

AGENDA
Lower Cape Fear Water & Sewer Authority
1107 New Pointe Boulevard, Suite # 17, Leland, North Carolina
8:30 a.m. – Finance Committee Meeting
May 13th, 2024

MEETING CALL TO ORDER: Chairman Knight

PRESENTATION: Preliminary Draft of Fiscal 2024-2025 Budget

DISCUSSION: Directors' Comments and Questions

ACTION/DIRECTION: Recommend to the full Board for Consideration at the Regular Meeting to follow and for approval at the June 17th, 2024, Regular Board Meeting.

ADJOURNMENT

AGENDA
Lower Cape Fear Water & Sewer Authority
1107 New Pointe Boulevard, Suite # 17, Leland, North Carolina
9:00 a.m. – Regular Monthly Board Meeting
May 13, 2024

MEETING CALL TO ORDER: Chairman Knight

INVOCATION

PLEDGE OF ALLEGIANCE

APPROVAL OF CONSENT AGENDA

- C1** – Minutes of April 8, 2024, Regular Board Meeting
- C2** – Minutes of April 8, 2024, Long Range Planning Committee Meeting
- C3** – Kings Bluff Monthly Operations and Maintenance Report
- C4** – Bladen Bluffs Monthly Operations and Maintenance Reports for March and April
- C5** – Retainer for General Counsel Services Agreement: Matthew Nichols, Attorney at Law in the amount of \$195 per hour for FY 2024-2025
- C6** – Line-Item Adjustment for March 31, 2024
- C7 A** – Resolution of Lower Cape Fear Water & Sewer Authority Exempting Lower Cape Fear Water & Sewer Authority from the Provisions of N.C.G.S. §143-64.31 for C7 B
- C7 B** – Retainer for Engineering Services Agreement: McKim & Creed in the amount of \$32,300 for Fiscal Year 2025-2026

PUBLIC HEARING: PRESENTED DRAFT BUDGET FOR FISCAL YEAR 2024-2025 BUDGET AND BUDGET ORDINANCE

A. Public Hearing:

- Motion to open Public Hearing in accordance with North Carolina General Statute Section 159-12 for the review of the Fiscal Year 2024-2025 Budget and Budget Ordinance for Consideration of Approval on June 17th, 2023
- Motion to close Public Hearing

OLD BUSINESS

- OB1** – Final Preliminary Engineering Report for the Walkway Replacement at Kings Bluff
- OB2** – Resolution Approving Work Order Number 1 to Financial Advisory Services Agreement with First Tryon Advisors, LLC for the Lower Cape Fear Water and Sewer Authority

NEW BUSINESS

- NB1** – Finance Committee Comments and Review of Draft Recommended Budget for the Fiscal Year 2024-2025 (Finance Committee Chairman Harry Knight)
- NB2** – Final Master Planning Document (25 Year Planning Period FY 2024-2049)
- NB3** – Budget Amendment #3

ENGINEER'S COMMENTS

ATTORNEY COMMENTS

EXECUTIVE DIRECTOR REPORT

- EDR1** – Comments on Customers' Water Usage and Raw Water Revenue for Fiscal Year to Date Ending March 31, 2024
- EDR2** – Operating Budget Status, Ending February 29, 2024
- EDR3** – Summary of Activities

DIRECTOR'S COMMENTS AND/OR FUTURE AGENDA ITEMS

PUBLIC COMMENT

ADJOURNMENT

The next board meeting of the Lower Cape Fear Water & Sewer Authority is scheduled for Monday, June 17th at 9:00 a.m. in the Authority's office located at 1107 New Pointe Boulevard, Suite 17, Leland, North Carolina.



Consent Agenda (CA)

Lower Cape Fear Water & Sewer Authority

AGENDA ITEM

To: CHAIRMAN KNIGHT AND BOARD MEMBERS

From: TIM H. HOLLOMAN, EXECUTIVE DIRECTOR

Date: May 13, 2024

Re: Consent Agenda

Reviewed and approved as to form: MATTHEW A. NICHOLS, AUTHORITY ATTORNEY

Please find enclosed the items of a routine nature for consideration and approval by the Board of Directors with one motion. However, that does not preclude a board member from selecting an item to be voted on individually, if so desired.

C1 – Minutes of April 8, 2024, Regular Board Meeting

C2 – Minutes of April 8, 2024, Long Range Planning Committee Meeting

C3 – Kings Bluff Monthly Operations and Maintenance Report

C4 – Bladen Bluffs Monthly Operations and Maintenance Report for March and April

C5 – Retainer for General Counsel Services Agreement: Matthew Nichols, Attorney at Law in the amount of \$195 per hour for FY 2024-2025.

C6 – Line-Item Adjustment for February 29, 2029

C7 A – Resolution of Lower Cape Fear Water & Sewer Authority Exempting Lower Cape Fear Water & Sewer Authority from The Provisions of N.C.G.S. §143-64.31 for C7 B.

C7 B – Retainer for Engineering Services Agreement: McKim & Creed in the amount of \$32,300 for Fiscal Year 2025-2026

Action Requested: Motion to approve/disapprove Consent Agenda.

Lower Cape Fear Water & Sewer Authority
Regular Board Meeting Minutes
April 8, 2024

Chairman Knight called to order the Authority meeting scheduled on April 8th, 2024, at 9:05 a.m. and welcomed everyone present. The meeting was held at the Authority's office located at 1107 New Pointe Boulevard, Suite 17, Leland, North Carolina. Director Leonard gave the invocation.

Roll Call by Chairman Knight:

Present: Norwood Blanchard, Patrick DeVane, Wayne Edge, Harry Knight, Al Leonard, Scott Phillips, Charlie Rivenbark, Chris Smith, Bill Sue, Phil Tripp, Frank Williams, and Rob Zapple

Present by Virtual Attendance: Jackie Newton and Bill Saffo

Absent: None

Staff: Tim H. Holloman, Executive Director; Matthew Nichols, General Counsel; Sam Boswell, COG; Tony Boahn P.E., McKim & Creed; Jess Powell P.E., McKim & Creed; and Danielle Hertzog, Financial Administration Assistant

Guests Present: Glenn Walker, Brunswick County Water Resources Manager; Jorgen Holmberg, Computer Warriors; Anthony Colon, Pender County Utilities Director of Utilities; James Proctor, Pender County Utilities Deputy Director of Utilities; and Tom Hendrick, Pender County Utilities Water Treatment Plant Superintendent

Guests Virtual Attendance: Craig Wilson, Cape Fear Public Utility Authority Engineering Manager; and John Nichols, Brunswick County Public Utilities Director

PLEDGE OF ALLEGIANCE: Chairman Knight led the Pledge of Allegiance.

APPROVAL OF CONSENT AGENDA

C1 – Minutes of March 11, 2024, Regular Board Meeting

C2 – Minutes of March 11, 2024, Finance Committee Meeting

C3 – Kings Bluff Monthly Operations and Maintenance Report

C4 – Resolution Adopting the Lower Cape Fear Water & Sewer Authority's Local Water Supply Plan for Kings Bluff Raw Water Pump Station, PWSID 50-09-013, for calendar year 2023.

C5 – Resolution Adopting the Lower Cape Fear Water & Sewer Authority's Local Water Supply Plan for Bladen Bluff's Regional Surface Water System, PWSID 50-09-013, for calendar year 2023.

C6 – Line-Item Adjustment for February 29, 2029.

Motion: Director Leonard **MOVED**; seconded by Director Phillips, approval of the Consent Agenda Items C1-C6. Upon voting, the **MOTION CARRIED UNANIMOUSLY.**

OLD BUSINESS

OB1- Resolution of Lower Cape Fear Water and Sewer Authority Board of Directors Awarding Contract for Partial Replacement of Existing Roof at the Kings Bluff Pump Station

Motion: Director Blanchard **MOVED**; seconded by Director Williams, approval of the Resolution of Lower Cape Fear Water and Sewer Authority Board of Directors Awarding Contract for Partial Replacement of Existing Roof at the Kings Bluff Pump Station. Upon voting, the **MOTION CARRIED UNANIMOUSLY.**

NEW BUSINESS

NB1- Resolution Recognizing National Drinking Water Week

Motion: Director DeVane **MOVED**; seconded by Director Zapple, approve of the Resolution Recognizing National Drinking Water Week. Upon voting, the **MOTION CARRIED UNANIMOUSLY.**

ENGINEER'S COMMENTS

No comments

ATTORNEY COMMENTS

Matthew Nichols advised the Board that on March 18th, 2024, the New Hanover County Board of Commissioners approved the Special Use Permit for the 421 Sand Mine with all of LCFWASA's requested conditions included in the approval.

EXECUTIVE DIRECTOR REPORT**EDR1 – Comments on Customers' Water Usage and Raw Water Revenue for Fiscal Year to Date Ending March 31, 2024**

Executive Director Holloman reported that during March 2024, Brunswick County and Cape Fear Public Utilities Authority were above projections.

DIRECTOR'S COMMENTS AND/OR FUTURE AGENDA ITEMS

Director Phillips would like to see the list of spare parts needed for the Kings Bluff Plant at the next board meeting, as the lead times are 30 to 50 weeks.

PUBLIC COMMENT

No comments

CLOSED SESSION

Chairman Knight requested a motion to go into a closed session in accordance with N.C.G.S. §143-318.11(a)(3) and (6) to preserve Authority's Attorney-Client Privilege and for Personnel Matters respectively:

Motion: Director Leonard **MOVED**; seconded by Director Blanchard, to go into closed session in accordance with N.C.G.S. §143-318.11(a)(3) and (6) to preserve Authority's Attorney-Client Privilege and for Personnel Matters respectively. Upon voting, the **MOTION CARRIED UNANIMOUSLY**.

At 9:26 a.m., the Board went into closed session. The board returned to open session at 9:39 a.m. Discussion only; no action taken.

ADJOURNMENT

There being no further business, Chairman Knight adjourned the meeting at 9:40 a.m.

Respectfully Submitted:

Scott Phillips, Secretary

Lower Cape Fear Water & Sewer Authority
Long Range Planning Committee Meeting
April 8th, 2024

Chairman Knight called to order the Long-Range Planning Committee Meeting on April 8, 2024, at 8:30 a.m. The meeting was held at the Authority's office located at 1107 New Pointe Boulevard, Suite 17, Leland, North Carolina.

Roll Call by Chairman Knight:

Present: Norwood Blanchard, Patrick DeVane, Harry Knight, Al Leonard, Charlie Rivenbark, Frank Williams, and Rob Zapple

Present by Virtual Attendance: None

Absent: None

Staff: Tim H. Holloman, Executive Director; Matthew Nichols, General Counsel; Sam Boswell, COG; Tony Boahn P.E., McKim & Creed; and Danielle Hertzog, Financial Administration Assistant

Guests Present: Director Wayne Edge; Director Chris Smith; Director Scott Phillips; Glenn Walker, Brunswick County Water Resources Manager; Jorgen Holmberg, Computer Warriors; and Sean Kenyon, McKim & Creed Senior Project Engineer.

Guests Virtual Attendance: None

Presentation: Master Plan Review (Capital Improvement Plan) review by Sean Kenyon

Sean Kenyon presented the current draft Capital Improvement Plan (CIP) from 2024 through 2049, including Kings Bluff, Raw Water, and Bladen Bluffs water treatment facilities. The CIP had several factors, including category of need, capacity issue, whether it needs to be replaced or rehabilitated, and whether there is a maintenance efficiency or redundancy issue. They assigned each project a criticality score as to whether it was a high or low priority and looked at consequence if no action was taken. There are three primary drivers: demand and capacity, life cycle, redundancy, and resiliency. The criticality is scored one, two, or three. One being the lowest and three being the highest need. The preliminary design memorandum is based on a demand table for projected usage from the different entities, with a future demand of 96 million gallons per day in 2062.

Sean Kenyon listed twelve projects for Kings Bluff and seven cost-sharing projects. KB1 New 4th Pump at Kings Bluff has a criticality of three because current pumps will meet projected demands by 2037. The fourth pump will be standby/backup and add to pump rotation to reduce hours per pump. KB2 Rebuild/Refurbish the existing 1600 HP vertical turbine raw water pump. Rebuilding the pumps will extend their service life. KB3 New generators have a criticality of two due to the need to upgrade due to the future increased load associated with auxiliary pump motor HP and larger quantities pump. The KB4 Pig 48" pipe from the Kings Bluff pump station to the 3 MG ground tank is critical because pigging will maintain a clean pipeline free of sediment, silt, and debris. It will also improve the efficiency of pumps by reducing the frictional characteristics of the pipeline. KB5 Pig future 54" pipe from 3MG ground tank to US 421 has a criticality of one sighting, the same reason as pigging the 48" pipeline. KB6 Walkway and air backwash building replacement have a criticality of two because the walkway is in serviceable condition and will need to be replaced by 2025 due to rotting wood and the overall weathering of the walkway. KB7 Replacing raw water pumps 1,4, and 5 has a criticality of three due to age and mechanical wear. This project is more of a placeholder so we can budget and plan for replacement. The pumps have been in operation since 2009. KB8 New surge tank at Kings Bluff has a criticality of two because as the demand increases, surges in the system will likely increase, and this needs to be installed before the fifth pump comes online. KB9 5 ROW acquisitions rated a criticality of two.

The KB10 48-inch PCCP inspection and pig from the ground tank to US 421, with a criticality of one, is a matter of utmost importance due to the current loss of capacity and/or clogging caused by

sediment buildup. Similarly, the KB11 48-inch PCCP repairs, also with a criticality of one, pose a significant risk of a pipeline break. The KB12 1.3 MW Solar Power Installation, a new project added this year, is a testament to our commitment to innovation and sustainability.

CS1 Intermediate booster pump station shelter and CS2 Intermediate booster pump station upgrade will drop off the CIP once CS5 and CS6 have been completed. They will be left on the report until CS5 and CS6 projects progress. CS3 The New fifth pump at Kings Bluff raw water pump station has a criticality of three because decreasing the load and run times of existing pumps will extend the life and improve all pumps' reliability. CS4 20 MG ground tank has a criticality of two for increasing the available system storage and providing a more consistent supply for the safe and efficient operation of the adjacent interim booster pump station. CS5 7-mile Parallel raw water main from 3MG ground tank to Pender vault has a criticality of one and is currently in process. CS6 3-Mile parallel raw water main from 3MG Pender Vault to Cape Fear Public Utilities vault has a criticality of one. CS7 100MGD Reservoir has a criticality of one due to the increasing availability of a system for water storage, allowing for temporary redundancy of supply in the case of an emergency (line break, power outage, hurricane)

Director Williams questioned if KB9 and KB10 should be cost share projected because of where they are located. Tony Boahn advised that KB9 is for the ROW of the 54-inch pipeline. After a discussion with the board members, it was realized that KB10 and KB11 are maintenance, not expansion, so Director Williams was fine with keeping the KB10 and KB11 LCFWASA project, not cost-shared. Director Williams would also like to know if the project will be maintained or expanded. Director DeVane is concerned about Bladen Bluffs's CIP amount. Executive Holloman advised LCFWASA that trust accounts for Bladen Bluffs GAC, Wells, SCADA, and Vehicle have been created. Mr. Holloman will discuss setting up a Trust CIP account with Buddy Harris at Smithfield Foods. Chairman Knight stated that the expansion of the Bladen Bluffs facility is likely to happen in the next decade due to population increases. Mr. Knight wanted to know what LCFWASA needs to do to start planning for that expansion. Executive Director Holloman advised LCFWASA that they will need to have some exploratory meetings internally and then with Bladen County Representatives.

Motion: Director Williams **MOVED**; seconded by Director Zapple, approval to present Master Planning Review to the full board. Upon voting, the **MOTION CARRIED UNANIMOUSLY**.

DIRECTOR'S COMMENTS AND/OR FUTURE AGENDA ITEMS

No comments.

FUTURE MEETINGS

TBD

ADJOURNMENT

There being no further business, Chairman Knight adjourned the meeting at 8:59 a.m.

Respectfully Submitted:

Scott Phillips, Secretary

COUNTY OF BRUNSWICK
PUBLIC UTILITIES DEPARTMENT
Kings Bluff Pump Station



246 Private Road
Riegelwood, NC 28456
(910) 655-4799 Office
(910) 655-4798 FAX

TO: Tim Holloman

FROM: Greg Lazorchak

DATE: 5/1/2024

SUBJECT: Monthly maintenance report for April 2024

Mr. Holloman,

The Maintenance and Operations of the king's bluff facility for the month of April were performed as prescribed in the station SOP'S and other items are as follows.

The diesel drive booster pumps along with the standby SCADA generator located at the raw tank and the SCADA generator located at INVISTA / CFPWA vaults off HWY 421 were run and tested weekly and verified standby ready.

KB personnel completed all locates issued by the Boss 811 system.

KB personnel scraped diesel storage tank in preparation for epoxy.

KB personnel assisted North Brunswick Electric installing new panel at garage.

KB personnel sorted and took inventory of pipes and gaskets at garage.

KB personnel successfully transitioned from one meter vault to a new meter vault at Northwest.

KB personnel cleared ARV on R.O.W. of rubble, rocks, & debris.

KB personnel hung and painted new doors on generator building.

KB personnel poured concrete step on walkway behind the plant.

KB personnel built wooden form around the bed of the GMC for storage.

KB personnel cleaned out garage of garbage, obsolete parts, and materials.

Contractors:

Pursuit Cleaning came to Kings Bluff offices for weekly cleaning.

LJ's landscaping cut grass at Kings Bluff and Authority property.

North Brunswick Electric.

Thank you,
Gregory Lazorchak



To: Tim Holloman - LCFWASA

From: James Kern – Bladen Bluffs SWTP ORC

Date: 4/9/24

Subject: March 2024 Operations

During the month of March, Bladen Bluffs SWTP operated a total of 16 days, treating 43.49 million gallons of water.

We used:

33,370 lbs. of aluminum sulfate (Alum)

8,785 lbs. of sodium hydroxide (Caustic)

762 lbs. of sodium hypochlorite (1,530 gallons of 6% Chlorine Bleach)

James Kern
Water Treatment Plant
Supervisor

Smithfield.
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(910) 862-3114
(910) 862-3146
(910) 733-0016 mobile
jkern@smithfield.com

Bladen Bluffs Surface Water Treatment
Plant
17014 Highway 87 West
Tar Heel, NC 28392
www.smithfieldfoods.com

Bladen Bluffs SWTP Maintenance Report

Date: 4/9/2024

ISSUE:

PLAN OF ACTION:

All PLC need updated	Getting quotes
Vault intrusion electrical needs sealed	Quote approved
Caustic Pump #2 clogged	Troubleshooting
Need to do full chemical pump PM	Getting Parts - Tencarva
Issue with Polymer pump #2	New Pump Ordered – 12 week lead
UPS PM Due	COMPLETE
Generator PM Due	COMPLETE
Filter #1 influent valve NA	IN PROGRESS
Raw generator batteries due to replace	COMPLETE

Monthly Operating Reports (MORs) Summary

(No user data entry – all values are auto-populated.)

Year: <u>2024</u>	PWS Name: <u>Bladen Bluffs Water System</u>	PWSID# : <u>NC5009012</u>
Month: <u>March</u>	Facility Name: <u>Bladen Bluff</u>	

Combined Filter Effluent (CFE) Turbidity

Samples exceeding 1 NTU (count): <u>0</u>	Number of samples required: <u>88</u>
Samples exceeding .3 NTU (count): <u>0</u>	Number of samples taken: <u>88</u>
Samples exceeding .3 NTU (pct): <u>0.0%</u>	Highest single turbidity reading NTU: <u>0.137</u>
	Monthly average turbidity NTU: <u>0.090</u>

Individual Filter Effluent (IFE) Turbidity

1) Was each filter <u>continuously</u> monitored for turbidity?	Yes	<u>X</u>	No	
2) Was each filter's monitoring results <u>recorded every 15 minutes</u> ?	Yes	<u>X</u>	No	
3) Was there a failure of the continuous turbidity monitoring equipment?	Yes		No	<u>X</u>
4) Was any individual filter turbidity level > 1.0 NTU in two consecutive measurements ?	Yes		No	<u>X</u>
5) Was any individual filter turbidity level > 0.5 NTU in two consecutive measurements at the end of 4 hours of operation after the filter has been backwashed or otherwise taken offline ?	Yes		No	<u>X</u>
6) Was any individual filter turbidity level > 1.0 NTU in two consecutive measurements in each 3 consecutive months ?	Yes		No	<u>X</u>
7) Was any individual filter turbidity level > 2.0 NTU in two consecutive measurements in 2 consecutive months ?	Yes		No	<u>X</u>

Entry Point Residual Disinfectant Concentration (EPRD)

Disinfectant Used <u>Chlorine</u>	Number of samples required <u>88</u>
Minimum EPRD concentration <u>0.5400</u>	Number of samples taken <u>88</u>

Distribution Residual Disinfectant Concentration

Number of samples under 0.010 mg/L (without any detectable) excluding where HPC is \leq 500/mL	<u>0</u>
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Contact Time (CT) Ratio

Lowest CT ratio reading <u>12.20</u>	Number of CT ratios required <u>16</u>
Number of CT ratios below 1.0 <u>0</u>	Number of CT ratios calculated <u>16</u>

Remarks From General Info Worksheet

☒ By checking this box, the ORC certifies that the requirements of 15A NCAC 18C .1301 "General Requirements", .1302 "Tests, Forms, and Reporting", and .1303 "Facility Oversight" have been met for the month of March, 2024 and that records documenting compliance with this rule are maintained on the premises and available for inspection upon request.

NCDENR/DEH
PWSS
Version: V02.10-00

COMPLETED BY:

James Kern

CERTIFICATE GRADE:

A - Surface

CERTIFICATE NUMBER:

120147



To: Tim Holloman - LCFWASA

From: James Kern – Bladen Bluffs SWTP ORC

Date: 5/2/24

Subject: April 2024 Operations

During the month of April, Bladen Bluffs SWTP operated a total of 17 days, treating 52.52 million gallons of water.

We used:

37,364 lbs. of aluminum sulfate (Alum)

10,385 lbs. of sodium hydroxide (Caustic)

1,022 lbs. of sodium hypochlorite (2,052 gallons of 6% Chlorine Bleach)

James Kern
Water Treatment Plant
Supervisor

(910) 862-3114
(910) 862-3146
(910) 733-0016 mobile
jkern@smithfield.com

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17014 Highway 87 West
Tar Heel, NC 28392
www.smithfieldfoods.com

Bladen Bluffs SWTP Maintenance Report

Date: 5/2/2024

ISSUE:

PLAN OF ACTION:

All PLC need updated	Getting quotes
Vault intrusion electrical needs sealed	Quote approved
Caustic Pump #2 clogged	Troubleshooting
Need to do full chemical pump PM	Getting Parts - Tencarva
Issue with Polymer pump #2	New Pump Ordered – 12 week lead
Filter #1 influent valve NA	FIXED
Caustic Pump #3 NA	FIXED
Drainage ditch need cleaning and sloping	IN PROGRESS
UPS filter #3 NA	FIXED
Hang up in SCADA with blower	FIXED and determining permanent fix

Monthly Operating Reports (MORs) Summary

(No user data entry – all values are auto-populated.)

Year: <u>2024</u>	PWS Name: <u>Bladen Bluffs Water System</u>	PWSID# : <u>NC5009012</u>
Month: <u>April</u>	Facility Name: <u>Bladen Bluff</u>	

Combined Filter Effluent (CFE) Turbidity

Samples exceeding 1 NTU (count): <u>0</u>	Number of samples required: <u>93</u>
Samples exceeding .3 NTU (count): <u>0</u>	Number of samples taken: <u>93</u>
Samples exceeding .3 NTU (pct): <u>0.0%</u>	Highest single turbidity reading NTU: <u>0.106</u>
	Monthly average turbidity NTU: <u>0.067</u>

Individual Filter Effluent (IFE) Turbidity

1) Was each filter <u>continuously</u> monitored for turbidity?	Yes	<u>X</u>	No	
2) Was each filter's monitoring results <u>recorded every 15 minutes</u> ?	Yes	<u>X</u>	No	
3) Was there a failure of the continuous turbidity monitoring equipment?	Yes		No	<u>X</u>
4) Was any individual filter turbidity level > 1.0 NTU in two consecutive measurements ?	Yes		No	<u>X</u>
5) Was any individual filter turbidity level > 0.5 NTU in two consecutive measurements at the end of 4 hours of operation after the filter has been backwashed or otherwise taken offline ?	Yes		No	<u>X</u>
6) Was any individual filter turbidity level > 1.0 NTU in two consecutive measurements in each 3 consecutive months ?	Yes		No	<u>X</u>
7) Was any individual filter turbidity level > 2.0 NTU in two consecutive measurements in 2 consecutive months ?	Yes		No	<u>X</u>

Entry Point Residual Disinfectant Concentration (EPRD)

Disinfectant Used <u>Chlorine</u>	Number of samples required <u>93</u>
Minimum EPRD concentration <u>0.5900</u>	Number of samples taken <u>93</u>

Distribution Residual Disinfectant Concentration

Number of samples under 0.010 mg/L (without any detectable) excluding where HPC is ≤ 500/mL	<u>0</u>
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Contact Time (CT) Ratio

Lowest CT ratio reading <u>15.90</u>	Number of CT ratios required <u>17</u>
Number of CT ratios below 1.0 <u>0</u>	Number of CT ratios calculated <u>17</u>

Remarks From General Info Worksheet



By checking this box, the ORC certifies that the requirements of 15A NCAC 18C .1301 "General Requirements", .1302 "Tests, Forms, and Reporting", and .1303 "Facility Oversight" have been met for the month of April, 2024 and that records documenting compliance with this rule are maintained on the premises and available for inspection upon request.

NCDENR/DEH
PWSS
Version: V02.10-00

COMPLETED BY:

James Kern

CERTIFICATE GRADE:

A - Surface

CERTIFICATE NUMBER:

120147

**LAW OFFICE OF
MATTHEW A. NICHOLS**

3205 Randall Parkway, Suite 104
Wilmington, NC 28403

Ph: (910) 508-7476
Email: matt@mattnicholslaw.com

May 3, 2024

Via email: director@lcfwasa.gov

Mr. Tim Holloman, Executive Director
Lower Cape Fear Water and Sewer Authority
1107 New Pointe Blvd., Suite 17
Leland, NC 28451

Dear Tim:

This letter is written in response to your request regarding my representation of Lower Cape Fear Water and Sewer Authority (the "Authority") in fiscal year 2024-2025 and the anticipated cost of doing so.

I will be pleased to serve as general counsel for the Authority for fiscal year 2024-2025 if the Board of Directors wishes for me to continue in that capacity. I will do so at my existing hourly rate of \$195.00 per hour, and my paralegal's hourly rate will remain at \$75.00 per hour.

I anticipate the total charges for fiscal year 2024-2025 will be approximately \$15,000. This total estimated fee assumes only limited additional work with Authority easement matters. If additional work is required, the annual fee will be higher. If you need additional information, please contact me.

Respectfully submitted,



Matthew A. Nichols

MN/nc

CONSENT AGENDA (C6)**Lower Cape Fear Water & Sewer Authority**

CONSENT ITEM- Background: Line-Item adjustments are made to align revenues and expenditures more closely to actuals without exceeding or decreasing the approved or amended budget.

LINE-ITEM ADJUSTMENTS FOR 02/29/2024

Operating Fund:	Line-Item Budget Amount prior to Adjustment	Decrease	Increase	Budget Amount as of 02/29/2024
Expenses				
30001-01 Brunswick County	\$1,908,193		\$15,000	\$1,923,193
30004-01 HWY 421 - Invista/Stepan	\$100,000		\$10,000	\$110,000
3005-01 Praxair	\$40,784	\$25,000		\$15,784
4059-01 Office Expenses	\$14,000		\$2,000	\$16,000
4062-01 Office Equipment	\$26,000		\$8,000	\$34,000
4046-01 Attorney	\$50,000	\$10,000		\$40,000
Total	\$ 2,138,977	\$(35,000)	\$35,000	\$ 2,138,977

**A RESOLUTION OF
LOWER CAPE FEAR WATER & SEWER AUTHORITY
EXEMPTING LOWER CAPE FEAR WATER & SEWER AUTHORITY
FROM THE PROVISIONS OF N.C.G.S. §143-64.31**

Whereas, N.C.G.S. §143-64.31 requires Lower Cape Fear Water & Sewer Authority (the "Authority") to conduct an initial selection of firms to provide engineering services without regard to fee; and

Whereas, N.C.G.S. §143-64.32 permits the Authority to exempt projects from the provisions of N.C.G.S. §143-64.31 in the case of proposed projects where the estimated professional fee is less than \$50,000.00; and

Whereas, the Authority proposes to enter into a contract with McKim & Creed, Inc. for engineering services as described hereinafter; and

Whereas, the estimated professional fee for the work to be performed by McKim & Creed, Inc. in connection with such project is less than \$50,000.00, with total estimated fees not to exceed \$32,300.00; and

Whereas, the Authority by its execution of this resolution intends to waive the requirements of N.C.G.S. §143-64.31.

NOW, THEREFORE, BE IT RESOLVED by the Board of Directors of Lower Cape Fear Water & Sewer Authority as follows:

1. Pursuant to N.C.G.S. §143-64.32 the Authority hereby exempts the following from the provisions of N.C.G.S. §143-64.31: McKim & Creed proposal for professional consulting engineering services to the Authority for FY 2025-2026, with total estimated fees not to exceed \$32,3000.00.
2. This Resolution shall be effective upon passage.

This Resolution was adopted on the 13th day of May 2024.

Harry Knight, Chairman

ATTEST:

Scott Phillips, Secretary



ENGINEERS

SURVEYORS

PLANNERS

May 6, 2024

241809

Mr. Tim Holloman, Executive Director
 Lower Cape Fear Water & Sewer Authority
 1107 New Pointe Blvd Suite 17
 Leland, NC 28451

Re: **Proposal for Professional Consulting Engineering Services**
Lower Cape Fear Water & Sewer Authority
FY 2025-2026 Annual Retainer Services

Dear Mr. Holloman:

McKim & Creed appreciates the opportunity to provide this proposal for professional consulting services for the fiscal year 2025-2026. This proposal is based on the project tasks as outlined below.

Task 1 – Monthly Authority Meetings

McKim & Creed will attend the Monthly meetings of the Authority and assist the Executive Director and Board of Directors by providing technical guidance and responding to general questions with respect to the Authority's facilities during the meetings. The standard service for this item will be \$250 per month (lump sum).

Task 2 – Technical Evaluations & On-Call Services

Frequently, the Authority receives requests for technical evaluations concerning their capabilities and capacity to meet the needs of its members or public and private entities within the five-county area (Bladen, Columbus, New Hanover, Pender, and Brunswick). At the request and direction of the Executive Director and the Board of Directors, McKim & Creed will provide technical evaluations or assistance for specific issues concerning the Authority's facilities and customers.

We will provide such assistance to the Authority on an hourly not to exceed basis or fixed fee basis at the discretion of the Executive Director and the Board of

243 North Front Street

Wilmington, NC 28401

910.343.1048

Fax 910.251.8282

www.mckimcreed.com

K:\Water\Lower Cape Fear Water & Sewer Authority (LCFWSA)\241809_LCFWSA FY 2025-2026 Annual Retainer Services_Fee
 Proposal\241809 Proposal FY 2025-2026.doc

Mr. Tim Holloman, Executive Director
 Lower Cape Fear Water and Sewer Authority
 May 6, 2024
 Page 2

Directors. McKim & Creed will obtain approval from the Executive Director prior to commencing work on an item.

