING ENGINEERS, P.A.  
 P.O. BOX 4428  
 ASHEBORO, NC 27204  
 Phone: (336) 629-3931  
 Fax: (336) 629-3932  
 NC License No. C-644

**COLLINGWOOD DRIVE PUMP STATION SITE PLAN**

**OVERHILLS SUBDIVISION WASTEWATER SERVICE**  
 Cumberland County, North Carolina

Scale: 1"=10'	Sheet No.:
Date: AUG. 2015	6
Drawn: TLM	
Checked: JCM	
Job No.: 29001	Of: 33 Version: 1









**WATER ASSET MANAGEMENT PLAN**

**SOUTHPOINT SUBDIVISION WATER SYSTEM**  
**GRAYS CREEK WATER AND SEWER DISTRICT**

**CUMBERLAND COUNTY, NC**



PINEHURST, NORTH CAROLINA

**WATER ASSET MANAGEMENT PLAN**

**SOUTHPOINT SUBDIVISION WATER SYSTEM**  
**GRAYS CREEK WATER AND SEWER DISTRICT**

**CUMBERLAND COUNTY, NC**

**MATTHEW JONES, PE**  
matthew.jones@mcgillassociates.com



5 Regional Circle, Suite A  
Pinehurst, North Carolina 28374  
910.295.3159

Firm License No.: C-0459

**AUGUST 2025**

**PROJECT NO. 20.02507**

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## **APPENDICES**

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## EXECUTIVE SUMMARY

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The purpose of this Asset Management Plan (AMP) is to inventory and document the condition of the water infrastructure for Southpoint Subdivision's Water System within the Gray's Creek Water and Sewer District. This will assist the County in becoming more proactive in the management and financing of its water system. The Southpoint Subdivision is a community located in Cumberland County. Cumberland County purchases potable water from the Bladen County Regional Water System and distributes the water to the Southpoint Subdivision and the adjacent community in southern Cumberland County.

The County does not have a previous Asset Management Plan for the water system, therefore this development process has resulted in the assembly of an AMP and 10-year Capital Improvements Plan (CIP) to guide the County with prioritizing capital projects and equipment purchases necessary to rehabilitate and maintain its water system.

This Asset Management Plan seeks to provide a foundation for evaluating the Southpoint Subdivision's distribution system. To address existing system deficiencies and improve overall operations, capital improvement projects are recommended for implementation within a 10-year planning period. An operation and maintenance plan is also provided to ensure long-term system efficiency and reliability. This report was prepared per NCDEQ Division of Water Infrastructure Asset Management Guidance, system operator knowledge, field work conducted by McGill Associates (McGill), Local Water Supply Plan information, and system mapping information prepared by McGill as a result of the field work.

Developing a Capital Improvements Plan (CIP) will allow the County to update its current rate setting model to better estimate future revenue and expenses, capital outlay, indebtedness, and overall health of the water distribution system enterprise fund reserves. A model of this nature would continue to balance revenues and expenditures with a longer-term approach to rate setting and establish a financially sound framework for the County to follow. This plan also includes a budget-level recommendation for staffing associated with system operations and maintenance for all County utility districts.

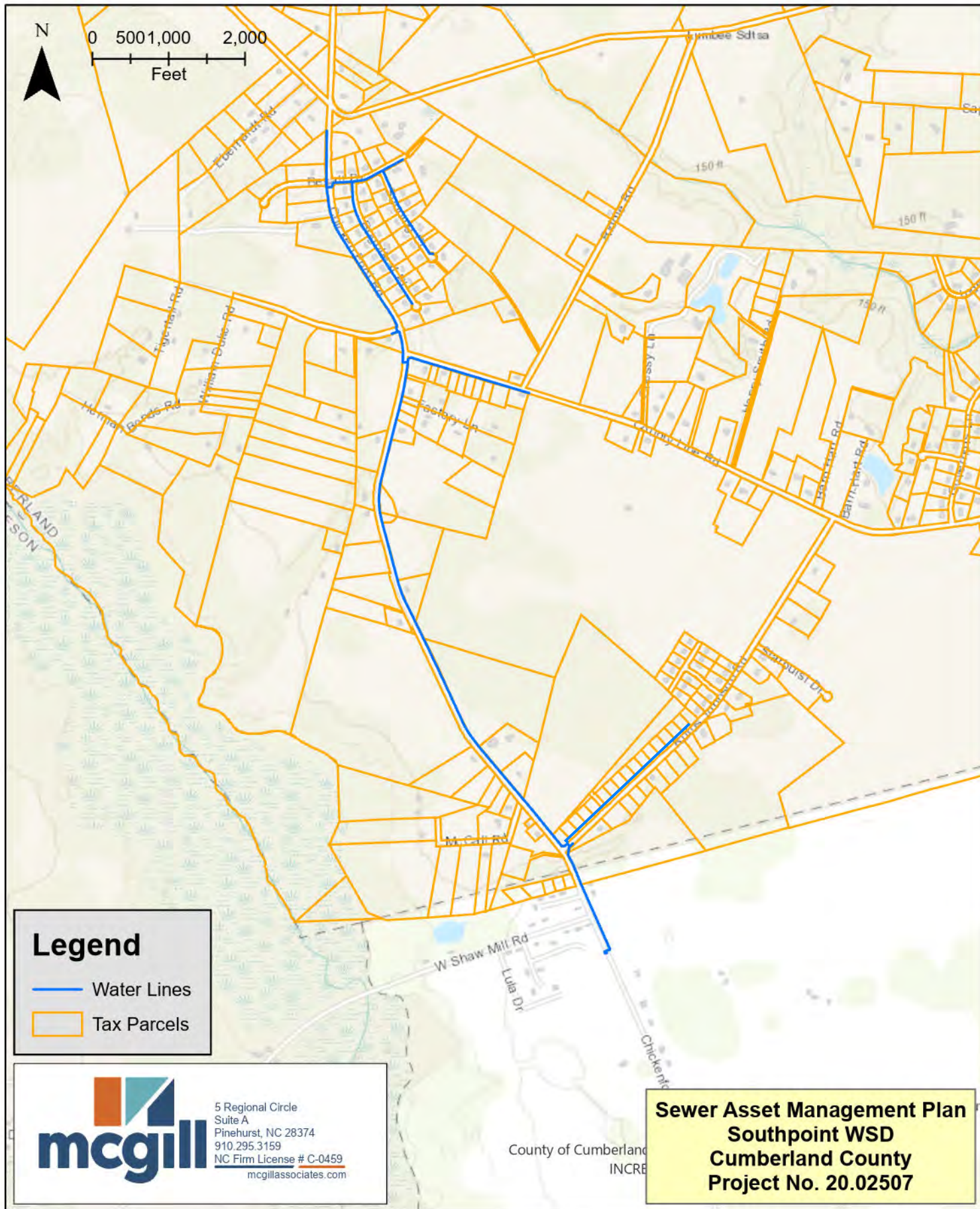


**1.1 BACKGROUND**

The Southpoint Subdivision Water System is in the Gray's Creek Water and Sewer District, located in Cumberland County, North Carolina, and is owned and operated by Cumberland County. The Southpoint Water District includes a water distribution system that currently serves 84 residential connections. Southpoint's Water Distribution System includes approximately 16,900 LF of 6-inch, 8-inch, and 12-inch water main, 12 hydrants, and 84 water meter service connections. The water mains are constructed of PVC pipe and were put into service in 2013. According to the 2022 Local Water Supply Plan (LWSP), the Southpoint community purchased a daily average of 0.0105 MGD of water from Bladen County. Figure 1 shows the current system.

The water source for the Southpoint water system is the Tobemory Well (#9) in the Bladen County Water Distribution-West Bladen water system, PWS ID 0309055. According to the Source Water Assessment Program (SWAP) Report for 2020, the well has a depth of 98 feet and yields water at 300 gallons per minute. Excerpted pages from the SWAP are included in orthophosphate used for corrosion control, Bladen County treats the water at Tobemory Well for iron through pressure sand filtration and for organics through granular activated carbon (GAC).

# Overall System Map Figure 1



## Legend

- Water Lines
- Tax Parcels



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**Sewer Asset Management Plan**  
**Southpoint WSD**  
**Cumberland County**  
**Project No. 20.02507**

## 1.2 EXISTING WATER DISTRIBUTION SYSTEM

The Southpoint water distribution system consists of 84 metered connections and approximately three miles of water distribution pipes, comprised of polyvinyl chloride, and ranging in size from 6-inches to 12-inches in diameter. Based on record drawing review and field work completed by McGill as part of this project, the system includes 12 fire hydrants and six valves. The system was put into service in 2013. The County reports no known issues with the existing system equipment.

Table 1 summarizes the existing assets within the water distribution system. Figure 2 shows the location of hydrants and valves within the system, and Figure 3 shows the diameter of existing water main.

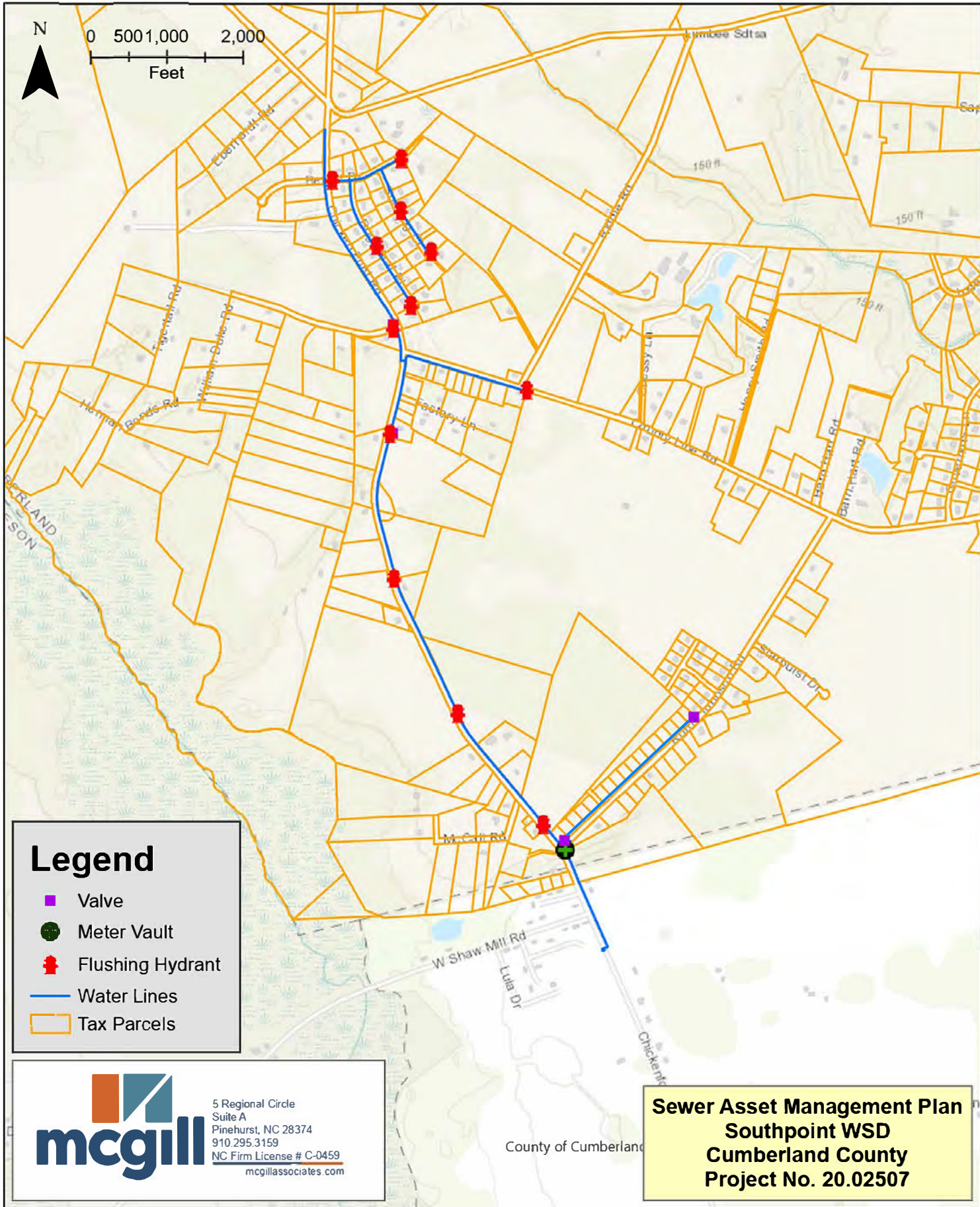
**Table 1: Water Distribution System Inventory**

<b>Asset</b>	<b>Size Range (in)</b>	<b>Estimated Length (feet)</b>
Polyvinyl Chloride Pipe	6-12	16,900
Valves	6-12	6
Fire Hydrants	N/A	12
Water Meters	N/A	81



# Hydrants and Valves Map

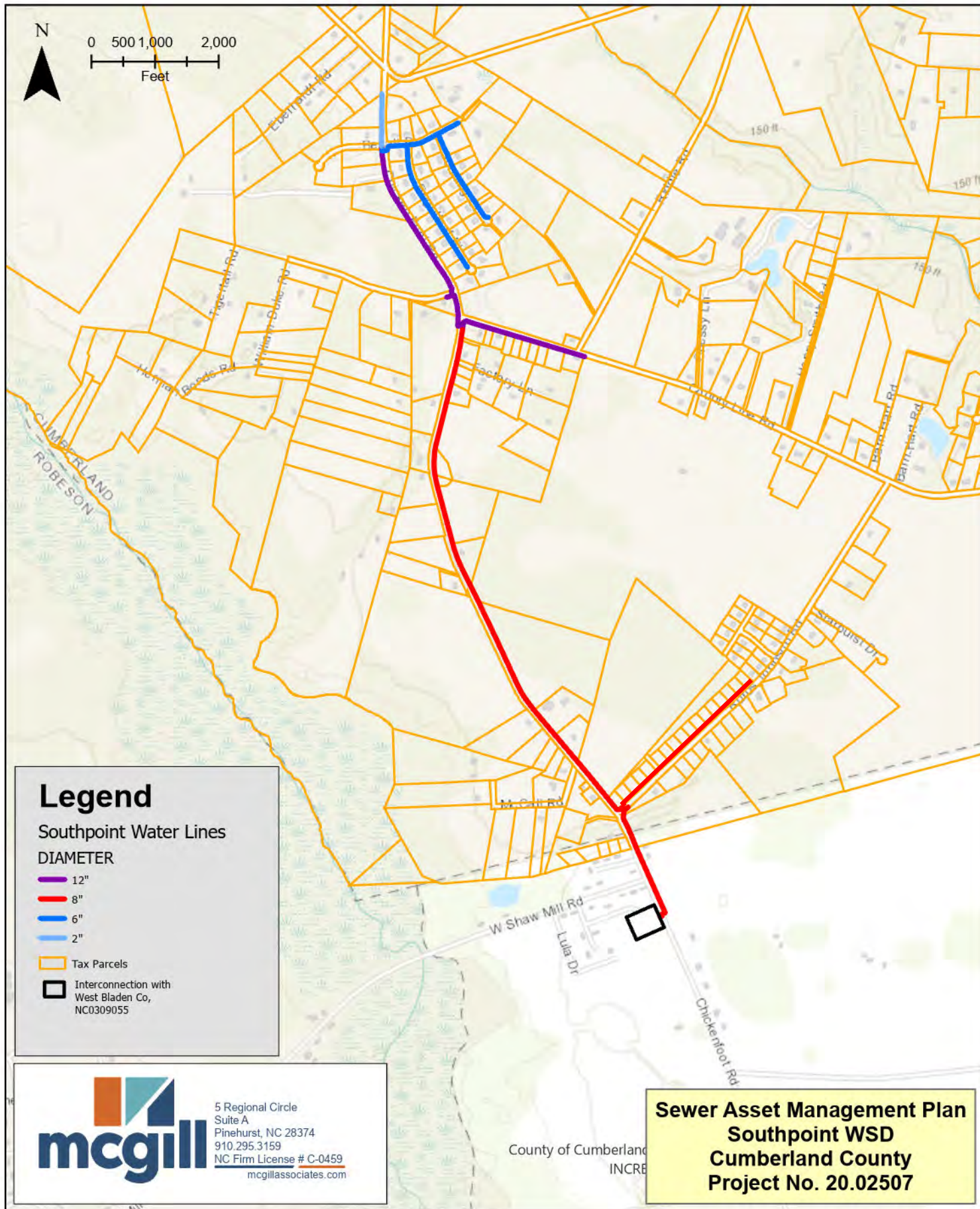
## Figure 2





# Water Line Diameter Map

## Figure 3



## 2.0

## CONDITION ASSESSMENT

### 2.1 WATER DISTRIBUTION SYSTEM

McGill Associates used a combination of water system GIS mapping, visual observations, record drawings, and operator/staff knowledge to assess the condition of the existing distribution system.