Task 3 – Kings Bluff Raw Water Facilities Annual Inspection Report

The consultant will review the activities related to the Authority's raw water pumping facilities for the Kings Bluff system and meet with the O&M Contractor's staff to prepare a summary report concerning current conditions and O&M conducted over the past fiscal year. This summary will constitute the Annual Inspection Report for the Authority for the Kings Bluff Raw Water Facilities.

Task 4 – Bladen Bluffs Water Treatment Facilities Annual Inspection Report

The consultant will review the activities related to the Authority's Bladen Bluffs Surface Water Treatment Facility, located in Tar Heel, NC. We will meet with plant operations staff to prepare a summary report concerning current conditions and O&M conducted at the facility over the past fiscal year. This summary will constitute the Annual Inspection Report for the Authority for the Bladen Bluffs Water Treatment Facilities.

Task 5 – Annual Master Plan Update

The consultant will prepare an update to the Fiscal Year 2019-2044 Master Plan. Primary tasks will include:

- Review current Master Plan projects and update year of occurrence and opinion of probable project costs.
- Remove/edit current Master Plan projects based on current needs of the Authority.
- Add additional Master Plan projects based on current needs of the Authority.
- Update Master Plan document for review and comment by Authority staff and Board of Directors
- Prepare Draft and Final Master Plan document in hard copy and electronic (PDF) format.
- Present updated Master Plan to the Authority's Board of Directors.

Mr. Tim Holloman, Executive Director
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Fee Summary

The following summarizes the fees proposed for this project.

Task	Fee Type	Annual Cost
1 - Monthly Assistance	\$270 Per Month	\$3,300
2 - Technical Evaluations	Hourly NTE	\$10,000
3 - Kings Bluff Annual Inspection	Fixed Fee	\$6,500
4 - Bladen Bluffs Annual Inspection	Fixed Fee	\$6,500
5 - Annual Master Plan Update	Fixed Fee	\$6,000
Total Estimated Fees		\$32,300

Miscellaneous Conditions

- 1.5% per month on overdue invoices.
- Either party may terminate with a 30-day notice.


ACCEPTANCE AND AUTHORIZATION

If this proposal is acceptable, please sign below as indicated and return one executed copy to our office. Upon receipt, McKim & Creed will consider this as the authorization to proceed.

We appreciate the opportunity to provide these services and look forward to our continuing work with the Authority. If you have any questions, please do not hesitate to contact me.

Sincerely,

McKIM & CREED, Inc.



Tony Boahn, PE
 Vice-President

Enclosure: McKim & Creed, Inc. Engineering Division General Conditions
 (01/2011-01)

Mr. Tim Holloman, Executive Director
 Lower Cape Fear Water and Sewer Authority
 May 6, 2024
 Page 4

Accepted by:

LOWER CAPE FEAR WATER & SEWER AUTHORITY

NAME: Harry Knight

SIGNATURE: _____

TITLE: Chairman, Board of Directors

DATE: _____

E-Verify Requirement. As a condition of payment for services rendered under this agreement, Engineer shall comply with the requirements of Article 2 of Chapter 64 of the North Carolina General Statutes (requirement that employers use E-Verify). Further, if Engineer provides the services to the Client utilizing a subcontractor, Engineer shall require the subcontractor to comply with the requirements of Article 2 of Chapter 64 of the North Carolina General Statutes as well. Engineer shall verify by affidavit compliance with the terms of this section upon request of Client.

This instrument has been pre-audited in the manner required by the Local Government Budget and Fiscal Control Act, this the ____ day of _____, 2024

 Finance Officer, Lower Cape Fear Water and Sewer Authority

McKim & Creed, Inc.
Engineering Division
General Conditions
(01/2011-1)

Billing and Payment. Invoices will be submitted by McKim & Creed, Inc. (the "Engineer") to the Client monthly for services performed and expenses incurred pursuant to this Agreement. Payment of each such invoice will be due upon receipt and considered past due if not paid within thirty (30) days of the date of the invoice. Any retainers shall be credited on the final invoice.

a) Interest. A service charge will be added to delinquent accounts at 18 percent per annum (1.5 percent per month).

b) Suspension of Services. If the Client fails to make any payment due the Engineer for services and expenses within thirty (30) days of the invoice date on the project(s) covered by this agreement or any other project(s) being performed by Engineer for Client, the Engineer may suspend services under this Agreement until it has been paid in full for all past due amounts owed by Client for services and expenses. The Engineer shall have no liability whatsoever to the Client for any costs or damages occurring as a result of such suspension caused by any such breach of this Agreement by Client.

c) Collection Costs. In the event legal action is necessary to enforce the payment provisions of this Agreement, the Engineer shall be entitled to collect from the Client any judgment or settlement sums due, reasonable attorneys' fees, court costs.

d) Termination Of Services. The failure of the Client to make payment to the Engineer in accordance with the payment terms set forth herein shall constitute a material breach of this Agreement and shall entitle the Engineer, at its option, to terminate the Agreement. Any material breach of this Agreement by the Client shall, at the Engineer's option and in its sole discretion, constitute a breach of and default under any and/or all other agreements between the Client and Engineer.

Confidentiality. The Engineer agrees to keep confidential and not to disclose to any person or entity, other than the Engineer's employees, sub-consultants and the general contractor and subcontractors, if appropriate, any data and information not previously known to and generated by the Engineer or furnished to the Engineer and marked CONFIDENTIAL by the Client. These provisions shall not apply to information in whatever form that comes into the public domain, nor shall it restrict the Engineer from giving notices required by law or complying with an order to provide information or data when such order is issued by a court, administrative agency or other authority with proper jurisdiction, or if it is reasonably necessary for the Engineer to defend itself from any suit or claim.

~~The Client agrees that the technical methods, techniques and pricing information contained in any proposal submitted by the Engineer pertaining to this project or in this Agreement or any addendum thereto, are to be considered confidential and proprietary, and shall not be released or otherwise made available to any third party without the express written consent of the Engineer.~~

Consequential Damages. Notwithstanding any other provision of the Agreement, neither party shall be liable to the other for any consequential damages incurred due to the fault of the other party, regardless of the nature of the fault or whether it was committed by the Client or the Engineer, their employees, agents, sub-consultants or subcontractors. Consequential damages include, but are not limited to, loss of use and lost profit.

Non-Contingency. The Client acknowledges and agrees that the payment for services rendered and expenses incurred by the Engineer pursuant to this Agreement is not subject to any contingency unless the same is expressly set forth in this Agreement. Payments to the Engineer shall not be withheld, postponed or made contingent on the financing, construction, completion or success of the project or upon receipt by the Client of offsetting reimbursement or credit from other parties causing Additional Services or expenses. No withholdings, deductions or offsets shall be made from the Engineer's compensation for any reason.

Opinions of Cost.

(a) Since the Engineer has no control over the cost of labor, materials, equipment or services furnished by others, or over methods of determining prices, or over competitive bidding or market conditions, any and all opinions as to costs rendered hereunder, including but not limited to opinions as to the costs of construction and materials, are estimates only and shall be made on the basis of its experience and qualifications and represent its best judgment as an experienced and qualified professional engineer, familiar with the construction industry; but the Engineer cannot and does not guarantee that proposals, bids or actual costs will not vary from opinions of probable cost prepared by it and the Engineer shall have no liability whatsoever if the actual cost differs from the Engineer's estimate. If at any time the Client wishes greater assurance as to the amount of any cost, Client shall employ an independent cost estimator to make such determination. Engineering services required to bring costs within any limitation established by the Client will be paid for as additional services hereunder by the Client.

Termination. The obligation to provide further services under this Agreement may be terminated by either party upon seven (7) days' written notice in the event of substantial failure by the other party to perform in accordance with the terms hereof through no fault of the terminating party. In the event of any termination, the Engineer shall provide a final statement of charges due and will be paid for all services rendered to the date of termination, all expenses subject to reimbursement hereunder, and other reasonable expenses incurred by the Engineer as a result of such termination. In the event the Engineer's compensation under this Agreement is a fixed fee, upon such termination the amount payable to the Engineer for services rendered will be determined using a proportional amount of the total fee based on a ratio of the amount of the work done, as reasonably determined by the Engineer, to the total amount of work which was to have been performed, less prior partial payments, if any, which have been made.

Reuse of Documents. All documents, including but not limited to drawings and specifications, prepared by the Engineer pursuant to this Agreement are related exclusively to the services described herein. They are not intended or represented to be suitable for reuse by the Client or others on extensions of this project or on any other project. Any reuse without written verification or adaptation by the Engineer for specific purposes intended will be at the Client's sole risk and without liability or legal exposure to the Engineer. The Client releases the Engineer harmless from all claims that the Client may have against the Engineer and arising out of any unauthorized reuse.

McKim & Creed, Inc.
Engineering Division
General Conditions
(01/2011-1)

Limitation of Liability. In performing its professional services hereunder, the Engineer will use that degree of care and skill ordinarily exercised, under similar circumstances, by reputable members of its profession practicing in the same or similar locality. No other warranty, express or implied, is made or intended by the Engineer's undertaking herein or its performance of services hereunder. THE CLIENT UNDERSTANDS AND AGREES THAT THE ENGINEER HAS NOT MADE AND IS NOT MAKING ANY PROMISE, WARRANTY OR REPRESENTATION EXCEPT THE WARRANTIES EXPRESSLY MADE HEREIN, AND THE ENGINEER EXPRESSLY DISCLAIMS ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER IMPLIED WARRANTIES. Under no circumstances shall the Engineer be liable for extra costs or other consequences due to changed conditions or for costs related to the failure of the contractor or material men to install work in accordance with the plans and specifications. The Engineer shall not be liable for errors in judgment or for any loss or damage, which occurs for any reason beyond the control of the Engineer. ~~No action may be instituted hereunder more than one year after the cause of action accrued or should have been discovered by reasonable diligence.~~ The provisions of this paragraph shall survive the termination of this Agreement.

Controlling Law. This Agreement is to be governed by the law of the State of North Carolina. ~~The parties agree that any suit or action related to this Agreement shall be instituted and prosecuted in the courts of the County of Wake, State of North Carolina, and each party waives any right or defense relating to such jurisdiction or venue.~~

Binding Effect. This Agreement shall bind, and the benefits thereof shall inure to the respective parties hereto, their legal representatives, executors, administrators, successors and permitted assigns.

Merger; Amendment. This Agreement constitutes the entire agreement between the Engineer and the Client with respect to its subject matter, and all negotiations and oral understandings between the parties are merged herein. This Agreement can be supplemented and/or amended only by a written document executed by both the Engineer and the Client.

Ownership Of Instruments Of Service. All reports, plans, specifications, field data, notes and other documents, including all documents on electronic media, prepared by the Engineer as instruments of service shall become the property of the Owner. The Owner shall retain all common law, statutory and other reserved rights, including the copyright thereto. If the Owner uses any reports, plans, specification, field data, notes or other documents ("documents") for any project other than the specific project for which the documents were intended, then Owner waives any claims for damages related to these other projects.

Photographs. Photographs of any completed project embodying the services of the Engineer provided hereunder may be made by the Engineer and shall be considered as its property, and may be used by it for publication.

Assignment. Neither party to this Agreement shall transfer, sublet or assign any rights under or interest in this Agreement, including but not limited to fees that are due or fees that may be due, without the prior written consent of the other party.

Archiving of Project Documentation. Engineer shall maintain copies of printed project documentation for a period of three years from substantial completion of Engineer's services. Engineer shall maintain copies of all electronic media related to the project for a period of one year from substantial completion of Engineer's services. Requests for reproduction of project documentation after these periods have expired will be considered additional services and will be invoiced at the Engineer's prevailing hourly rates at the time of the request, plus expenses.

Betterment. If, due to the Engineer's error, any required item or component of the project is omitted from the Engineer's construction documents, the Engineer shall not be responsible for paying the cost to add such item or component to the extent that such item or component would have been otherwise necessary to the project or otherwise adds value or betterment to the project. In no event will the Engineer be responsible for any cost or expense that provides betterment, upgrade or enhancement of the project.

Electronic Files. Because data stored on electronic media can deteriorate undetected or be modified without the Engineer's knowledge, the Client agrees that it will accept responsibility for the completeness, correctness, or readability of any electronic media delivered to the Client after an acceptance period of 30 days after delivery of the electronic files, and that upon the expiration of this acceptance period, Client will release, indemnify and save harmless the Engineer from any and all claims, losses, costs, damages, awards or judgments arising from use of the electronic media files or output generated from them. The Engineer agrees that it is responsible only for the printed and sealed drawings and documents, and if there is a conflict between these printed documents and the electronic media, the sealed documents will govern. Engineer makes no warranties, express or implied, under this agreement or otherwise, in connection with the Engineer's delivery of electronic files.

Certifications, Guarantees and Warranties. The Engineer shall not be required to sign any documents, no matter by whom they may be requested, that would result in the Engineer's having to certify, guarantee or warrant the existence of conditions which the Engineer cannot ascertain. The Client also agrees that it has no right to make the resolution of any dispute with the Engineer or the payment of any amounts due to the Engineer in any way contingent upon the Engineer's signing any such certification.

Corporate Protection. It is intended by the parties to this Agreement that the Engineer's services in connection with the project shall not subject the Engineer's individual employees, officers or directors to any personal legal exposure for the risks associated with this project. Therefore, and notwithstanding anything to the contrary contained herein, the Client agrees that as the Client's sole and exclusive remedy, any claim, demand or suit shall be directed and/or asserted only against the Engineer, a North Carolina corporation, and not against any of the Engineer's employees, shareholders, officers or directors.

Job-Site Safety. Neither the professional activities of the Engineer, nor the presence of the Engineer or its employees and sub-consultants at a construction site, shall relieve the General Contractor and any other entity of their obligations, duties and responsibilities including, but not limited to, construction means, methods, sequence, techniques or procedures necessary for performing, superintending or coordinating all portions of the Work of construction in accordance with the contract documents and any health or safety precautions required by any regulatory

McKim & Creed, Inc.
Engineering Division
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agencies. The Engineer and its personnel have no authority to exercise any control over any construction contractor or other entity or their employees in connection with their work or any health or safety precautions. The Client agrees that the General Contractor is solely responsible for job-site safety, and warrants that this intent shall be made evident in the Client's agreement with the General Contractor. ~~The Client also agrees that the Client, the Engineer and the Engineer's consultants shall be indemnified and shall be made additional insured under the General Contractor's general liability insurance policy.~~ The Client, upon written request of the Engineer, agrees to use its best efforts to add the Engineer as an additional insured on the contractor's general liability and auto liability policies.

Scope of Services. Services not set forth as Basic Services or Additional Services and listed in this Agreement are excluded from the scope of the Engineer's services and the Engineer assumes no responsibility to perform such services.

Severability And Survival. Any provision of this Agreement later held to be unenforceable for any reason shall be deemed void, and all remaining provisions shall continue in full force and effect. All obligations arising prior to the termination of this Agreement and all provisions of this Agreement allocating responsibility or liability between the Client and the Engineer shall survive the completion of the services hereunder and the termination of this Agreement.

Shop Drawing Review. If included in the scope of services to be provided, the Engineer shall review and approve Contractor submittals, such as shop drawings, product data, samples and other data, as required by the Engineer, but only for the limited purpose of checking for conformance with the design concept and the information expressed in the contract documents. This review shall not include review of the accuracy or completeness of details, such as quantities, dimensions, weights or gauges, fabrication processes, construction means or methods, coordination of the work with other trades or construction safety precautions, all of which are the sole responsibility of the Contractor. The Engineer's review shall be conducted with reasonable promptness while allowing sufficient time in the Engineer's judgment to permit adequate review. Review of a specific item shall not indicate that the Engineer has reviewed the entire assembly of which the item is a component. The Engineer shall not be responsible for any deviations from the contract documents not brought to the attention of the Engineer in writing by the Contractor and approved by the Engineer. The Engineer shall not be required to review partial submissions or those for which submissions of correlated items have not been received.

Specification Of Materials. The Client understands and agrees that products or building materials, which are permissible under current building codes or ordinances may, at some future date, be banned or limited in use in the construction industry because of presently unknown hazardous characteristics. The Client agrees that if the Client directs the Engineer to specify any product or material, after the Engineer has informed the Client that such product or material may not be suitable or may embody characteristics that are suspected of causing or may cause the product or material to be considered a hazardous substance in the future, the Client waives all claims as a result thereof against the Engineer. ~~The Client further agrees that if any product or material specified for this project by the Engineer shall, at any future date be suspected or discovered to be a health or safety hazard, the Client hereby releases the Engineer from any and all~~

~~liabilities and waives all claims against the Engineer relating thereto.~~

Standard Of Care. Services provided by the Engineer under this Agreement will be performed in a manner consistent with that degree of care and skill ordinarily exercised by members of the same profession currently practicing under similar circumstances in the same geographic area.

Suspension Of Services. If the project is suspended for more than thirty (30) calendar days in the aggregate, the Engineer shall be compensated for services performed and charges incurred prior to such suspension and, upon resumption of services, the Engineer shall be entitled to an equitable adjustment in fees to accommodate the resulting demobilization and re-mobilization costs. In addition, there shall be an equitable adjustment in the project schedule based on the delay caused by the suspension. If the project is suspended for more than ninety (90) calendar days in the aggregate, the Engineer may, at its option, terminate this Agreement upon giving notice in writing to the Client.

Unauthorized Changes To Documents. In the event the Client consents to, allows, authorizes or approves of changes to any plans, specifications, construction documents or electronic media, and these changes are not approved in writing by the Engineer, the Client recognizes that such changes and the results thereof are not the responsibility of the Engineer. Therefore, the Client releases the Engineer from any liability arising from the construction, use or result of such changes. ~~In addition, the Client agrees, to the fullest extent permitted by law, to indemnify and hold the Engineer harmless from any damage, liability or cost (including reasonable attorneys' fees and costs of defense) arising from such changes.~~

Compensation for Additional Services. The undertaking of the Engineer to perform professional services under this Agreement extends only to those services specifically described herein. If upon the request of the Client, the Engineer agrees to perform additional services hereunder, the Client and the Engineer shall negotiate and agree upon an additional fee to be paid to the Engineer for completion of the agreed upon Additional Services. The Engineer will be under no obligation to begin or complete requested Additional Services until the additional fee has been negotiated and agreed upon in writing by the Client and the Engineer.

Hourly Billing Rates. All services to be billed on an hourly basis under this agreement will be billed using the Engineer's prevailing billing rate schedule at the time services are provided. If a specific rate schedule is to be used for this Agreement, it shall expire no later than one year from the date of this Agreement and will be replaced with the prevailing rate schedule in effect at that time.

Priority Over Form Agreements. The parties agree that the provisions of this Agreement shall control and govern over any Work Orders, Purchase Orders or other documents, which the Client may issue to Engineer in regard to the project(s) which is (are) the subject of this Agreement. The Client may issue such documents to Engineer for its convenience for accounting or other purposes, but any such Orders will not alter the terms of this Agreement, regardless of any contrary language appearing therein.

McKim & Creed, Inc.
Engineering Division
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Paragraph Headings. The paragraph headings contained in this Agreement are for reference purposes only and shall not affect in any way the meaning or interpretation of this Agreement.

Third Parties. Nothing in this Agreement shall be construed as giving any person, firm, corporation or other entity other than the parties to this Agreement and their respective successors and permitted assigns, any right, remedy or claim under or in respect of this Agreement or any of its provisions.

Default. The Client shall be in default under this Agreement if (i) it fails to pay in full any invoice from the Engineer on the due date or fails to make any other payment due to the Engineer under this Agreement, (ii) it fails to observe or perform any other term, condition or covenant under this Agreement, (iii) it breaches any warranty or representation made under this Agreement, (iv) it dissolves, terminates or liquidates its business, or its business fails or its legal existence is terminated or suspended, (v) any voluntary or involuntary bankruptcy, reorganization, insolvency, receivership, or other similar proceeding is commenced by or against the Client, or (vi) it becomes insolvent, makes an assignment for the benefit of creditors, or conveys substantially all of its assets.

Design Without Construction Phase Services. If the services to be provided by Engineer hereunder do not include construction observation and/or construction administration services, or if such services are included in Engineers contracted services and Client later decides to perform these services itself or decides to retain other consultants or individuals to perform these services, Engineer assumes no responsibility for interpretations of the Engineer's services or for any construction observation, construction administration and/or supervision performed by Client or other parties and Client waives any and all claims against Engineer for any losses, claims, costs or damages of any kind whatsoever that may be in any way connected thereto.

~~In addition Client agrees, to the fullest extent permitted by law, to indemnify and hold Engineer harmless from any loss, claim, damage or cost, including reasonable attorneys' fees and costs of defense, arising or resulting from the performance of construction observation, construction administration and/or supervision by Client, its employees, agents or consultants, and including any and all claims arising from the modification or adjustment of, or any clarifications or interpretations of, the Engineer's Work by others.~~

~~Unless, in the Engineer's sole opinion, appropriate levels of construction observation and construction administration services are contracted for and performed by Engineer, Engineer will not be responsible to provide any engineering or other certifications related to the construction or installation of any improvements.~~

Reliance on Data Provided by Others. Engineer shall be entitled to reasonably rely on the accuracy of information provided to it by Client or any of Client's other consultants or sub-consultants. Engineer shall not be responsible to extensively review the information provided to insure the accuracy thereof. Client agrees to not hold Engineer responsible for errors or omissions in Engineer's work that are directly attributable to errors or incorrect data provided to Engineer by Client or Client's other consultants. Client further acknowledges that any redesign or corrective efforts required by Engineer resulting from incorrect information provided by Client or Client's other consultants will be paid for by the Client as additional services.

Credit and Financial Obligations. Prior to commencement of the work, Engineer may require that Client provide reasonable credit information and other documentation to confirm that the Client has made financial arrangements to fulfill the Client's payment obligations under this Agreement. Engineer may also require such information at any time during the performance of Engineer's services should the Client fail to make payments per this Agreement, a change in the scope materially changes the contract sum, or Engineer identifies in writing a reasonable concern regarding the Client's ability to make payment when payment is due. The Client may be required to furnish this information prior to further commencement or continuation of services by Engineer and Engineer shall not be responsible for the cost of any delay occurring as a result of such a request.

Markup on Expenses. Unless specified otherwise in our proposal, all sub consultant costs and other project related costs incurred by Engineer will be billed with a 15% markup. Company vehicle mileage and internal reproduction costs will be billed at the Engineer's prevailing rate for those items. Personal vehicle mileage costs incurred on the project by employees of Engineer will be billed at the prevailing IRS mileage rate in effect at the time of travel.

SUE Technical Standards. Quality Level A information obtained by direct exposure of the existing utilities can greatly increase the level of confidence with respect to the location of underground utilities at a particular jobsite. Utility exposure (Quality Level A) permits three-dimensional measurements to be taken on utilities for accurate location at each test hole. The overall level of confidence with respect to the location of site utilities can be raised by increasing the number of test holes examined; however, Engineer provides no guarantee of the location of utilities on the site other than at the locations where test holes have been established.

Quality Level B services include the horizontal, above ground detection, marking and mapping of underground utilities. Geophysical prospecting methods are used to indicate the presence and surface position of buried utilities. Utilities are identified and marked in the field in order to be surveyed and mapped. Quality Level B information should not be used for construction purposes, or where exact horizontal and vertical measurements are required.

The accuracy of Quality Level B designating information and depth of cover readings obtained by utilizing Geophysical and Ground Penetrating Radar equipment and techniques are subject to field and soil conditions beyond our control. Engineer will make reasonable efforts to provide comprehensive and correct positional utility marks to the limits obtainable by the instrumentation used and the existing ground conditions; however, Engineer provides no guarantee that all existing utilities on a particular site will be properly located using these methods.

Utilizing Engineer's SUE services does not relieve any party from their obligation to contact the utility damage prevention system before digging begins. Utility marks placed on the ground by Engineer are not to be used for construction purposes.

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INSURANCE. Engineer shall take out and maintain during the life of this Contract the following insurance:

- a. Statutory Workers Compensation insurance;
- b. Comprehensive General Liability insurance in an amount of \$1,000,000.00 for each occurrence and \$2,000,000.00 aggregate;
- c. Automobile Insurance in an amount of \$1,000,000.00

Client shall be named as an additional insured on the Comprehensive General Liability and Automobile insurance policies. Prior to commencing work, Engineer shall provide evidence that the required insurance is in place. Each policy shall provide that Client shall receive not less than thirty days prior written notice of any cancellation, non-renewal or reduction of coverage of any of the policies.

AGENDA ITEM

To: CHAIRMAN KNIGHT AND BOARD MEMBERS

From: TIM HOLLOMAN, EXECUTIVE DIRECTOR

Date: May 13, 2024

Re: Public Hearing Prior to Approval of the Fiscal Year 2024 – 2025 Budget and Budget Ordinance

Please find enclosed for consideration of approval, appropriations for the listed funds for the operation of the Authority for the Fiscal Year beginning July 1, 2024, and ending June 30, 2025.

Public Hearing: In accordance with North Carolina General Statute Section 159-12 (b), prior to adopting the budget ordinance, the Board shall hold a public hearing at which time any persons who wish to be heard on the budget may appear. Legal notice of the public hearing on the budget was published on April 24th, May 1st, and 8th, 2024, in Star-News and on the Authority's web page.

Written public comment regarding the Fiscal Year 2024-2025 Budget may be submitted to Executive Director Holloman at director@lcfwasa.gov until 4:30 p.m. on June 7th, 2024.

- A. Operating Fund Appropriations in the Amount of \$30,655.307
- B. Operating General Fund Appropriations in the Amount of \$3,635,215
- C. Enterprise Fund/Capital Project Fund Appropriations in the Amount of \$494,823
- D. Renewal and Replacement Appropriations Fund in the Amount of \$1,240,084
- E. Right of Way Fund Appropriations in the Amount of \$281,479

Motion to Open Public Hearing

1. A motion is made by _____ to open a public hearing on the FY 2024-2025 Budget.
2. The motion is seconded by _____.

Motion to Close Public Hearing

1. A motion is made by _____ to close the public hearing.
2. The motion is seconded by _____.

Executive Director Holloman will briefly review the recommended budget as recommended by the Finance Committee

Action Requested: No action is required at this time. The Budget is being presented for consideration of approval/disapproval on June 17, 2024, at 9:00 a.m.

AGENDA ITEM

To: CHAIRMAN KNIGHT AND BOARD MEMBERS

From: TIM H. HOLLOMAN, EXECUTIVE DIRECTOR

Date: May 13, 2024

Re: Final Preliminary Engineering Report for the Walkway Replacement at Kings Bluff

Reviewed and approved as to form: MATTHEW A. NICHOLS, AUTHORITY ATTORNEY

Background: On June 5th, 2023, the Board awarded the contract for engineering services related to the Kings Bluff raw water pump station air backwash building and access walkway replacement to McKim & Creed, Inc. McKim & Creed, Inc. will review the Final PER (Preliminary Engineering Report) for the Walkway replacement at Kings Bluff

Action Requested: Motion to approve/disapprove.



LOWER CAPE FEAR WATER & SEWER AUTHORITY EXISTING KINGS BLUFF P.S. AIR BACKWASH BUILDING

Preliminary Engineering Report Elevated Access Walkway and Equipment Building

Date: April 30, 2024



FINAL

Prepared for:

Cape Fear Water & Sewer Authority
1107 New Pointe Boulevard
Leland, NC 28451

Prepared by:

McKim & Creed, Inc.
243 North Front Street
Wilmington, NC 28401
Firm License No. F-1222

McKim & Creed Project No. 01675-0070

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1. INTRODUCTION

1.1 Background

The Lower Cape Fear Water and Sewer Authority (LCFWSA) owns and operates the Kings Bluff Pump Station facility. The facility was originally constructed in 1982 just upstream of U.S. Lock and Dam #1 of the Cape Fear River, to utilize the river as a source to supply water in southeastern North Carolina. The pump station site consists of an approximate 30-acre property located in southeastern Bladen County on the west bank of the Cape Fear. The pump station is accessed by Private Road and Locks No. 1 Road (county road 1734) from North Carolina state road (SR) 87), northwest of the SR 87 / SR 11 intersection northwest of Riegelwood, North Carolina. The existing site layout is shown below in **Figure 1.1**.

The original construction included a 48-inch diameter raw water intake pipe and screen assembly, an Air Backwash Control (ABC as referenced on as-built drawings) building and an elevated access walkway located over the river wetland/water surface, with the water surface elevation variable depending upon season and rainfall events. The ABC was constructed approximately 800 feet from the west riverbank. The elevated walkway in general is adjacent to the intake pipe alignment. Both the ABC and the access walkway are timber framed assemblies supported by round timber piles. Record drawings reviewed indicated the piles were to be driven to five ton capacity compression loading and a minimum embedment depth of 10 feet below grade. The record drawings did not clarify if grade was the top associated with the compression load. The existing initial construction elevated access walkway is shown below in **Figure 1.1** and the ABC building is shown below in **Figure 1.1**.

The pump station was expanded in 2009 and subsequently, in 2010 a new 60-inch diameter intake pipe and screen assembly was installed. Associated with this project was an additional Air Backwash (AB as referenced on as-built drawings) building and an elevated access walkway. The 60-inch intake pipe and screen assembly, AB and walkway were constructed upstream of the initial construction 48-inch intake pipe and elevated walkway. The elevated walkway for the 2010 project consists of a small section that bridges the AB to the initial construction walkway. The AB and walkway bridge were also constructed of timber framing over the river wetland/water surface and in approximate vertical alignment with the initial construction ABC and elevated walkway. Similar to the initial ABC and elevated walkway construction, the AB and walkway bridge are supported by round timber piles. Regarding the piles, record drawings reviewed indicated the project general contractor was responsible for contracting with a geotechnical consultant to engineer the pile diameter and embed depth requirements. The 2010 existing elevated access walkway bridge and the AB building are shown below in **Figure 1.1**.

The existing ABC, AB and elevated timber walkways vary in age. Timber assemblies from initial construction could be approximately (41) years old. Timber assemblies from the 2010 project have been in place for approximately (13+) years.

Regarding existing timber framing for the initial construction elevated walkway, review of record drawings indicated the following:

- The existing decking is constructed of 2x8's.
- The existing hand / guard rail assemblies constructed of the following:
 - Top, bottom and intermediate rails are 2x8's.
 - Posts are 4x4's spaced approximately 4'-0" on center (o.c.).
 - Handrails are 2x4's.
- The existing elevated walkway support beams are 3-ply 2x10's spanning between the piles.
- The existing elevated walkway x-bracing assemblies between the piles are 2x10's.

Regarding existing timber framing for the initial construction ABC building, review of record drawings indicated the following:

- The existing walls are 2x4 studs spaced approximately 2'-0" o.c. with approximate ½" thick plywood wall sheathing at the outside face of the studs.
- The existing roof rafters are 2x8's spaced approximately 2'-0" o.c. with ½" thick plywood roof sheathing at the top surface of the rafters.

Regarding existing timber framing for the 2010 elevated walkway bridge, review of record drawings and on site observations indicated the following:

- The existing decking appears to be 2x8's to match the initial construction elevated walkway.
- The existing hand / guard rail assemblies appear to be constructed to match the initial construction.
- The existing elevated walkway support beams are 2-ply 2x12's spanning between the piles.
- The existing elevated walkway x-bracing assemblies between the piles are 2x12's.

Regarding existing timber framing for the 2010 AB building, review of record drawings and on site observations indicated the following:

- The existing floor joists are 2x12's spaced approximately at 1'-4" o.c. supporting the 2x8 decking outside the building and plywood flooring panels inside the building.



- The floor joists are supported by W10 steel wide flange beams spanning between the piles.
- The existing walls are 2x4 studs spaced approximately 1'-4" o.c. with OSB wall sheathing at the outside face of the studs.
- The existing roof rafters are 2x's with plywood roof sheathing at the top surface of the rafters.
- The existing ceiling joists are 2x's with and approximate ½" thick plywood ceiling at the bottom surface of the joists.

The existing timber framing for the initial construction elevated access walkways and the 2010 project bridge connection are exposed to severe weathering and temperature changes. These assemblies are subjected to high heat and humidity, ultraviolet rays from the sun and constant repetitive wet and dry cycles from precipitation. Although these timber assemblies are pressure treated, the pressure treatment is not capable of protecting the members from the long term effects of the continuous weathering cycles. Constant maintenance by LCFWSA has been required. For the initial construction and subsequent repairs, the assemblies have surpassed their intended time frame for their level of service. For the 2010 bridge connection the assembly is approaching the end of its intended time frame for its level of service.

In the interest of operations and maintenance personnel safety and improved access, in addition to rehousing / upgrading air backwash equipment, LCFWSA has determined the existing facilities need replacement. LCFWSA desires to construct a new elevated access walkway and equipment building.

In August of 2023 McKim & Creed (M&C) contracted with LCFWSA to evaluate various options for the design of a new air backwash equipment building and an elevated access walkway.

Figure 1.1 - Existing Kings Bluff Pump Station Site Layout



Figure 1.2 – Existing Kings Bluff Pump Station Elevated Access Walkway



Figure 1.3 - Existing Kings Bluff Air Backwash Control Building (ABC)



Figure 1.4 - Existing Kings Bluff Air Backwash Building & Walkway Bridge (AB)



1.2 Project Criteria and Evaluation Objectives

M&C contracted with LCFWSA to evaluate various material options for the design and construction of a new air backwash equipment building and an elevated access walkway. The evaluation will consider various materials to install a system to achieve the following:

- Structurally capable of supporting the facilities expected loadings.
- Consisting of materials tolerable to the expected weathering and temperature exposures.
- Consisting of materials of compatible constructability.
- Consisting of materials to be constructed utilizing industry standard means and methods and durable in the existing marine environment.
- Economically constructible based upon expected material and labor construction costs.
- Constructed Assemblies result in safe access for maintenance personnel for the operation of the facilities.

- Reduce the continuous maintenance of access walkway deck and hand / guard rail components required by the timber assemblies.

To achieve the aforementioned items, the materials included in this evaluation are the following:

- Precast reinforced concrete.
- Cast-in-place (c.i.p.) reinforced concrete.
- Structural steel - with a hot-dipped galvanized finish.
- Stainless steel.
- Aluminum.
- Timber – unexposed to the environment.

For the evaluation the aforementioned materials will be utilized for the following assemblies:

- Regarding precast reinforced concrete:
 - Deep foundation piles.
 - Walkway / building deck slab panels.
 - Walkway / building support framing.
 - Equipment building wall and roof panels.
- Regarding c.i.p. reinforced concrete:
 - Deep foundation piers.
 - Walkway / Building support framing.
- Regarding structural steel:
 - Deep foundation piles.
 - Walkway grating panels the entire walkway or combined with precast concrete.
 - Walkway / Building support framing.
 - All structural steel shall be hot dipped galvanized.
- Regarding stainless steel:
 - Walkway hand / guard rails.

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- Regarding aluminum:
 - Walkway grating panels the entire walkway or combined with precast concrete.
 - Walkway hand / guard rails.
 - Equipment building - prefabricated.
- Regarding timber:
 - Building 2x stud wall and timber truss roof framing.
 - Building plywood walls and roof sheathing.
 - All timber shall be pressure treated.

Previous coordination with LCFWSA has indicated concrete is the preferred material of choice for the elevated access walkway and the platform to support the equipment building. Regarding the equipment building, the precast concrete option will be more durable, but it will also be heavier. Evaluating the options to verify an all concrete assembly is one of the primary objectives of this evaluation.

Regarding the evaluation of the various materials for the components of the elevated access walkway and the platform to support the equipment building and design criteria, note the following:

- Similar to the existing facilities, LCFWSA, requires the new elevated access walkway and the air backwash equipment building to be above the existing river wetland / water surface, with the elevated framing supported by deep foundations embedded in the existing river / wetland.
- Similar to the existing facilities, framing assemblies for the new building and walkway will span between and be supported by the deep foundation members.
- Regarding horizontal layout, both the building and the walkway will be situated downstream of the existing air backwash buildings, walkways, the 48-inch and 60-inch diameter intake lines. The distance of the horizontal offset remains to be determined, but it is expected to be in close proximity to the alignment of the geotechnical borings conducted for this evaluation. The geotechnical report for the project is addressed in Section 2 of the report. In addition, a copy of the geotechnical report is included in Appendix A of this report. For this evaluation an 800 foot long walkway has been utilized.
- Vertically the building, its support platform and the walkway will be located 4'-6" (min.) above the existing elevated walkways, to try to ensure resilience against waterline fluctuations. Review of record drawings indicated two different elevations for the existing elevated walkways constructed

during the 1982 initial construction and the 2010 60-inch diameter intake and AB project. Note the following:

- T.O. Deck EL = 25.00' (initial construction).
- T.O. Deck EL = 27.80' (2010 project).
- T.O. Deck EL = 32.50' (for this evaluation).
- 100-Year Flood EL = 25.00' (2010 project record drawings).

Regarding the varying elevations, the top of deck elevation to be utilized will be further evaluated for the design of the new walkway. It is noted information provided by LCFWSA, indicated water levels were approximately 4" above the existing walkway handrail after Hurricane Florence in September 2018. The design of the new walkway will be above the reported Hurricane Florence water elevation.

Regarding the evaluation of the various materials for the components of the elevated access walkway, the platform to support the equipment building and the equipment building, design loads and load combinations the assemblies could be subjected to, in conformance with the current edition (2018) of the North Carolina Building Code (NCBC).

Regarding the design loads to be utilized, note the following:

- Dead load for the various individual materials, note the following:
 - Concrete Density = 150 lbs. / cu. ft.
 - Steel, Aluminum and Timber Sections = industry standard published weights in lbs. / ft.
 - Equipment Weight = vendor provided assembly weights.
- Live load, note the following:
 - Elevated access walkway = 100 lbs. / sq. ft.
 - Gator / Golf cart type vehicle = 2,400 lbs. (Gator) & 1,100 lbs. (Golf Cart).
 - Roof live load = 20 lbs. / sq. ft.
- Flood load, note the following:
 - Hydrostatic flood load calculated in conformance with ASCE 7-10.
 - Hydrodynamic flood load calculated in conformance with ASCE 7-10.
- Snow loads, note the following:

- Snow load roof pressure calculated in conformance with ASCE 7-10 based upon ground pressure = 10 lbs. / sq. ft.
- Seismic loads, note the following:
 - Seismic load calculated in conformance with ASCE 7-10.
 - In accordance with the project geotechnical report the proposed structures have a fundamental period of less than 0.5 seconds. Subsequently per ASCE 7 the seismic loads will be calculated based upon Site Class E criteria.

Regarding the aforementioned design loads to be utilized, the loads will be incorporated into the combinations the assemblies could be subjected to note the following:

- Load combinations to be applied in conformance with Section 1605.3 of the NCBC.

Utilizing the previous paragraphs project criteria, this Preliminary Engineering Report (PER) is provided by M&C to evaluate for the LCFWSA the following key design aspects of the proposed new structures for the elevated access walkway, the platform to support the equipment building and the equipment building:

- Construction material options for deep foundation assemblies utilizing Geotechnical engineering subconsultant.
- Construction material options for walkway deck and platform deck and floor assemblies.
- Construction material options for walkway and platform support framing.
- Construction material matrix options for walkway and platform decking and support framing.
- Construction material options for equipment building.
- Construction material options for hand / guard rail assemblies.
- Construction of a single building for the air backwash tanks, one for each intake pipe screen, and the potential to utilize the same components where possible.
- Utilize the existing tank(s) or installation of new assemblies.
- Assess alternative brands for improved equipment satisfaction.
- Consider electric or pneumatic operator for enhanced operational efficiency.

Based upon these design aspects, M&C can utilize the PER to delineate recommendations for LCFWSA concerning the walkway, equipment building, and its support platform. This includes planned design and construction assemblies that boast structural integrity capable of withstanding anticipated loadings, crafted from materials resilient to weathering and the rigors of the marine environment. Moreover, the



evaluation should be economically prudent while ensuring safe access and ultimately diminishing maintenance needs.

By attaining these objectives, LCFWSA stands to optimize their financial and personnel resources, redirecting them towards maintaining other critical assets necessary for the continued operation of the existing pump station facility.

2. EVALUATION OF OPTIONS FOR DEEP FOUNDATIONS

M&C subcontracted with S&ME in August 2023 to obtain subsurface information to characterize the subsurface soils on the existing pump station site at the general location of the proposed project to provide recommendations for foundation design and construction.

2.1 Testing

On September 5, 2023, and September 6, 2023, S&ME personnel mobilized to the site to conduct Standard Penetration Test (SPT) borings to the target depth of 50 feet below the existing wetland surfaces. A total of (4) test borings were conducted spaced along the approximate alignment for the walkway and building support platform structures.

Testing procedures at each bore hole generally consisted of drilling the bore hole and collecting soil samples at designated intervals throughout the depth of the bore hole. In general testing included the following:

- S&ME's bore hole procedure was conducted utilizing the mud rotary drilling method.
- S&ME's samples procedure consisted of utilizing the split-spoon method and collected samples at the following intervals of the bore holes:
 - 2.50 foot intervals for the upper 10 feet.
 - 5.00 foot intervals from 10 feet of depth until the bore termination depth.

All bore holes were terminated at 50 feet below the existing wetland surface as planned. The collected field tests were transported to S&ME's laboratory, where samples were examined and tested. A breakdown of the examination and laboratory tests can be found in the copy of the geotechnical report, included in Appendix A of this PER.

2.2 Report

The Report of General Exploration LCF Backwash Structure Project Bladen County, North Carolina by S&ME provided to M&C is dated October 27, 2023. In general the report includes project information regarding the following:

- Field and laboratory testing conducted on site and in S&ME's laboratory.
- Description of site and surface conditions, including local geology and physiology.
- Description of subsurface conditions and the various subsurface soils.
- Seismic site classification, seismic load design parameters and liquefaction potential of saturated loose and / or cohesionless soils.
- Deep pile foundation recommendations.

2.3 Deep Foundations

Prior to the geotechnical work M&C proposed deep foundation options to consists of the following:

- Precast reinforced concrete piles.
- C.I.P. reinforced concrete drill shaft piers.
- Structural steel hot-dipped galvanized HP section piles.

Prior to contracting with S&ME, pre-proposal coordination included removing the c.i.p. reinforced concrete drill shaft piers as an alternative option. S&ME's recommendation was based upon familiarity of the site and the expected constructability issues, regarding the expected soil characteristics, making the piers an ineffective and potentially unfeasible option.

For both the precast concrete and structural steel pile alternatives, S&ME has recommended utilizing driven pile assemblies. The (2) pile alternative options are summarized in **Table 2.2-1** below. Regarding the pile alternatives in the table below, note the following:

- Precast concrete pile reinforcing to include prestressed wire strands.
- Structural steel HP pile sections with 0.435-inch thick web and flanges.
- Regardless of the pile material, the piles will support the loads conveyed by the walkway and equipment building platform support framing and decking.

- The piles would be installed in a bent configuration with (2) piles per primary bent support spaced at 8'-0" o.c. and the support framing spanning between the bents.
- For this evaluation for the walkway, it is estimated (46) bents and (92) piles will be required if concrete piles installed and (81) bents and (162) steel piles installed.
- Pile length required = 57 feet, 40 foot embedment depth + 17 foot aerial section.
- Additional pile information can be found in the copy of the geotechnical report, included in Appendix A of this PER.

Table 2.2-1– Deep Foundation Pile Options.

Pile Type	Pile Dimensions (w x d)	Pile Section	Allowable Axial Compression Load (tons)	Required Embed Depth Below Exist. Wetlands Surface (feet)
Precast Concrete	12" x 12"	Square	18	40
Steel	12" x 11.8"	HP12x53	10	40

Both pile systems would require a minimum 40 foot embedment into the existing wetlands. Based upon estimated loads and the allowable axial compression load, for the elevated access walkway deck and support framing, it is expected the pre-cast concrete option would be the preferred assembly. Calculations indicate the concrete piles could be installed spaced at 18'-0" o.c. while the steel piles would require a 10'-0" o.c. spacing. Pile spacing will be further evaluated during the design of the new walkway. Potentially the top of deck elevation required to achieve the elevation warranted to be above potential hurricane flood waters, could alter the length of the aerial section of pile.

An opinion of construction cost and analysis can be found in Section 8 of this PER. Reference **Table 2.2-1** for additional information.

3. EVALUATION OF OPTIONS FOR WALKWAY DECKING

Regarding the elevated access walkway deck assembly, for the evaluation M&C has utilized an 8'-0" wide deck assembly which is an increase from the existing 4'-0" wide decking for the existing walkway. In addition to the respective deck material weight dead load, criteria for live load includes a 100 lbs. / sq. ft. uniform load and a 2,400 lbs. total maintenance vehicle load, broken down to 1,200 lbs. per axle and 600 lbs. per wheel. Regarding the live load note the following:

- The 100 load lbs. / sq. ft. uniform load and the vehicle load are not applied to the structure simultaneously over the same area on the deck panels.
- For this evaluation loading from the guard rail is not transferred to the decking. The guard rail posts to be directly connected to the walkway support framing. Reference Section 4 and 6 of this PER for additional information.

Elevated access walkway decking options consists of the following:

- Precast reinforced concrete slab panels.
- Aluminum grating panels the length of the walkway or in combination with the precast concrete slab panels.
- Steel grating panels the length of the walkway or in combination with the precast concrete slab panels.

Regarding the precast reinforced concrete slab panels, note the following:

- The evaluation utilized panels 6-inch thick to span the 8-foot wide walkway.
- It is estimated panels would be constructed (2) feet in width to accommodate the 10-foot steel pile spacing.
- It is estimated panels would be constructed (3) feet in width to accommodate the 18-foot concrete pile spacing.

Regarding the aluminum panels, note the following:

- The evaluation utilized rectangular bar grating, I-bar grating and riveted "AR" series panels to span the 8-foot wide walkway and minimize additional beams besides the exterior beams spanning between the pile bents.
- All (3) aluminum panels would require 2 ½" thick panels.

- The rectangular bar and I-bar grating options would require 11-SG-4 and 11-SGI-4 space profiles respectively. These space profiles set the rectangular bar / I-bar spacings at 11/16" o.c., which is narrower than the traditional 1 3/16" spaced bars in the more commonly used grating assemblies.
- The "AR" series is an aluminum riveted assembly comprised of straight main bearing bars and bent connecting bars. These bent connecting bars are joined at their contact points to the sides of the bearing bars with rivet fasteners. The "AR" series option would require a 12-AR-7 space profile sets the main bearing bars at 3/4" o.c. and the rivets at 7" o.c. spacing.
- Weight of the aluminum panels would be 6 to 10 lbs. / sq. ft. depending upon the option.

Regarding the steel panels, note the following:

- The evaluation utilized light duty welded rectangular bar grating, light duty riveted "R" series, and heavy duty welded bar grating panels to span the 8-foot wide walkway and minimize additional beams besides the exterior beams spanning between the pile bents.
- The (2) steel light duty panel options would require 2 1/2" thick panels if the traditional 19-W4 space profiles were utilized. If alternative space profiles were utilized, the light duty welded assembly could be reduced to 1 3/4" for an 11-W4 space profile and the light duty riveted assembly could be reduced to 2" for a 12-R-7 space profile.
- The steel heavy duty panel option would require 1 1/2" thick panels utilizing a 38-W-4 space profile.
- Weight of the steel panels would be 17 to 24 lbs. / sq. ft. for the light duty steel options and 10 lbs. / sq. ft. for the heavy duty steel option.

All (3) walkway decking systems could adequately support the expected live loads. It is expected the concrete decking system provides the best alternative for slip resistance, provided the concrete finish for the panels includes a "broom" or other "rough" textured finish. The aluminum and steel grating options include serrated edges on the top of the bars, which potentially could be rough on the tires for the vehicles to be used by maintenance. Although concrete deck is the heaviest of the options, it is the best option to contribute to lateral stability of the pile bents and the walkway support framing. The aluminum "AR" and steel "R" series are better options for lateral stability than the aluminum rectangular bar / I-bar grating and light duty welded steel bar grating panels. Regarding maintenance, replacement or temporary removal of grating panels will be easier for the aluminum and steel options.

An opinion of construction cost and analysis can be found in Section 8 of this PER. Reference **Table 2.2-1** for additional information.

4. EVALUATION OF OPTIONS FOR WALKWAY SUPPORT FRAMING

Regarding the elevated access walkway deck support framing assembly, for the evaluation M&C has utilized an 8'-0" wide deck assembly in conjunction with the deck evaluation in Section 3 of the PER and pile spacings of 10'-0" and 18'-0" in Section 4 of the PER. Support framing will consist of the following:

- A short span cross beam that spans 8'-0" between the (2) individual piles at each bent.
- (2) long span beams, with (1) beam each supporting each end of the deck panels and spans the 10-feet /18-feet between the pile bents.

In general, the beams in addition to their respective material weight dead load, support deck and guard rail material weight dead load and the live loads transferred from the deck and guardrails. Reference Section 3 of this PER for the uniform and vehicle live loads, and Section 6 of this PER for the guardrail live load. Support framing beam options consists of the following:

- Precast reinforced concrete beam sections.
- C.I.P. reinforced concrete beam sections.
- Structural steel beam sections.

Regarding the precast reinforced concrete beam sections, note the following:

- For this evaluation M&C has utilized a 1'-8" wide x 1'-0" deep rectangular section for the short span cross beam.
- For this evaluation M&C has utilized a 1'-0" wide x 1'-2" deep rectangular section for the long span beams.

Regarding the c.i.p. reinforced concrete beam sections, note the following:

- For this evaluation M&C has utilized beam sections matching the precast concrete sections.

Regarding the structural steel beam sections, note the following:

- For this evaluation M&C has utilized wide flange shaped sections for all beams.
- For this evaluation M&C has utilized L/360 deflection criteria for the short span cross beam and L/720 criteria for the long span beams, to minimize deflections from 1/4" to 3/8" in the vertical direction.
- Analysis for this evaluation resulted in W16x31 short span beams and W14x38 long span beams.

All (3) support framing systems could adequately support the expected dead and live loads transferred from the walkway decking and guardrail assemblies. It is expected the concrete systems provides the best alternative for durability with the precast concrete beams the easier of the (2) concrete options to construct. Although it is expected c.i.p. concrete construction will allow for increased flexibility for a contractor, transportation of concrete to the site and out over the existing wetlands, in addition to erecting forms will be challenging. The structural steel option will also provide a contractor flexibility during construction, and work well, regardless of if the entire assembly is constructed of metals or a hybrid assembly to consist of concrete deck panels and concrete piles. Steel beam sections will be durable provided they are hot dipped galvanized. In the event steel surfaces are nicked, chipped, marred or subjected to other undesirable effects that can potentially harm the galvanized coating, can be easily treated with a zinc rich coating.

Regardless of whether the beam framing consists of concrete or steel beam sections framing assemblies to include bracing for lateral stability of the walkway assemblies. Bracing will be steel angle sections in either a knee brace or "x"-brace configuration. Bracing assemblies for the design of the new walkway will be further evaluated during the design of the new walkway. It is estimated bracing will be required for lateral stability of the walkway and the aerial sections of the piles.

An opinion of construction cost and analysis can be found in Section 8 of this PER. Reference **Table 2.2-1** for additional information.

5. EVALUATION OF OPTIONS FOR EQUIPMENT BUILDING

Regarding the equipment building, for the evaluation M&C has estimated the building area will be 16'-0" wide x 28'-0" long. The building wall height will be 10'-0" above the floor / deck height, matching the height of the 2010 AB building. The building size has been determined to house (2) air receiver tanks, a valve manifold and control panel skid for each tank, and miscellaneous electrical panels to power the system for the process equipment. The building design incorporates its ability to support its material weight dead load, roof and deck live loads, snow load, wind load and seismic loads, all in accordance with load combinations applied in conformance with Section 1605.3 of the NCBC.

Equipment building options consists of the following:

- Prefabricated precast reinforced concrete building; Easi-Set Buildings manufactured in Midland, VA.
- Prefabricated aluminum building with the manufacturer to be determined if utilized.
- Construct in place timber building.

Regarding the precast reinforced concrete building, note the following:

- The heavier and most durable option of the (3) alternatives.
- For this evaluation M&C has utilized the following precast concrete building criteria:
 - A concrete panel roof section that is 6" thick at the centerline ridge and tapers to 4" thick at the exterior walls and eaves.
 - A concrete panel roof overhang dimension that is 3" from the outside face (o/f) of the walls.
 - A wall system comprised of 4" thick wall panels.
 - A floor system comprised of a 6" thick floor slab.

Regarding the aluminum building, note the following:

- The middle option in terms of weight and durability.
- For this evaluation M&C has utilized the following aluminum building criteria:
 - The roof assembly consists of aluminum standing seam metal 24 gage thick panels supported by aluminum channel section purlins and beams.
 - The wall assembly consists of aluminum 2" corrugated metal 20 gage thick panels supported by aluminum channel section studs.

- The floor assembly consists of 1/4" thick aluminum checkered floor plate supported by aluminum wide flange or channel section floor joists that are supported by an aluminum skid support assembly.
- Based upon aluminum building costs received from manufacturers for other projects, M&C has observed the cost for these buildings ranging 40% to 50% higher than the costs for the prefabricated precast concrete buildings.

Regarding the timber building, note the following:

- The lightest and the least durable option of the (3) alternatives.
- For this evaluation M&C has utilized the following timber building criteria:
 - The roof consists of standing seam metal panels with color and corrugations similar to the existing Pump Station building, over 3/4" thick plywood roof sheathing, supported by Southern Yellow Pine (SYP) No.2 2x10 rafters spaced at 1'-4" o.c. for the roof framing.
 - The walls assemblies consist of cement board siding with 5/8" thick plywood sheathing supported by SYP "Stud" grade wall studs spaced at 1'-4" o.c. and no interior plywood finish.
 - No plywood or other ceiling finishes.
- The floor for the timber building option consists of precast slab panels similar to the deck panels for the elevated walkway.

For all (3) options the support platform for the equipment building is similar to the elevated access walkway and would include a 4'-0" wide walkway / service area around the perimeter of the building.

Regarding the support platform deck and framing, note the following:

- No grating panels for the walkway decking.
- Support beams for the platform will be either precast concrete or structural steel. No c.i.p. concrete beams.
- Piles for the platform will be precast concrete. No HP steel section. It is expected (18) precast concrete piles are required for the precast concrete building option and (14) precast concrete piles are required for the timber building option.

All (3) support framing systems could adequately support the expected dead, live, snow, wind and seismic loads. The precast concrete and timber options will be the easiest to maintain. These (2) options will be the easiest to configure connections to either the precast concrete or steel support framing. It is expected

the precast concrete building system provides the best alternative for durability. Constructability potentially could be challenging due to the crane requirements to erect the heavy roof, wall and floor slab panels over the existing wetlands. The timber building option will allow for increased flexibility for a contractor, with an expected sequence of construction as follows:

- Install elevated walkway piles and building support platform piles.
- Install elevated walkway and building support platform framing.
- Install elevated walkway and building support platform decking panels.
- Utilize the elevated walkway to transport materials to construct the timber equipment building assemblies.

Regarding support of the building, regardless of whether the beam framing consists of concrete or steel beam sections framing assemblies to include bracing for lateral stability of the support platform assemblies. Similar to the elevated walkway bracing will be steel angle sections in either a knee brace or "x"-brace configuration.

An opinion of construction cost and analysis can be found in Section 8 of this PER. Reference **Table 2.2-1, Table 2.2-1, and Table 2.2-1** for additional information.

6. EVALUATION OF OPTIONS FOR WALKWAY HAND / GUARD RAILING

Regarding the walkway hand/guard rail assemblies for the elevated walkway and the equipment building support platform, for the evaluation M&C has estimated the rail assemblies will include the following:

- Top railing 3'-6" above the top surface of the walkway and support platform deck panels.
- Bottom railing 1'-9" above the top surface of the walkway and support platform deck panels.
- A separate hand railing inside the plane of the guard rails 3'-0" above the top surface of the walkway and support platform deck panels.
- A continuous toe plate assembly 4" high x 1/4" thick connected to the guard rail posts.
- Hand and guard rails and posts will be 1 1/2" diameter pipe sections.
- Railing assemblies will be fabricated using Schedule 40 pipe and post assemblies will be fabricated using Schedule 80 pipe sections.
- Hand and guard rails shall include splice connections intermittently spaced to allow for movements based upon thermal expansion and contraction.

Hand and guard railing assemblies will be installed on each side of the elevated walkway decking and the outside edge of the equipment building support platform. To maximize space between the (2) rails for the walkway, and the space between the rail system and the equipment building walls, the railing post assemblies will be side connections to the framing support beams, regardless of beam material.

In addition to the respective railing system material weight dead load, each rail of the railing system will be designed to transfer a live load of 50 lbs. / ft. uniform load to the support beams below. The live load on the rails is not required to be applied to each rail simultaneously.

Hand / guard rail assembly options consists of the following:

- Aluminum rails and posts with a 5'-0" o.c. maximum post spacing.
- Stainless steel rails and posts with a 6'-0" o.c. maximum post spacing.

Both the aluminum and stainless steel railing systems could adequately support the expected dead and live loads. In addition, both systems are durable enough for the environment they will be exposed to and corrosion resistant. However, the stainless steel option is more resistant but also more expensive. An opinion of construction cost and analysis can be found in Section 8 of this PER. Reference **Table 2.2-1** for additional information.

7. EVALUATION OF TANK, EQUIPMENT & OPERATOR

Repurposing existing compressed air reservoirs for new applications is a cost-effective and practical solution in many industrial settings. However, it's crucial to prioritize safety when repurposing these reservoirs due to the accidental release of hazardous potential energies which could cause personnel injury and/or damage nearby equipment. Compressed air reservoirs are subject to stringent safety regulations and standards, requiring periodic inspections to ensure their integrity and reliability. According to safety guidelines, these reservoirs must undergo inspection by a qualified inspector every five years to assess their structural integrity and compliance with safety regulations. This inspection includes a thorough examination of the reservoir's components, such as its walls, fittings, and valves, to detect any signs of corrosion, wear, or damage that could compromise its safety and performance.

Furthermore, as part of the inspection process, compressed air reservoirs need to undergo hydrostatic pressure testing to verify their ability to withstand pressure and maintain structural integrity under operating conditions. Hydrostatic pressure testing involves filling the reservoir with water and subjecting it to increased pressure to simulate the conditions it would experience during operation. This testing helps identify any weaknesses or defects in the reservoir's structure that could lead to leaks or failures. By ensuring that compressed air reservoirs undergo proper inspection and hydrostatic pressure testing before repurposing them mitigates the risk of accidents, ensures compliance with safety regulations, and safeguards the well-being of personnel and equipment. McKim and Creed recommends repurposing the existing compressed air reservoirs for the new project, should they pass inspection testing and verification by certified professional.

The existing backwashing system utilizes pneumatic valve actuators to release the compressed air from the tank for flushing the screens. LCFWASA and BCPU staff have asked for consideration of switching from pneumatic to electric actuators when the new walkway and equipment building is constructed. There are pros and cons to each type of actuator depending on the application.

Electric actuators offer precise control and positioning capabilities, making them suitable for applications requiring high accuracy. They are known for their ability to provide precise control over valve operation, with positioning accuracy down to ten thousandths of an inch. However, electric actuators tend to be heavier and more costly due to the high-quality components required for precision. While they may not match the speed and thrust of pneumatic actuators, their operating expenses are lower, primarily stemming from the power draw of the motors.

On the other hand, pneumatic actuators offer high force and speed in a smaller footprint compared to electric actuators, depending on available air pressure supply. They are generally less expensive upfront, but costs can escalate due to added expenses such as compressor costs, tubing, solenoid wiring, maintenance, and operating costs over time. While pneumatic actuators may be more economical when appropriately matched with compressor size, unused compressor capacity can lead to wasted money. Moreover, pneumatic actuators are less precise than their electric counterparts and require additional components, like electric solenoid valves, for shifting air supply. Overall, the choice between electric and pneumatic actuators depends on factors such as application requirements, operating conditions, and long-term cost considerations.

Regarding electric valve actuators, several reputable brands offer reliable solutions for various industrial applications. Among these brands, AUMA, Rotork, and Limitorque stand out for their quality, performance, and versatility. AUMA is renowned for its precision engineering and innovative designs, providing electric actuators known for their durability and precise control. Rotork is another well-established brand, known for its comprehensive range of electric actuators tailored to meet the demands of various applications, offering advanced features and robust construction. Limitorque is recognized for its robust and rugged electric actuators, trusted by industries worldwide for their long-lasting performance and advanced features. Whether it's for modulating, on/off, or emergency shutdown applications, these brands offer electric valve actuators that prioritize efficiency, safety, and ease of use, making them popular choices among engineers and operators alike.

8. EVALUATION OF COST OPINIONS FOR VARIOUS OPTIONS

Regarding the various material options for the various components for the construction of the elevated access walkway, the equipment building, and its support platform, discussed previously in Sections 2 thru 6 of this PER, reference the cost opinion tables below to see cost options to help assess the materials to utilize for the design of the new assemblies. Note these costs opinions do not reflect the expected total cost for these assemblies but are comparisons of the primary differences in expected material and labor installation costs.

Regarding the deep foundation piles evaluation:

Table 8-1 – Deep Foundation Pile Cost Opinion

Description	Quantity	Unit	Unit Cost	Total Cost
Precast Concrete Piles	7,200	LF	\$50.00	\$360,000.00
Steel Piles	12,880	LF	\$60.00	\$772,800.00

Regarding the elevated walkway decking slab panels evaluation:

Table 8-2 - Walkway Decking Cost Opinion.

Description	Quantity	Unit	Unit Cost	Total Cost
Precast Concrete Slab	6,400	SF	\$25.00	\$160,000.00
Aluminum Grating	6,400	SF	\$125.00	\$800,000.00
Steel Grating (Light Duty)	6,400	SF	\$60.00	\$384,000.00
Steel Grating (Heavy Duty)	6,400	SF	\$80.00	\$512,000.00

Regarding the elevated walkway support framing evaluation:

Table 8-3 - Walkway Support Framing Cost Opinion.

Description	Quantity	Unit	Unit Cost	Total Cost
Precast Concrete Beam	178	EA	\$2945.00	\$524,210.00
C.I.P. Concrete Beam	12,830	CY	\$1,600.00	\$20,528,000.00
Steel Beam	2,035	LF	\$175.00	\$356,125.00

Regarding the equipment building evaluation:

Table 8-4 - Equipment Building Cost Opinion.

Description	Quantity	Unit	Unit Cost	Total Cost
Precast Concrete Bldg.	1	LS	\$336,000.00	\$336,000.00
Prefab Aluminum Bldg.	1	LS	\$470,400.00	\$470,400.00
Timber Bldg.	1	LS	\$134,400.00	\$134,400.00

Regarding the platform support framing for the precast concrete equipment building evaluation:

Table 8-5 - Precast Concrete Equipment Building Support Platform Framing Cost Opinion.

Description	Quantity	Unit	Unit Cost	Total Cost
Precast Concrete Piles	720	LF	\$50.00	\$36,000.00
Precast Concrete Slabs	864	SF	\$25.00	\$21,600.00
Precast Concrete Beam	24	EA	\$2945.00	\$70,680.00
Steel Beam	244	LF	\$175.00	\$42,700.00

Note, for this cost opinion the precast concrete beam and steel beam assemblies are options in the framing system and not to be considered concurrently in the total summation, note the following:

- Total Cost Precast Piles / Slabs / Beams = \$128,280.00.
- Total Cost Precast Piles / Slabs / Steel Beams = \$100,300.00.