The analysis concluded that the general condition of the system is good, based on the low age of the system and primarily residential users connected to the system. The water meter condition is noted as good/fair, based on the age of the meters and the software no longer being supported.

**Table 2: Distribution System Condition Assessment**

Line Type	Size Range (in)	Quantity	% of System	Condition
PVC Pipe	6-12	16,900 LF	100%	Good
Meters	N/A	84 EA	100%	Good/Fair

**Table 3: Hydrant Condition Assessment**

Fire Hydrant Manufacturer	Average Age	Excellent	Good	Fair	Poor	Unknown	Total
American	20 years	-	12	-	-	-	12

**Table 4: Valve Condition Assessment**

Excellent	Good	Fair	Poor	Total
-	6	-	-	6

## **2.2 WATER SYSTEM HYDRAULICS AND CAPACITY**

The water system has an average pressure of 55 psi based on hydrant testing conducted by the McGill and County staff. The lowest static pressure noted during any test was 51 psi, which is still well above the minimum pressure of 30 psi for a public water system under peak flow conditions. Ground elevations within the area are relatively consistent from 160 to 165-ft above sea level.

The water system is not designed to provide fire protection. For the purposes of this report, fire hydrant flow tests were performed in the field to understand the characteristics of the system.

The Southpoint water system has 45,000 GPD of total capacity under the County's current operating agreement with Bladen County. As of March 2024, the County has approximately 10,900 GPD of remaining capacity that is currently unobligated. The County has seen a recent increase in requests from residential developers for properties that would be served by the water system. As a result, the County is interested in in-ground storage to increase its available capacities. Based on existing treatment at the source well in the Bladen County system, Cumberland County may choose to implement additional filtration ahead of proposed water storage.

The County has worked for several years to provide public water to citizens in the Gray's Creek Area, of which the Southpoint S/D water system is a part. As a part of this investigation, the County contracted with HDR to pursue funding for construction of deep wells, treatment, and distribution lines. This project would provide benefit to both the existing customers in the Southpoint S/D water system with increased hydraulic reliability and fire protection, as well as making public water available to the broader Gray's Creek area. This project with cost estimate prepared by HDR is included in the CIP for this report.



## 2.2 CONCLUSION

The existing distribution system is relatively young, and therefore the County does not face the challenge of replacing aging infrastructure at this point. Recommendations for operations and maintenance are included in this report that will serve to extend the life of the existing equipment and infrastructure in the system. Therefore, the focus of the County's needs in this system relate to other operational needs that stem from having only one full-time staff person who oversees the management of the County's three existing sewer systems and this Southpoint water system. The recommended improvements to the system are targeted at improving operational capabilities and developing resiliency within the system:

- Replacing AMR water meters with new AMI water meters and updated meter reading system
- Procure new billing software
- Construct ground-level storage tank with water filtration.

These items have been addressed in the Capital Improvements Plan.

## **3.0**

## **CAPITAL IMPROVEMENTS PLAN**

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The fieldwork, asset inventory, review of existing documentation, and consideration of staff input provided evidence for various water system improvements including specific and general recommendations. Specific recommendations determined the imminent projects in the next few years, and general recommendations are primarily maintenance and further investigation and can be implemented at minimal cost.

### **3.1 GENERAL RECOMMENDATIONS**

#### **3.1.1 Valve Turning**

EPA recommends exercising all mainline valves in the system once per year to ensure valves can be located and opened/closed properly during emergency shut-down periods. Recording the number and direction of turns to open/close will help identify problems and need for maintenance. During valve exercising, a complete evaluation of the asset should be made including difficulty accessing the valve, excessive force needed to operate and leaking during operation. Also, when exercising, complete inventory should be taken of each valve including size, type, valve box/manhole condition, depth of cover, operating condition, and evidence of other potential problems.

#### **3.1.2 Hydrant Testing**

It is recommended to continue testing hydrants throughout the year to verify that the pressures at each hydrant in the system can meet the current fire flow requirements. Hydrant tests can also give valuable information in order to find existing or additional deficiencies in the system.

### **3.1.3 Mapping**

The mapping completed as part of the AIA has been provided to the County on ArcGIS online such that the County staff can maintain and update as needed in the future. It is recommended that the County update materials for water lines where known and as maintenance and replacements are completed. Any age information should be inserted as well as keeping the system map up-to-date and providing information for future work.

## 3.2 PRIORITY PROJECTS

### 3.2.1 Water Meter Replacement Project

This project includes replacement of existing AMR meters with AMI based water meters, as well as new meter reading equipment, installation, startup and training for the associated water meter reading software and data logging software.

**Table 5: Preliminary Opinion of Probable Cost for Water Meter Replacement Project**

Item	Description	Units	Quantity	Unit Price	Total Cost
1	AMI Residential Water Meter	EA	84	\$ 500	\$ 42,000
2	Water Meter Reading System and Startup	LS	1	\$ 20,000	\$ 20,000
<b>Construction Subtotal</b>					<b>\$ 62,000</b>
Contingency (15%)					\$ 9,300
<b>Total Base Project Cost</b>					<b>\$ 71,300</b>

*\*Cost estimates are based on the knowledge of a professional engineer based on 2024 construction costs and are subject to change due to bidding environment and other factors.*

### 3.2.2 Water Storage Tank and Filtration Project

This project includes the construction of a ground storage tank to provide additional capacity for the water system, as well as additional filtration equipment.

**Table 6: Preliminary Opinion of Probable Cost for Water Storage Tank Project**

Item	Description	Units	Quantity	Unit Price	Total Cost
1	22,500 Gallon Ground Storage Tank	LS	1	\$ 55,000	\$ 55,000
2	Greensand Iron Manganese Filter	LS	1	\$ 175,000	\$ 175,000
<b>Construction Subtotal</b>					<b>\$ 230,000</b>
Contingency (15%)					\$ 43,500
Engineering Assistance (If Needed)					\$ 30,000
<b>Total Base Project Cost</b>					<b>\$ 303,500</b>

*\*Cost estimates are based on the knowledge of a professional engineer based on 2024 construction costs and are subject to change due to bidding environment and other factors.*

### 3.2.3 Construct New Wells and Water Main

This project includes approximately 25,550 linear feet of 12-inch distribution pipeline to help reduce the contamination in private drinking water wells. This project will provide well pumps and wellheads, the transmission of raw water from production wells to a treatment unit for a variety of cleaning processes, and then to distribute the water to a maximum of 100 connections throughout Gray's Creek.

Item	Description	Units	Quantity	Unit Price	Total Cost
1	Source (pumps and wellheads for 2 existing wells, 3,660 LF raw water main)	LS	1	\$ 2,861,732	\$ 2,861,732
2	Treatment (pre-filtration, IX, GAC, disinfection, ground storage, booster pumps)	LS	1	\$ 3,447,158	\$ 3,447,158
3	Distribution Lines (25,500 LF, 12" distribution line)	LS	1	\$ 8,203,417	\$ 8,203,417
<b>Construction Subtotal</b>					<b>\$ 14,512,307</b>
Contingency (10%)					\$ 1,451,231
Engineering Assistance (If Needed)					\$ 1,915,625
Administration Cost					\$ 1,734,974
<b>Total Base Project Cost</b>					<b>\$ 19,614,136</b>

### **3.3 CIP PROJECTS SUMMARY**

Cumberland County's goal is to provide clean, safe and economical water service to current and future customers. The customers include primarily residential households and businesses within the County. The County intends to provide and maintain a reliable and safe water supply and water distribution system in the Southpoint water system, which exceeds the standards imposed to protect the public health and the quality of the receiving waters.

Throughout the AIA process, the Southpoint water system was evaluated through visual inspections, hydrant testing, and water modeling. The highest priorities were collected and put into a 10-year capital improvements plan. In this plan, projects were prioritized based on existing conditions and providing operational benefit to the County.

A Capital Improvements Plan (CIP) is a plan and schedule of anticipated and required capital expenditures for public utility facilities with descriptions of project needs, estimated project costs, and timing of work over a planning period. Thus, a CIP is an important planning tool that allows a public utility to prepare for upcoming projects and to proactively determine how and when to fund them.



**Table 7: CIP Cost Summary**

Year	Water Meter Replacement	Ground Storage Tank and Filter	Construct New Wells and Water Main	TOTAL COST
1	\$ -	\$ -	\$ -	\$ -
2	\$ 71,300	\$ -	\$ -	\$ 71,300
3	\$ -	\$ -	\$ 19,614,136	\$ 19,614,136
4	\$ -	\$ -	\$ -	\$ -
5	\$ -	\$ 303,500	\$ -	\$ 303,500
6	\$ -	\$ -	\$ -	\$ -
7	\$ -	\$ -	\$ -	\$ -
8	\$ -	\$ -	\$ -	\$ -
9	\$ -	\$ -	\$ -	\$ -
10	\$ -	\$ -	\$ -	\$ -
<b>TOTAL ESTIMATED CIP COST</b>				<b>\$ 19,988,936</b>

**4.1 GENERAL RECOMMENDATIONS**

The purpose of an Operations and Maintenance (O&M) Program is to provide an organized and cost-effective approach to ongoing maintenance, repair and replacement activities that will maintain the water distribution system, so it performs as intended and adheres to applicable sections of the of the Water System Management Plan, set forth under North Carolina Office of Administrative Hearings, Subchapter 18c of Title 15A.

This section provides a general description of proactive O&M, that can be defined as scheduled maintenance activities (preventive maintenance), performed on a regular basis in order to achieve the highest level of system performance using available resources and minimizing failures that can result in low pressure, degraded quality, service interruptions and possible contamination.

Developing an O&M Program begins with accurate records of infrastructure inventory, asset locations and physical condition. Coupled with work records and system performance history, preventive maintenance schedules can be developed to efficiently address general system needs, from regular flushing of stagnate water to site-specific maintenance work such as leak repairs.

The following elements provide the foundation for an effective O&M program:

- Maintain up-to-date water distribution system maps and related work history and operational data.
- Develop a routine preventive O&M program and activities for staff and contractors maintaining the water distribution system and a system to document scheduled activities.
- Develop a rehabilitation and replacement plan identifying and prioritizing system deficiencies and implement short- and long-term actions to address the deficiencies.
- Develop and implement training programs to build technical competence and emergency preparedness.

- Develop and provide equipment and replacement part inventories, including critical replacement parts.

The County has an Operations and Maintenance Plan for the water system that was developed by Koonce, Noble and Associates in 2013. The plan focuses on six areas, including: Frost Prevention, Leak Detection and Repair, Meter Calibration, Flushing, Valve Exercise, and Control of Authorized Use. A copy of this plan is included in Appendix B of this report. In addition to and as an elaboration on that plan, McGill suggests the following as critical elements to proactive O&M.

### **Water System Mapping**

Water system maps and related databases are typically managed using a Geographic Information System (GIS). These maps and datasets can be viewed through a GIS desktop program (i.e. ArcGIS), or by creating digital (typically pdf format) maps and tables to be viewed on screen, exported to other software (excel) for analysis, or printed for manual markup, editing, etc. GIS mapping is supported by a database that records water main size, material types, locations of valves, meters, service connections and other attributes of system appurtenances. It can also attach images and records such as field inspections to specific asset(s) or location(s) and attach performance data such as operating pressure or fire flow to sections of the distribution system. GIS provides a powerful tool to build, organize and display the physical and operational attributes of the water distribution system.

The GIS database should be updated on a regular basis. Software applications such as work order systems are available to allow field staff to update GIS data as inspection and maintenance activities are completed. Other applications can also allow staff to update and edit maps.

GIS can organize work history along with operational data, inspection records and images to provide managers, operations staff and engineers with powerful data sets to track current resource allocations and forecast short and long-term operational and capital needs. Outcomes of detailed analysis such as recommended water main rehabilitation work versus water main break history can be mapped to present the relationship visually for ease of communicating and understanding.

### **Preventive Operation and Maintenance (O&M)**

Preventive maintenance is performing routine and scheduled maintenance activities before equipment or buried infrastructure fails, for the purpose of extending useful life, reducing overall operating costs, and increasing system reliability. This proactive approach to maintenance work is more efficient and cost effective than reactive and curative operations.

Preventive maintenance activities will also help operations staff to better understand the distribution system and how it works under various conditions. This knowledge is essential to setting maintenance priorities and developing the scope and timing of long-term rehabilitation and replacement projects.

### **Scheduled Flushing/Cleaning of Water Mains**

A regular flushing schedule for maintaining or improving water quality, primarily by raising chlorine residual, in key locations is typically developed based on the history of regular sampling and/or customer complaints. Care must be taken to flow sufficient volume to remove stagnant water at a rate of flow capable of removing sediments that contribute to degraded water quality. Monitoring chlorine residuals will provide a good indicator that water quality has reached the desired level to complete the task. Automatic flushing valves may be installed to reduce labor costs and ensure regular flushing at appropriate intervals and duration to accomplish the desired results.

More frequent flushing may be necessary during summer months when temperature will speed up degradation and possible formations of disinfectant byproducts. Unidirectional flushing should also be considered on a periodic basis to enhance sediment removal as needed. Mechanical cleaning, forcing a “pig” through the pipe network may be considered where extensive sedimentation and tuberculation occurs.

As part of the O&M Program, a master list of flushing/cleaning operations, priority locations and scheduling can be incorporated into GIS. Maps can be produced to define work areas, schedule resources, including contracted services, track progress and task completion. Updating GIS maintenance operations data (water quality monitoring, sediment quantity, etc.) will help managers adjust cleaning frequency and area boundaries as needed to increase program efficiency, maintain water quality and reduce customer complaints.

### **Routine Visual Inspections**

Routine inspections are used to assess the condition of valve structures, hydrants and other surface facilities, recording general conditions and evidence of water leaks, possible structural problems or failures (offset structures, etc.), corrosion and other damage. Work orders are generated based on inspection records to effect operational adjustments, scheduling more detailed inspections and/or making necessary repairs.

### **Valve Exercising Program**

EPA recommends exercising all mainline valves in the system once per year to ensure valves can be located and opened/closed properly during emergency shut-down periods. Recording the number and direction of turns to open/close will help identify problems and need for maintenance. During valve exercising, a complete evaluation of the asset is made including difficulty accessing the valve, excessive force needed to operate and leaking during operation.

During valve exercising complete inventory is taken of each valve including size, type, valve box/manhole condition, depth of cover, operating condition, and evidence of other potential problems.

Develop a standard form for recording information to ensure consistency of work and accuracy of records. These records are used to prioritize maintenance and repair scheduling and provide a history of condition assessments that will help develop the scope of rehabilitation and replacement work.

### **Leak Detection and Water Loss Reduction**

Proactively identifying and repairing system leaks will reduce the amount of finished water that does not reach the customer and would also increase the overall cost of water delivered to the customer. Reducing water system loss will help to contain utility costs, reduce the need and frequency of rate increases, and preserve a valuable natural resource.

Developing a water loss control program is essential to meeting these goals. Two options are the small system water audit, which was developed from the N.C. Division of Water Resources' Local Water Supply Plan (LWSP), and the American Water Works Association (AWWA) water loss control committee's free water audit. While the AWWA water audit applies to all systems, smaller systems (less than 10,000 people) with more limited resources may elect to complete a slightly less comprehensive audit. DWR has developed an alternative water audit that is available on the division's website.

## **Maintenance Activity Records**

Detailed records and daily logs of O&M work provide valuable information to help managers evaluate the effectiveness of maintenance activities and make adjustments to optimize the use of limited resources. Equipment, manpower and other resources are tracked along with detailed descriptions of defects and other repair needs encountered. Maintenance work resulting in system modifications or extensions should be incorporated into record drawings and system maps. Scheduled testing of emergency and standby equipment is also recommended.

These records should be reviewed periodically to identify problems that cannot be resolved in a short period of time in order to develop a plan to address the problem(s). Maintaining these records for an extended period of time (5 years or more) will also provide accurate reference points of maintenance investments made over time that will track the effectiveness of operation and maintenance activities.

In the event of pressure loss or boil water notice, maintenance records will need to provide sufficient detail to satisfy reporting requirements for the event, including location(s), corrective actions, testing and monitoring, etc. This data may also be integrated into GIS to allow mapping of these events over time in order to identify patterns and/or trends that will assist with scheduling maintenance and planning rehabilitation and other capital improvements.



## **Resolution of Customer Complaints**

Customer complaints are primarily for low pressure, tastes and odors. These conditions require an immediate response to diagnose and resolve the problem. These calls can occur outside normal business hours, significantly escalating costs. Detailed records of the problems found, and the resources needed to address the conditions provide valuable feedback for making adjustments to the preventive maintenance program that can reduce these types of calls and help lower overall maintenance costs.

## **Capital Improvements Plan**

A Capital Improvements Plan (CIP) identifies rehabilitation, replacement and expansion needs of the system. The CIP should address the short and long-term needs of the system, covering at least a 5 to 10-year planning period, and includes the estimated cost of each capital project.

CIP development incorporates maintenance activity, cleaning and inspection records, and system performance data that may include flow monitoring and hydraulic modeling to evaluate the existing system and to recommend improvements needed to correct existing deficiencies, and ensure adequate capacity is maintained throughout the system.

Capital planning includes consideration of on-going funding for rehabilitation and replacement of the collection system as it wears out, and potential upgrades for expansion as needed.

## **Training Program**

Training programs provide a mechanism for educating employees and establishing their technical competence to perform operations, maintenance, and emergency responses safely and effectively. A combination of in-house skill training and specialized training purchased or provided through state and national associations, conferences and vendor training programs are typically used to build and enhance skills for performing daily work duties. Periodic training reinforces previous efforts, as people often overlook things that are used infrequently. It also provides an opportunity to train new staff and learn about new problems, new techniques, and changes in equipment.

Emergency training educates system personnel about emergency situations and resulting effects on the wastewater system, public health and environmental impacts. It also provides an opportunity to practice responses. Good record keeping ensures personnel are properly trained and prepared to effectively operate and maintain the collection system under any given circumstance. Regular review of training records is essential for keeping content up-to-date and maintaining proper employee awareness.

## **Equipment and Replacement Parts**

A reasonable supply of equipment and replacement parts should be maintained to fully support all operations and maintenance activities. A detailed inventory is essential to ensure availability under normal operations and emergency conditions. Specialized equipment or parts may be too costly to keep in stock, so arrangements with vendors, contractors and other utilities (under mutual aid agreements) may be necessary to ensure availability during non-business hours or during emergencies.

## 4.2 STAFFING RECOMMENDATIONS

Cumberland County is responsible for three wastewater collection systems and one water system: NORCRESS, Overhills, Kelly Hills, and Southpoint Water System. While each of these districts maintains its own operating budget, the Board leadership and operational management is performed solely by Cumberland County. Therefore, in consideration of the typical utility system management and operations and maintenance that is necessary for maintaining each of the systems, McGill has considered all of the four utility systems cumulatively. While each system could be analyzed separately, considering the systems together is more consistent with actual management of the systems.

Typical metrics for analyzing full-time equivalent (FTE, representing quantity full-time workers) are based on either the population served by the system or by miles of utility piping (water main or sewer line) within each system. For reference, Table 6 below summarizes the customers and piping in each of the County's utility systems.

**Table 6: Utility System Comparison**

DISTRICT	Number of Connections		Paying Avail. Fee	Pipe in System (mi.)
	Water	Sewer		
<b>Southpoint</b>	84		129	2.8
<b>Kelly Hills</b>		102	166	4.5
<b>Overhills</b>		107	318	4.0
<b>NORCRESS</b>		452	666	41.1
<b>TOTALS</b>	<b>84</b>	<b>661</b>	<b>1279</b>	<b>52.4</b>

**Table 7: Typical Population vs. Pipe Length**

<b>Population</b>	<b>Pipe in System (mi.)</b>
0-100	5
101-500	5
501-3300	21
3301-10000	62

The typical sizes of utility systems from a community system EPA study<sup>1</sup> are shown in Table 7, and are generally consistent when compared to the County’s systems. This study was selected as a basis for comparison due to its comprehensive nature, having included water systems nationwide in its breadth. NORCRESS is the exception when compared to Table 7. This is mostly likely indicative of the system serving a more rural population where the connection density is less, and resulting from the length of force main piping in the system that increases the overall length but does not contribute to population density. Overall, these metrics were found to be reasonably consistent with the County’s systems. Similarly, the data is consistent regardless of whether the utility system is a water systems or wastewater collection system.

The objective is to make budget-level staffing recommendations for the County’s utility systems based on what is typical across the industry and other utility systems of comparable size. The EPA study utilized provides typical FTE for the roles of manager, plant operator, distribution (and collection, for our purposes), and administrative functions. All of these were considered applicable to management and operation of the County’s utility systems. Note: while the County is not responsible for plant operation in any system, the lift stations in the NORCRESS and Overhills systems are the County’s responsibility, therefore this metric was used, albeit in a smaller percentage, to account for the management of those resources.

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<sup>1</sup> Analysis conducted using excerpts from US EPA document, “National Characteristics of Drinking Water Systems Serving 10,000 or Fewer People,” published July 2011.

Table 8 shows Further utilizing the EPA statistics as base for typical FTE for each of the positions, based on the system size in terms of miles of pipe main.

**Table 8: Average Community System Statistics**

Employee Category	System Size (miles of Main)		Mean	Cumberland County
	Pop. 500-3300	Pop. 3300-10000		
	21	62	41.5	51.7
<b>Manager FTE</b>	0.6	1.1	0.85	1.06
per mile	0.029	0.018	0.020	0.020
<b>Plant Operator FTE</b>	0.6	1.3	0.95	1.03
per mile	0.029	0.021	0.023	0.023
<b>Distribution FTE</b>	0.8	2.5	1.65	2.06
per mile	0.038	0.040	0.040	0.040
<b>Administrative FTE</b>	0.6	1.5	1.05	1.31
per mile	0.029	0.024	0.025	0.025

The green highlighted cells are the calculated FTEs that were applied to estimate staffing size based on the quantity of pipe across the County’s four utility systems. Those calculated FTEs are based on the size of systems managed by the County and reasonable estimate of staffing needed for these systems.

Each of the FTEs is applied to each respective employee category. McGill utilized wage information from Zip Recruiter and a benefits multiplier of 1.38 from the U.S. Bureau of Labor Statistics to develop the summary shown in Table 9.

**Table 9: Overall Salary Estimates**

Employee Category	Hourly Rate	Annual Salary	Ben. Mult.	Total	Applied FTE	Applied Budget Cost
Manager	\$38.50	\$80,080.00	1.38	\$110,510.40	1.06	\$117,000
Operator	\$24.52	\$51,001.60	1.38	\$70,382.21	1.03	\$72,700
Distribution	\$23.57	\$49,025.60	1.38	\$67,655.33	2.06	\$139,100
Administrative	\$21.33	\$44,366.40	1.38	\$61,225.63	1.31	\$80,100
<b>Total Applied Budget Cost Based FTEs</b>						<b>\$408,900</b>

Utilizing industry metrics and comparing to systems of comparable size, McGill offers the proceeding section as a general staffing recommendation. This section and these budget values are provided for preliminary planning purposes only.

Staffing levels appear to be reasonable based on the District's ability to operate and maintain the system while providing a reliable level service to its customers.

While this budget number is higher than the current budget staffing, consideration should also be given to the cumulative effect cost to the County for contracted operation and distribution support in the NORCRESS and Kelly Hills district.

# **APPENDICES**





## **Appendix A**

**Excerpt from West Bladen County Water System SWAP**



**Source Water Assessment Program Report for  
BLADEN CO WTR DIST-WEST BLADEN**  
*Community Water System*

**Introduction: What is a Source Water Assessment?**

The North Carolina Division of Water Resources, Public Water Supply (PWS) Section is responsible for implementing the Source Water Assessment Program (SWAP) and completing assessments for all public drinking water supplies in the state. The 1996 amendments to the Safe Drinking Water Act provided federal support and required states to conduct assessments of all public water systems. A source water assessment is a qualitative evaluation of the potential of a drinking water source to become contaminated by the identified potential contaminant sources (PCS) within the delineated area. In North Carolina there are approximately 8,000 public water supply sources that were assessed by the state. The PWS Section has gathered information for each water supply and developed a process for completing the assessments. This process is summarized in the next few pages and detailed in Section 6 of this report.

This report provides a summary of the results for the **Source Water Assessment** for your drinking water source(s).

**What is the Source of Your Drinking Water?**

Everyone wants clean, safe drinking water and we assume this natural resource will always be available to us. However, drinking water sources can be threatened by many potential contaminant sources, including underground storage tanks for gasoline, permitted wastewater discharges and other waste disposal sites, improper handling of hazardous materials, urban storm water runoff, or other types of non-point source contamination such as runoff produced by agricultural activities and land clearing for development. Your drinking water source(s) is listed in Table 1. Protecting your drinking water from becoming contaminated is a wise investment in public health and your community's future.

**Table 1. Public Water Supply System Information**

System Name	BLADEN CO WTR DIST-WEST BLADEN
City	ELIZABETHTOWN
PWS ID	NC0309055
Source Name	WELL #10 MT HOREB WELL
Source Name	WELL #11
Source Name	WELL #13
Source Name	WELL #4/ABBOTTSBURG
Source Name	WELL #5/WHITE'S XRD
Source Name	WELL #8
Source Name	WELL #9 TOBEMORY

In addition to the sources listed in Table 1 above, this water supply system has interconnections to allow for the purchase of water from the following water system(s) or "Seller" system(s):

**BLADENBORO, TOWN OF  
CLARKTON, TOWN OF  
EAST ARCADIA, TOWN OF  
ELIZABETHTOWN, TOWN OF**

## **TAR HEEL WATER CORP**

Please refer to the Source Water Assessment Program Report for the "Seller" system(s) to review the assessment results for the purchased water supply sources that provide drinking water for this water system.

### **Assessment Report Contents**

This assessment report includes the following sections:

- Section 1: Assessment Area Delineation
- Section 2: Potential Contaminant Source Inventory and Map
- Section 3: What is a Susceptibility Rating?
- Section 4: Reviewing Your SWAP Results
- Section 5: Maps, Tables and Figures for your Drinking Water Source(s)
- Section 6: North Carolina's SWAP Approach

### **Section 1: Assessment Area Delineation**

The area delineated for your well(s) for the purpose of this assessment is the contributing area for the well(s). When a well is pumped, it begins to influence groundwater that is flowing through the subsurface and towards the well. The pumping of the well creates a contributing area around the well that supplies water to the well. This is the area through which contaminants, if released to the environment, can be reasonably expected to move through the ground and reach the well.

### **Section 2: Potential Contaminant Source Inventory and Map**

The potential contaminant source inventory map shows the delineated area for your drinking water source(s). This is the area where potential contaminant sources, if released to the environment, could reasonably be expected to be a risk or a potential for contamination of your drinking water supply. A PCS in this assessment report is a facility or site regulated under a state or federal regulatory program. These facilities are identified in electronic databases that contain location information for each facility. Only databases that include statewide information were used for this source water assessment. Included in this report are:

- 1) A table of any PCS identified within the delineated assessment area; and
- 2) A map of the delineated assessment area showing PCSs, roads, jurisdictional boundaries and other pertinent information.

It is important to note that the PCSs identified in this report are only potential sources of contamination to your drinking water source. Environmental contamination is not likely to occur if harmful contaminants are managed properly.

### **Section 3: What is a Susceptibility Rating?**

In North Carolina the susceptibility of any drinking water source is based on two components, a contaminant rating and an inherent vulnerability rating. Your drinking water source(s) was assigned a qualitative susceptibility rating of higher, moderate or lower based on the results of the contaminant rating and inherent vulnerability rating process as described in the following paragraphs.

## **Susceptibility Rating**

The final susceptibility rating for your drinking water source(s) is determined by combining the contaminant rating and the inherent vulnerability rating. More detailed information on the susceptibility rating process can be found in Section 6 of this report.

### **Contaminant Rating**

The contaminant rating for your drinking water source(s) was determined based on the number and location of PCSs within the delineated area. Each PCS identified within the delineated area was assigned a risk rating of higher, moderate or lower. The number of PCSs that occur within the delineated area was determined and a contaminant rating of higher, moderate, or lower was assigned to your drinking water source(s).

### **Inherent Vulnerability Rating**

The inherent vulnerability rating of your well(s) refers to the geologic characteristics or existing conditions of the well and its delineated assessment area. These characteristics include aquifer rating, unsaturated zone rating and well integrity/well construction rating. The aquifer rating is an assessment of the water transmitting characteristics of the aquifer. The unsaturated zone rating is an assessment of the likelihood that contaminants from surface and shallow sources will follow the path of aquifer recharge and reach the water table. The well integrity/construction rating is an assessment of the quality of the construction of the well. An inherent vulnerability rating of higher, moderate or lower was assigned to your well(s).

**Table 2. SWAP Results Summary**

<b>Source Name</b>	<b>Inherent Vulnerability Rating</b>	<b>Contaminant Rating</b>	<b>Susceptibility Rating</b>
WELL #10 MT HOREB WELL	Lower	Lower	Lower
WELL #11	Lower	Lower	Lower
WELL #13	Lower	Lower	Lower
WELL #4/ABBOTTSBURG	Lower	Lower	Lower
WELL #5/WHITE'S XRD	Moderate	Lower	Moderate
WELL #8	Lower	Lower	Lower
WELL #9 TOBEMORY	Moderate	Lower	Moderate

It is important to understand that a susceptibility rating of higher does not imply poor water quality. Susceptibility is an indication of a water supply's potential to become contaminated by the identified PCSs within the assessment area.

**Table 3. Well Information**

<b>Source Name</b>	<b>Well Yield (Gallons/Min)</b>	<b>Well Depth (Feet)</b>
WELL #10 MT HOREB WELL	300	293
WELL #11	320	283
WELL #13	250	205
WELL #4/ABBOTTSBURG	500	127
WELL #5/WHITE'S XRD	390	144
WELL #8	300	188
WELL #9 TOBEMORY	300	98

#### **Section 4: Reviewing Your SWAP Results**

Please review the information on your drinking water source(s) provided in this report. If you believe any of this information is incorrect please contact the Public Water Supply Section by e-mail at the following address: **SWAP@ncdenr.gov** or you may submit comments to us at:

SWAP  
Public Water Supply Section  
1634 Mail Service Center  
Raleigh, NC 27699-1634

Or you may contact the Source Water Assessment staff by phone at 919-707-9098.