Regarding the platform support framing for the timber framed equipment building evaluation:

Table 8-6 - Timber Equipment Building Support Platform Framing Cost Opinion.

Description	Quantity	Unit	Unit Cost	Total Cost
Precast Concrete Piles	560	LF	\$50.00	\$28,000.00
Precast Concrete Slabs	864	CY	\$25.00	\$21,600.00
Precast Concrete Beam	24	EA	\$1965.00	\$47,160.00
Steel Beam	244	LF	\$120.00	\$29,280.00

Note, for this cost opinion the precast concrete beam and steel beam assemblies are options in the framing system and not to be considered concurrently in the total summation, note the following:

- Total Cost Precast Piles / Slabs / Beams = \$96,760.00.
- Total Cost Precast Piles / Slabs / Steel Beams = \$78,880.00.

Regarding the hand / guard railing evaluation:

Table 8-7 - Hand / Guard Rail Cost Opinion.

Description	Quantity	Unit	Unit Cost	Total Cost
Aluminum Railing	1720	LF	\$90.00	\$154,800.00
Stainless Steel Railing	1720	LF	\$160.00	\$275,200.00

9. CONCLUSIONS

The information provided in the sections of the PER evaluate the options for materials for the elevated access walkway and the equipment building. Materials have been evaluated regarding the deep foundation piles that will be required, the decking panels, the support framing, the equipment building, and the hand / guard rails and the process equipment associated with the building. The various materials have been evaluated regarding the following:

- Structurally capable of supporting the facilities expected loadings.
- Consisting of materials tolerable to the expected weathering and temperature exposures.
- Consisting of materials of compatible constructability.
- Consisting of materials to be constructed utilizing industry standard means and methods and durable in the existing marine environment.
- Economically constructible based upon expected material and labor construction costs.
- Constructed Assemblies result in safe access for maintenance personnel for the operation of the facilities.
- Reduce the continuous maintenance of access walkway deck and hand / guard rail components required by the timber assemblies.

The following conclusions for the various material options are based upon achieving the aforementioned goals of the evaluation.

Regarding the deep foundations, note the following:

- Based upon the information provided in the project geotechnical report (ref. Appendix A), the expected loads, the evaluation in Section 2 and the cost opinion in Section 8, M&C recommends the future design incorporate the precast concrete reinforced foundation piles.

Regarding the decking panels for the walkway and the equipment building, note the following:

- Based upon the expected loads, information provided in the evaluation in Section 3 and the cost opinion in Section 8, M&C recommends the future design incorporate the precast concrete reinforced slab panels for the future design of both the elevated walkway and the equipment building support platform.

Regarding the support framing for the walkway and the equipment building, note the following:

- Based upon the expected loads induced to the framing systems from the deck panels and the equipment building, M&C recommends either the precast concrete beam assemblies or the structural steel beam assemblies be considered for the future design of the elevated walkway and the equipment building support platform.
- Based upon the evaluations in Section 4 and Section 5, M&C recommends either the precast concrete beam or structural steel framing options based upon durability and constructability.
- Based upon the cost opinion of Section 8, M&C recommends the structural steel framing option based upon the expected differences in the cost between the precast concrete and steel beam options.

Regarding the equipment building, note the following:

- Based upon the expected loads, information provided in the evaluation in Section 5 and the cost opinion in Section 8, M&C recommends the future design incorporate the timber building assembly for the future design of the equipment building.

Regarding the hand / guard railing assemblies for the walkway and the equipment building, note the following:

- Based upon the expected loads, information provided in the evaluation in Section 6 and the cost opinion in Section 8, M&C recommends the future design incorporate the aluminum assemblies for the future design of both the elevated walkway and the equipment building support platform.

Regarding the associated process equipment to be housed in the equipment building, note the following:

- While there are advantages and disadvantages to both options of valve operators, McKim & Creed understands that the plant operator's preference is to switch from pneumatic to electric valve operators when reconfiguring the equipment during this project. During the design phase, McKim & Creed will work with equipment vendors and evaluate various brands and models to ensure the electric operators can provide similar performance to the existing pneumatic equipment.

APPENDIX A – REPORT OF GEOTECHNICAL EXPLORATION



Report of Geotechnical Exploration
LCF Backwash Structure Project
Bladen County, North Carolina
S&ME Project No. 23060102

PREPARED FOR:

McKim & Creed

243 North Front Street

Wilmington, North Carolina 28401

PREPARED BY:

S&ME, Inc.

3006 Hall Waters Drive, Suite 100

Wilmington, North Carolina 28405

October 27, 2023



October 27, 2023

McKim & Creed
243 North Front Street
Wilmington, North Carolina 28401

Attention: Mr. Jess Powell, P.E.

Reference: **Report of Geotechnical Exploration**
LCF Backwash Structure Project
Bladen County, North Carolina
S&ME Project No. 23060102
NC PE Firm License No. F-0176

Dear Mr. Powell:

S&ME, Inc. (S&ME) is pleased to submit this Report of Geotechnical Exploration for the referenced project. This work was performed in general accordance with S&ME Proposal No. 23060102, dated August 1, 2023.

The purpose of this geotechnical exploration was to obtain subsurface information to allow us to characterize the subsurface soils on the proposed site, and to provide recommendations for foundation design and construction.

This report describes our understanding of the project, presents the results of the field exploration and laboratory testing, and discusses our geotechnical conclusions and recommendations.

S&ME appreciates this opportunity to be of service to you. Please call if you have questions concerning this report or any of our services.

Respectfully submitted,

S&ME, Inc.

A handwritten signature in blue ink, appearing to read 'Thomas Still'.

Thomas Still, P.E.
Principal Engineer
NC Registration No. 023923

A handwritten signature in blue ink, appearing to read 'Nathan P. Buffum'.

Nathan P. Buffum, P.E.
Office Principal
NC Registration No. 042575

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Appendix

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1.0 Project Information

The purpose of this exploration was to obtain subsurface information to allow us to characterize the subsurface conditions at the site and to develop recommendations concerning foundation design and construction. This report describes our understanding of the project, presents the results of the field exploration and laboratory testing, and discusses our conclusions and recommendations.

Project information was presented to S&ME in emails from Mr. Jess Powell and Mr. Bill Band, with McKim & Creed, to Mr. Nate Buffum, of S&ME, from July 17 to July 24, 2023. The emails provided several photos of the site and a draft of the Engineering Services Proposal for the project, prepared by McKim & Creed.

A meeting by conference call occurred on September 29, 2023, between the above-referenced team members and Tommy Still (S&ME). Initial findings of our exploration and additional project information were discussed. Mr. Powell then emailed S&ME the finalized Engineering Services Proposal, dated August 10, 2023.

We understand that Lower Cape Fear Water & Sewer plans to replace a pile supported timber walkway and air backwash structure at the Lock and Dam #1 facility, located near Locks No 1 Road, in Bladen County, North Carolina. A Site Vicinity Map is provided as Figure 1 in the Appendix.

The existing walkway extends approximately 800 feet northeast from an existing facility across wetlands to the existing building at the edge of the Cape Fear River. We understand that a new walkway and building, elevated on framing assemblies above the wetlands and river, will be constructed to the southeast of the existing structure. The new structures will likely be supported by driven concrete or steel piles, pinned at the head by beam framing. Decking and framing components will likely consist of concrete, aluminum, or steel components, while the new building framing may consist of precast concrete, timber, or aluminum components.

At the current stage of the project, structural requirements for individual piles, such as deflection limits and axial compressive, uplift, or lateral loads, have not been provided to us.

2.0 Exploration Program

2.1 Field Exploration

On September 5 and 6, 2023, a representative of S&ME and a drill team visited the site. Four Standard Penetration Test (SPT) borings were advanced to the target depth of 50 feet below the existing ground surface along the approximate alignment of the proposed structure. Drilling was conducted using the mud rotary method and samples were collected using the split-spoon method at regular depth intervals of every 2 ½ feet within the upper 10 feet, and every 5 feet thereafter.

A Test Location Sketch which illustrates the approximate boring locations is attached as Figure 2 in the Appendix, along with a soil classification legend and the soil boring logs.



2.2 Laboratory Testing

After the recovered soil samples were transported to our laboratory, a geotechnical professional examined each sample to estimate its distribution of grain sizes, plasticity, organic content, moisture condition, color, presence of lenses and seams, and apparent geologic origin in general accordance with ASTM D 2488, *"Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)"*.

The resulting classifications are presented on the boring logs, included in the Appendix. Similar soils were grouped into representative strata on the logs. The strata contact lines represent approximate boundaries between soil types. The actual transitions between soil types in the field are likely more gradual in both the vertical and horizontal directions than those which are indicated on the logs.

We performed the following quantitative ASTM-standardized laboratory tests on recovered samples, to help classify the soils and formulate our conclusions and recommendations:

- Five (5) split-spoon samples were tested in general accordance with ASTM D 2216, *"Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass"*, to measure the in-situ moisture content of the soil.
- Twelve (12) split-spoon samples were tested in general accordance with ASTM D 1140, *"Standard Test Methods for Amount of Material in Soils Finer than No. 200 (75- μ m) Sieve"*, to measure the percent clay and silt fraction.
- Six (6) split-spoon samples were tested in general accordance with ASTM D 4318, *"Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils"*, to measure the plasticity characteristics of the material.

Laboratory data sheets presenting the individual test results are provided in the Appendix.

3.0 Site and Surface Conditions

This section of the report describes the general site and surface conditions observed at the time of our exploration.

3.1 Topography

Ground surface elevations were not directly surveyed by S&ME, and no site-specific topographic plan was made available to us; therefore, for the purpose of our boring logs, the ground surface level was set to zero.

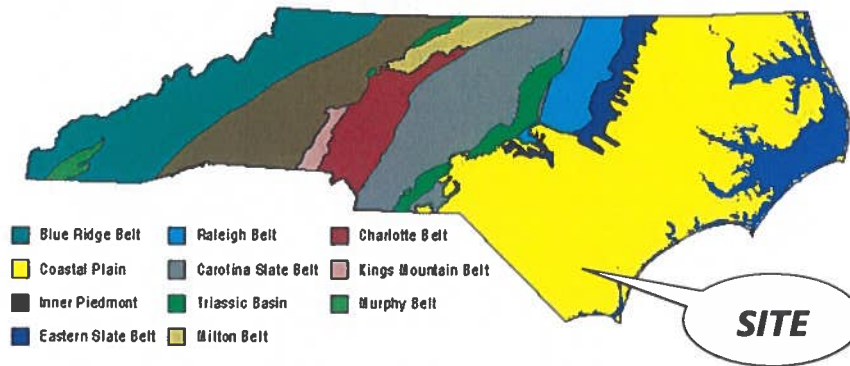
3.2 Site Surface Conditions

The ground surface along the proposed walkway alignment slopes down about 10 or more feet from the existing grassy embankment on the north side of the existing building, and then appears relatively level across wetlands to the river. Ground cover generally consists of marshy, wetlands vegetation and sediments. Portions of the alignment were inundated with up to about 1 ½ feet of water at the time of our exploration.



3.3 Local Geology and Physiography

Figure 3-1: Physiography



The site is located within the Coastal Plain Physiographic Province of North Carolina as shown in Figure 3-1. The Coastal Plain Province is typically characterized by marine, alluvial, and aeolian sediments that were deposited during periods of fluctuating sea levels and moving shorelines. The soils and basal formations in the North Carolina Coastal Plain Physiographic Province are typical of those laid down in a shallow sloping sea bottom; interbedded sands and clays with irregular deposits of shells and layers of limestone and cemented sands. Alluvial sands, silts, and clays are typically present near rivers and creeks. Deposits of peat, organic silt, and organic clay are also typically present in or near current or former tidal marsh areas in the outer portion of the Coastal Plain.

Surface soils penetrated by our borings have been interpreted to be undivided surficial deposits of Quaternary age. These deposits consist of sand, clay, gravel, and peat deposited in marine, fluvial, eolian, and lacustrine environments. Based on the *1985 Geologic Map of North Carolina*, surficial deposits are likely underlain by the Waccamaw Formation of Tertiary age, and the Peedee Formation, member of the Upper Cretaceous series and Cretaceous System. Sediments of the Peedee Formation consist of fine to medium-grained sand, interbedded with gray to black clay and silt deposited under marine conditions. Sand beds are gray to greenish-gray in color. Shells are common throughout the formation. Thin beds of calcareous sandstone and impure limestone are interlayered in the sand beds.

4.0 Subsurface Conditions

The generalized subsurface conditions encountered at the site are described below. For more detailed descriptions and stratifications at a test location, the respective boring logs should be reviewed in the Appendix.

4.1 Interpreted Subsurface Profile

A subsurface cross-sectional profile of the site soils is attached in the Appendix as Figure 3 to illustrate a general representation of the subsurface conditions within the proposed project area. The cross-section orientation in



plan view is shown on Figure 2. Profile A-A' (Figure 3) depicts the subsurface conditions generally from south to north along the walkway alignment, looking in a westerly direction.

The strata indicated in the profile are characterized in the following section. Note that the profile is not to scale and was prepared for illustrative purposes only. Subsurface stratifications may be more gradual than indicated, and conditions may vary between test locations.

Soils presented on the profile were grouped into several general strata based on estimated physical properties derived from the borings and the recovered samples, and to allow their properties to be systematically described.

4.2 Description of Subsurface Soils

This section describes soil conditions observed at our test locations.

4.2.1 *Stratum I: Very Soft Cohesive Soils*

Borings B-1 through B-4 encountered an upper layer of cohesive soils, interpreted to be likely alluvial deposits, to depths ranging from approximately 18 to 28 feet below the existing ground surface. These soils primarily consisted of fat clay (USCS Classification "CH"), and lean clay with sand (CL). Several samples recovered from the lower portion of this stratum within borings B-2 and B-3 consisted of clayey sand (SC).

Recovered samples were wet, and those from the upper five feet of this stratum contained some organic materials. Relatively isolated zones of wood fragments were observed within samples recovered from borings B-1 and B-2, at respective depths of 10 and 20 feet. SPT N-values within the clays of this stratum typically ranged from weight of hammer (WOH), where only the weight of hammer is required to advance the sampler a full 1-foot increment, to 2 blows per foot (bpf). SPT N-values within the clayey sands ranged from 2 to 5 bpf. These values indicate a very soft consistency for the clays and a very loose to loose relative density for the clayey sands.

Laboratory testing conducted on a sample recovered from boring B-4, at a depth of 6 feet, indicated a silt/clay fines content of 82 percent by weight, a liquid limit of 40 percent, a plastic limit of 19 percent, and a plastic index of 21 percent. A sample recovered from boring B-3 at a depth of 23 ½ feet exhibited a fines content of 35.7 percent, a liquid limit of 46 percent, a plastic limit of 23 percent, and a plastic index of 23 percent.

4.2.2 *Stratum II: Very Loose to Loose Sands*

Underlying Stratum I in borings B-2 through B-4, a layer of sandy soils, interpreted to be potential alluvial deposits, was encountered to a depth of about 32 feet. Recovered samples were wet and consisted of poorly graded sand (SP) and silty sand (SM). The SPT N-values of this layer ranged from 4 to 8 bpf, indicating a very loose to loose relative density.

Laboratory testing conducted on a sample recovered from boring B-2, at a depth of 28 ½, indicated a silt/clay fines content of 3.3 percent. Samples recovered from boring B-4, at individual depths of 18 ½, 23 ½, and 28 ½ feet, exhibited fines contents of 22.4 percent, 4.6 percent, and 4.2 percent, respectively.

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4.2.3 *Stratum III: Medium Dense Sands*

Beneath Stratum I soils within boring B-1, and beneath Stratum II sands at remaining borings, a stratum of medium dense sands with varying fines content was encountered to depths of about 46 to 48 feet. The soils of this stratum consisted of wet poorly graded sand (SP), poorly graded sand with silt (SP-SM) and clayey sand (SC). The SPT N-values measured in this stratum ranged from 11 to 25 bpf, indicating a very loose to medium dense relative density.

Laboratory testing conducted on five samples recovered from various depths within this stratum indicated fines contents varying from 3.3 to 47.7 percent.

4.2.4 *Stratum IV: Very Dense Sands*

Underlying Stratum III, the borings encountered very dense sands with some cemented fragments to boring termination depths of 50 feet. Soils consisted of poorly graded sand (SP), poorly graded sand with silt (SP-SM) silty sand (SM) and clayey sand (SC). SPT N-values within this stratum were greater than 100 bpf.

4.2.5 *Water Levels*

Portions of the walkway alignment were inundated with water at the time of our exploration. At the boring locations, water levels were observed to range from at the existing ground surface to 1 ½ feet above the ground surface. Located in the floodplain of the Cape Fear River, water levels will fluctuate seasonally at the site, being influenced by rainfall variation, tidal changes, and other factors.

5.0 **Seismic Site Class and Design Parameters**

Seismic-induced ground shaking at the foundation is the effect taken into account by seismic-resistant design provisions of the North Carolina Building Code (NCBC) and International Building Code (IBC). Other effects, including landslides and soil liquefaction, must also be considered.

5.1 **Selection of Seismic Site Class**

The current NCBC references the 2015 IBC and ASCE 7-10 for determining the design spectral accelerations and liquefaction potential; however, Seismic Ground Motion Maps were updated in 2014 and are incorporated into ASCE 7-16, which is referenced by the 2018 version of the IBC. The updated seismic maps, which result in lower spectral accelerations, represent the updated understanding of the seismic hazards and will presumably eventually be incorporated into the next edition of the NCBC, which is based on the IBC. Listed in Table 5-1 below are the ground motion parameters from both resources, ASCE 7-10 and ASCE 7-16. Use of the newer, more up to date seismic parameters may require the authorization of the local Building Official.

5.1.1 *Evaluation of the Potential for Site Class F Conditions*

The initial step in site class definition is to check for the four conditions described for Site Class F, which may require a site-specific evaluation to determine site coefficients F_A and F_v . Soils vulnerable to potential failure include the following: 1) quick and highly sensitive clays or collapsible weakly cemented soils, 2) peats and highly

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organic clays, 3) very high plasticity clays, and 4) very thick soft/medium stiff clays. These soils were not evident in the borings.

One other determining characteristic, liquefaction potential under seismic conditions, was assessed. Soils were assessed qualitatively for liquefaction susceptibility based on their age, stratum, mode of deposition, degree of cementation, and size composition. This assessment considered observed liquefaction behavior in various soils in areas of previous seismic activity.

Our analysis, which is more fully described below, indicates that some liquefaction of subsoils appears likely to occur at this site in the event of the design magnitude earthquake. Analysis indicates that some of the sands between depths of about 18 feet to 32 feet which lie beneath the water table in boring B-4 appear to contain relatively few fines and exhibit relatively low density characteristics. We therefore consider the soil conditions within this site to be liquefaction prone, and Site Class F conditions apply to this site.

5.1.2 *Liquefaction of Bearing Soils*

Liquefaction of saturated, loose, cohesionless soils occurs when they are subjected to earthquake loading that causes the pore pressures to increase and the effective overburden stresses to decrease, to the point where large soil deformation or even transformation from a solid to a liquid state results. Earthquake-induced ground surface acceleration at the site was assumed from the design peak ground acceleration of 0.288g considering the ground accelerations described by ASCE 7-10.

To evaluate liquefaction potential, we performed analyses using the data obtained in the borings, considering the characteristics of the soil and water levels observed in the borings. The liquefaction analysis was performed based on the design earthquake prescribed by the NCBC, the "simplified procedure" as presented in Youd et al. (2001), and recent research concerning the liquefaction resistance of aged sands (Hayati & Andrus, 2008; Andrus et al. 2009; Hayati & Andrus, 2009).

To help evaluate the consequences of liquefaction, we have computed the Liquefaction Potential Index (LPI), which is an empirical tool used to evaluate the potential for liquefaction to cause damage. The LPI considers the factor of safety against liquefaction, the depth to the liquefiable soils, and the thickness of the liquefiable soils to compute an index that ranges from 0 to 100. An LPI of 0 means there is no risk of liquefaction; an LPI of 100 means the entire profile is expected to liquefy. The level of risk is generally defined below.

- **LPI < 5** – surface manifestation and liquefaction-induced damage not expected.
- **5 ≤ LPI ≤ 15** – moderate liquefaction with some surface manifestation possible.
- **LPI > 15** – severe liquefaction and foundation damage is likely.

the LPI for borings B-1 through B-3 was less than 5. However, for boring B-4, we estimate an LPI of about 12. This indicates that the risk of liquefaction is generally low on the south and central portions of the walkway, and moderate at the north portion of the proposed walkway and structures. Considering that the structures will be pile supported, liquefaction mitigation does not appear necessary, provided that pile design takes into account the negligible shear strength of liquefied sands during the design earthquake.

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5.1.3 Seismic Design Coefficients

Based on the liquefaction considerations discussed above, Site Class F applies. The Code typically requires that a site-specific response analysis be performed for Seismic Site Class F. However, the Code also indicates that the acceleration response spectra (necessary for structural design) can be determined based on data obtained from the geotechnical explorations without regard to liquefaction if the structure has a fundamental period of less than or equal to 0.5 seconds. We anticipate that the proposed structure will have a period of less than 0.5 seconds, but this assumption should be confirmed by the project structural engineer. If so, Seismic Site Class E values are appropriate for design. If not, the Building Code requires that a site-specific response analysis be performed for this project.

Considering the exception described above, our recommendation for Seismic Site Class E values is based on the Standard Penetration Test N-values measured in the soil test borings and more than 10 feet of soil within the upper 100 feet of the subsurface profile having the following characteristics:

- Plasticity Index, $PI > 20$;
- Moisture Content, $w > 40\%$; and
- Undrained Shear Strength, $S_u < 500$ psf.

It is our interpretation that Stratum I soils encountered at the site have these characteristics. Site Class E parameters are given below in Table 5-1.

Table 5-1: Seismic Design Coefficients

Criteria	Site Class	S_s	S_1	S_{DS}	S_{D1}	PGA_M	Seismic Design Category
2018 North Carolina Building Code (ASCE 7-10)	F*	0.243	0.101	0.405	0.234	0.288	D
2018 International Building Code (ASCE 7-16)	F*	0.171	0.073	0.273	0.205	0.207	D

* Use Site Class E based on the exception listed in ASCE 7, Section 20.3.1

5.1.4 Seismic Design Category

For a structure having a Risk Category classification of I, II, or III, the S_{DS} and S_{D1} values obtained are consistent with "Seismic Design Category D" as defined in section 1613.3.5 of the NCBC under either ASCE 7-10 or ASCE 7-16.



6.0 Conclusions and Recommendations

The conclusions and recommendations included in this section are based on the project information outlined previously and the data obtained during our exploration. If the construction scope is altered, the proposed new structure location is changed, or if conditions are encountered during construction that differ from those encountered in the borings, then S&ME should be retained to review the following recommendations based upon the new information and make any necessary changes.

6.1 Deep Foundation Recommendations

At the current stage of the project, structural requirements for individual piles, such as deflection limits and axial compressive, uplift, and lateral loads, have not been provided to us. We understand that axial resistance requirements are anticipated to be relatively low.

In conjunction with subsurface conditions, structural requirements will dictate the selected pile types, lengths, and embedment depths. Based on the interpreted subsurface profile, it is probable that lateral stability, which has not been evaluated at this time, may govern pile types and embedment depths.

Based on our understanding of the project and the clients anticipated structural design, our team anticipates the use of one of two types of piles systems to support the walkway and structure.

One option is to use driven pre-cast, pre-stressed concrete (PSC) pile foundations to provide enough resistance to support the structure. For our analysis, we elected to analyze a 12-inch square pile based on our discussions and project understanding.

The second option is steel H-piles, which also appear to be a feasible deep foundation system for this site. We understand that steel piles, in conjunction with protective measures against possible deleterious action on the materials, are under consideration for the project. For our analysis, we elected to analyze a HP 12x53 pile section based on our discussions and project understanding.

As described previously, and as illustrated in the Figure 3 profile, bearing depths will likely vary across the site. Production pile lengths should be determined based on the results of index piles at representative locations within the site as further discussed in Section 6.1.3 of this report.

6.1.1 Pile Axial Resistance

Considering axial resistance, the proposed structure may be supported on 12-inch square driven PSC piles bearing within the medium dense sands (Stratum III) at a recommended depth of 35 feet or more below the existing ground surface. Likewise, HP 12x53 piles bearing within Stratum III sands will provide similar axial resistances at a recommended depth of 40 feet or more.

The estimated *allowable* (design) axial compressive and uplift resistance values for 12-inch square PSC piles and HP 12x53 piles are provided below in Table 6-1 and are based on conditions encountered within borings B-2 through B-4.

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LCF Backwash Structure Project
 Bladen County, North Carolina
 S&ME Project No. 23060102



Our evaluation, and the embedment depths discussed, is based on the understanding that axial resistance requirements will be relatively low. Higher single-pile resistance is possible with deeper embedment, and much higher end bearing resistance would be provided for piles bearing upon the very dense sands encountered at depths of about 49 feet. Additionally, we have assumed a factor of safety of 3.0 for the allowable pile resistances with the expectation that load testing will not be performed to confirm pile capacities. A lower factor of safety could be considered in conjunction with load testing, if desired. Please contact us to discuss these options further if needed.

Table 6-1: Pile Vertical Resistances

Pile Type and Size	Allowable Axial Resistance ^A (tons)	Allowable Uplift Resistance ^B (tons)	Embedment Depth below Existing Surface (feet)
PSC 12"x12"	13	6	35
Steel HP 12x53	10	4	40

- A.** Allowable compressive resistance assumes a factor of safety of 3.0 applied to the estimated ultimate axial compressive resistance, and a load test is not performed.
- B.** Allowable uplift resistance assumes a factor of safety of 3.0 applied to the estimated ultimate skin friction resistance, and a load test is not performed.

We developed the soil coefficients to be used in vertical resistance analyses using published correlations relating soil skin friction and end bearing unit resistances to SPT N-values. The very soft Stratum I soils of the soil profile were considered not to contribute to pile resistance, but were considered to contribute to downdrag under the seismic loading condition.

The minimum recommended center-to-center pile spacing is 3 pile diameters. For center-to-center pile spacings of at least 3 pile diameters, no reduction factor will need to be applied to the individual pile capacity to account for group effects due to the type of the bearing soils. The structural capacity of the piles has not been considered in our analysis and is the responsibility of the structural engineer.

6.1.2 Lateral Response of Piles

The following design values were developed based on the generalized interpreted subsurface profile and are intended to be used with the LPILE computer program. This program performs a beam-column analysis of single piles subjected to given lateral and axial loading, and assuming a non-linear soil response. Analysis of driven piles can be performed once axial and lateral loads are determined and boundary conditions are established, such as pile stickup, application/fixed points of lateral loads and deflection limits. These values are based on the boring data and our experience with these types of materials.



Table 6-2: Lateral Load Analysis Parameters

Stratum	Depth (ft) Below Existing Ground Surface	LPILE Soil Type	Cohesion (psf)	Friction Angle (deg)	Effective Unit Weight (pcf)		Modulus, K ^B (pci)	ε ₅₀
					Moist Unit Weight (pcf)	Buoyant Unit Weight (pcf)		
I	0-18	Clay	250	0	110	48	30	0.020
II	18-32	Sand	0	29 ^A	110	48	20	N/A
III	32-46	Sand	0	31	120	58	60	N/A
IV	46-50	Sand	0	36	120	58	125	N/A

- A.** Under seismic loading conditions, the friction angle of the Stratum II liquefiable sands will be 0.
B. K refers to the Soil-Modulus Parameter used in LPILE computer code.

6.1.3 Pile Driving Equipment and Installation

Compatibility of the pile driving equipment, the soil conditions and the pile type being driven are all essential elements achieving the required penetration and resistance. Criteria for terminating driving should take into account the hammer used, pile weight, allowable pile stresses, and required resistances.

Prior to the start of construction, a wave equation analysis should be performed to verify that the proposed driving system (i.e., hammer type and size) is capable of effectively driving the piles to the desired depth without overstressing or damaging the piles.

1. The pile driving hammer used under these soil conditions should typically be rated by the manufacturer to have between 25,000 and 50,000 ft-lbs. of energy with a hammer weight of about 5,000 lbs. Pile hammer type, hammer base, and cushion material selected by the contractor should be provided to the Geotechnical Engineer for review prior mobilizing it to the site and driving piles. Performance of the driving system may vary considerably due to the type and model of hammer used, type and condition of the hammer cushion, and the condition and state of maintenance of the particular hammer in use. Gravity "drop" hammers and vibratory hammers may not be used. Diesel or air-powered (pneumatic) impact hammers are recommended. Advancing the piles by jetting is not recommended.
2. We recommend that prior to ordering production piles, at least 4 overlength index piles be driven in representative locations along the walkway alignment, including one each near boring locations B-1 (south end) and B-4 (north end at the river) prior to production pile installation. Index piles are typically longer than anticipated production pile lengths by 5 or 10 feet. Index pile driving should be observed by S&ME and driving criteria compared to criteria developed using wave equation and/or driving formula. Index piles and the pile driving equipment should be the same as to be used in production. Following installation, index piles may be cut-off, withdrawn or used in production as desired unless damaged by driving.

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LCF Backwash Structure Project
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3. After a production pile length has been determined and production piles ordered, production pile installation should be observed by an S&ME representative working under the guidance and supervision of the Geotechnical Engineer (S&ME). Piles should be driven to the recommended design depth.
4. In the event that the piles encounter refusal to further advancement above the desired bearing depth, the full allowable resistances may or may not be available depending upon the conditions at termination of driving, and extra piles may need to be driven to accommodate the axial, lateral, or uplift loads of the structure. This should be evaluated by the Structural Engineer and Geotechnical Engineer on a case-by-case scenario during construction.
5. Records of all piles driven should be prepared on an appropriate driving log by the Geotechnical Engineer's representative. This should include the following as applicable:
 - A. size, length, head cut-off elevation, toe elevation, location;
 - B. sequence of driving;
 - C. number of blows per ft. or per inch;
 - D. pre-augering, diameter and depth;
 - E. driving start time, and end time;
 - F. cushion arrangements;
 - G. movement of adjacent piles.

7.0 Limitations of Report

This report has been prepared in accordance with generally accepted geotechnical engineering practice for specific application to this project. The conclusions and recommendations in this report are based on the applicable standards of our practice in this geographic area at the time this report was prepared. No other warranty, express or implied, is made.

The analyses and recommendations submitted herein are based, in part, upon the data obtained from the subsurface exploration. The nature and extent of variations across the site may not become evident until construction. If variations appear evident, then we should be given a reasonable opportunity to re-evaluate the recommendations of this report. In the event that any changes in the nature, design, or location of the structures are planned, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and conclusions modified or verified in writing by the submitting engineers.

Assessment of site environmental conditions; sampling of soils, ground water or other materials for environmental contaminants; identification of jurisdictional wetlands, rare or endangered species, geological hazards or potential air quality and noise impacts were beyond the scope of this geotechnical exploration. Information regarding auxiliary construction items including but not limited to stairs, retaining walls, curbing, street lights, signage, utilities, etc. was not provided by the client and therefore has not been addressed as part of the scope of this report. If additional foundation design or construction recommendations are needed with regard to any such items, please contact us.

Appendix



REFERENCE:
Image Courtesy of Google Earth



FIGURE NO.