#### **Section 5: Maps, Tables and Figures for Your Drinking Water Source(s)**

Maps, tables and figures specific to your drinking water source(s) are included in this report in the following pages and are listed below.

Map 1. Location Map

Map 2. Delineated Area and PCS Map

Table 4. Potential Contaminant Source Attributes

Table 5. Inherent Vulnerability Rating

Table 6. Unsaturated Zone Rating Calculation or Watershed Characteristics Rating Calculation

Figure 1. Land Use / Land Cover Categories

Figure 2. Unsaturated Zone Rating or Watershed Characteristics Rating

Figure 3. Vertical Hydraulic Conductance Rating or Average Annual Precipitation Rating

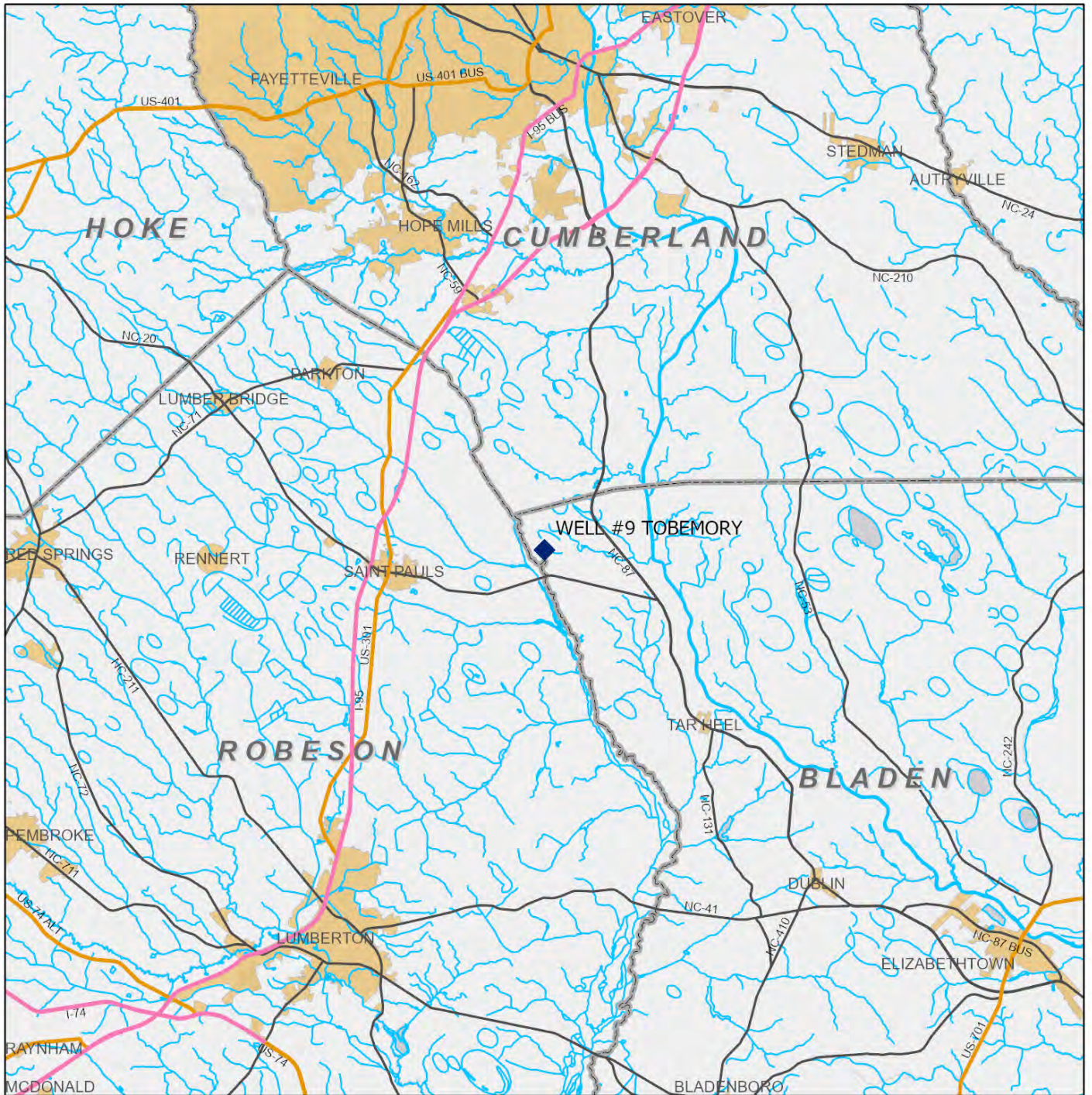
Figure 4. Land Surface Slope Rating

Figure 5. Land Use Rating

Figure 6. Land Cover Rating

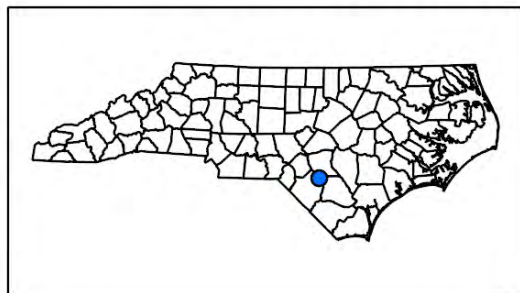
Figure 7. Ground Water Contribution Rating (only applicable to surface water sources)



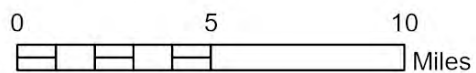


MAP 1. LOCATION MAP

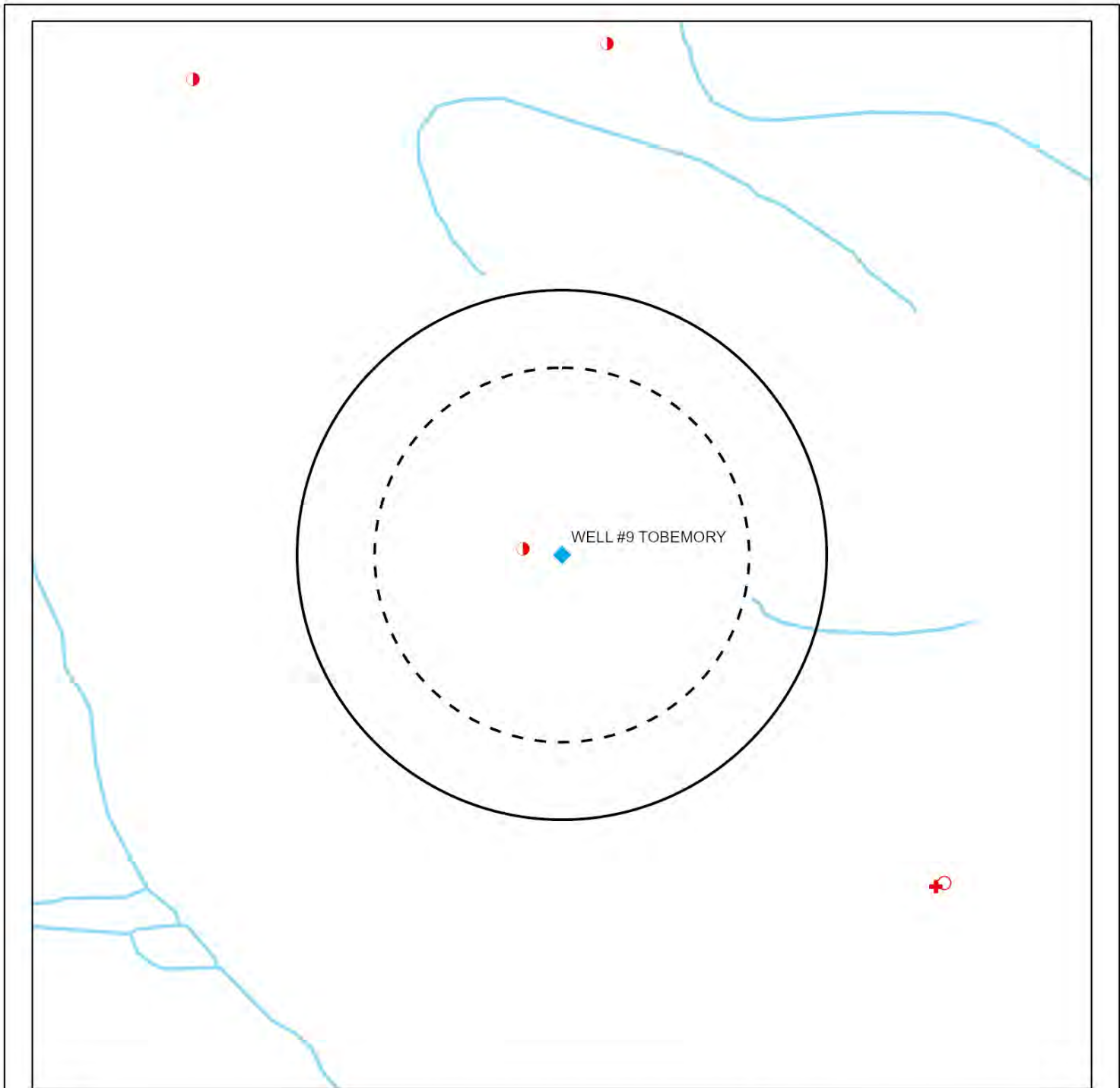
BLADEN CO WTR DIST-WEST BLADEN, PWS ID: 0309055, WELL #9 TOBEMORY



- |             |                      |
|-------------|----------------------|
| Major Roads | Major Hydrology      |
| Interstate  | Municipal Boundaries |
| US Route    | County Boundaries    |
| NC Route    | Rivers and Streams   |







### MAP 2. DELINEATED AREA AND PCS MAP

BLADEN CO WTR DIST-WEST BLADEN, PWS ID: 0309055, WELL #9 TOBEMORY

**PCS Types**

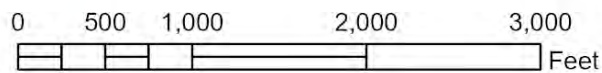
- Animal Operations
- CERCLA-Fed. Remediation
- Hazardous Waste Sites
- Inactive Hazardous Waste Sites
- Non Discharge Permits
- NPDES Permits
- PCB Sites
- Pollution Incidents

- Septage Disposal Sites
- Soil Remediation Sites
- Solid Waste Facilities
- Tier II Sites
- Old Landfill Sites
- UIC Permits
- UST Permits

**Major Roads**

- Interstate
- US Route
- NC Route
- Rivers and Streams
- Major Hydrology
- Municipal Boundaries

- Ground Water Assessment Area - Delineated Area
- Ground Water Assessment Area - Zone A



**Table 4. Potential Contaminant Source Attributes  
BLADEN CO WTR DIST-WEST BLADEN  
PWS ID: NC0309055, WELL #9 TOBEMORY**

PCS Name	PCS ID	PCS Type	PCS Risk Rating	Street Address	City	Zip	County
Tobermory Well	WQ0033325	Non-Discharge Permits	Moderate				Bladen

**Table 5. Inherent Vulnerability Rating  
BLADEN CO WTR DIST-WEST BLADEN  
PWS ID: NC0309055, WELL #9 TOBEMORY**

Ground Water Source Characteristics	Vulnerability
Aquifer Rating	Moderate
Unsaturated Zone Rating	Moderate
Well Integrity/Construction Rating	Higher

**Inherent Vulnerability Rating: Moderate**

**Table 6. Unsaturated Zone Rating Calculation  
BLADEN CO WTR DIST-WEST BLADEN  
PWS ID: NC0309055, WELL #9 TOBEMORY**

<b>Unsaturated Zone Score</b>	<b>59.7</b>
-------------------------------	-------------

**Notes:**

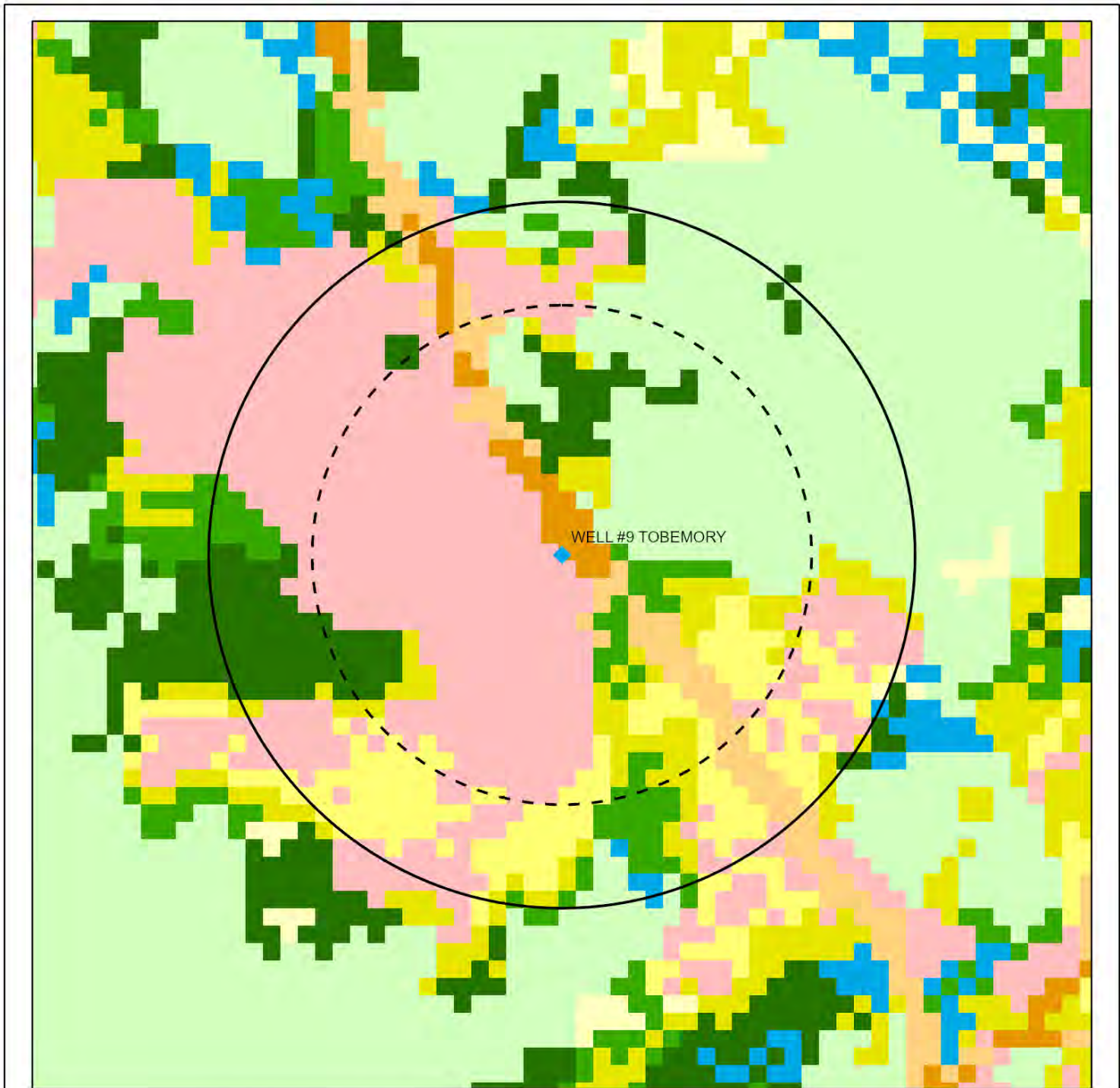
1. Unsaturated Zone Score for each cell (CS):

$$CS = [3 \times (\text{vertical hydraulic conductance score})] + [2 \times (\text{land surface slope score})] + [3 \times (\text{land use score})] + [2 \times (\text{land cover score})]$$

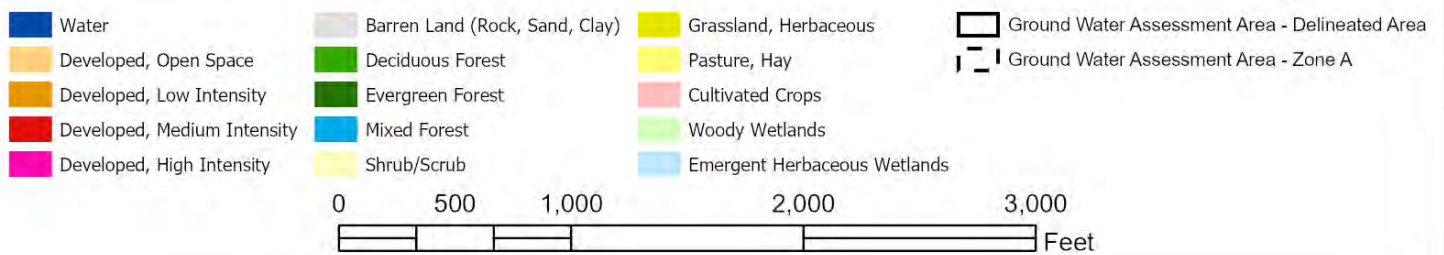
2. Unsaturated Zone Score (S) for the entire assessment area is the mean of the cell scores (CS) calculated as:

The sum of all cell unsaturated zone scores (CS) divided by the number of cells (N) within the assessment area:  $S = (\sum CS) / N$

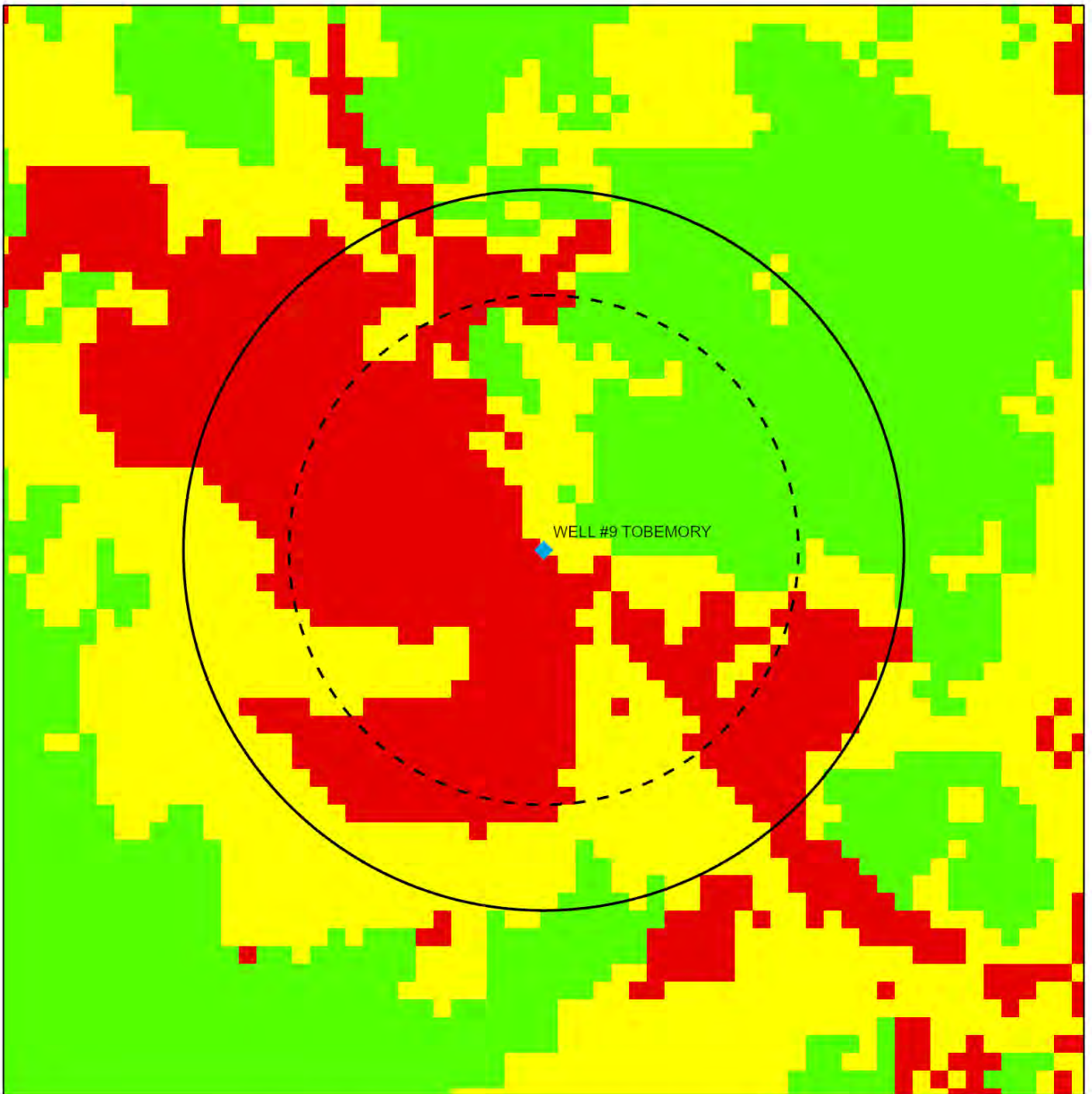
3. The USGS publication "Methods of ranking unsaturated zone and watershed characteristics of public water supplies in North Carolina", by J. L. Eimers, J. C. Weaver, S. Terziotti, and R. W. Midgette, 1999, provides a detailed discussion of the methods used to determine unsaturated zone ratings.



**FIGURE 1. LAND USE/LAND COVER CATEGORIES**  
 BLADEN CO WTR DIST-WEST BLADEN, PWS ID: 0309055, WELL #9 TOBEMORY



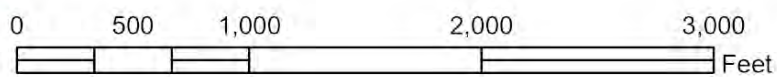




**FIGURE 2. UNSATURATED ZONE RATING**  
 BLADEN CO WTR DIST-WEST BLADEN, PWS ID: 0309055, WELL #9 TOBEMORY



- Lower  $\leq 50$
- Moderate  $> 50$  to  $65$
- Higher  $> 65$
- Ground Water Assessment Area - Delineated Area
- Ground Water Assessment Area - Zone A



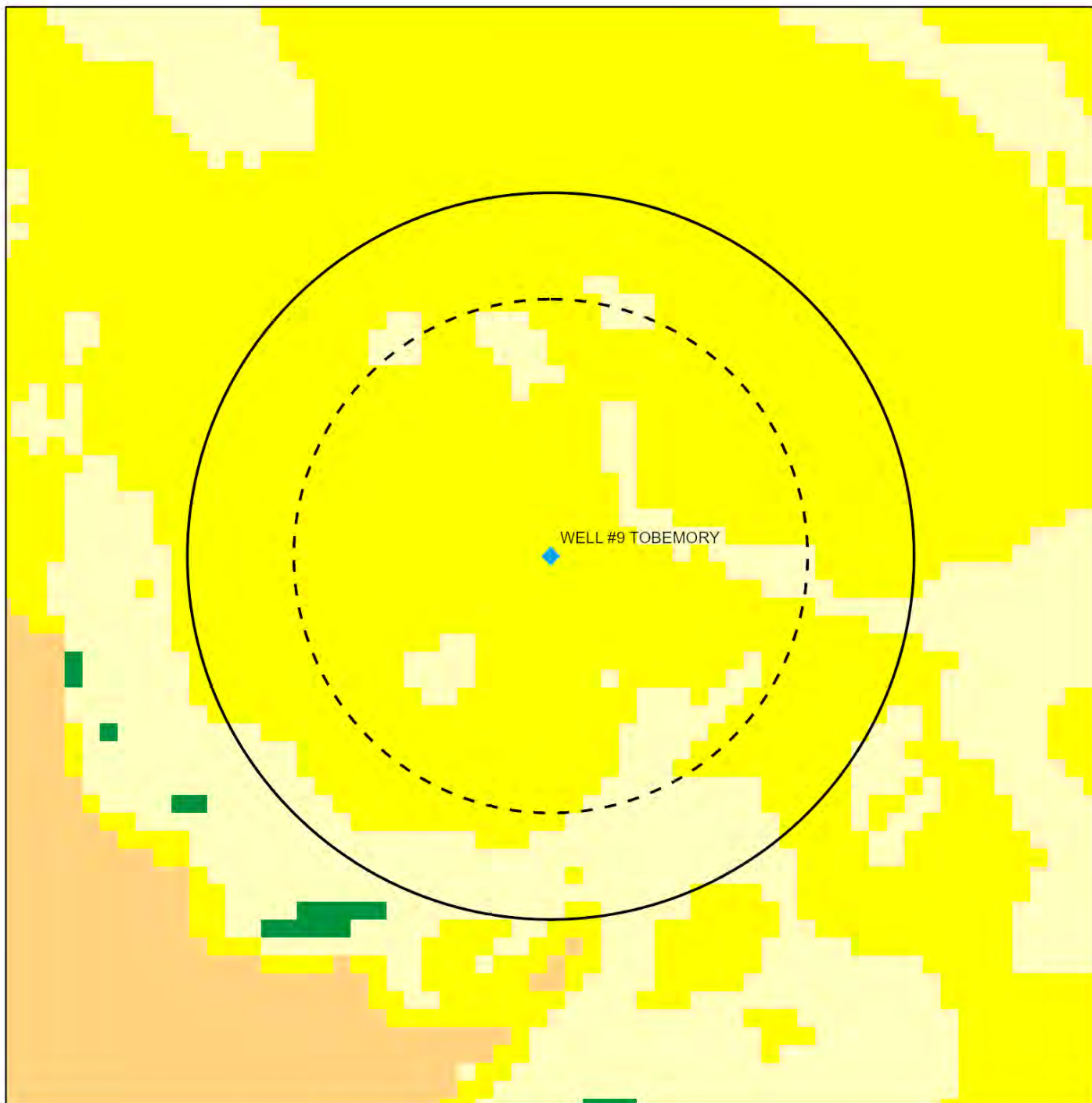
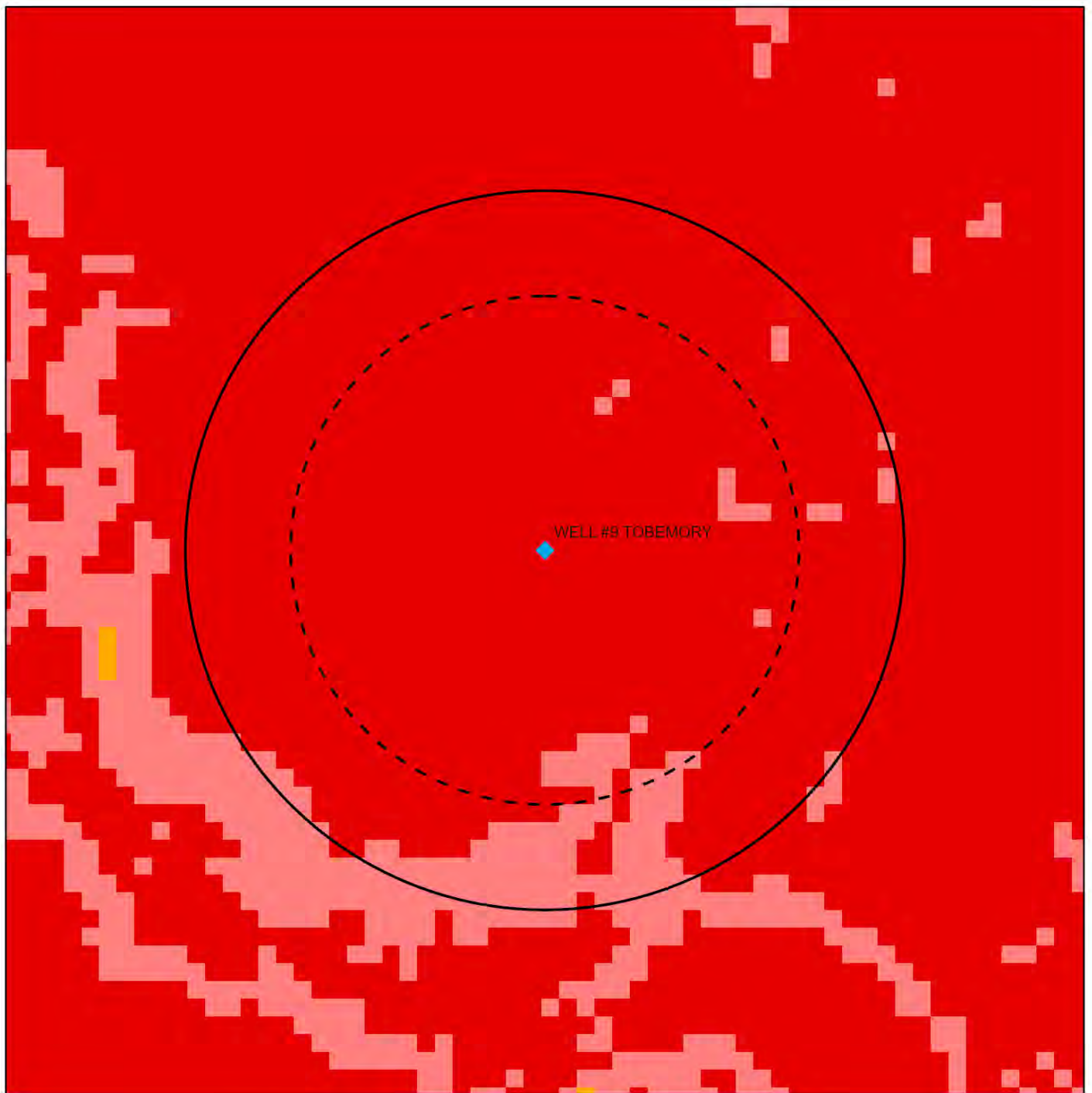


FIGURE 3. VERTICAL HYDRAULIC CONDUCTANCE RATING  
 BLADEN CO WTR DIST-WEST BLADEN, PWS ID: 0309055, WELL #9 TOBEMORY





**FIGURE 4. LAND SURFACE SLOPE RATING**  
 BLADEN CO WTR DIST-WEST BLADEN, PWS ID: 0309055, WELL #9 TOBEMORY



- |                        |                       |  |
|------------------------|-----------------------|--|
| 1 (> 50 percent)       | 7 (> 5 to 10 percent) | Ground Water Assessment Area - Delineated Area |
| 3 (> 20 to 50 percent) | 9 (> 2 to 5 percent)  | Ground Water Assessment Area - Zone A          |
| 5 (> 10 to 20 percent) | 10 (<= 2 percent)     |  |