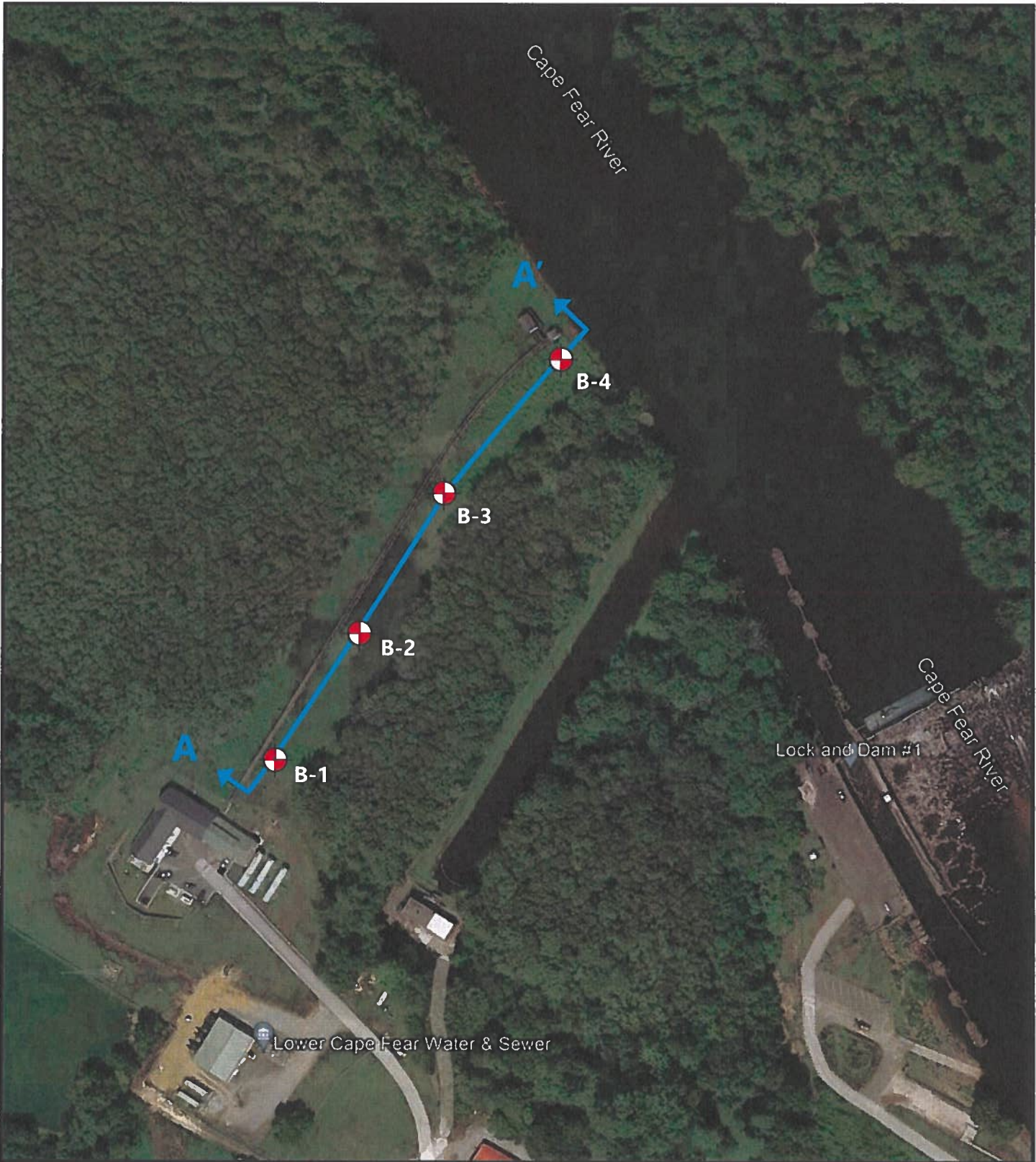
1



Site Vicinity Map

LCF Backwash Structure
Bladen County, North Carolina

SCALE:
As Shown
DATE:
9/27/2023
PROJECT NUMBER
23060102




REFERENCE:
Image courtesy of Google Earth,

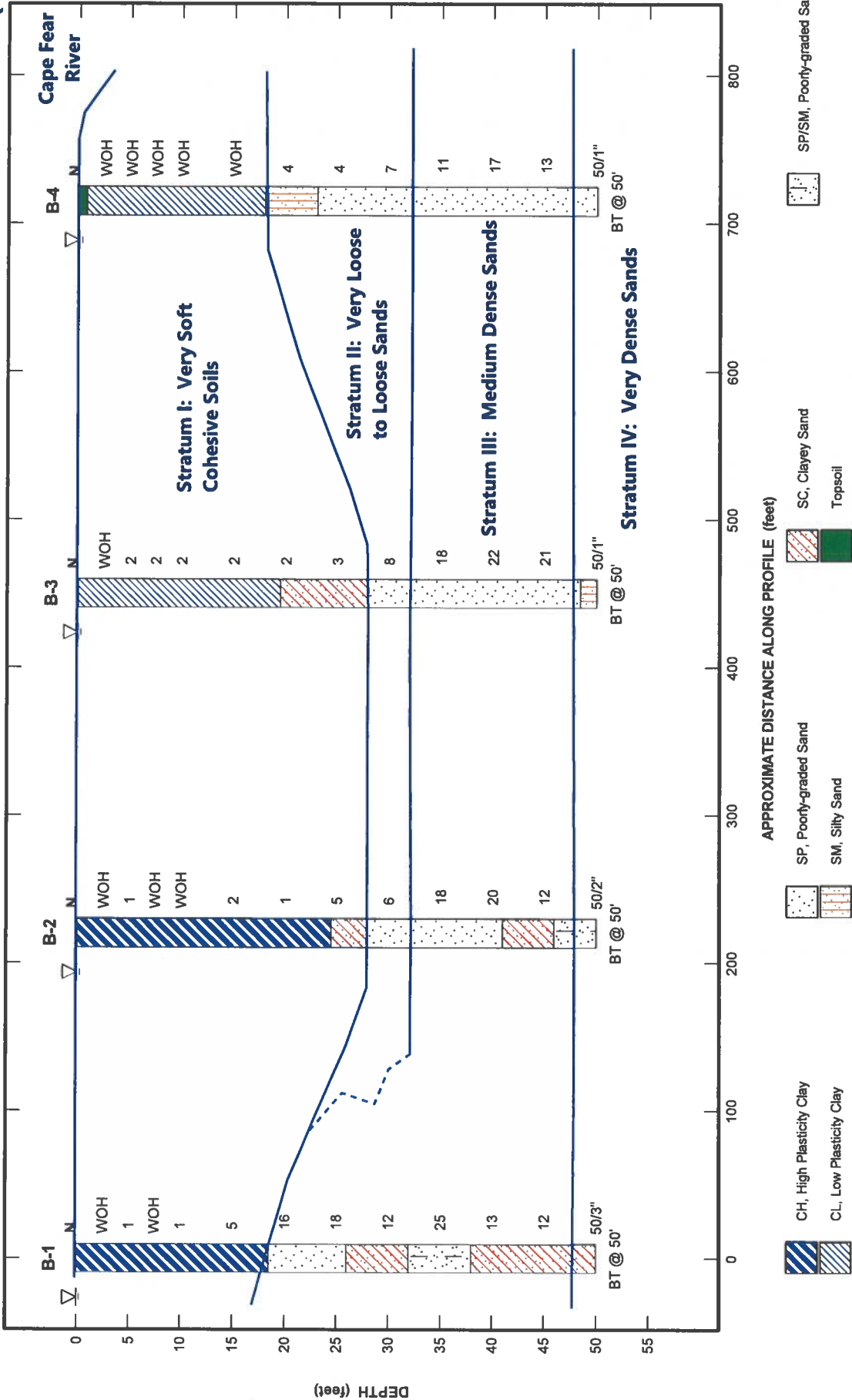
Legend

 = SPT Boring



	Test Location Sketch		SCALE: As Shown	FIGURE NO. 2
	LCF Backwash Structure Bladen County, North Carolina		DATE: 9/27/2023	
			PROJECT NUMBER 23060102	

A (South) A' (North)



N = Standard Penetration Test resistance value (blows per foot). The depicted stratigraphy is shown for illustrative purposes only. The actual subsurface conditions will vary between boring locations.



Interpreted Subsurface Profile A - A'

Project: LCF Backwash Structure Project
Location: Bladen County, North Carolina

Figure
3

JOB NO: 23060102

DATE: 9/29/23

LEGEND TO SOIL CLASSIFICATION AND SYMBOLS

SOIL TYPES

(Shown in Graphic Log)



Fill



Asphalt



Concrete



Topsoil



Gravel



Sand



Silt



Clay



Organic



Silty Sand



Clayey Sand



Sandy Silt



Clayey Silt



Sandy Clay



Silty Clay



Partially Weathered Rock



Cored Rock

WATER LEVELS

(Shown in Water Level Column)

- = Water Level At Termination of Boring
 = Water Level Taken After 24 Hours
 = Loss of Drilling Water
 = Hole Cave

CONSISTENCY OF COHESIVE SOILS

CONSISTENCY

Very Soft
 Soft
 Firm
 Stiff
 Very Stiff
 Hard
 Very Hard

STD. PENETRATION RESISTANCE BLOWS/FOOT

0 to 2
 3 to 4
 5 to 8
 9 to 15
 16 to 30
 31 to 50
 Over 50

RELATIVE DENSITY OF COHESIONLESS SOILS

RELATIVE DENSITY

Very Loose
 Loose
 Medium Dense
 Dense
 Very Dense

STD. PENETRATION RESISTANCE BLOWS/FOOT

0 to 4
 5 to 10
 11 to 30
 31 to 50
 Over 50

SAMPLER TYPES

(Shown in Samples Column)



Shelby Tube



Split Spoon



Rock Core



No Recovery

TERMS

Standard Penetration Resistance - The Number of Blows of 140 lb. Hammer Falling 30 in. Required to Drive 1.4 in. I.D. Split Spoon Sampler 1 Foot. As Specified in ASTM D-1586.

REC - Total Length of Rock Recovered in the Core Barrel Divided by the Total Length of the Core Run Times 100%.

RQD - Total Length of Sound Rock Segments Recovered that are Longer Than or Equal to 4" (mechanical breaks excluded) Divided by the Total Length of the Core Run Times 100%.



LCF Backwash Structure Project Bladen County, North Carolina S&ME Project No. 23060102				BORING LOG B-1										
DATE DRILLED: 9/6/23		ELEVATION:		NOTES: Elevation unknown										
DRILL RIG: Marsh Buggy		BORING DEPTH: 50.0 ft												
DRILLER: MAD		WATER LEVEL: 0.5 ft above ground surface												
HAMMER TYPE:		LOGGED BY: J. Prevatte												
SAMPLING METHOD: Split-Spoon														
DRILLING METHOD: Mud Rotary														
DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA			STANDARD PENETRATION TEST DATA (blows/ft) / REMARKS				N VALUE
							1st 6in / RUN #	2nd 6in / REC	3rd 6in / RQD	10	20	30	60/80	
5		FAT CLAY (CH) - Very soft, brown and gray, mostly medium to high plasticity fines, some organics, trace fine sand, wet. --- Some wood fragments. --- No wood or organics, orange and gray, firm.			1	WOH	WOH	WOH						WOH
2			WOH	WOH	1							1		
3			WOH	WOH	WOH								WOH	
4			WOH	WOH	1								1	
5					5	1	2	3						5
6		POORLY GRADED SAND (SP) - Medium dense, gray, mostly fine to medium sand, trace low plasticity fines, wet.			6	8	8	8						16
7			5	10	8							18		
8		CLAYEY SAND (SC) - Medium dense, gray, mostly fine to medium sand, some low to medium plasticity fines, wet.			8	3	3	9						12
9			5	13	12							25		
10		POORLY GRADED SAND WITH SILT (SP-SM) - Medium dense, gray, mostly fine to medium sand, few low plasticity fines, some clay lenses, wet.			10	5	6	7						13
11			5	6	6							12		
12		CLAYEY SAND (SC) - Medium dense, gray, mostly fine to medium sand, some low to medium plasticity fines, wet. --- Very dense, some weathered limestone fragments. Boring terminated at 50 ft Target Depth			12	16	50/3"							50/3"

NOTES:

- THIS LOG IS ONLY A PORTION OF A REPORT PREPARED FOR THE NAMED PROJECT AND MUST ONLY BE USED TOGETHER WITH THAT REPORT.
- BORING, SAMPLING AND PENETRATION TEST DATA IN GENERAL ACCORDANCE WITH ASTM D-1586.
- STRATIFICATION AND GROUNDWATER DEPTHS ARE NOT EXACT.
- WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.



LCF Backwash Structure Project Bladen County, North Carolina S&ME Project No. 23060102					BORING LOG B-2				
DATE DRILLED: 9/6/23		ELEVATION:		NOTES: Elevation unknown					
DRILL RIG: Marsh Buggy		BORING DEPTH: 50.0 ft							
DRILLER: MAD		WATER LEVEL: 1.5 ft above ground surface							
HAMMER TYPE:		LOGGED BY: J. Prevatte							
SAMPLING METHOD: Split-Spoon									
DRILLING METHOD: Mud Rotary									

DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA			STANDARD PENETRATION TEST DATA (blows/ft) / REMARKS				N VALUE
							1st 6in / RUN #	2nd 6in / REC	3rd 6in / RQD	10	20	30	60/80	
5	FAT CLAY (CH) - Very soft, brown and gray, mostly medium to high plasticity fines, some organics, trace fine sand, wet. --- No wood or organics.				1	WOH	WOH	WOH						WOH
		2	WOH	WOH	1								1	
		3	WOH	WOH	WOH									WOH
10		4	WOH	WOH	WOH									WOH
15		5	1	1	1									2
20		6	WOH	WOH	1									1
25	CLAYEY SAND (SC) - Loose, gray, mostly fine to medium sand, some low to medium plasticity fines, wet.	7	1	1	4								5	
30		8	5	3	3								6	
35	POORLY GRADED SAND (SP) - Loose to medium dense, gray, mostly fine to medium sand, trace low plasticity fines, wet. --- With subrounded gravel.	9	5	8	10								18	
40		10	7	9	11								20	
45		11	4	6	6								12	
50	POORLY GRADED SAND WITH SILT (SP-SM) - Very dense, gray, mostly fine to medium sand, few low plasticity fines, some clay lenses, wet. Boring terminated at 50 ft Target Depth	12	5	50/2"									50/2"	

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- WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.



LCF Backwash Structure Project Bladen County, North Carolina S&ME Project No. 23060102				BORING LOG B-3										
DATE DRILLED: 9/5/23		ELEVATION:		NOTES: Elevation unknown										
DRILL RIG: Marsh Buggy		BORING DEPTH: 50.0 ft												
DRILLER: MAD		WATER LEVEL: 1.5 ft above ground surface												
HAMMER TYPE:		LOGGED BY: J. Prevatte												
SAMPLING METHOD: Split-Spoon														
DRILLING METHOD: Mud Rotary														
DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA			STANDARD PENETRATION TEST DATA (blows/ft) /REMARKS				N VALUE
							1st 6in / RUN #	2nd 6in / REC	3rd 6in / RQD	10	20	30	60/80	
5	[Hatched Pattern]	LEAN CLAY WITH SAND (CL) - Very soft, dark brown, mostly medium to high plasticity fines, some fine sand, some organics, wet. --- Some wood fragments.			1	WOH	WOH	WOH						WOH
2			1	1	1								2	
3			1	1	1									2
4			1	1	1									2
5			1	1	1									2
10	[Hatched Pattern]	--- No wood or organics.			6	1	1	1						2
15														2
20														2
25														3
30														8
35	[Dotted Pattern]	POORLY GRADED SAND (SP) - Loose, gray, mostly fine to medium sand, trace low plasticity fines, wet. --- Medium dense. --- Some sub-round gravel.			8	3	4	4						18
40														22
45														21
50														50/1"
50														50/1"
		SILTY SAND (SM) - Very dense, gray, mostly fine to medium sand, some low plasticity fines, wet. Boring terminated at 50 ft Target Depth												

NOTES:

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LCF Backwash Structure Project Bladen County, North Carolina S&ME Project No. 23060102				BORING LOG B-4			
DATE DRILLED: 9/5/23		ELEVATION:		NOTES: Elevation unknown			
DRILL RIG: Marsh Buggy		BORING DEPTH: 50.0 ft					
DRILLER: MAD		WATER LEVEL: At the ground surface					
HAMMER TYPE:		LOGGED BY: J. Prevatte					
SAMPLING METHOD: Split-Spoon							
DRILLING METHOD: Mud Rotary							

DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA			STANDARD PENETRATION TEST DATA (blows/ft) /REMARKS				N VALUE
							1st 6in / RUN #	2nd 6in / REC	3rd 6in / RQD	10	20	30	60/80	
0 - 8		TOPSOIL - 8 inches.			1	WOH	WOH	WOH						WOH
8 - 20		LEAN CLAY WITH SAND (CL) - Very soft, dark brown, mostly medium to high plasticity fines, some fine sand, some organics, wet. --- No organics. --- Gray.			2	WOH	WOH	WOH						WOH
20 - 25		SILTY SAND (SM) - Very loose, gray, mostly fine to medium sand, some low plasticity fines, wet.			3	WOH	WOH	WOH						WOH
25 - 50		POORLY GRADED SAND (SP) - Very loose, gray, mostly fine to medium sand, trace low plasticity fines, wet. --- Loose. --- With round to subrounded gravel. --- Medium dense. --- With gravel. --- Very dense.			4	WOH	WOH	WOH						WOH
50		Boring terminated at 50 ft Target Depth			5	WOH	WOH	WOH						WOH
					6	X	1	1	3					4
					7	X	3	2	2					4
					8	X	3	3	4					7
					9	X	3	4	7					11
					10	X	8	9	8					17
					11	X	8	5	8					13
					12	X	50/1"							50/1"

NOTES:

1. THIS LOG IS ONLY A PORTION OF A REPORT PREPARED FOR THE NAMED PROJECT AND MUST ONLY BE USED TOGETHER WITH THAT REPORT.
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3. STRATIFICATION AND GROUNDWATER DEPTHS ARE NOT EXACT.
4. WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.



Form No: TR-D2216-T265-2
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT



ASTM D 2216 ☒ AASHTO T 265 ☐

S&ME, Inc. - Wilmington: 3006 Hall Waters Drive, Suite 100, Wilmington, NC 28405

Project #:	23060102	Report Date:	9/26/23
Project Name:	LCF Backwash Structure Project	Test Date(s):	9/23-9/26/23
Client Name:	McKim & Creed		
Client Address:	243 North Front Street, Wilmington, NC 28401		
Sample by:	J. Prevatte	Sample Dates:	9/4-9/5/23
Sampling Method:	SPT	Drill Rig :	N/A

Method:	A (1%)	B (0.1%)	<input checked="" type="checkbox"/>	Balance ID.	14862	Calibration Date:	7/1/23
				Oven ID.	14603	Calibration Date:	7/24/23

[illegible]

Notes / Deviations / References

Tests Performed By: J.FAUCETTE

AASHTO T 265: Laboratory Determination of Moisture Content of Soils

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

Jason Faucette
Technical Responsibility

Jason C Faucette Jason Faucette
Sep 27 2023 11:51 AM
Signature

Laboratory Supervisor
Position

9/26/2023
Date

Results shown in this report, relate only to the samples noted above.

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No: TR-D1140-1
Revision No. 1
Revision Date: 8/2/17

MATERIAL FINER THAN THE #200 SIEVE



ASTM D1140

S&ME, Inc. - Wilmington: 3006 Hall Waters Drive, Suite 100, Wilmington, NC 28405

Project #: 23060102 Report Date: 9/29/23
Project Name: LCF Backwash Structure Project Test Date(s): 9/27-9/29/23
Client Name: McKim & Creed
Client Address: 243 North Front Street, Wilmington, NC 28401
Sample by: J. Prevatte Sample Dates: 9/4-9/5/23
Sampling Method: SPT Drill Rig: N/A

Method: A ☐ B ☒

Soaked ☒ Soak Time 7.0 hrs

Boring #	Sample #	Sample Depth	Tare #	Tare Weight	Tare Wt. + Wet Wt	Tare Wt. + Dry Wt	Tare Wt. + Dry Wt. after Wash	% Passing #200
				grams	grams	grams	grams	%
B-1	S-6	18.5'-20.0'	M	0.00	223.17	186.61	177.32	5.0%
B-1	S-11	43.5'-45.0'	E	0.00	224.06	174.87	96.01	45.1%
B-2	S-8	28.5'-30.0'	A	0.00	199.77	158.48	153.27	3.3%
B-3	S-9	33.5'-35.0'	K	0.00	220.19	182.27	176.27	3.3%
B-4	S-6	18.5'-20.0'	1	0.00	208.13	160.59	124.54	22.4%
B-4	S-7	23.5'-25.0'	2	0.00	212.27	175.08	166.95	4.6%
B-4	S-8	28.5'-30.0'	520	0.00	212.12	171.32	164.13	4.2%

Balance ID: 14862 Calibration Date: 7/1/23 #200 Sieve 17508 Calibration Date: 4/18/23

Notes / Deviations / References: ASTM D1140: Amount of Material in Soil Finer Than the No. 200 (75-um) Sieve

All samples taken from the marsh area on site, and soaked for 7.0 hours.

B-1/S-6: Light Gray Poorly Graded SAND (SP)

B-1/S-11: Gray Clayey SAND (SC)

B-2/S-8: Light Brown Poorly Graded SAND (SP)

B-3/S-9: Light Brown Poorly Graded SAND (SP)

B-4/S-6: Gray Silty Sand (SM)

B-4/S-7: Gray-Brown Poorly Graded SAND (SP)

B-4/S8: Gray-Brown Poorly Graded SAND (SP)

J. FAUCETTE

Technician

Jason Faucette

Technical Responsibility

Jason C. Faucette Jason Faucette
Sep 29 2023 10:53 AM

Signature

Laboratory Supervisor

Position

9/26/2023

Date

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Form No. TR-D4318-T89-90

Revision No. 1

Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☐ AASHTO T 89 ☒ AASHTO T 90 ☒

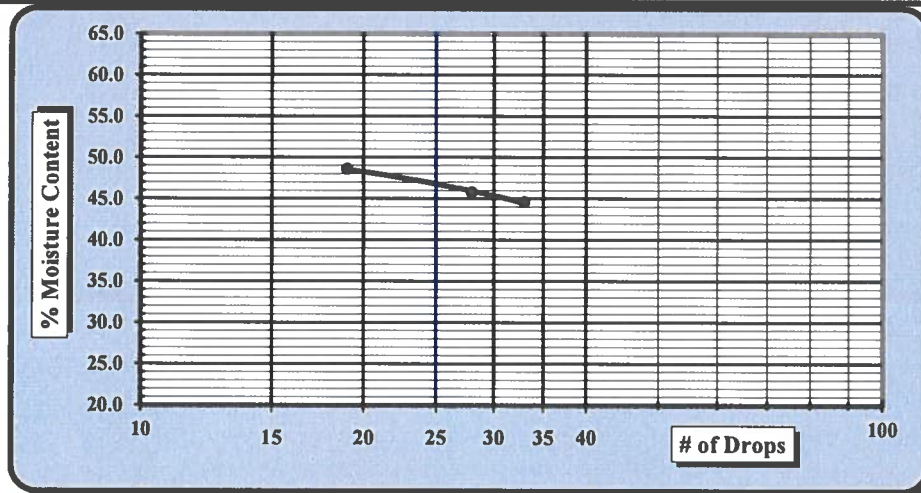
S&ME, Inc. - Wilmington: 3006 Hall Waters Drive, Suite 100, Wilmington, NC 28405

Project #:	23060102	Report Date:	9/26/23
Project Name:	LCF Backwash Structure Project	Test Date(s)	9/23-9/26/23
Client Name:	McKim & Creed		
Client Address:	243 North Front Street, Wilmington, NC 28401		
Sample Id:	161	Type: Site Material	Sample Date: 9/4-9/5/23
Location:	Marsh Area	Source Loc.: B-1/S-8	Depth(ft): 28.5'-30.0'

Sample Description: Gray Clayey SAND (SC)

Type and Specification	S&ME ID #	Cal Date:	Type and Specification	S&ME ID #	Cal Date:
Balance (0.01 g)	14862	7/1/2023	Grooving tool	14947(E)	7/12/2023
LL Apparatus	17515	7/12/2023	Grooving tool		
Oven	14993	7/24/2023	Grooving tool		

Pan #		Liquid Limit						Plastic Limit		
Tare #:		1	2	3				4	5	
A	Tare Weight	11.07	10.64	11.62				11.31	10.72	
B	Wet Soil Weight + A	21.58	20.83	21.80				19.04	19.03	
C	Dry Soil Weight + A	18.34	17.63	18.47				17.91	17.80	
D	Water Weight (B-C)	3.24	3.20	3.33				1.13	1.23	
E	Dry Soil Weight (C-A)	7.27	6.99	6.85				6.60	7.08	
F	% Moisture (D/E)*100	44.6%	45.8%	48.6%				17.1%	17.4%	
N	# OF DROPS	33	28	19				Moisture Contents determined by AASHTO T 245		
LL	LL = F * FACTOR									
Ave.	Average							17.3%		



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit **47**

Plastic Limit **17**

Plastic Index **30**

Group Symbol **CL**

Multipoint Method ☒

One-point Method ☐

Wet Preparation Dry Preparation Air Dried Estimate the % Retained on the #40 Sieve: N/A

Notes / Deviations / References: ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Tests Performed By: J.FAUCETTE

Jason Faucette

Technical Responsibility

Jason Faucette
Sep 26 2023 1:03 PM

Signature

Laboratory Supervisor

Position

9/26/2023

Date

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Form No. TR-D4318-T89-90

Revision No. 1

Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☐ AASHTO T 89 ☒ AASHTO T 90 ☒

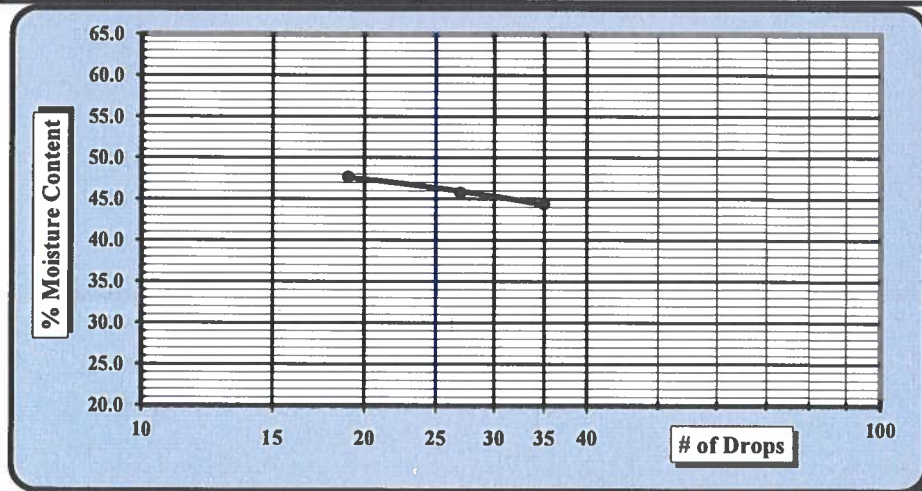
S&ME, Inc. - Wilmington: 3006 Hall Waters Drive, Suite 100, Wilmington, NC 28405

Project #:	23060102	Report Date:	9/29/23
Project Name:	LCF Backwash Structure Project	Test Date(s)	9/27-9/29/23
Client Name:	McKim & Creed		
Client Address:	243 North Front Street, Wilmington, NC 28401		
Sample Id:	163	Type: Site Material	Sample Date: 9/4-9/5/23
Location:	Marsh Area	Source Loc.: B-1/S-11	Depth(ft): 43.5'-45.0'

Sample Description: Gray Clayey SAND (SC)

Type and Specification	S&ME ID #	Cal Date:	Type and Specification	S&ME ID #	Cal Date:
Balance (0.01 g)	14862	7/1/2023	Grooving tool	14947(E)	7/12/2023
LL Apparatus	17515	7/12/2023	Grooving tool		
Oven	14993	7/24/2023	Grooving tool		

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	1	2	3				4	5	
A	Tare Weight	11.05	10.63	11.60				11.33	10.73	
B	Wet Soil Weight + A	19.74	19.93	20.79				20.00	19.15	
C	Dry Soil Weight + A	17.07	17.01	17.82				18.52	17.76	
D	Water Weight (B-C)	2.67	2.92	2.97				1.48	1.39	
E	Dry Soil Weight (C-A)	6.02	6.38	6.22				7.19	7.03	
F	% Moisture (D/E)*100	44.4%	45.8%	47.7%				20.6%	19.8%	
N	# OF DROPS	35	27	19				Moisture Contents determined by AASHTO T 245		
LL	LL = F * FACTOR									
Ave.	Average							20.2%		



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐Liquid Limit **46**Plastic Limit **20**Plastic Index **26**Group Symbol **CL**Multipoint Method ☒One-point Method ☐

Wet Preparation Dry Preparation Air Dried Estimate the % Retained on the #40 Sieve: N/A

Notes / Deviations / References: ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Tests Performed By: J.FAUCETTE

Jason Faucette

Technical Responsibility

Signature

Laboratory Supervisor

Position

9/29/2023

Date

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Revision No. 1

Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☐ AASHTO T 89 ☒ AASHTO T 90 ☒

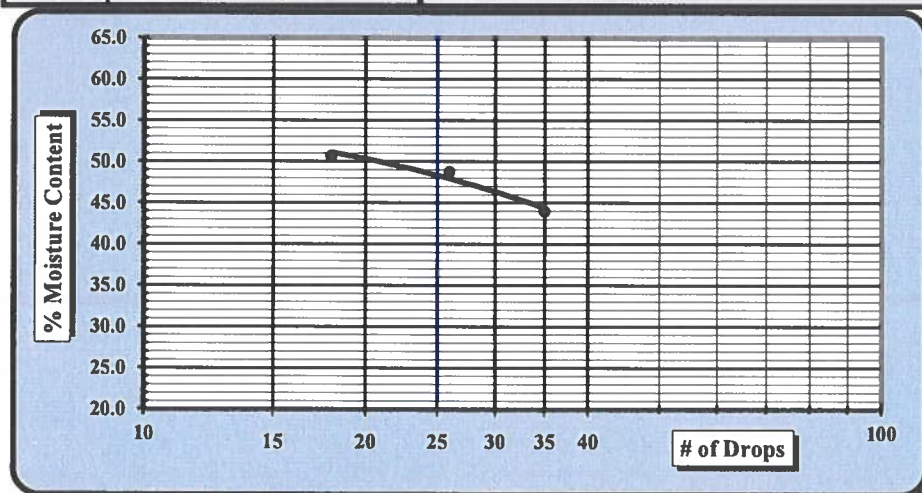
S&ME, Inc. - Wilmington: 3006 Hall Waters Drive, Suite 100, Wilmington, NC 28405

Project #:	23060102	Report Date:	9/26/23
Project Name:	LCF Backwash Structure Project	Test Date(s)	9/23-9/26/23
Client Name:	McKim & Creed		
Client Address:	243 North Front Street, Wilmington, NC 28401		
Sample Id:	161	Type: Site Material	Sample Date: 9/4-9/5/23
Location:	Marsh Area	Source Loc.: B-2/S-11	Depth(ft): 43.5'-45.0'

Sample Description: Gray Clayey SAND (SC)

Type and Specification	S&ME ID #	Cal Date:	Type and Specification	S&ME ID #	Cal Date:
Balance (0.01 g)	14862	7/1/2023	Grooving tool	14947(E)	7/12/2023
LL Apparatus	17515	7/12/2023	Grooving tool		
Oven	14993	7/24/2023	Grooving tool		