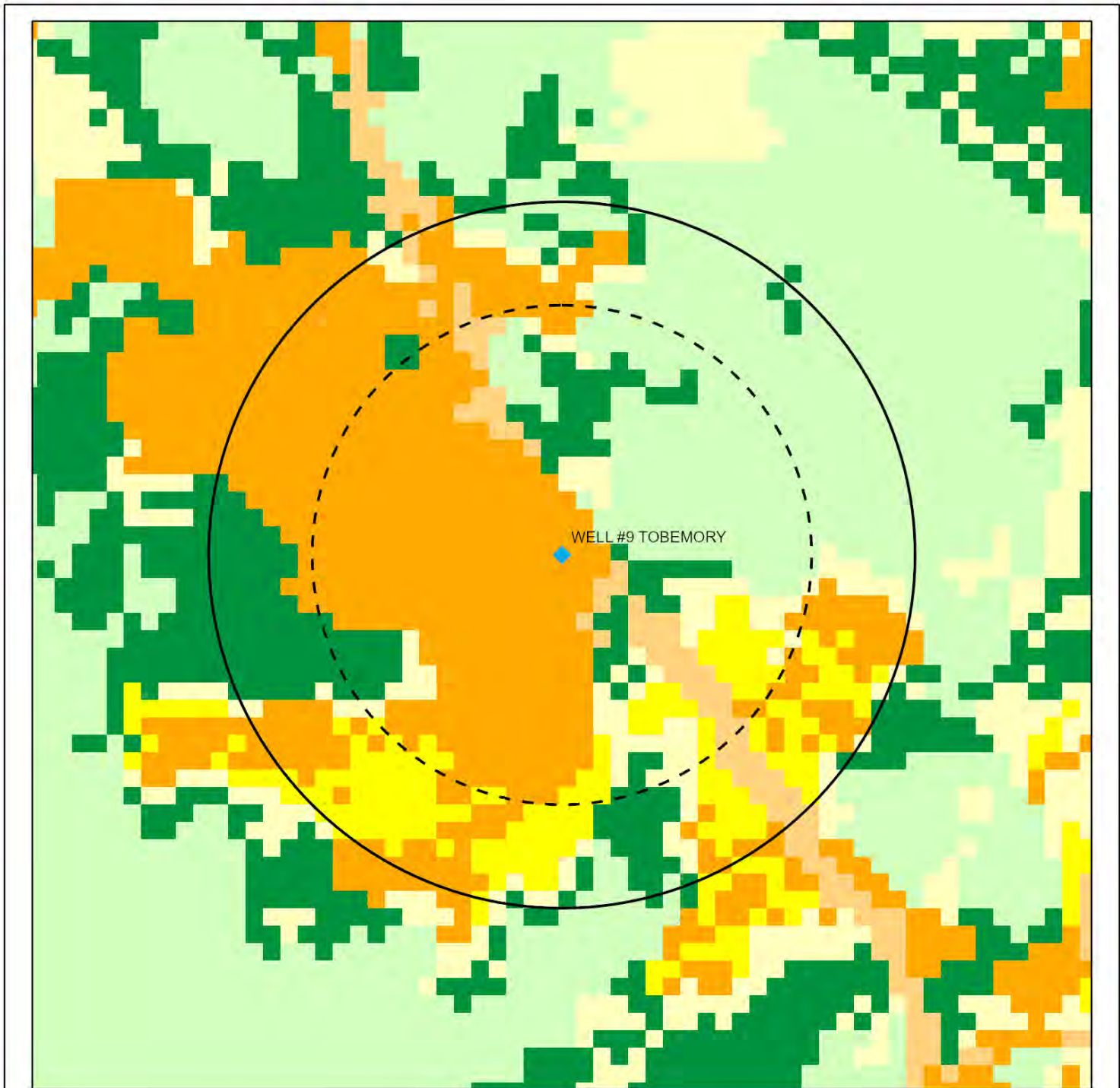
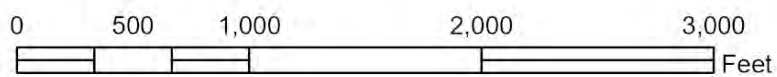


FIGURE 5. LAND USE RATING

BLADEN CO WTR DIST-WEST BLADEN, PWS ID: 0309055, WELL #9 TOBEMORY



- |  |  |  |
|--|--|--|
| 1 Water, Wetlands (Woody and Herbaceous) | 5 Pasture/Hay                                | 10 Developed, High Intensity                   |
| 2 Barren Land (Rock/Sand/Clay)           | 6 Developed, Open Space                      | Ground Water Assessment Area - Delineated Area |
| 3 Forest (Deciduous, Evergreen, Mixed)   | 7 Developed, Low Intensity; Cultivated Crops | Ground Water Assessment Area - Zone A          |
| 4 Grassland/Herbaceous; Shrub/Scrub      | 8 Developed, Medium Intensity                |  |



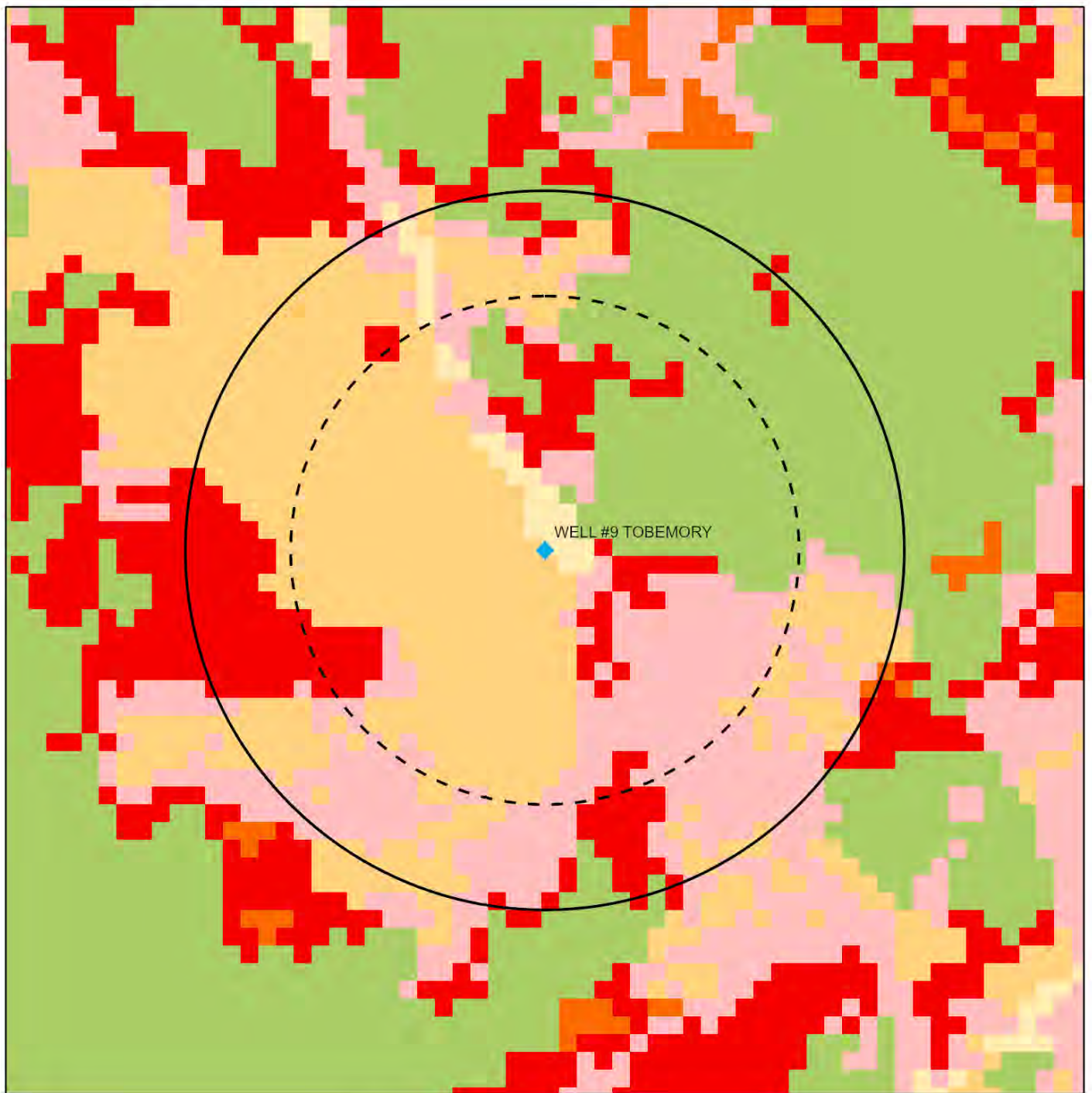


FIGURE 6. LAND COVER RATING

BLADEN CO WTR DIST-WEST BLADEN, PWS ID: 0309055, WELL #9 TOBEMORY



- |   |   |
|---|---|
| <span style="display: inline-block; width: 15px; height: 10px; background-color: #90EE90; border: 1px solid black; margin-right: 5px;"></span> 1 Developed, High Intensity                                | <span style="display: inline-block; width: 15px; height: 10px; background-color: #FF8C00; border: 1px solid black; margin-right: 5px;"></span> 9 Shrub/Scrub                            |
| <span style="display: inline-block; width: 15px; height: 10px; background-color: #90EE90; border: 1px solid black; margin-right: 5px;"></span> 2 Water; Wetlands; Developed, Medium Intensity             | <span style="display: inline-block; width: 15px; height: 10px; background-color: #FF0000; border: 1px solid black; margin-right: 5px;"></span> 10 Deciduous, Evergreen and Mixed Forest |
| <span style="display: inline-block; width: 15px; height: 10px; background-color: #FFD700; border: 1px solid black; margin-right: 5px;"></span> 4 Developed, Low Intensity                                 | <span style="display: inline-block; width: 15px; height: 10px; border: 1px solid black; margin-right: 5px;"></span> Ground Water Assessment Area - Delineated Area                      |
| <span style="display: inline-block; width: 15px; height: 10px; background-color: #FFA500; border: 1px solid black; margin-right: 5px;"></span> 6 Barren Land (Rock, Sand, Clay); Cultivated Crops         | <span style="display: inline-block; width: 15px; height: 10px; border: 1px dashed black; margin-right: 5px;"></span> Ground Water Assessment Area - Zone A                              |
| <span style="display: inline-block; width: 15px; height: 10px; background-color: #FFB6C1; border: 1px solid black; margin-right: 5px;"></span> 8 Grassland/Herbaceous; Pasture/Hay; Developed, Open Space |   |





## **Appendix B**

### **2013 O&M Plan for Cumberland County Water System**



**OPERATION AND MAINTENANCE PLAN  
CUMBERLAND COUNTY WATER SYSTEM/  
WEST BLADEN PURCHASE SYSTEM**

**PWS I.D. NO.: 50-26-026**

**County Of Cumberland North Carolina  
130 Gillespie Street, Room 215  
Fayetteville, NC 28301**

**Cumberland County**

**Phone: 910-678-7637**

**Email: [ahall@co.cumberland.nc.us](mailto:ahall@co.cumberland.nc.us)**

**PREPARED BY:  
KOONCE, NOBLE AND ASSOCIATES, INC.  
CONSULTING ENGINEERS  
LUMBERTON, NORTH CAROLINA**

**MARCH, 2013**

**F-0103**



## CUMBERLAND COUNTY WATER SYSTEM

### Operation and Maintenance

Some problems associated with water supply systems can be alleviated if not corrected by observing proper procedures for operating and maintaining the system. Proper maintenance practices should be adhered to according to a pre-established schedule (Walski 1987b, AWWA 1987).

#### A. Frost Prevention

Severe winter conditions may warrant actions to prevent water from freezing and bursting pipes or other structures. The easiest short-term action is to keep water moving in problem pipes either by requesting that consumers run water or by bleeding water from pipes at crucial points in the system. Dead-end sections are most susceptible to freezing. Storage tanks, pump stations and meter vaults are susceptible to freezing and, therefore, are possible candidates for supplemental heating.

#### B. Leak Detection and Repair

Unless specific measures are taken to detect and repair leaks, a considerable amount of water can be lost through poor joints or cracked pipes. Leak detection techniques can uncover previously undetected leaks or pinpoint suspected ones. Most leak detection surveys use sonic equipment that allows operators to listen for the source of the leak. Experienced operators can accurately locate the leak and, in some instances, estimate the leakage rate. Leak detection surveys are often conducted by private firms that contract with the water utility, which often follows up on the survey and repairs the leaks. The cost of leak detection and repair usually is less than the value of water that would have been lost through unrepaired leaks over some reasonably short period of time (Moyer et al. 1983, Moyer 1985). Leak detection surveys can be one-time affairs or can be scheduled periodically. The value of leak detection is not realized unless the identified leaks are repaired. It is possible that extremely high leakage in one pipe segment might warrant replacement of the entire pipe segment instead of repair. Leak detection and repair will also help determine which geographic areas and types of pipe are more likely to leak. The degree to which this approach will alleviate water loss depends on the condition of the system. Leak repair might also contribute to a longer-lasting system. First, leaking water tends to erode soil surrounding and supporting a pipe. Continued leaking, therefore, might lead to a more costly break. Second, the increased soil moisture resulting from the leak can promote corrosion if stray direct current is present (because of its higher electric conductivity in wet soil). Repair may not eliminate the cause of leaks and future leakage may result. Poor joint material and corrosion (caused by direct current, bimetallic connections, poor soil, or corrosive water in unlined pipe) are possible causes



that need to be addressed to prevent recurrence of the leaks. Some leaks do not require repair but merely tightening or replacing fittings (Male, Noss and Moore 1985; Moyer et al. 1983; Brown and Caldwell 1984; Walski 1984b).

C. Meter Calibration

Master meters (connection to Bladen County) can over-register, thereby creating the appearance that more water is being used in the system than actually is. Calibration of the meter(s) will not save any water, but will contribute to better accounting practices, which in turn will lead to better operation of the existing system and better design of improvements. Master meter calibration should be a routine part of preventive maintenance. Consumer meters should also be tested and calibrated on a periodic basis. Consumer meters often tend to under-register as they age. This under-registration results in lost revenue (in cases where consumers are being billed) and an elevated assessment of unaccounted-for water. Meters can be checked on a periodic basis, and, in addition, failed meters can be identified by surveillance of billing records (Male, Noss and Moore 1985; AWWA 1986d).

D. Flushing

In some systems with turbidity problems, periodic flushing of the system will improve water quality by removing any settled material. This sediment can occasionally be resuspended and cause dirty water. Flushing assures that when the material is resuspended, it is removed from the lines. Periodic flushing is particularly useful where velocities are slow, such as in dead ends. Flushing eliminates symptoms but does not eliminate the underlying problem. When flushing in a complex grid, it is helpful to isolate individual lines to maximize velocities and hence the effectiveness of the flushing (California-Nevada AWWA 1981).

E. Valve Exercise

Regular exercising of valves is important for several reasons. First, it helps to ensure that the valves can be found and that they will operate when necessary. Second, valves may have been incorrectly left closed or partially closed, and periodic exercise will allow correct positioning. Third, valve exercise also serves as training, allowing personnel to find valves more quickly in an emergency. Records of valve exercising should be kept to determine the effectiveness of the program (e.g., number of valves found stuck), and to ensure that each valve is exercised within a reasonable time period. Valves do not need to be exercised every week but do need to be exercised every few years.

F. Control of Unauthorized Use

Utility personnel need to be on the alert for apparent theft of water. Meter readers, valve crews and construction inspectors all need to be on the alert for water theft.