Pan #		Liquid Limit						Plastic Limit		
Tare #:		6	7	8				9	10	
A	Tare Weight	11.26	11.69	10.91				11.97	11.73	
B	Wet Soil Weight + A	19.84	21.78	20.84				20.01	20.03	
C	Dry Soil Weight + A	17.22	18.47	17.50				18.97	18.93	
D	Water Weight (B-C)	2.62	3.31	3.34				1.04	1.10	
E	Dry Soil Weight (C-A)	5.96	6.78	6.59				7.00	7.20	
F	% Moisture (D/E)*100	44.0%	48.8%	50.7%				14.9%	15.3%	
N	# OF DROPS	35	26	18				Moisture Contents determined by AASHTO T 245		
LL	LL = F * FACTOR									
Ave.	Average							15.1%		



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐Liquid Limit **48**Plastic Limit **15**Plastic Index **33**Group Symbol **CL**Multipoint Method ☒One-point Method ☐

Wet Preparation Dry Preparation Air Dried Estimate the % Retained on the #40 Sieve: N/A

Notes / Deviations / References: ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Tests Performed By: J.FAUCETTE

Jason Faucette

Technical Responsibility

Signature

Laboratory Supervisor

Position

9/26/2023

Date

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Form No. TR-D4318-T89-90

Revision No. 1

Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☐ AASHTO T 89 ☒ AASHTO T 90 ☒

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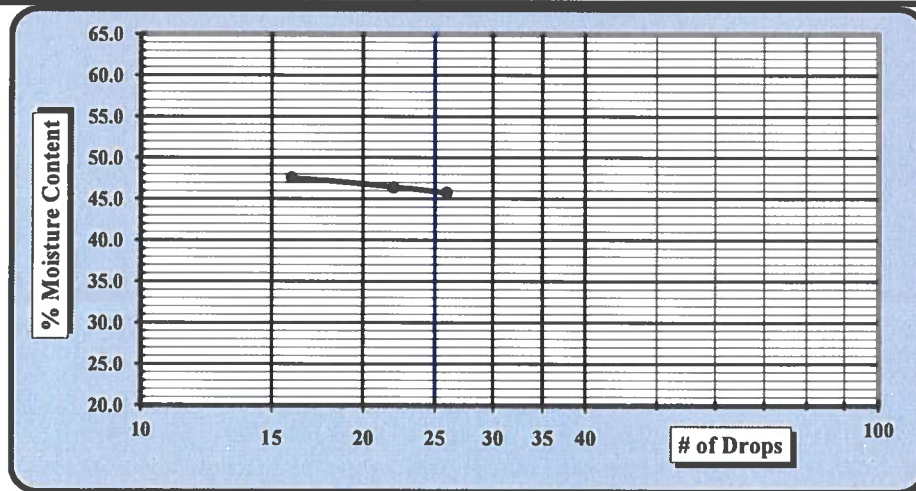
Project #: 23060102 Report Date: 9/26/23
 Project Name: LCF Backwash Structure Project Test Date(s): 9/23-9/26/23
 Client Name: McKim & Creed
 Client Address: 243 North Front Street, Wilmington, NC 28401

Sample Id: 161 Type: Site Material Sample Date: 9/4-9/5/23
 Location: Marsh Area Source Loc.: B-3/S-7 Depth(ft): 23.5'-25.0'

Sample Description: Gray-Brown Clayey SAND (SC)

Type and Specification	S&ME ID #	Cal Date:	Type and Specification	S&ME ID #	Cal Date:
Balance (0.01 g)	14862	7/1/2023	Grooving tool	14947(E)	7/12/2023
LL Apparatus	17515	7/12/2023	Grooving tool		
Oven	14993	7/24/2023	Grooving tool		

Pan #		Liquid Limit						Plastic Limit		
Tare #:		11	12	13				14	15	
A	Tare Weight	11.06	10.76	12.04				11.79	11.84	
B	Wet Soil Weight + A	21.72	21.05	21.25				20.56	20.87	
C	Dry Soil Weight + A	18.37	17.79	18.28				18.91	19.19	
D	Water Weight (B-C)	3.35	3.26	2.97				1.65	1.68	
E	Dry Soil Weight (C-A)	7.31	7.03	6.24				7.12	7.35	
F	% Moisture (D/E)*100	45.8%	46.4%	47.6%				23.2%	22.9%	
N	# OF DROPS	26	22	16				Moisture Contents determined by AASHTO T 245		
LL	LL = F * FACTOR									
Ave.	Average							23.1%		



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐Liquid Limit **46**Plastic Limit **23**Plastic Index **23**Group Symbol **CL**Multipoint Method ☒One-point Method ☐

Wet Preparation Dry Preparation Air Dried Estimate the % Retained on the #40 Sieve: N/A

Notes / Deviations / References: ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Tests Performed By: J.FAUCETTE

Jason Faucette

Technical Responsibility

Jason C. Faucette
 Jason Faucette
 Sep 26 2023 1:13 PM

Signature

Laboratory Supervisor

Position

9/26/2023

Date

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Form No. TR-D4318-T89-90

Revision No. 1

Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX


 ASTM D 4318 ☐ AASHTO T 89 ☒ AASHTO T 90 ☒

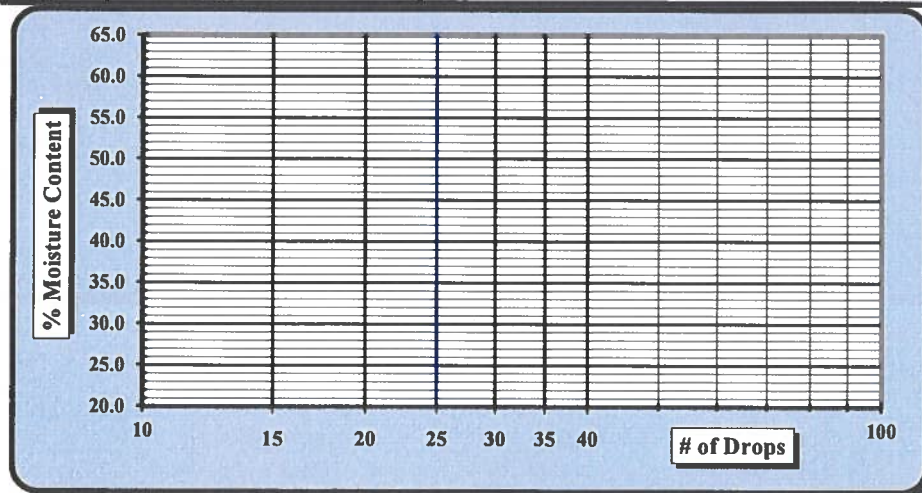
S&ME, Inc. - Wilmington: 3006 Hall Waters Drive, Suite 100, Wilmington, NC 28405

Project #:	23060102	Report Date:	9/26/23
Project Name:	LCF Backwash Structure Project	Test Date(s)	9/23-9/26/23
Client Name:	McKim & Creed		
Client Address:	243 North Front Street, Wilmington, NC 28401		
Sample Id:	161	Type: Site Material	Sample Date: 9/4-9/5/23
Location:	Marsh Area	Source Loc.: B-3/S-12	Depth(ft): 48.5'-50.0'

Sample Description: Gray Silty SAND (SM)

Type and Specification	S&ME ID #	Cal Date:	Type and Specification	S&ME ID #	Cal Date:
Balance (0.01 g)	14862	7/1/2023	Grooving tool	14947(E)	7/12/2023
LL Apparatus	17515	7/12/2023	Grooving tool		
Oven	14993	7/24/2023	Grooving tool		

Pan #		Liquid Limit						Plastic Limit		
Tare #:		16	17	18				19	20	
A	Tare Weight									
B	Wet Soil Weight + A									
C	Dry Soil Weight + A									
D	Water Weight (B-C)									
E	Dry Soil Weight (C-A)									
F	% Moisture (D/E)*100									
N	# OF DROPS							Moisture Contents determined by AASHTO T 245		
LL	LL = F * FACTOR									
Ave.	Average									



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☒

Liquid Limit

Plastic Limit

Plastic Index

Group Symbol **NP**Multipoint Method ☒One-point Method ☐

Wet Preparation Dry Preparation Air Dried Estimate the % Retained on the #40 Sieve: N/A

Notes / Deviations / References: ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Tests Performed By: J.FAUCETTE

No LL or PL could be determined, therefore classified as NP

Jason Faucette

Technical Responsibility

 Jason Faucette
Sep 26 2023 1:16 PM

Signature

Laboratory Supervisor

Position

9/26/2023

Date

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LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX


 ASTM D 4318 ☐ AASHTO T 89 ☒ AASHTO T 90 ☒

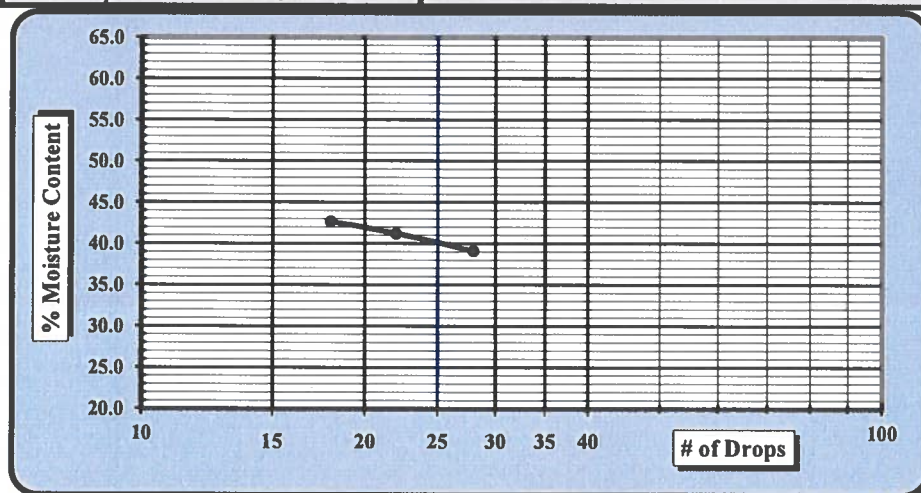
S&ME, Inc. - Wilmington: 3006 Hall Waters Drive, Suite 100, Wilmington, NC 28405

Project #:	23060102	Report Date:	9/26/23
Project Name:	LCF Backwash Structure Project	Test Date(s)	9/23-9/26/23
Client Name:	McKim & Creed		
Client Address:	243 North Front Street, Wilmington, NC 28401		
Sample Id:	161	Type: Site Material	Sample Date: 9/4-9/5/23
Location:	Marsh Area	Source Loc.: B-4/S-3	Depth(ft): 6.0'-7.5'

Sample Description: Brown-Gray Lean CLAY with Sand (CL)

Type and Specification	S&ME ID #	Cal Date:	Type and Specification	S&ME ID #	Cal Date:
Balance (0.01 g)	14862	7/1/2023	Grooving tool	14947(E)	7/12/2023
LL Apparatus	17515	7/12/2023	Grooving tool		
Oven	14993	7/24/2023	Grooving tool		

Pan #		Liquid Limit						Plastic Limit		
Tare #:		16	17	18				19	20	
A	Tare Weight	11.86	11.91	11.92				11.82	11.88	
B	Wet Soil Weight + A	22.24	22.19	21.15				21.34	21.24	
C	Dry Soil Weight + A	19.32	19.19	18.39				19.82	19.74	
D	Water Weight (B-C)	2.92	3.00	2.76				1.52	1.50	
E	Dry Soil Weight (C-A)	7.46	7.28	6.47				8.00	7.86	
F	% Moisture (D/E)*100	39.1%	41.2%	42.7%				19.0%	19.1%	
N	# OF DROPS	28	22	18				Moisture Contents determined by AASHTO T 245		
LL	LL = F * FACTOR									
Ave.	Average							19.1%		



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐Liquid Limit **40**Plastic Limit **19**Plastic Index **21**Group Symbol **CL**Multipoint Method ☒One-point Method ☐

Wet Preparation Dry Preparation Air Dried Estimate the % Retained on the #40 Sieve: N/A

Notes / Deviations / References: ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Tests Performed By: J.FAUCETTE

Jason Faucette

Technical Responsibility

 Jason C. Faucette
 Jason Faucette
 Sep 27 2023 11:20 AM

Signature

Laboratory Supervisor

Position

9/26/2023

Date

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APPENDIX B – ELEVATED ACCESS WALKWAY OPTIONS FIGURES



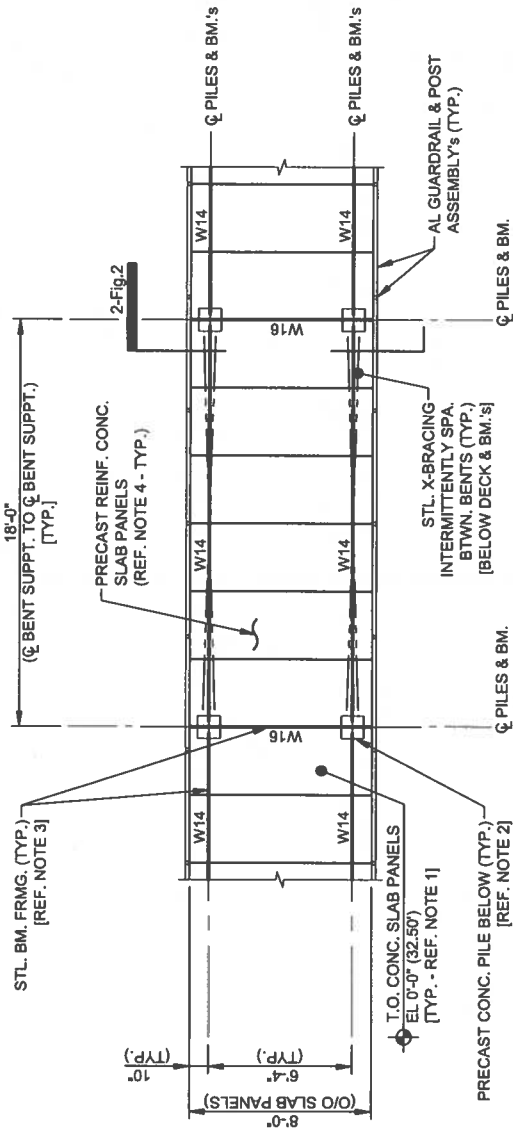
SCALE: 3/16" = 1'-0"

1. REFERENCE ELEVATION FOR THE ELEVATED ACCESS WALKWAY IS THE T.O. CONC. SLAB PANEL ELEVATION EL. 0' = 32'-8" (32.50') N.A.V.D. ±83.
2. PILES = 12" SQ. PRECAST REINFORCED CONCRETE PILE ASSEMBLIES.
3. BEAM B1 = 20" WIDE X 12" DEEP SECTION w/ 4" WIDE X 8" EXTENSION.
BEAM B2 = 12" WIDE X 14" DEEP SECTION.
4. PRECAST REINFORCED CONCRETE DECK PANELS 2'-11 1/2" WIDE X 6" THK. SPA. w/ 3/4" WIDE SPACES BTWN. ADJACENT PANEL SECTIONS.
5. STRUCTURAL STEEL BRACING ASSEMBLY w/ HOT DIPPED GALVANIZED FINISH.



SCALE: 1/4" = 1'-0"

OB1 - 67

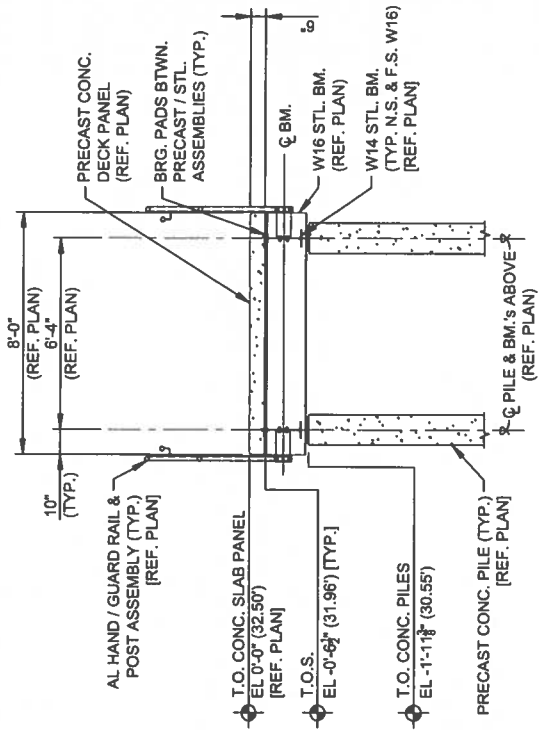


1 - PLAN - ELEVATED WALKWAY PRECAST CONCRETE FRMG.

SCALE: 3/16" = 1'-0"

NOTES:

- 1. REFERENCE ELEVATION FOR THE ELEVATED ACCESS WALKWAY IS THE T.O. CONC.
- 2. PILES = 12" SQ. PRECAST PRESTRESSED REINFORCED CONCRETE PILE ASSEMBLIES.
- 3. REGARDING STEEL FRAMING SECTIONS, NOTE THE FOLLOWING:
 - W16 = W16x31 WIDE FLANGE SECTION.
 - W14 = W14x38 WIDE FLANGE SECTION.
- 4. PRECAST REINFORCED CONCRETE DECK PANELS 2'-1 1/2" WIDE x 6" THK. SPA. w/ 3/4" WIDE SPACES BTWN. ADJACENT PANEL SECTIONS.
- 5. STRUCTURAL STEEL BM. & BRACING ASSEMBLY'S w/ HOT DIPPED GALVANIZED FINISH.



2 - SECTION - THRU BENT ASSEMBLY

SCALE: 1/4" = 1'-0"

NO.	REVISION	DATE	BY	CHK.

MKM & CREED
253 N. First Street
Wilmington, North Carolina 28401
Phone: (910) 343-1041 Fax: (910) 351-6321
www.mkmcreed.com



EXIST. KINGS BLUFF P.S. ELEVATED ACCESS WALKWAY & EQUIP. BLDG. PER

ELEVATED ACCESS WALKWAY STEEL FRMG. PLAN & SECTION

STRUCTURAL

Fig. 2

SCALE: 1/4" = 1'-0"

PREPARED BY: W.A. CREED
CHECKED BY: W.A. CREED
DATE: 02/17/2024

PRELIM. ENG. REPORT DRAFT NOT FOR CONSTRUCTION

AGENDA ITEM

To: CHAIRMAN KNIGHT AND BOARD MEMBERS

From: TIM H. HOLLOMAN, EXECUTIVE DIRECTOR

Date: May 13, 2024

Re: Resolution Approving Work Order Number 1 to Financial Advisory Services Agreement with First Tryon Advisors, LLC for the Lower Cape Fear Water and Sewer Authority

Reviewed and approved as to form: MATTHEW A. NICHOLS, AUTHORITY ATTORNEY

Background: An annual fee of \$10,000, paid in quarterly installments of \$2,500 billed on January 1, April 1, July 1, and October 1, beginning on July 1, 2024.

Action Requested: Motion to approve/disapprove.

**Resolution Approving Work Order Number 1 to Financial Advisory Services Agreement
with First Tryon Advisors, LLC for the Lower Cape Fear Water and Sewer Authority**

WHEREAS, the Lower Cape Fear Water and Sewer Authority (“LCFWASA”) serves Brunswick, Bladen, Pender, New Hanover, Columbus Counties, and the City of Wilmington with a Board of Directors representing those local governments. As the largest regional water system in Eastern North Carolina, LCFWASA’s primary role is to provide raw water from the Cape Fear River to supply treatment facilities that serve 550,000 customers;

WHEREAS, as the largest regional water system in Eastern North Carolina, LCFWASA recognizes the importance of financial planning in relation to infrastructure, construction, maintenance and emergency work;

WHEREAS, among the recommendations included in the Water Rate Study prepared for LCFWASA by Wildan Financial Services in 2023 was a recommendation that LCFWASA hire a financial advisor to assist with financial planning, including evaluating potential debt issuances in the future;

WHEREAS, following an evaluation of all responses to a Request for Qualifications (RFQ) for Financial Advisory Services, the LCFWASA Board selected First Tryon Advisors, LLC to serve as LCFWASA’s Financial Advisor at the Board’s Meeting on March 11, 2024;

WHEREAS, LCFWASA and First Tryon Advisors, LLC have entered into a Financial Advisory Services Agreement executed as of March 11, 2024 (the “Agreement”); and,

WHEREAS, First Tryon Advisors, LLC has presented LCFWASA with proposed Work Order Number 1 dated April 24, 2024, pursuant to the Agreement, and LCFWASA has determined that it is in the best public interest to accept and approve Work Order Number 1.

NOW, THEREFORE, BE IT RESOLVED by the Chairman and Directors of the LCFWASA Board that LCFWASA accepts and approves Work Order Number 1 to the Financial Advisory Services Agreement between LCFWASA and First Tryon Advisors, LLC. The Board hereby authorizes the Chairman to execute Work Order Number 1 with First Tryon Advisors, LLC dated April 24, 2024.

THEREFORE, BE IT FURTHER RESOLVED, that a copy of this Resolution be recorded in the permanent minutes of this Board.

Adopted this _____ day of May, 2024

Harry Knight, Chairman

ATTEST:

Scott Phillips, Secretary



6101 Carnegie Boulevard, Suite 210
Charlotte, NC 28209

WORK ORDER NUMBER 1

WORK ORDER to the Agreement dated March 11, 2024 by and between Lower Cape Fear Water and Sewer Authority (the “Client”) and First Tryon Advisors, LLC (the “Advisor”).

SERVICES

The Advisor will provide the following Services under this Work Order related to quarterly update meetings:

- Evaluate and provide a detailed analysis of the Client’s existing financial condition, credit profile and debt portfolio.
- Advise the Client with respect to its existing accounts and available investment pool alternatives.
- Assist the Client in clarifying its financing objectives and identifying potential financing structures, including detailed comparative analysis of alternatives to assist the Client in quantifying trade-offs and risks associated with each option.
- Advise the Client with respect to current market conditions, rating agency methodologies and changes to the regulatory environment as they relate to the issuance of tax-exempt debt.
- As requested, provide periodic updates and recommendations to the Client’s Board.

TERM

The term with respect to the Services to be performed under this Work Order shall end 30 days after the completion of the Services described above, unless terminated earlier in accordance with the Agreement.

COMPENSATION

In establishing fees, the Advisor considers multiple factors, including the efficiency with which the work was done, the result achieved, the complexity of the matter and any special experience or expertise applied to it, any extraordinary scheduling or preemptive attention devoted to the project, and the degree of professional responsibility or liability undertaken by the firm.

For services to be performed in connection with this Work Order, the Advisor shall be compensated as follows:

- An annual fee of **\$10,000**, paid in quarterly installments of **\$2,500** billed on January 1, April 1, July 1, and October 1, beginning on July 1, 2024.
- Beginning July 1, 2025, the fee is subject to annual adjustment based on CPI.

Such fees may vary if (1) the contemplated assignment changes materially during the course of the Term or (2) unusual or unforeseen circumstances arise which require a significant increase in the type or scope of the Advisor’s responsibilities. The Advisor will consult with the Client if at any time the Advisor believes that circumstances require an adjustment to its fees.

In addition to the compensation outlined above, the Client will reimburse the Advisor for out-of-pocket expenses incurred in connection with the Services. Customary out-of-pocket expenses include, without limitation, costs of travel, meals, lodging, printing/copying, etc. The Advisor will bill the Client for such expenses at cost, with no mark-up. The Advisor will not bill the Client for indirect costs such as telephone, fax, and conference call services; instead, the Client will pay the Advisor an administrative expense fee equal to 4% of any invoiced fee for Services as reimbursement for costs not reasonably allocable on a client-by-client basis.

Lower Cape Fear Water and Sewer Authority
Work Order Number 1
April 24, 2024
Page 2 of 2


AGREED AND ACCEPTED this _____ day of _____, 2024:

**LOWER CAPE FEAR WATER AND SEWER
AUTHORITY**

By: _____
Name: _____
Title: _____

FIRST TRYON ADVISORS, LLC

By:  _____
Name: Amy Vitner
Title: Managing Director

By:  _____
Name: J. Walter Goldsmith
Title: President & COO

This instrument has been pre-audited in the manner required by the Local Government Budget and Fiscal Control Act, this the ____ day of _____, 20____

Finance Office, Lower Cape Fear Water & Sewer Authority

NEW BUSINESS (NB1)

**Lower Cape Fear Water & Sewer
Authority**

AGENDA ITEM

To: CHAIRMAN KNIGHT AND BOARD MEMBERS

From: TIM H. HOLLOMAN, EXECUTIVE DIRECTOR

Date: May 13, 2024

Re: FY 2024-2025 Draft Fiscal Year Budget

Reviewed and approved as to form: MATTHEW A. NICHOLS, AUTHORITY ATTORNEY

Background: The Finance Committee has met and reviewed drafts since March and recommend the FY 2024-2025 Budget as presented during the Public Hearing for consideration for approval on June 17th, 2024.

Action Requested: For information purposes.

ANNUAL BUDGET

Fiscal Year 2024 - 2025



LOWER CAPE FEAR WATER & SEWER AUTHORITY
1107 NEW POINTE BLVD., SUITE 17
LELAND, NORTH CAROLINA 28451

AUTHORITY BOARD OF DIRECTORS

HARRY KNIGHT, CHAIRMAN

PATRICK DEVANE, VICE CHAIRMAN

SCOTT PHILLIPS, SECRETARY

AL LEONARD, TREASURER

CHARILE RIVENBARK, ASSISTANT TREASURER

NORWOOD BLANCHARD

WAYNE EDGE

JACKIE NEWTON

BILL SAFFO

CHRIS SMITH

WILLIAM SUE

PHIL TRIPP

FRANK WILLIAMS

ROB ZAPPLE

NEW HANOVER COUNTY

BLADEN COUNTY

BRUNSWICK COUNTY

COLUMBUS COUNTY

CITY OF WILMINGTON

PENDER COUNTY

BLADEN COUNTY

PENDER COUNTY

CITY OF WILMINGTON

COLUMBUS COUNTY

BRUNSWICK COUNTY

BRUNSWICK COUNTY

BRUNSWICK COUNTY

NEW HANOVER COUNTY

TIM HOLLOMAN, EXECUTIVE DIRECTOR

DANIELLE HERTZOG, ADMINISTRATIVE ASSISTANT

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June 17, 2024

Harry Knight and Directors:

I am pleased to present the FY 2024-2025 Budget for the Lower Cape Fear Water and Sewer Authority for your review and consideration. The enclosed FY 24-25 Budget has been prepared in accordance with the North Carolina General Statute 159 Article 3, entitled "*The Local Government Budget and Fiscal Control Act.*"

The Public Hearing on the annual budget was held during the regularly scheduled monthly meeting of the Authority Board at 9:00 AM on Monday, May 13, 2024, in the conference room of the Authority's offices located at 1107 New Pointe Boulevard, Suite 17, Leland, North Carolina.

Legal notice of the public hearing on the budget was published on April 24, May 1, and May 8, 2024, in accordance with the General Statutes.

The Authority's annual budget outlines the revenues that the Authority expects to receive during the fiscal year and outlines the expenditures expected to be made during the fiscal year. The core business of the Authority is providing raw water from the Cape Fear River to the Authority's customers. The Authority also continues to work with Smithfield Foods in the operation of the Bladen Bluffs Regional Water Treatment Plant.

The region served by the Authority continues to be one of the fastest-growing regions in the nation. The counties served by the Authority have increased in population from 456,941 in 2010 to an estimated population of 545,634 in 2022. This represents a 20% increase in the number of people served by the Authority's customers.

FY 23-24 ACCOMPLISHMENTS

Rate Study completed and approved.

Funds received for the last 3 miles of line and the initial reservoir study.

On going work for the 10-mile parallel line project, now broken into three phases to utilize partner State Revolving loan funds and other funding for the maximum benefit and project schedule advancement.

Engaged First Tryon as the Authority's Financial Advisor.

Upgrading Financial Management System from QuickBooks to Southern Software
Reroofing on the original plant started this Fiscal Year.

Completed Preliminary Engineering Evaluation on the Reservoir.

CAPITAL IMPROVEMENT PLAN ALIGNED WITH RATES

The Authority continues to align the CIP with adequate rates to stabilize various funds and levels and anticipate unexpected emergencies and long-term needs. The Long-Range Planning Committee approved a rate policy aligned with construction, refurbishment, and expansion needs.

FISCAL YEAR 2024-2025 FUND DESCRIPTION

The Authority maintains five funds. The funds and their purposes are as follows:

BLADEN BLUFFS OPERATING FUND

While the Authority owns the Bladen Bluffs Regional Water Treatment Plant and is responsible for the debt associated with its construction, Smithfield Foods operates the facilities and pays all costs related to their operation, including the debt service. The Authority receives the bills related to the facility's operation, pays the vendors, and then submits a consolidated statement to Smithfield Foods monthly per the December 19, 2009, Agreement.

The debt service principal for the Bladen Bluffs Regional Water Treatment Plant for FY 24-25 is \$1,035,000.00, to be paid in December 2024. The interest rate on the remaining principal is variable, and based on current interest rates, it is estimated that \$500,000 in interest will be paid.

In FY 24-25, expenditures by Smithfield on the operation of the Bladen Bluffs Regional Water Treatment Plant are expected to be \$5,570,183.

The Authority charges approximately 30% of the personnel costs and direct costs to Smithfield in recognition of personnel's work performed on Bladen Bluffs Regional Water Treatment Plant-related issues such as accounts payable, expenditure accounting, and capital project management. Smithfield pays its proportionate share of other direct costs, such as insurance and audits.

KINGS BLUFF OPERATING FUND

REVENUES

In FY 24-25, the projected water revenues reflect an increase of 9 % over the FY 23-24 projections. The projected water demand for FY 23-24 is 10.78 billion gallons or 29.39 million gallons per day (mgd). By Board approval, the raw water rate increases in FY 24-25 to \$0.4400 per 1,000 gallons for governmental partners and to \$0.88 for Industrial customers. This rate and the projected flow will generate \$4,720,602.00 in operating revenue.

EXPENDITURES

The Authority owns the Kings Bluff Raw Water Pump Station and associated transmission system. While the Authority contracts with Brunswick County for the daily operation of the station, the Authority is responsible for paying for several direct costs associated with station operation, such as electric charges from Duke Energy, fuel costs related to the main generators, debt service on capital improvements, and significant capital expenditures for repairs of station equipment.

In FY 24-25, costs associated with the Operations and Maintenance by Brunswick County are recommended to increase from \$696,990 to \$736,811. The increase is due to salary, benefits, and right-of-way maintenance.

In FY 24-25, the cost of operating the Kings Bluff Pump Station is \$4,252,174. This year, the Operating Fund will transfer \$52,000 to Renewal and Replacement and nothing to the Enterprise Fund. \$2,685,000 million in capital funds will be expended for various projects, with approximately \$2,180,000.00 on the air back wash and walkway replacement. \$20,000,000 will be spent on the three-phase, 10-mile parallel line project.

RENEWAL AND REPLACEMENT FUND

The purpose of this fund is to pay the cost of equipment that needs to be replaced at the Kings Bluff Pump Station. In FY 24-25, this fund will appropriate \$104,534 towards the Air Backwash/Walkway replacement. If revenues allow, operational funds will cover this expense without an appropriation. An anticipated transfer from the Operational Fund of \$52,000 will bring the R & R fund up to \$1,292,085 by the end of FY 24-25. Also, we project the possibility of using \$104,534 for the Air Backwash/Walkway, depending on Operating receipts at the time of

construction. Over ten years, the projected balance should be \$5,000,000 at a minimum and adjusted for inflation.

ENTERPRISE FUND

The Enterprise Fund is the primary source of funds for capital projects and major repairs. No projects are budgeted for this fund in FY 24-25. The balance of this fund is \$494,823. Over ten years, the projected balance should be \$10,000,000 at a minimum. Annual allocations to this fund need to be in the range of \$400,00 to \$500,000 annually to reach 50% of the projected need.

RIGHT OF WAY FUND

The Right of Way Maintenance Fund was funded by a developer and will be used to repair the roadway constructed with the Authority's easement in Brunswick County. We do not anticipate any expenditure from this fund in FY 24-25.

CONCLUSION

I want to thank the Finance Committee and the Board for supporting and recognizing the resources needed to keep the Authority moving forward. I would also like to express special appreciation to our Financial Administrative Assistant for her attention to detail with Authority funds. Emergency preparedness is a focal point for our Board of Directors, are working to ensure the entire length of the raw water pipeline is redundant, allowing customers peace of mind regarding supply. In addition, enhancing the Authority's Financial position is a critical factor in fulfilling capital obligations to our partners and the communities they serve. Furthermore, planning to accommodate future growth and promoting business retention and recruitment to the Cape Fear Region is a top concern for the Board. Recognition also goes to our partners and Board for their continued efforts to secure funding for our larger capital projects in addition to rate revenue.

Respectfully Submitted,

Tim H. Holloman
Executive Director



BUDGET ORDINANCE

FY 2024-2025

Lower Cape Fear Water & Sewer Authority

BE IT ORDAINED by the Governing Board of the Lower Cape Fear Water & Sewer Authority:

Section 1: The following amounts are hereby appropriated in the **Operating Fund** for the operation of the Authority and its activities for the fiscal year beginning July 1, 2024, and ending June 30, 2025:

APPROPRIATIONS

Administration	\$951,748
Operating Expenses	
Sales Tax Expense	105,000
Operating Capital Expense	2,685,000
Bladen Bluffs Expense	3,821,385
Utilities/Energy – Kings Bluff Pump Station	775,363
O&M Expense – Kings Bluff	736,811
Transfer to R&R - Kings Bluff R&R Expense	55,000
Transfer to Enterprise	0
Series 2010 Revenue Bond-Principal Expense (BB)	1,035,000
Series 2010 Revenue Bond-Interest Expense (BB)	500,000
SRF/ARPA	<u>20,000,000</u>

TOTAL APPROPRIATIONS

\$30,655,307

Section 2: It is estimated the following revenues will be available in the **Operating General Fund** for the fiscal year beginning July 1, 2024, and ending June 30, 2025:

REVENUES

Operating Revenues

Brunswick County	\$2,522,662
Cape Fear Public Utility Authority	1,835,996
Pender County	256,344
Hwy 421	88,000
Praxair	17,600
Bladen Bluffs Revenue	5,570,183
Bladen Bluffs Admin Reimbursement	119,988
Sales Tax Refund	105,000

Non-Operating Revenues

Interest	45,000
Other Revenue	0
Bladen Bluffs FEMA Admin Reimbursement	0
Renewal and Replacement Fund Appropriated	104,534
SRF/ARPA	<u>20,000,000</u>

TOTAL REVENUES

30,655,307

Section 3: The Board of Directors of the Lower Cape Fear Water & Sewer Authority hereby establishes a raw water rate of \$0.4000 per 1,000 gallons as of July 1, 2023, for raising the necessary revenue to balance the appropriations noted in Section 1.

Section 4: The following amount is hereby appropriated in the **Operating General Fund** for the fiscal year beginning July 1, 2023, and ending June 30, 2024:

APPROPRIATIONS

Operating General Fund – Appropriated for Future Expenditures	\$ 3,635,215
TOTAL APPROPRIATIONS	\$ 3,635,215

Section 5: It is estimated the following revenue will be available in the **Operating General Fund** for the fiscal year beginning July 1, 2023, and ending June 30, 2024:

REVENUES

Operating General Fund - Fund Balance	\$ 3,635,215
TOTAL ESTIMATED REVENUES	\$ 3,635,215

Section 6: The following amount is hereby appropriated in the **Enterprise Fund** for the fiscal year beginning July 1, 2023, and ending June 30, 2024:

APPROPRIATIONS

Enterprise Fund - Reserve for Future Expenditures	\$ 494,823
TOTAL APPROPRIATIONS	494,823

Section 7: It is estimated the following revenue will be available in the **Enterprise Fund** for the fiscal year beginning July 1, 2023, and ending June 30, 2024:

REVENUES

Enterprise Fund - Fund Balance Appropriated	\$ 494,823
TOTAL ESTIMATED REVENUES	\$ 494,823

Section 8: The following amounts are hereby appropriated in the **Renewal and Replacement Fund (R&R)** for the fiscal year beginning July 1, 2023, and ending June 30, 2024:

APPROPRIATIONS

R&R - Reserve for Future Expenditures	\$ 1,240,084
R&R - Kings Bluff R&R Expense	52,000
TOTAL APPROPRIATIONS	\$ 1,295,084

Section 9: It is estimated the following revenues will be available in the **Renewal and Replacement Fund** for the fiscal year beginning July 1, 2023, and ending June 30, 2024:

REVENUES

R&R - Fund Balance Appropriated	\$ 1,240,084
Transfer In from Operating Fund	52,000
TOTAL ESTIMATED REVENUES	\$ 1,295,084

Section 10: The following amount is hereby appropriated in the **Right of Way Maintenance Fund** for the fiscal year beginning July 1, 2023, and ending June 30, 2024:

APPROPRIATIONS

Right of Way Fund - Reserve for Future Expenditures	\$ 281,479
TOTAL APPROPRIATIONS	\$ 281,479

Section 11: It is estimated the following revenue will be available in the **Right of Way Maintenance Fund (ROW)** for the fiscal year beginning July 1, 2023, and ending June 30, 2024:

REVENUES

ROW - Fund Balance Appropriated	\$ 281,479
TOTAL ESTIMATED REVENUES	\$ 281,479

Section 10: Copies of this Budget Ordinance shall be furnished to the Finance Officer to be kept on file for direction in the disbursement of funds. This budget acknowledges and approves any transfers between funds expected as revenue from one fund or account specifically in reference to the Bladen Bluffs Administrative transfers as reflected in this budget and any funds in associated Kings Bluff Funds, including the Revenue and Replacement Fund, Enterprise Fund, and Right of Way Fund.

Adopted this 17th day of June 2024

Harry Knight, Chairman

ATTEST:

Scott Phillips, Secretary

LOWER CAPE FEAR WATER AND SEWER AUTHORITY
FISCAL YEAR 2024-2025 BUDGET

ACCOUNT NO	REVENUES	FY 22-23 APPROVED BUDGET	FY 22-23 ACTUALS	FY 23-24 AMENDED BUDGET	FY 23-24 ACTUAL 03/31/2024	PROPOSED FY 24-25 BUDGET		FY 24-25 TOTAL COMBINED BUDGET
						KINGS BLUFF	BLADEN BLUFFS	
	OPERATING							
3001-01	Brunswick County	\$ 1,606,437	\$ 2,050,591	\$ 1,908,193	\$ 1,468,856	\$ 2,522,662	\$ -	\$ 2,522,662
3002-01	Cape Fear Public Utility Authority	\$ 2,869,315	\$ 2,980,055	\$ 1,652,562	\$ 1,203,832	\$ 1,835,996	\$ -	\$ 1,835,996
3003-03	Pender County	\$ 551,428	\$ 552,787	\$ 234,160	\$ 172,881	\$ 256,344	\$ -	\$ 256,344
3004-01	Stepan/Invista	\$ 141,566	\$ 209,855	\$ 100,000	\$ 90,819	\$ 88,000	\$ -	\$ 88,000
3005-01	Praxair, Inc	\$ 61,179	\$ 68,649	\$ 40,784	\$ 11,314	\$ 17,600	\$ -	\$ 17,600
3006-01	Bladen Bluffs Reimbursement for Plant Operation Costs	\$ 4,673,818	\$ 5,169,651	\$ 4,938,603	\$ 4,588,246	\$ -	\$ 5,570,183	\$ 5,570,183
3006-02	Bladen Bluffs Administrative Reimbursement	\$ 102,190	\$ 139,090	\$ 110,473	\$ 119,066	\$ 119,988	\$ -	\$ 119,988
3007-01	Sales Tax Refund	\$ 100,000	\$ 114,314	\$ 100,000	\$ 106,041	\$ -	\$ 105,000	\$ 105,000
	Subtotal	\$ 10,105,933	\$ 11,284,992	\$ 9,084,775	\$ 7,761,055	\$ 4,840,590	\$ 5,675,183	\$ 10,515,773
	Non-Operating							
3105-01	Interest	\$ 500	\$ 1,969	\$ 9716	\$ 44,609	\$ 45,000	\$ -	\$ 45,000
3120-01	Other Revenue (Insurance Proceeds/Refunds/FEMA)	\$ -	\$ 11,838	\$ -	\$ 729	\$ -	\$ -	\$ -
3125-01	Federal Tax Subsidy	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3156-00	Rental House Income	\$ -	\$ 16,047	\$ -	\$ -	\$ -	\$ -	\$ -
3170-01	Transfer In	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3900-01	Renewal and Replacement Fund Appropriated	\$ -	\$ -	\$ -	\$ -	\$ 104,534	\$ -	\$ 104,534
3900-02	SRF/ARPA	\$ 1,900,000	\$ 1,596,733	\$ 2,500,000	\$ 1,024,421	\$ 20,000,000	\$ -	\$ 20,000,000
2900-00	Fund Balance Appropriated	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	Subtotal	\$ 1,900,500	\$ 1,626,587	\$ 2,509,716	\$ 1,069,759	\$ 20,149,534	\$ -	\$ 20,149,534
	TOTAL REVENUES	\$ 12,006,433	\$ 12,911,579	\$ 11,594,491	\$ 8,830,814	\$ 24,990,124	\$ 5,675,183	\$ 30,665,307

LOWER CAPE FEAR WATER AND SEWER AUTHORITY
FISCAL YEAR 2024-2025 BUDGET

ACCOUNT NO.	EXPENDITURES	FY 22-23 APPROVED BUDGET	FY 22-23 ACTUALS	FY 23-24 AMENDED BUDGET	FY 23-24 ACTUAL 03/31/2024	PROPOSED FY 24-25 BUDGET		FY 24-25 TOTAL COMBINED BUDGET
						KINGS BLUFF	BLADEN BLUFFS	
	Administration							
4001-01	Salaries	\$ 187,024	\$ 149,791	\$ 203,530	\$ 151,335	\$ 155,418	\$ 66,608	\$ 222,026
4010-01	Per Diem and Mileage Board Members	\$ 62,500	\$ 46,079	\$ 64,001	\$ 41,236	\$ 45,133	\$ 19,343	\$ 64,476
4012-01	Vehicle Allowance	\$ 5,200	\$ 4,400	\$ 5,200	\$ 4,000	\$ 3,640	\$ 1,560	\$ 5,200
4019-01 & 4024-01	FICA Taxes	\$ 19,542	\$ 15,193	\$ 20,953	\$ 14,971	\$ 15,774	\$ 6,760	\$ 22,534
4029-01	Retirement	\$ 22,462	\$ 16,198	\$ 26,153	\$ 18,423	\$ 21,137	\$ 9,059	\$ 30,196
4035-01	401K Plan	\$ 5,311	\$ 4,426	\$ 11,312	\$ 8,022	\$ 8,695	\$ 3,727	\$ 12,422
4036-01	Miscellaneous Payroll Expenses	\$ 2,900	\$ 2,288	\$ 2,900	\$ 2,287	\$ 2,900	\$ -	\$ 2,900
4038-01	Group Insurance	\$ 38,074	\$ 26,818	\$ 40,176	\$ 28,501	\$ 29,810	\$ 12,776	\$ 42,586
4039-01	Property and Liability Insurance	\$ 94,301	\$ 99,948	\$ 103,734	\$ 83,442	\$ 85,322	\$ 36,566	\$ 121,888
4046-00	Professional Services General	\$ 15,000	\$ -	\$ 3,800	\$ -	\$ 10,500	\$ 4,500	\$ 15,000
4046-01	Attorney	\$ 45,000	\$ 36,246	\$ 50,000	\$ 27,787	\$ 35,000	\$ 15,000	\$ 50,000
4047-01	Auditor	\$ 9,000	\$ 5,400	\$ 8,200	\$ 8,200	\$ 5,600	\$ 2,400	\$ 8,000
4048-01	Engineer	\$ 245,041	\$ 149,737	\$ 290,000	\$ 38,859	\$ 150,000	\$ 25,000	\$ 175,000
4049-01	Information Technology	\$ 14,000	\$ 1,333	\$ 50,428	\$ 15,499	\$ 17,500	\$ 7,500	\$ 25,000
4050-01	Financial Advisor					\$ 7,000	\$ 3,000	\$ 10,000
4055-01	Office Maintenance/Repair/Common Charge	\$ 23,903	\$ -	\$ 24,000	\$ 12,485	\$ 40,000	\$ -	\$ 40,000
4058-01	Office Utilities	\$ 5,000	\$ 1,600	\$ 5,000	\$ 1,513	\$ 3,500	\$ -	\$ 3,500
4059-01	Office Expenses (telephone, Printing, Adv)	\$ 16,000	\$ 31,430	\$ 14,000	\$ 10,794	\$ 15,000	\$ -	\$ 15,000
4062-01	Office Equipment	\$ 12,000	\$ 14,748	\$ 26,000	\$ 250	\$ 25,000	\$ -	\$ 25,000
4064-01	Printing and Advertising	\$ 6,500	\$ 5,241	\$ 8,000	\$ 4,630	\$ 8,000	\$ -	\$ 8,000
4065-01	Telephone and Internet	\$ 3,500	\$ 2,624	\$ 3,500	\$ 2,405	\$ 3,500	\$ -	\$ 3,500
4070-01	Travel and Training	\$ 33,000	\$ 25,222	\$ 29,000	\$ 18,901	\$ 29,000	\$ -	\$ 29,000
4070-20	Phone Allowance	\$ 520	\$ 440	\$ 520	\$ 400	\$ 520	\$ -	\$ 520
4075-01	Vehicle Expense	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4080-01	Miscellaneous Expense	\$ 23,000	\$ 18,218	\$ 20,000	\$ 12,310	\$ 20,000	\$ -	\$ 20,000
	Subtotal	\$ 888,777	\$ 657,378	\$ 1,010,407	\$ 506,250	\$ 737,950	\$ 213,798	\$ 951,748
	Operating							
4501-01	Sales Tax Expense	\$ 100,000	\$ 87,704	\$ 100,000	\$ 104,520	\$ -	\$ 105,000	\$ 105,000
4510-01	Bladen Bluffs O & M	\$ 3,315,596	\$ 2,742,958	\$ 3,324,385	\$ 2,984,733	\$ -	\$ 3,821,385	\$ 3,821,385
4515-01	Bladen Bluffs Hurricane Florence	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4520-01	Utilities/Energy Kings Bluff	\$ 730,336	\$ 599,221	\$ 786,589	\$ 540,246	\$ 775,363	\$ -	\$ 775,363
4530-01	Contract O & M Kings Bluff	\$ 549,822	\$ 358,284	\$ 686,749	\$ 309,896	\$ 736,811	\$ -	\$ 736,811
4537-01	O&M Kings Booster Pump Bluff Pump Station	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4541-01	Combined Enterprise Funded Series 2010 Principal	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4542-01	Combined Enterprise Funded Series 2010 Interest	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4543-01	Combined Enterprise System Ref Series 2012 Principal	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4544-01	Combined Enterprise System Ref Series 2012 Interest	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

LOWER CAPE FEAR WATER AND SEWER AUTHORITY

FISCAL YEAR 2024-2025 BUDGET

4545-01	Bladen Buffs Debt Service Principal	\$ 910,000	\$ 910,000	\$ 970,000	\$ 970,000	\$ -	\$ 1,035,000	\$ 1,035,000
4546-01	Bladen Buffs Debt Service Interest	\$ 256,998	\$ 347,154	\$ 450,000	\$ 351,436	\$ -	\$ 500,000	\$ 500,000
	Operating Capital Expense	\$ 2,846,069	\$ 2,219,441	\$ 1,286,360	\$ 83,593	\$ 2,685,000	\$ -	\$ 2,685,000
4998-05	Transfer to R&R - Kings Bluff R&R Expense	\$ 250,000	\$ 150,000	\$ 380,000	\$ 380,000	\$ -	\$ -	\$ -
	Transfer to R&R - Industrial					\$ 55,000		\$ 55,000
4998-06	Transfer to Enterprise Fund	\$ -	\$ 100,000	\$ 100,000	\$ 100,000		\$ -	\$ -
2041-01	421 Relocation New Hanover County Loan Principal	\$ 258,835	\$ 258,835	\$ -	\$ -		\$ -	\$ -
5180-00	SRF/7 mile parallel line expenditures			\$ 2,500,000	\$ 1,698,417	\$ 20,000,000		\$ 20,000,000
	Subtotal	\$ 9,217,656	\$ 7,773,597	\$ 10,584,083	\$ 7,522,841	\$ 24,252,174	\$ 5,461,385	\$ 29,713,559
	TOTAL EXPENDITURES	\$ 10,106,433	\$ 8,430,975	\$ 11,594,490	\$ 8,029,091	\$ 24,990,124	\$ 5,675,183	\$ 30,665,307

WATER REVENUE ESTIMATES AND WATER RATE CALCULATION

Raw Water Customer	FLOWS			
	FY 22-23 Actual	FY 23-24 Projected	FY 23-24 Actual (as of 03-31-2024)	FY 24-25 Projected
Brunswick County	5,696,086	4,762,839	3,673,668	5,733,322
CFPUA	4,309,296	4,131,405	3,009,580	4,172,719
Pender County	580,590	586,200	432,202	582,600
Stephan	410,855	232,500	227,048	200,000
Praxair	26,569	101,960	28,283	40,000
	11,023,396	9,814,904	7,370,781	10,728,641

Raw Water Customer	REVENUES			
	FY 22-23 Actual	FY 23-24 Projected	FY 23-24 Actual (as of 03-31-2024)	FY 24-25 Projected
RATE PER 1,000 GALLONS	\$ 0.3600	\$ 0.4000	\$ 0.4000	\$ 0.4400
Brunswick County	\$ 2,050,591	\$ 1,905,136	\$ 1,469,467	\$ 2,522,662
CFPUA	\$ 1,551,347	\$ 1,652,562	\$ 1,203,832	\$ 1,835,996
Pender County	\$ 209,012	\$ 234,480	\$ 172,881	\$ 256,344
	\$ 3,810,950	\$ 3,792,178	\$ 2,846,180	\$ 4,615,002
RATE PER 1,000 GALLONS	\$ 0.3600	\$ 0.4000	\$ 0.4000	\$ 0.8800
Stepan	\$ 147,908	\$ 93,000	\$ 90,819	\$ 88,000
Praxair	\$ 9,565	\$ 40,784	\$ 11,313	\$ 17,600
	\$ 157,473	\$ 133,784	\$ 102,132	\$ 105,600
Combined Total	\$ 3,968,423	\$ 3,925,962	\$ 2,948,312	\$ 4,720,602

KINGS BLUFF EXPENSES	
ADMINISTRATION	\$ 737,950
OPERATING INCLUDING DEBT SERVICE	\$ 24,252,174
TOTAL EXPENSES	\$ 24,990,124

KINGS BLUFF REVENUES	
WATER SALES BASED ON CURRENT RATE	\$ 4,720,602
OTHER REVENUES	\$ 119,988
TOTAL REVENUES	\$ 4,840,590

BRUNSWICK COUNTY

PROJECTED WATER USE

FOR JULY 1, 2024 THROUGH JUNE 30, 2025

WATER RATE OF \$0.44 / 1,000 GALLONS

Month	Estimated Usage	Cumulative Total
July 2023	542,689,100.00	542,689,100.00
August	515,406,200.00	1,058,095,300.00
September	463,498,800.00	1,521,594,100.00
October	456,231,600.00	1,977,825,700.00
November	368,382,000.00	2,346,207,700.00
December	347,491,200.00	2,693,698,900.00
January 2024	351,065,300.00	3,044,764,200.00
February	351,065,300.00	3,395,829,500.00
March	368,382,000.00	3,764,211,500.00
April	456,231,600.00	4,220,443,100.00
May	515,406,200.00	4,735,849,300.00
June	476,261,200.00	5,212,110,500.00
TOTAL	5,212,110,500.00	
Annual Daily Average:	14,279,754.79	Annual Revenue
	\$	2,293,328.62

CAPE FEAR PUBLIC UTILITY AUTHORITY

PROJECTED WATER USE

FOR JULY 1, 2024 THROUGH JUNE 30, 2025

WATER RATE OF \$0.44 / 1,000 GALLONS

Month	Estimated Usage	Cumulative Total
July 2022	296,726,688.00	296,726,688.00
August	307,029,698.00	603,756,386.00
September	330,726,621.00	934,483,007.00
October	325,575,116.00	1,260,058,123.00
November	253,454,046.00	1,513,512,169.00
December	371,938,661.00	1,885,450,830.00
January 2023	427,574,915.00	2,313,025,745.00
February	383,271,972.00	2,696,297,717.00
March	444,059,731.00	3,140,357,448.00
April	414,181,002.00	3,554,538,450.00
May	325,575,116.00	3,880,113,566.00
June	292,605,484.00	4,172,719,050.00
TOTAL	4,172,719,050.00	
Annual Daily Average:	11,432,106.99	Annual Revenue \$ 1,835,996.38

PENDER COUNTY
PROJECTED WATER USE
FOR JULY 1, 2024 THROUGH JUNE 30, 2025
WATER RATE OF \$0.44 / 1,000 GALLONS

Month	Estimated Usage	Cumulative Total
July 2022	50,680,000.00	50,680,000.00
August	50,750,000.00	101,430,000.00
September	51,230,000.00	152,660,000.00
October	50,390,000.00	203,050,000.00
November	46,490,000.00	249,540,000.00
December	47,410,000.00	296,950,000.00
January 2023	46,560,000.00	343,510,000.00
February	41,910,000.00	385,420,000.00
March	46,970,000.00	432,390,000.00
April	47,910,000.00	480,300,000.00
May	51,720,000.00	532,020,000.00
June	50,580,000.00	582,600,000.00
TOTAL	582,600,000.00	
Annual Daily Average:	1,596,164.38	\$ 256,344.00
		Annual Revenue

PERSONNEL COST

Employee	Adopted FY 23-24	Salary	Proposed FY 24-25	Notes
Executive Director	\$	131,442.30	\$ 139,986.05	4% COLA/2.5% Merit
Administrative Assistant	\$	62,948.55	\$ 67,040.21	4% COLA/2.5% Merit
Part-Time	\$	10,000.00	\$ 15,000.00	
	\$	204,390.85	\$ 222,026.26	
Board				
Board Per Diem and Mileage	\$	64,001.00	\$ 64,475.94	
		FICA		
Executive Director	\$	11,238.32	\$ 11,968.81	8.55 % of Salary
Administrative Assistant	\$	5,382.10	\$ 5,731.94	8.55 % of Salary
Part-Time	\$	855.00	\$ 1,282.50	8.55% of Salary
Board Members	\$	3,550.95	\$ 3,550.95	8.55% of Salary
	\$	21,026.37	\$ 22,534.19	
		Retirement		
Executive Director	\$	15,786.22	\$ 19,038.10	13.60%
Part-Time	\$	7,560.12	\$ 2,040.00	
Administrative Assistant	\$	1,201.00	\$ 9,117.47	13.60%
	\$	24,547.34	\$ 30,195.57	
		Health Insurance		
Executive Director	\$	20,088.00	\$ 21,293.00	
Administrative Assistant	\$	20,088.00	\$ 21,293.00	
	\$	40,176.00	\$ 42,586.00	
		401 K Contribution		
Executive Director	\$	7,886.54	\$ 8,399.16	6.0% of the salary
Administrative Assistant	\$	3,776.91	\$ 4,022.41	6.0% of the salary
	\$	11,663.45	\$ 12,421.58	

BOARD MEMBER COST

Board Member Salaries and Mileage Reimbursement

Salary for Board Member per meeting	\$	300
Salary for Chairman Per Board Meeting	\$	330
Total Salary Costs	\$	50,760.00 Based upon 12 meetings per year
Current Board Total Mileage		875
Current IRS Mileage Rate	\$	0.670 per mile
Total Mileage Cost Per Year	\$	7,035.00
Total for Budget	\$	57,795.0
Round to \$50,000 increase of committee meetings outside of normal meetings		
Social Security	\$	3,883
Breakfast	\$ 233.15 per month	\$ 2,797.80
		\$ 64,475.9

BLADEN BLUFFS ADMINISTRATIVE COST CALCULATION

Employee	Allocation		Bladen Bluffs Allocation
SALARY			
Executive Director		\$ 139,986.05	
Administrative Assistant		\$ 67,040.21	
Part Time		\$ 15,000.00	
		<u>\$ 222,026.26</u>	\$66,607.88
Board Per Diem, Mileage and Expense		\$64,475.94	\$19,342.78
VEHICLE & CELL PHONE ALLOWANCE			
Executive Director - Vehicle		\$5,200.00	
Executive Director - Cell phone		<u>\$520.00</u>	
		\$5,720.00	\$1,716.00
FICA			
Executive Director		\$11,968.81	
Administrative Assistant		\$5,731.94	
Part Time		\$1,282.50	
Board Members		<u>\$3,550.95</u>	
		\$22,534.19	\$6,760.26
RETIREMENT			
Executive Director		\$19,038.10	
Part Time		\$2,040.00	
Administrative Assistant		<u>\$9,117.47</u>	
		\$30,195.57	\$9,058.67
401K			
Executive Director		\$8,399.16	
Administrative Assistant		<u>\$4,022.41</u>	
		\$12,421.58	\$3,726.47
HEALTH INSURANCE			
Executive Director		\$21,293.00	
Administrative Assistant		<u>\$21,293.00</u>	
		\$42,586.00	\$12,775.80
		\$ 399,959.54	\$119,987.86

BLADEN BLUFFS ADMINISTRATIVE COST CALCULATION CONTINUED

ATTORNEY	\$	15,000
ENGINEER	\$	25,000
AUDITOR	\$	2,400
INFORMATION TECHNOLOGY	\$	4,800
ADMINISTRATIVE COST FROM FIRST SHEET	\$	<u>119,988</u>
	\$	167,188
INSURANCE PROPERTY & LIABILITY		
Total cost of Property and Liability Insurance is \$94,301		
Bladen Bluffs share is		
based upon percent		
	\$	<u>36,566</u>
Total Annual Admin Cost	\$	203,754

BLADEN BLUFFS OPERATING BUDGET

Bladen Bluffs Budget FY 2023-24	FY 2023-2024	FY 2024-2025
Sales Tax	\$100,000.00	\$105,000.00
Administrative LCFWASA	\$110,000.00	\$213,798.00
Administrative General	\$62,000.00	\$62,000.00
Audit	\$2,800.00	\$2,800.00
Insurance	\$27,500.00	\$36,566.00
Professional Services	\$98,000.00	\$98,000.00
Professional Services Engineering	\$30,000.00	\$25,000.00
Postage	\$810.00	\$1,000.00
Training	\$1,500.00	\$12,500.00
Computer/IT	\$32,000.00	\$43,500.00
Fuel Diesel	\$29,000.00	\$15,000.00
Fuel Gas	\$10,000.00	\$5,000.00
Equipment Rental	\$90,000.00	\$35,207.00
Utilities Water	\$1,000.00	\$1,000.00
Building Maintenance	\$4,400.00	\$12,000.00
Grounds Maint./Landscaping	\$340.00	\$15,000.00
Equipment Maintenance	\$250,000.00	\$200,000.00
Departmental Supplies	\$1,650,253.00	\$1,500,000.00
Departmental Supplies/Parts	\$170,000.00	\$75,000.00
Lab Expenses	\$122,000.00	\$135,000.00
Permitting	\$140,000.00	\$55,000.00
Environmental/Livestock Safety	\$17,000.00	\$15,000.00
Land Application	\$275,000.00	\$275,000.00
Capital Expense	\$40,000.00	\$50,000.00
Capital Reserve General		\$355,000.00
Capital Reserve Vehicle	\$12,000.00	\$39,600.00
Capital Reserve Scada	\$52,000.00	\$99,000.00
Capital Reserve GAC	\$360,000.00	\$435,600.00
Capital Reserve Water and Well	\$148,000.00	\$237,600.00
Debt Service Principal	\$970,000.00	\$1,035,000.00
Debt Service Interest	\$450,000.00	\$500,000.00
Total	\$5,255,603.00	\$5,690,171.00

Add New Expenditure Line Item In Space Below

[illegible]

OPERATING FUND CAPITAL EXPENDITURES AND TRANSFERS	
EQUIPMENT TO BE REPLACED	REPLACEMENT COST
VFD COMPONENT REPLACEMENT	
SCADA	\$ 125,000
VTR PUMP/INSPECT REFURBISH	\$ 200,000
NEW BOWL ASSEMBLY	\$ -
ANTI VORTEXING	\$ 50,000
UPDATE RATE STUDY	\$ -
ROW ACQUISITION	\$ 100,000
MATCHING SRF FUNDING	
FOURTH PUMP	
WALKWAY REPLACEMENT AND AIR BACKWASH	\$ 2,180,000
MISCELLANEOUS	\$ 30,000
TOTAL	\$ 2,685,000

**LOWER CAPE FEAR WATER AND SEWER AUTHORITY
5 YEAR CAPITAL IMPROVEMENT PLAN**

KINGS BLUFF CIP PROJECTS		0.33	0.36	0.4	0.44	0.48	FY 2026 PROJECT TOTALS	
		FY2022	FY2023	FY 2024	FY2025			
INTERMEDIATE BOOSTER PUMP STATION SHELTER	\$	-	\$	-	\$	-	\$	-
SURVEYING	\$	-	\$	-	\$	-	\$	-
VFD	\$	266,875.00	\$	266,875.00	\$	-	\$	533,750.00
VTR PUMP	\$	-	\$	200,000.00	\$	200,000.00	\$	400,000.00
ROW MAINTENANCE	\$	-	\$	35,000.00	\$	65,000.00	\$	230,000.00
ROW CLEARING	\$	-	\$	-	\$	-	\$	-
SCADA UPGRADE	\$	-	\$	-	\$	125,000.00	\$	125,000.00
REBUILD EXISTING HIGH SERVICE PUMP MOTORS/INSPECT	\$	-	\$	275,000.00	\$	-	\$	275,000.00
PURCHASE BOWL ASSEMBLY			\$	250,000.00				
48" PARALLEL LINE LAST 10 MILE SECTION			\$	2,000,000.00	\$	20,000,000.00	\$	35,000,000.00
ANTI VORTEXING	\$	-	\$	50,000.00	\$	50,000.00		\$
INDEPENDENT RATE STUDY	\$	-	\$	57,000.00	\$	-	\$	57,000.00
ROW ACQUISITIONS	\$	-	\$	100,000.00	\$	100,000.00	\$	110,000.00
4TH PUMP	\$	-	\$	225,000.00			\$	225,000.00
REPLACE GENERATOR RADIATORS	\$	-	\$	-	\$	-	\$	-
WALKWAY REPLACEMENT AND AIR BACKWASH BUILDING	\$	-	\$	226,360.00	\$	2,180,000.00	\$	2,406,360.00
48"PCCP Repairs								
VEHICLE REPLACEMENT/ARGO/FORKLIFT	\$	122,000.00	\$	30,000.00	\$	30,000.00	\$	312,000.00
PIG 48" WATER MAIN TO CFPUA/PENDER	\$	-	\$	-			\$	-
TOTALS KINGS BLUFF PROJECTS		\$388,875.00	\$	681,875.00	\$	3,378,360.00	\$22,750,000.00	\$35,175,000.00
KINGS BLUFF CIP-SOURCES		FY 2022	FY2023	FY 2024	FY 2025	Source Totals		
OPERATING CAPITAL	\$	388,875.00	\$	681,875.00	\$	1,321,360.00	\$	2,645,466.00
CAPITAL RESERVES	\$	-	\$	-	\$	-	\$	104,534.00
DEBT PROCEEDS	\$	-	\$	-	\$	-	\$	-
GRANT	\$	-	\$	-	\$	-	\$	20,000,000.00
OTHER SOURCE			\$	2,057,000.00			\$	37,057,000.00
TOTAL KINGS BLUFF SOURCES		\$388,875.00	\$681,875.00	\$3,378,360.00	\$22,750,000.00	\$35,175,000.00	\$62,269,576.00	

AGENDA ITEM

To: CHAIRMAN KNIGHT AND BOARD MEMBERS

From: TIM H. HOLLOMAN, EXECUTIVE DIRECTOR

Date: May 13, 2024

Re: Final Master Planning Document (25 Year Planning Period FY2024-2049)

Reviewed and approved as to form: MATTHEW A. NICHOLS, AUTHORITY ATTORNEY

Background: The proposed CIP budget over the next 25 years has been compiled based on these initiatives. It is recommended that each project be periodically reevaluated, which provides an opportunity to reassess the budget and needs for each. This will allow the Authority to adjust priorities and budgets based on meeting customer needs.