## **Appendix C**

### **NC0309055 Well Treatment Process Summary**



<a href="#">County Map of NC</a>	<a href="#">Water System Search</a>	<a href="#">Public Water Supply Section Home Page</a>	
<b><u>Water System Detail Information</u></b>			
Water System No.:	NC0309055	Federal Type:	C
Water System Name:	BLADEN CO WTR DIST-WEST BLADEN	Federal Source:	GW
Principal County Served:	BLADEN	System Status:	A
Principal City Served:	ELIZABETHTOWN	Activity Date:	11-01-1989

<b>Water System Facility</b>			
Facility ID No.	P09	Type:	TP - Treatment Plant
Facility Name	TREATMENT_PLT_WELL #9	Status/Reason	A
Water Type	GW	ACTIVITY_DATE	07-01-2007

<b>Sample Points</b>		
<b>Sample Point ID</b>	<b>Location Description</b>	<b>Type</b>
E09	WELL #9	EP

<b>Water System Facility Contacts</b>		
<b>Type</b>	<b>Contact</b>	<b>Communication</b>

<b>Facility Annual Operating Period(s)</b>			
<b>Effective Begin Date</b>	<b>Effective End Date</b>	<b>Start Month/Day</b>	<b>End Month/Day</b>

<b>Treatment Plant</b>	
<b>Treatment Plant Filter Type</b>	

<b>Treatment Plant Contact Time</b>				
<b>Status</b>	<b>Status Date</b>	<b>Contact Time (Minutes)</b>	<b>Disinfection Concentration (mg/L)</b>	<b>CT Value (mg.min/L)</b>

<b>Treatment Plant Disinfection Profiling Benchmark</b>							
<b>Giardia Status</b>	<b>Giardia Inact. Log</b>	<b>Giardia Inact.</b>	<b>Giardia Status Date</b>	<b>Virus Status</b>	<b>Virus Inact Log</b>	<b>Virus Inact</b>	<b>Virus Status Date</b>

Treatment Plant Analyte Removal					
Code	Analyte Name	Removal Credited	Removal Achieved	Removal/Inact. Required	Inactivation Needed

Treatment Plant BIN Determination		
Status	BIN	Status Date

Treatment Plant Filter Backwash Recycling Rule						
Schem Stat	Schem Rec	Schem Rev	Alt Ret Loc Req Stat	Alt Ret Loc Req Stat Dt	Corr Act Req Stat	Corr Act Req Stat Dt

Treatment Units								
Type	Name	Subtype	Cont. Dis.	Aerator Type	Sludge Rem. Type	Filter Media Type	Basin Count	Subunit Count
<u>GU - Generic Unit</u>	GENERIC UNIT						0	0
<b>Treatment Objective Process Associations</b>								
	<b>Primary</b>	<b>Obj. Code</b>	<b>Objective Name</b>		<b>Proc. Code</b>	<b>Process Name</b>		
		C	CORROSION CONTROL		741	PH ADJUSTMENT, POST		
		C	CORROSION CONTROL		445	INHIBITOR, ORTHOPHOSPHATE		
		D	DISINFECTION		423	HYPOCHLORINATION, PRE		
		D	DISINFECTION		421	HYPOCHLORINATION, POST		
		F	IRON REMOVAL		742	PH ADJUSTMENT, PRE		
		F	IRON REMOVAL		344	FILTRATION, PRESSURE SAND		
		O	ORGANICS REMOVAL		121	ACTIVATED CARBON, GRANULAR		

Treatment Plant Unit Process Flows				
Train ID	Sequence ID	Supply	Receive	Connection Type

WSF Indicators		
Type	Value	Date

## **Appendix D**

### **Hydrant Flow Test Reports**









PROJECT: Cumberland County Public Utilities  
Asset Management Plan

McGill Associates, P.A.  
5 Regional Circle, Suite A  
Pinehurst, North Carolina 28374  
Phone (910-295-3159) / Fax (910-295-3647)

## Hydrant Flow Test Report

Location Southpoint Neighborhood, Cumberland County, NC Date 4/10/2024  
Test made by Demi Watkins, Dean Byrd, Amy Hall Time 3:40 PM

Conditions	Sunny, 85 degrees		
Flow Hydrant		Residual Hydrant	
No.	<u>8634 Brightleaf</u>	No.	<u>8480 Brightleaf</u>
Location	<u>Place</u>	Location	<u>Place</u>
Size nozzle	<u>2 1/2 Steamer</u>	Static	<u>54</u> psi
Inlet type	<u></u>	Residual	<u>1</u> psi
Discharge coefficient	<u></u>	Elev. (Autocad)	<u>161</u>
Pitot Pressure	<u>1</u> psi	Residual Hydrant 2 (if applicable)	
GPM	<u>168</u>	No.	<u></u>
		Location	<u></u>
		Static	<u></u> psi
		Residual	<u></u> psi

Remarks Amy was at the Residual hydrant, Dean and Demi were at the Flow hydrant.

*Disclaimer: Hydrant test results indicated are for the single point in time that the test was conducted, and are subject to variation. A number of factors may affect test results which are specific to conditions during testing. These conditions include water system demand, water tank levels, booster pump station status, valve positions, etc.*



# Cumberland County Water and Sewer Asset Inventory and Assessment





# Asset Inventory & Assessment

## History:

- In 2021, Cumberland County was designated as “distressed” by the Local Government Commission and the State Water Infrastructure Authority.
- County staff began working to address required steps to be removed from distressed list
- In 2023, Cumberland County contracted with McGill to develop Asset Management Plans (AMP) for each of the existing utility districts.
- Cumberland County intended to adopt CIP’s for each of the utility districts in order to perform and adopt a System Development Fee study.
- McGill utilized NCDEQ AIA guidance and industry standards to **inventory** and **assess** the County’s one water distribution system and three wastewater collection systems.





# What is an Asset Management Plan?

It is a **WORKING** plan and includes 4 key components:

- An **Inventory** of system assets:  
WATER: water main, water valves, fire hydrants, interconnections  
SEWER: sewer line, manholes, lift stations
- A summary of **Asset Conditions**
- A **Capital Improvements Plan**
- An **Operations and Maintenance and Staffing Recommendations Plan**





# Summary of NORCRESS System Assets

- Year put into service: 2005
- Active Service Connections : 452 (394 residential, 87%)
- Performed smoke testing, manhole inspections, flow monitoring

## Sewer Mains – 138,200 feet (26.2 mi)

- PVC (97%) and Ductile Iron Pipe

## Sewer Manholes – 424

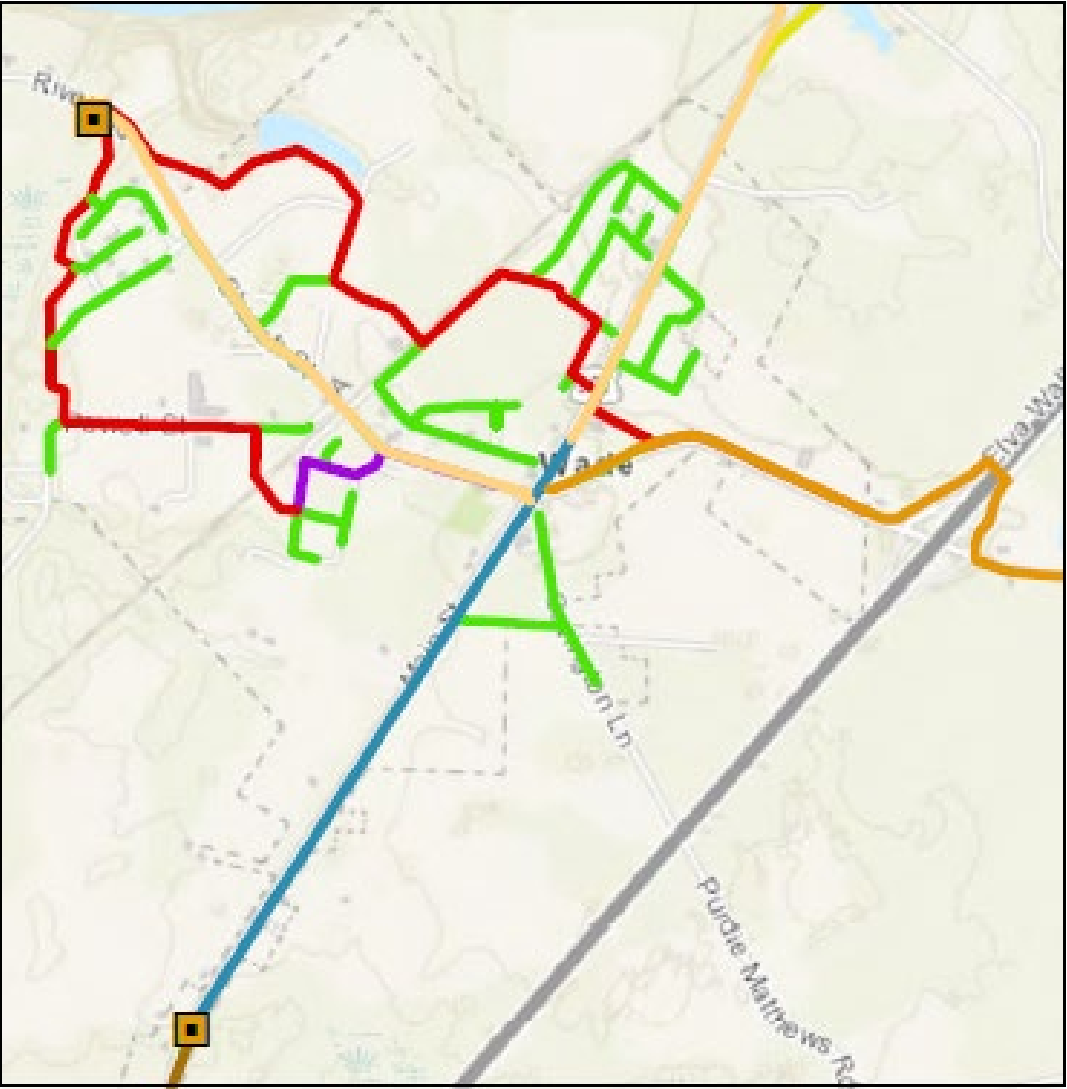
- All Precast Concrete Material
- Beginning to show some corrosion
- Generally good condition

## Lift Stations - 4

- Godwin LS, Falcon LS, Wade #1 LS, Wade #2 LS



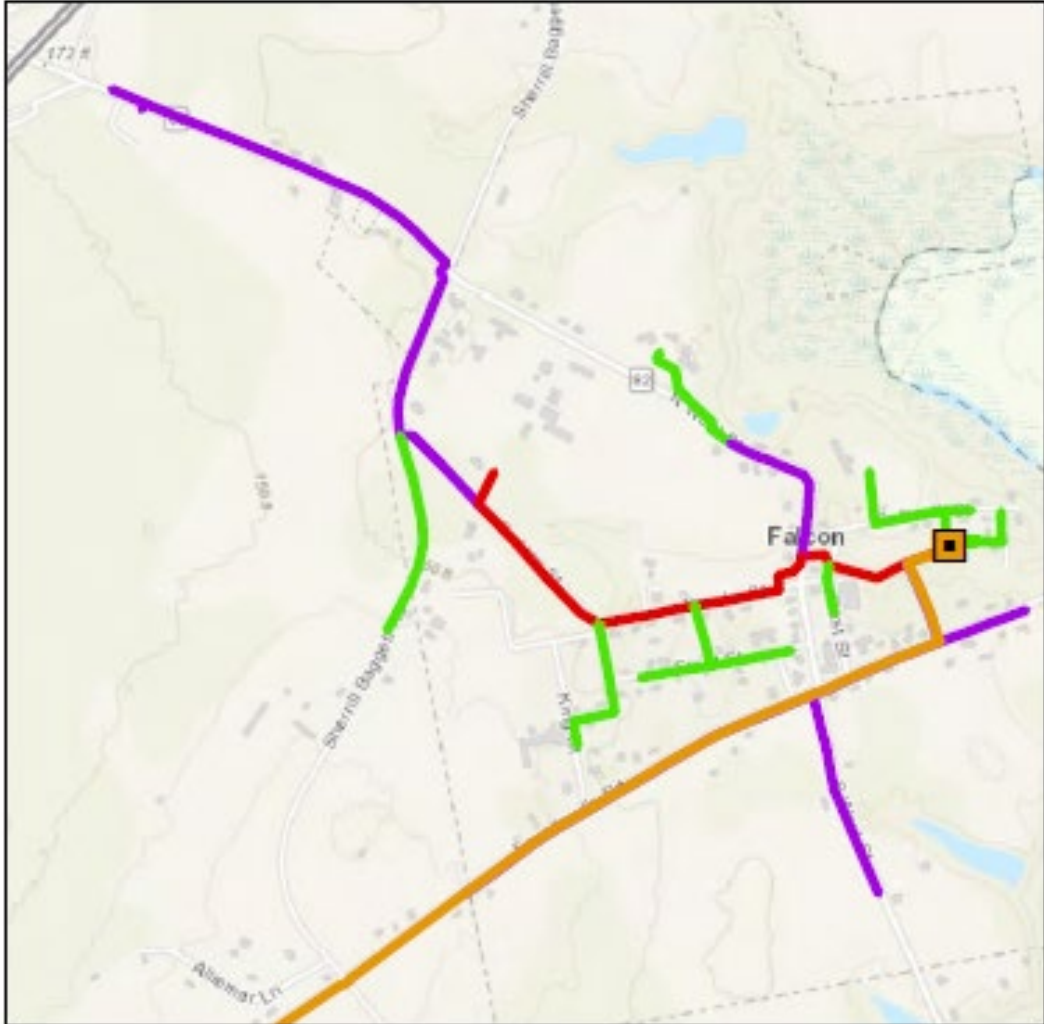
# Wade



# Godwin



# Falcon



**Legend**

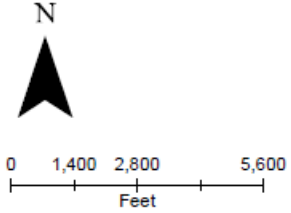
GRAVITY SEWER DIAMETER

- 8" (Green line)
- 10" (Purple line)
- 12" (Red line)
- 15" (Blue line)

FORCE MAIN DIAMETER

- 3" (Yellow line)
- 6" (Orange line)
- 8" (Dark Orange line)
- 10" (Brown line)

☐ Lift Station





# NORCRESS Sewer Capital Improvement Projects

No.	Project Name	Cost
1	New Generators – All Lift Stations	\$640,000.00
2	Upgrade SCADA	\$240,000
3	Flow Meter Project	\$203,900.00
4	Flow Monitoring Study	\$25,440.00
5	Falcon Force Main and ARV Project	\$80,000.00
6	Manhole Rehabilitation Project 1	\$118,600.00
7	Manhole Rehabilitation Project 2	\$118,600.00
8	Manhole Rehabilitation Project 3	\$118,600.00
9	Manhole Rehabilitation Project 4	\$118,600.00
	<b>10-Year CIP Total Project Cost</b>	<b>\$1,714,620.00</b>



# Summary of Kelly Hills System Assets

- Year put into service: 2005
- Active Service Connections: 102 (all residential)
- Performed Smoke testing, manhole inspections

## Sewer Mains – 23,540 feet (4.4 mi)

- PVC (84%) and Ductile Iron Pipe

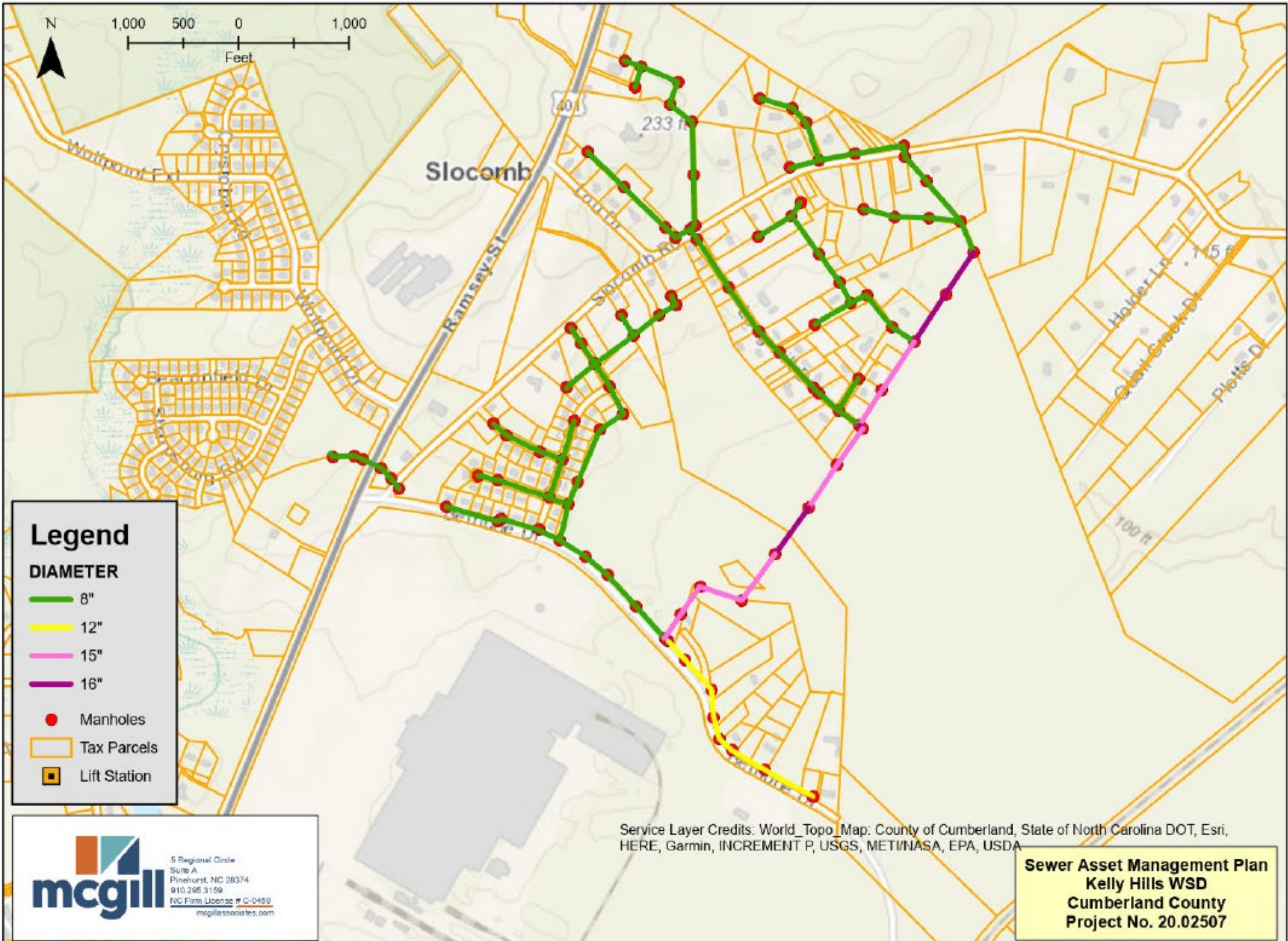
## Sewer Manholes – 100

- All Precast Concrete Material
- Beginning to show some corrosion
- Generally good condition

## Lift Station - 1

- Unobligated Capacity: 53,580 GPD (~230 res. conn.)





**Legend**

**DIAMETER**

- 8"
- 12"
- 15"
- 16"

- Manholes
- Tax Parcels
- Lift Station

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Service Layer Credits: World\_Topo\_Map: County of Cumberland, State of North Carolina DOT, Esri, HERE, Garmin, INCREMENT P, USGS, METI/NASA, EPA, USDA

**Sewer Asset Management Plan**  
**Kelly Hills WSD**  
**Cumberland County**  
**Project No. 20.02507**





# Kelly Hills Sewer Capital Improvement Projects

No.	Project Name	Cost
1	Manhole Rehabilitation Project 1	\$81,000.00
2	Flow Monitoring Improvements	\$103,900.00
3	Manhole Rehabilitation Project 2	\$81,000.00
4	Manhole Rehabilitation Project 3	\$81,000.00
5	Manhole Rehabilitation Project 4	\$81,000.00
	<b>10-Year CIP Total Project Cost</b>	<b>\$427,900.00</b>



# Summary of Overhills System Assets

- Year put into service: 2019
- Active Service Connections: 107 (all residential)
- Performed Smoke testing, manhole inspections

## Sewer Mains – 17,420 feet

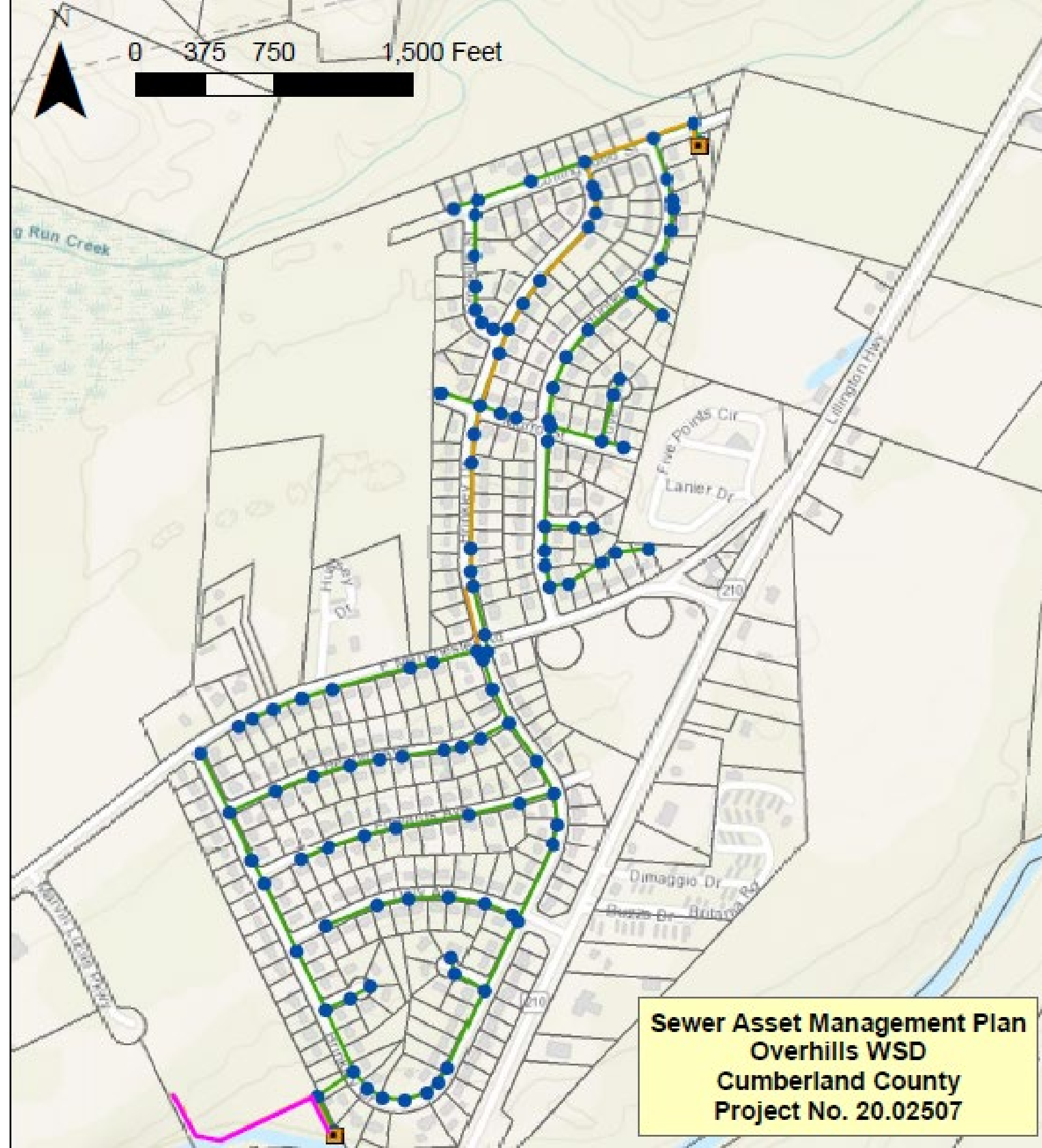
- All 8" PVC Pipe

## Sewer Manholes – 119

- All Precast Concrete Material

## Lift Stations - 2

- Collinswood LS, Brinkley LS
- FY 2025 Daily Flow Per Connection: 84 – 276 GPD



0 375 750 1,500 Feet

### Legend

- Lift Station
- 6" PVC Forcemain
- Manhole
- 4" PVC Forcemain
- 8" PVC Gravity Sewer

**Sewer Asset Management Plan  
Overhills WSD  
Cumberland County  
Project No. 20.02507**





# Overhills Sewer Capital Improvement Projects

No.	Project Name	Cost
1	Brinkley Lift Station Improvements	\$33,100.00
2	Manhole Rehabilitation Project 1	\$84,100.00
3	Manhole Rehabilitation Project 2	\$84,100.00
4	Manhole Rehabilitation Project 3	\$84,100.00
	<b>10-Year CIP Total Project Cost</b>	<b>\$285,400.00</b>



# Summary of Southpoint Water Assets

- Year Put into service: 2013
- Active Service Connections: 84 (all residential)
- Flow testing performed, 55 psi average pressure

## Water Main – 16,900 feet

- Diameters: 12-inch, 8-inch, 6-inch, 2-inch

## Valves – 6

- Condition generally good

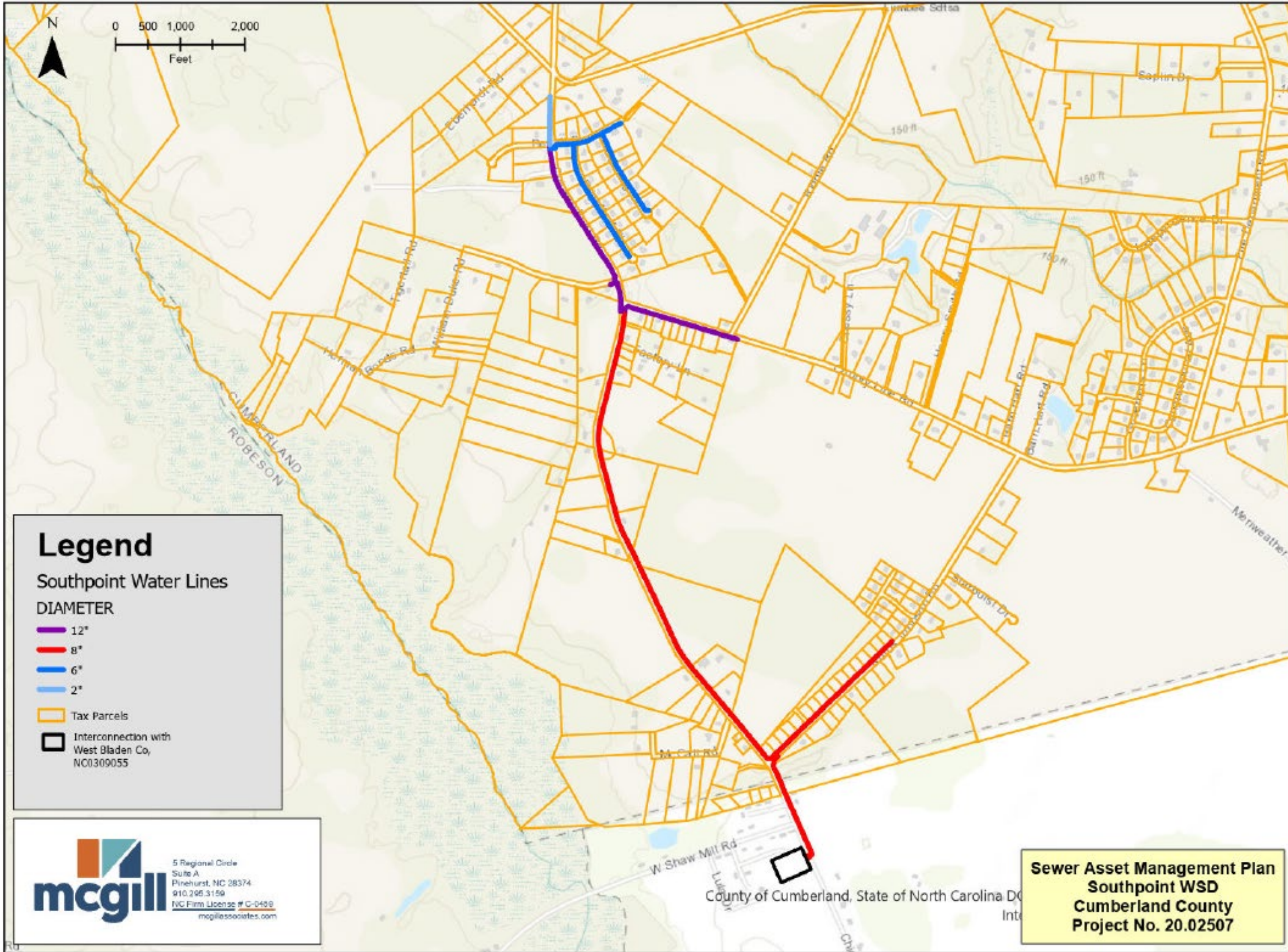
## Fire Hydrants– 12

- Condition generally good

## System Interconnection – Bladen County Water

- 45,000 GPD capacity
- 10,500 GPD average usage





**Legend**  
 Southpoint Water Lines  
 DIAMETER

- 12"
- 8"
- 6"
- 2"
- Tax Parcels
- Interconnection with West Bladen Co, NC0309055

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 910.296.3159  
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**Sewer Asset Management Plan**  
**Southpoint WSD**  
**Cumberland County**  
**Project No. 20.02507**

County of Cumberland, State of North Carolina





# Southpoint Water Capital Improvement Projects

No.	Project Name	Cost
1	Water Meter Replacement	\$71,300.00
2	Construction New Wells and Water Main	\$19,614,136.00
3	Ground Storage Tank and Filter	\$303,500.00
	<b>10-Year CIP Total Project Cost</b>	<b>\$19,988,936.00</b>



# Staffing Recommendations

- County is responsible for management of 3 Sewer Systems and 1 Water System
- Staffing analysis was performed based on typical staffing from EPA study
- EPA study utilizes population and pipe length to estimate staffing
- Table 19 shows calculated Full Time Equivalent (FTE) based on position type

**Table 19: Average Community System Statistics**

Employee Category	System Size (miles of Main)		Mean	Cumberland County
	Pop. 500-3300	Pop. 3300-10000		
	21	62	41.5	51.7
Manager FTE	0.6	1.1	0.85	1.06
per mile	0.029	0.018	0.020	0.020
Plant Operator FTE	0.6	1.3	0.95	1.03
per mile	0.029	0.021	0.023	0.023
Distribution FTE	0.8	2.5	1.65	2.06
per mile	0.038	0.040	0.040	0.040
Administrative FTE	0.6	1.5	1.05	1.31
per mile	0.029	0.024	0.025	0.025



# Staffing Recommendations

- Calculated FTE's were applied based on employee categories
- Wage information based on Zip Recruiter statistics and Benefits Multiplier from U.S. Bureau of Labor Statistics
- Provided for preliminary planning purposes only

**Table 20: Overall Salary Estimates**

Employee Category	Hourly Rate	Annual Salary	Ben. Mult.	Total	Applied FTE	Applied Budget Cost
Manager	\$38.50	\$80,080.00	1.38	\$110,510.40	1.06	\$117,000
Operator	\$24.52	\$51,001.60	1.38	\$70,382.21	1.03	\$72,700
Distribution	\$23.57	\$49,025.60	1.38	\$67,655.33	2.06	\$139,100
Administrative	\$21.33	\$44,366.40	1.38	\$61,225.63	1.31	\$80,100
<b>Total Applied Budget Cost Based FTEs</b>						<b>\$408,900</b>

Any questions?

Thank you!







# Additional Information as needed



# System Development Fees

- Enacted in the North Carolina Public Water and Sewer System Development Fee Act approved in 2017 (House Bill 436)
- Enables public water and sewer utilities in North Carolina to assess system development fees for utility service to new development
- The SDF Act defines new development as:
  1. Subdivision of land
  2. Construction or structural change that increases service needs, or
  3. Any use of land which increases service needs
- SDFs serve as the mechanism by which “growth pays for growth”



# System Development Fees

- Fee calculation in a written analysis prepared by a financial professional or licensed engineer employing generally accepted accounting, engineering and planning methodologies
- The analysis must be posted on the County's website and provide a means by which public comments are received for 45 days
- Comments received must be considered by the preparer of the analysis for possible adjustments to the analysis
- A public hearing must be held prior to considering adoption