Action Requested: Motion to approve/disapprove



FINAL MASTER PLANNING DOCUMENT

25 Year Planning Period

FY 2024-2049

Updated May 2024

Prepared for:

Lower Cape Fear Water & Sewer Authority
1107 New Pointe Blvd., Ste. 17
Leland, NC 28451

Prepared by:

McKim & Creed, Inc.
243 N. Front St.
Wilmington, NC 28401
M&C Project No. 01675-0042
License F-1222

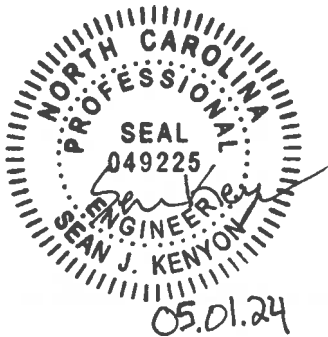


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1. Executive Summary
2. King's Bluff Raw Water Facilities Capital Improvement Project Sheets
 - a. Lower Cape Fear Water and Sewer Authority Projects
 - KB1. New 4th Pump at King's Bluff Raw Water Pumping Station
 - KB2. Rebuild/Refurbish Existing 1600 HP Vertical Turbine Raw Water Pump
 - KB3. New Generators at King's Bluff Raw Water Pumping Station
 - KB4. Pig 48" Pipe from King's Bluff Pump Station to 3 MG Ground Tank
 - KB5. Pig Future 54" Pipe from King's Bluff Pump Station to 3 MG Ground Tank
 - KB6. Walkway and Air Backwash Building Replacement
 - KB7. Replace Raw Water Pumps 1, 4, 5
 - KB8. New Surge Tank at King's Bluff
 - KB9. 5 ROW Acquisitions
 - KB10. 48-Inch PCCP Inspection and Pig – Ground Tank to US-421
 - KB11. 48-Inch PCCP Repairs
 - KB12. 1.3 MW Solar Power Installation
 - b. Cost Sharing Projects
 - ~~CS1. Intermediate Booster Pump Station Shelter*~~
 - ~~CS2. Intermediate Booster Pump Station Upgrade*~~
 - CS3. New 5th Pump at King's Bluff
 - CS4. 20 MG Ground Storage Tank
 - CS5. 7-Mile 48" Parallel Raw Water Main – 3 MG Ground Tank to Pender Vault
 - CS6. 3-Mile 48-Inch Parallel Raw Water Main – Pender Vault to CFPUA Vault
 - CS7. 100 MGD Reservoir

* Note: Projects are no longer required due to expedited schedules of CS5 & CS6
3. King's Bluff Raw Water Facilities Annual Fiscal Year Budget Breakdown
4. Bladen Bluffs Regional Surface Water Facility Capital Improvement Project Sheets
 - BB1. New High Service Pumping Station
 - BB2. Construct New 1 MG Capacity Clearwell
 - BB3. Replace Anthracite Media in the Treatment Plant Filter System
 - BB4. Replace Existing Pumps at Bladen Bluffs Raw Water Pumping Station
 - BB5. Replace Blower in the Blower Building
 - BB6. Replace Existing Pumps at the Recycle Pumping Station
 - BB7. Replace Existing Pumps at the Transfer Pumping Station
 - BB8. Replace Existing Generators at Bladen Bluffs Pumping Station
5. Bladen Bluffs Regional Surface Water Facility Annual Fiscal Year Budget Breakdown
6. Appendix

Executive Summary

I. Kings Bluff Raw Water Facilities

The Authority's proposed 25-year (FY2024-FY2049) Capital Project budget for the Kings Bluff Raw Water Facilities is estimated at approximately \$206M. This includes a 48-inch parallel raw water main from the existing 3 MG ground tank to the US 421 service area that may be required in the future to meet the capacity needs of the US 421 area customers and CFPUA. The cost of this parallel main is estimated at \$61M and is subject to grant funding.

The following summarizes the primary drivers for the 25-year Capital Improvement Plan:

- Increase overall system capacity via new infrastructure and/or parts to meet long term raw water demands.
- Rehabilitate and replace infrastructure as needed to maintain system functionality of raw water pipeline.
- Plan and design system capacity in order to balance the supply with the demands and meet the needs of any potential customers.
- Design and construct maintenance system for pipeline in order to periodically clean pipeline and maintain station capacity.

The largest capital initiatives (over \$1 M) anticipated over the next twenty-five fiscal years is summarized as follows:

- New generators at King's Bluff Raw Water Pumping Station
- Walkway and Air Backwash Building Replacement
- Pig 48" existing water main from King's Bluff Pumping Station to 3 MG ground tank
- Pig future 54" water main from King's Bluff Pumping Station to 3 MG ground tank
- 20 MG Ground Tank
- 100 MG Reservoir
- Install 4th pump at King's Bluff Pumping Station
- Replace existing pumps at King's Bluff Pumping Station
- Install 48" parallel raw water main from 3 MG ground tank to US 421
- New 5th Pump at King's Bluff Pumping Station
- Installation of a new surge tank at the King's Bluff Pumping Station
- 48-Inch PCCP Inspection and Pig – Ground Tank to US421
- 1.3 MW Solar Power Installation

In addition to these large capital initiatives, there are a several projects that are estimated at less than \$1 M, which include:

- Refurbish/rebuild existing pumps
- 5 ROW Acquisitions
- 48-Inch PCCP Repairs

II. Bladen Bluffs Regional Surface Water Facility

The Authority's proposed 25-year (FY2024-FY2049) Capital Project budget for the Bladen Bluffs Regional Surface Water Facility is estimated at approximately \$13.1M. However, it is noted that Smithfield Farmland Company (SFC) provides all operation and maintenance of the Bladen Bluffs Regional Surface Water Treatment Facility. All capital improvements and/or maintenance requirements listed in this document are for recommendation only and are the sole responsibility of SFC. LCFWSA would only be responsible for the recommended projects should LCFWSA assume full operation of the facility from SFC.

The following summarizes the primary drivers for the 25-year Capital Improvement Plan:

- Replace aging infrastructure and parts to meet long term demand
- Plan and design to maintain system capacity to meet current and potential future customer demands

The largest capital initiatives (over \$1 M) anticipated over the next twenty-five fiscal years is summarized as follows:

- New 1 MG Capacity Clearwell
- New High Service Pumping Station

In addition to these large capital initiatives, there are a few projects that are estimated at less than \$1 M, which include:

- Replace Pumps at Raw Water Pumping Station
- Replace Pumps at Recycle Pumping Station
- Replace Pumps at Transfer Pumping Station
- Replace Blower in Blower Building
- Replace On-Site Generators

The proposed CIP budget over the next 25 years has been compiled based on these initiatives. It is recommended that each project be periodically reevaluated, which provides an opportunity to reassess the budget and need for each. This will allow the Authority to adjust priorities and budgets based on meeting customer needs.

III. Capital Projects Evaluations

Each project identified in the CIP was evaluated for the following factors:

1) Category of Need

- Capacity – *the project is needed to either maintain current capacity or increase capacity to meet future need.*
- Renewal/Rehabilitation - *the project is needed to replace or rehabilitate existing infrastructure to maintain capacity and operational readiness.*
- Efficiency- *the project is needed to increase or maintain the efficiency of the facilities and/or to maintain operations.*
- Maintenance – *the project is required for a general maintenance need to maintain equipment and/or facilities in operational condition.*

2) Criticality Score: 1 (Lowest) to 3 (Highest)

The criticality score was developed for each project to provide a summary assessment of impact to operations as a driver for project implementation. Note that criticality levels provided in this document are specific to the fiscal year for which they have been identified.

Criticality Scoring Scale

1	2	3
The need for the project is low and does not fundamentally impact operational readiness	The project has a moderate impact on operations and may provide limited improvement to the facilities	The project is of critical need and will greatly impact operations if not completed.

3) Consequence of No-Action

In addition to the identification of the category and criticality assessment, a “Consequence of No-Action” statement has been included for each project. The intent of this statement is to clarify the impacts to operations, capacity, facility maintenance, etc. that would result if the project were not implemented.

4) Project Raw Water Demands

For capacity related improvements, updated customer projections were taken from the May 2018 Preliminary Design Memorandum for the Lower Cape Fear Water & Sewer Authority Parallel Raw Water Main report. A summary of the projected demands is provided as follows:

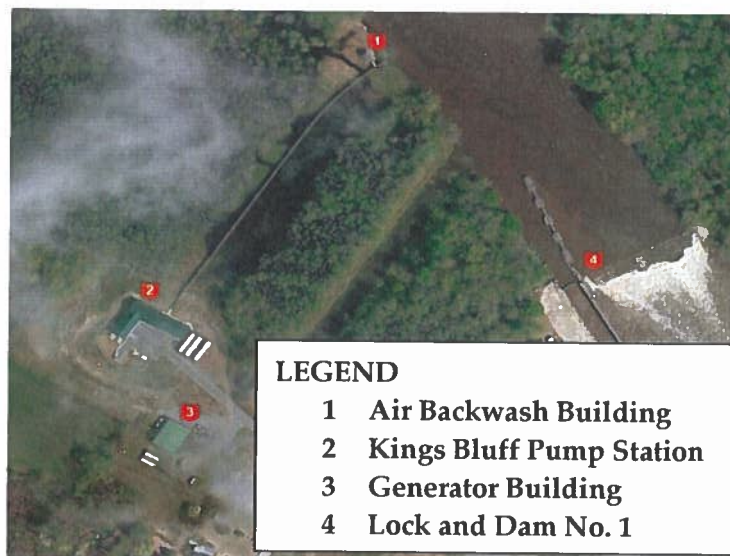
LCFWSA Projected Raw Water Demands

Customer	2015 Demands (MGD)	2025 Demands (MGD)	2035 Demands (MGD)	2045 Demands (MGD)	2055 Demands (MGD)	2062 Demands (MGD)
CFPUA	10.4	13.5	20.5	28.6	34.3	38.2
Brunswick County	19.7	25.1	30.6	36.67	43.89	49.8
US 421 Industries	2.0	2.0	2.0	2.0	2.0	2.0
Pender County	1.1	2.4	4.8	6.0	6.0	6.0
Totals	33.2	43.01	57.9	73.27	87.55	96.0

**Kings Bluff Raw Water Facilities
Capital Improvements
LCFWSA Projects
FY 2024-2049**

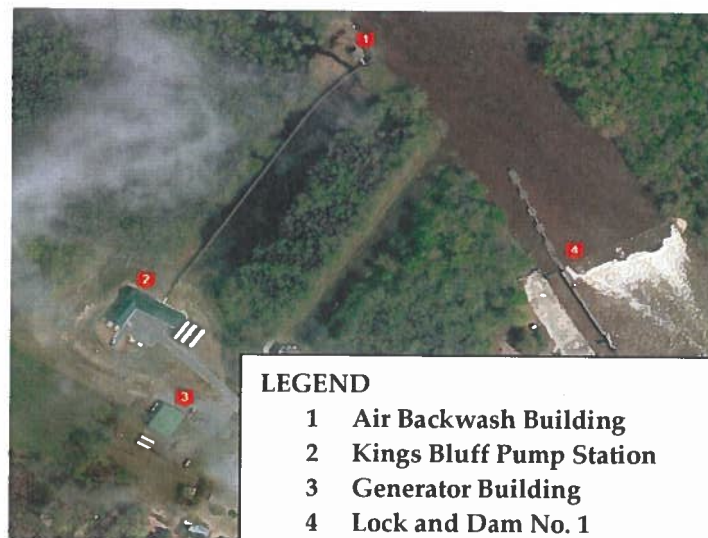
KING'S BLUFF RAW WATER FACILITIES

PROJECT TITLE	New 4 th Pump at King's Bluff Raw Water Pump Station		KB 1
CATEGORY OF NEED:	Capacity/Efficiency	EXPENDITURE CATEGORY:	Expansion
Summary: <ul style="list-style-type: none"> Provide a fourth raw water pump at King's Bluff Pumping Station to meet projected demands. (See #2 on legend in graphic below) Projected demands will exceed station firm capacity by 2037. 			
Justification: <ul style="list-style-type: none"> Increase station capacity to meet long term raw water demand. Firm capacity of station will require 3 pumps by 2037. Fourth pump will be standby/backup and added to pump rotation to reduce hours per pump. 			
Consequence of No Action: <ul style="list-style-type: none"> The projected demands at the station will exceed the firm capacity and the station will not be able to serve the project customer demand. 			
Criticality: <div style="text-align: right;">▼</div> <div style="display: flex; justify-content: space-around; background-color: #f0f0f0; padding: 5px;"> 1 2 3 </div>			
DURATION (MONTHS)	24		
REQUIRED COMPLETION	2029		
TOTAL ESTIMATED COST	\$5,150,000		
FISCAL YEAR	ANTICIPATED FISCAL YEAR EXPENDITURE		
2027 - 2028	\$3,850,000		
2028 - 2029	\$1,300,000		



KING'S BLUFF RAW WATER FACILITIES

PROJECT TITLE	Rebuild/Refurbish Existing 1600 HP Vertical Turbine Raw Water Pump		KB 2
CATEGORY OF NEED:	Renewal/Rehabilitation	EXPENDITURE CATEGORY:	Maintenance
Summary: <ul style="list-style-type: none"> Rebuild and/or refurbishment of an existing 1600 HP vertical turbine raw water pump originally installed in 2009. 			
Justification: <ul style="list-style-type: none"> Due to age and mechanical wear, it is anticipated that a rebuilding of one of the raw water pumps will be required. Rebuilding of pumps will extend the service life of the pumps 			
Consequence of No Action: <ul style="list-style-type: none"> The likelihood of failure of the pumps increases due to age and wear of the existing pump. 			
Criticality: <div style="text-align: right;">▼</div> <div style="display: flex; justify-content: space-around; background-color: #0056b3; color: white; padding: 5px;"> 1 2 3 </div>			
DURATION (MONTHS)	12		
REQUIRED COMPLETION	2036		
TOTAL ESTIMATED COST	\$500,000		
FISCAL YEAR	ANTICIPATED FISCAL YEAR EXPENDITURE		
2035 - 2036	\$500,000		



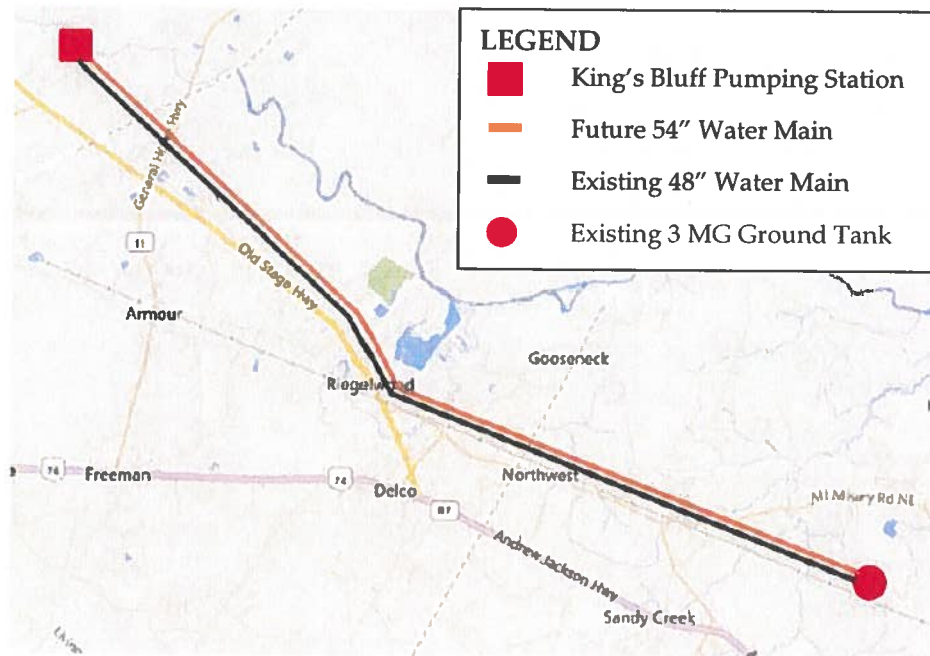
KING'S BLUFF RAW WATER FACILITIES

PROJECT TITLE	Generators at King's Bluff Raw Water Pump Station		KB 3
CATEGORY OF NEED:	Capacity, Efficiency, Maintenance	EXPENDITURE CATEGORY:	Maintenance /Expansion
Summary: <ul style="list-style-type: none"> Provide new standby generator(s) and a new generator building at the pump station. 			
Justification: <ul style="list-style-type: none"> Requires upgrade due to future increased load associated with additional pump motor HP as well as larger quantity of pumps. A new building will be needed to house the new generators. 			
Consequence of No Action: <ul style="list-style-type: none"> The current generators are undersized to accommodate long term demands. The existing generators are anticipated to become cost prohibitive to maintain. 			
Criticality: <div style="text-align: center; margin-top: 10px;">▼</div> <div style="display: flex; justify-content: space-around; background-color: #0056b3; color: white; padding: 5px;"> 1 2 3 </div>			
DURATION (MONTHS)	24		
REQUIRED COMPLETION	2036		
TOTAL ESTIMATED COST	\$21,500,000		
FISCAL YEAR	ANTICIPATED FISCAL YEAR EXPENDITURE		
2034 - 2035	\$2,200,000		
2035 - 2036	\$19,300,000		



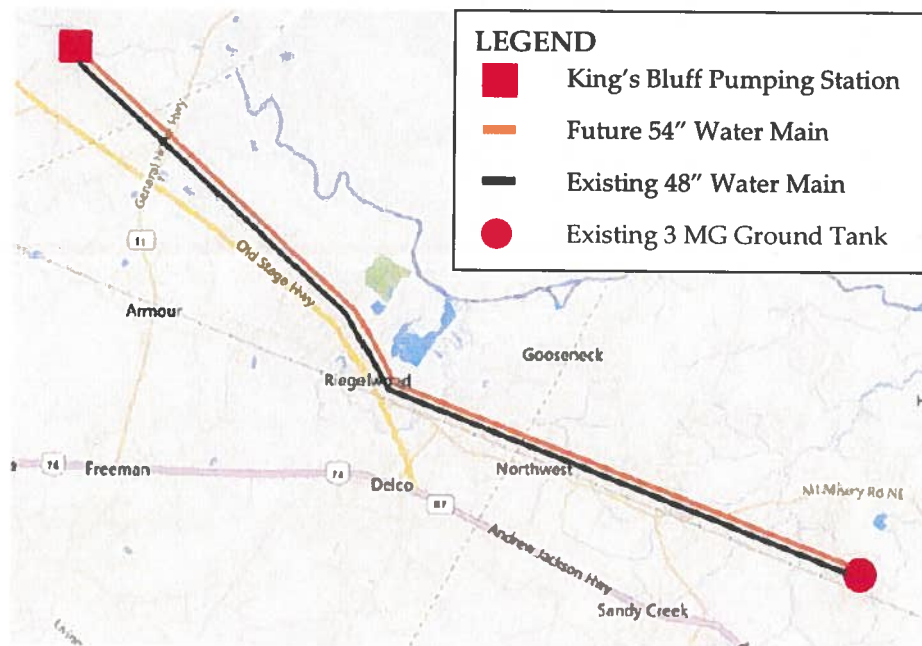
KING'S BLUFF RAW WATER FACILITIES

PROJECT TITLE	Pig 48" Pipe from King's Bluff Pump Station to 3 MG Ground Tank		KB 4
CATEGORY OF NEED:	Renewal/Rehabilitation, Efficiency	EXPENDITURE CATEGORY:	Maintenance
Summary: <ul style="list-style-type: none"> Pig 48" pipeline from King's Bluff to 3 MG ground tank. Repair and/or replace air release valves and blow-offs. 			
Justification: <ul style="list-style-type: none"> Pigging will maintain a clean pipeline free of sediment, silt, and debris cleaned or emptied in the case of an emergency. Improves efficiency of pumps by reducing frictional characteristics of the pipeline 			
Consequence of No Action: <ul style="list-style-type: none"> Potential for loss of capacity and/or clogging due to sediment buildup. Loss of efficiency and higher electrical costs 			
Criticality: <div style="display: flex; justify-content: space-around; align-items: center;"> </div>			
DURATION (MONTHS)	12		
REQUIRED COMPLETION	2041		
TOTAL ESTIMATED COST	\$2,100,000		
FISCAL YEAR	ANTICIPATED FISCAL YEAR EXPENDITURE		
2040 - 2041	\$2,100,000		



KING'S BLUFF RAW WATER FACILITIES

PROJECT TITLE	Pig 54" Pipe from 3 MG Ground Tank to US 421		KB 5
CATEGORY OF NEED:	Renewal/Rehabilitation, Efficiency	EXPENDITURE CATEGORY:	Maintenance
Summary: <ul style="list-style-type: none"> Pig 54" pipeline from King's Bluff to 3 MG ground tank. Repair and/or replace air release valves and blow-offs. 			
Justification: <ul style="list-style-type: none"> Pigging will maintain a clean pipeline free of sediment, silt, and debris cleaned or emptied in the case of an emergency. Improves efficiency of pumps by reducing frictional characteristics of the pipeline 			
Consequence of No Action: <ul style="list-style-type: none"> Potential for loss of capacity and/or clogging due to sediment buildup. Loss of efficiency and higher electrical costs 			
Criticality: <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="width: 30%; height: 20px; background-color: #008000;"></div> <div style="width: 35%; height: 20px; background-color: #ffff00;"></div> <div style="width: 35%; height: 20px; background-color: #ff0000;"></div> </div>			
DURATION (MONTHS)	12		
REQUIRED COMPLETION	2035		
TOTAL ESTIMATED COST	\$1,800,000		
FISCAL YEAR	ANTICIPATED FISCAL YEAR EXPENDITURE		
2034-2035	\$1,800,000		



KING'S BLUFF RAW WATER FACILITIES

PROJECT TITLE	Walkway and Air Backwash Building Replacement		KB 6
CATEGORY OF NEED:	Renewal/Rehabilitation, Maintenance	EXPENDITURE CATEGORY:	Maintenance
Summary: <ul style="list-style-type: none"> Funding for replacement of existing walkway from the King's Bluff Pumping Station to the Air Backwash buildings with a new concrete walkway. Upgrade/replace existing air backwash building. (See number 1 on legend below). 			
Justification: <ul style="list-style-type: none"> Walkway going from pumping station to air backwash buildings is currently in serviceable condition and will need to be replaced by 2025 due to rotting wood and overall weathering of walkway. During Hurricane Florence the walkway was nearing submergence Existing, original air backwash building needs significant improvements due to a loss of structural integrity caused by the general degradation of original building materials. 			
Consequence of No Action: <ul style="list-style-type: none"> Deterioration of the walkway could limit access to the air backwash buildings and raw water intakes. The air backwash facility will continue to deteriorate and create potential issues with protection of equipment and access for operations and maintenance. 			
Criticality: <div style="text-align: center;">▼</div> <div style="display: flex; justify-content: space-around; background-color: #0056b3; color: white; padding: 5px;"> 1 2 3 </div>			
DURATION (MONTHS)	12		
REQUIRED COMPLETION	2025		
TOTAL ESTIMATED COST	\$2,400,000		
FISCAL YEAR	ANTICIPATED FISCAL YEAR EXPENDITURE		
2024 - 2025	\$2,400,000		



KING'S BLUFF RAW WATER FACILITIES

PROJECT TITLE	Replace Raw Water Pumps 1, 4, 5		KB 7
CATEGORY OF NEED:	Renewal/Rehabilitation	EXPENDITURE CATEGORY:	Maintenance
Summary: <ul style="list-style-type: none"> Replace 1600 HP vertical turbine raw water pumps 1, 4, 5 originally installed in 2009. 			
Justification: <ul style="list-style-type: none"> Due to age and mechanical wear, it is anticipated that replacement of raw water pumps 1, 4, and 5 will be required. 			
Consequence of No Action: <ul style="list-style-type: none"> The likelihood of failure of the pumps increases due to age and wear of the existing pump. The service life of the existing pumps will be expended. 			
Criticality: <div style="text-align: right;">▼</div>			
<div style="display: flex; justify-content: space-around; background-color: #f0f0f0; padding: 5px;"> 1 2 3 </div>			
DURATION (MONTHS)	36		
REQUIRED COMPLETION	2030, 2035, 2038		
TOTAL ESTIMATED COST	\$15,700,000		
FISCAL YEAR	ANTICIPATED FISCAL YEAR EXPENDITURE		
2029 - 2030	\$4,600,000		
2034 - 2035	\$5,300,000		
2037 - 2038	\$5,800,000		



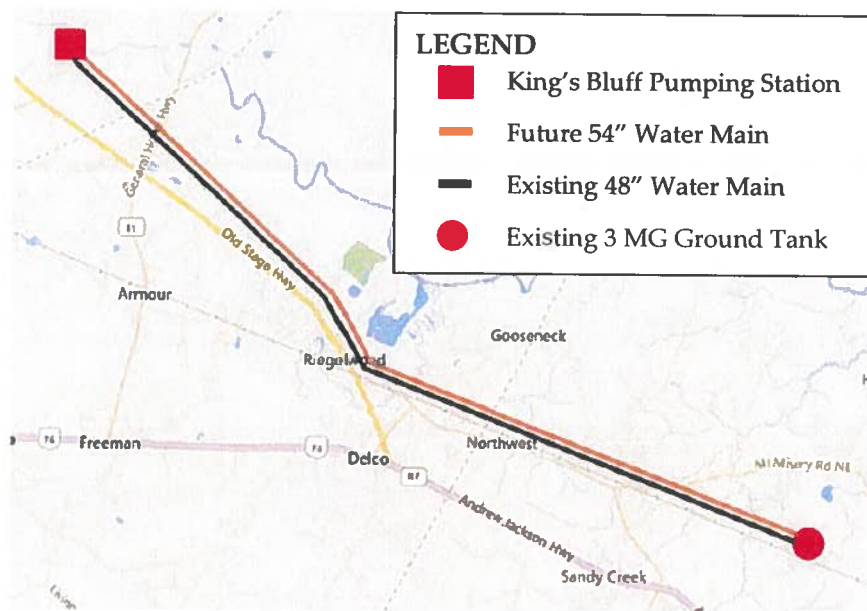
KING'S BLUFF RAW WATER FACILITIES

PROJECT TITLE	New Surge Tank at King's Bluff		KB 8
CATEGORY OF NEED:	Capacity	EXPENDITURE CATEGORY:	Expansion
Summary: <ul style="list-style-type: none"> Addition of a 4th surge tank at King's Bluff Pumping Station 			
Justification: <ul style="list-style-type: none"> As demand increases, surges in the system will likely increase. The 4th surge tank will serve to mitigate system surges and protect the pumps, piping and miscellaneous equipment from surges and water hammer. 			
Consequence of No Action: <ul style="list-style-type: none"> Existing pump station and piping infrastructure would be put at risk for damage due to system surges and could potentially create failures in the pipeline. 			
Criticality: <div style="text-align: center;">▼</div> <div style="display: flex; justify-content: space-around; background-color: #0056b3; color: white; padding: 5px;"> 1 2 3 </div>			
DURATION (MONTHS)	12		
REQUIRED COMPLETION	2044		
TOTAL ESTIMATED COST	\$1,300,000		
FISCAL YEAR	ANTICIPATED FISCAL YEAR EXPENDITURE		
2043 - 2044	\$1,300,000		



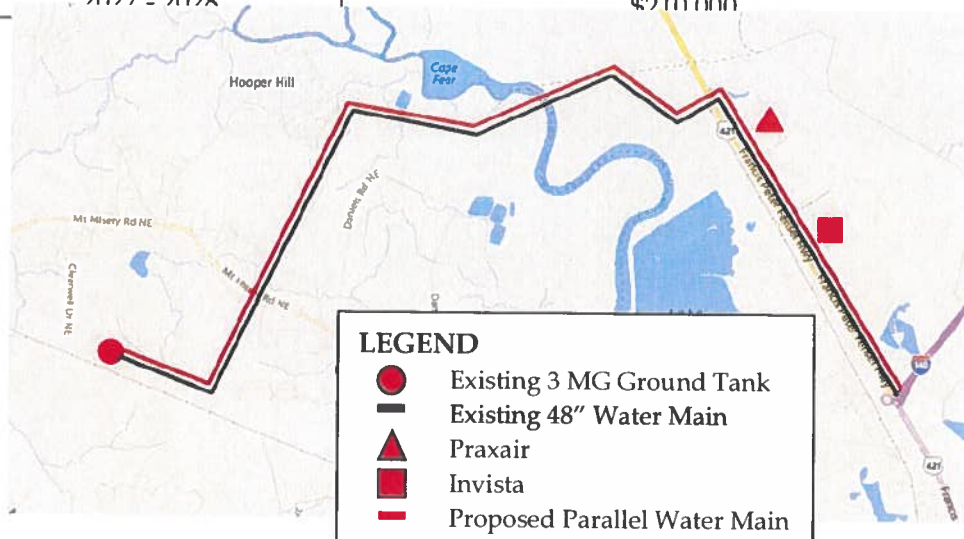
KING'S BLUFF RAW WATER FACILITIES

PROJECT TITLE	5 ROW Acquisitions		KB 9
CATEGORY OF NEED:	Maintenance	EXPENDITURE CATEGORY:	Maintenance
Summary: <ul style="list-style-type: none"> Right-of-Way acquisitions along the existing 48" Raw Water Main from the King's Bluff Pump Station to the 3 MG Ground Tank. 			
Justification: <ul style="list-style-type: none"> Required to access the existing line for maintenance and repairs. 			
Consequence of No Action: <ul style="list-style-type: none"> Lack of maintenance in these sections would increase the likelihood of pipeline failure. Inaccessibility during a pipeline failure would increase the amount of time that the system would be down. 			
Criticality:			
▼			
<div style="display: flex; justify-content: space-around; width: 100%;"> 1 2 3 </div>			
DURATION (MONTHS)	36		
REQUIRED COMPLETION	2026		
TOTAL ESTIMATED COST	\$310,000		
FISCAL YEAR	ANTICIPATED FISCAL YEAR EXPENDITURE		
2023 - 2024	\$100,000		
2024 - 2025	\$100,000		
2025 - 2026	\$110,000		



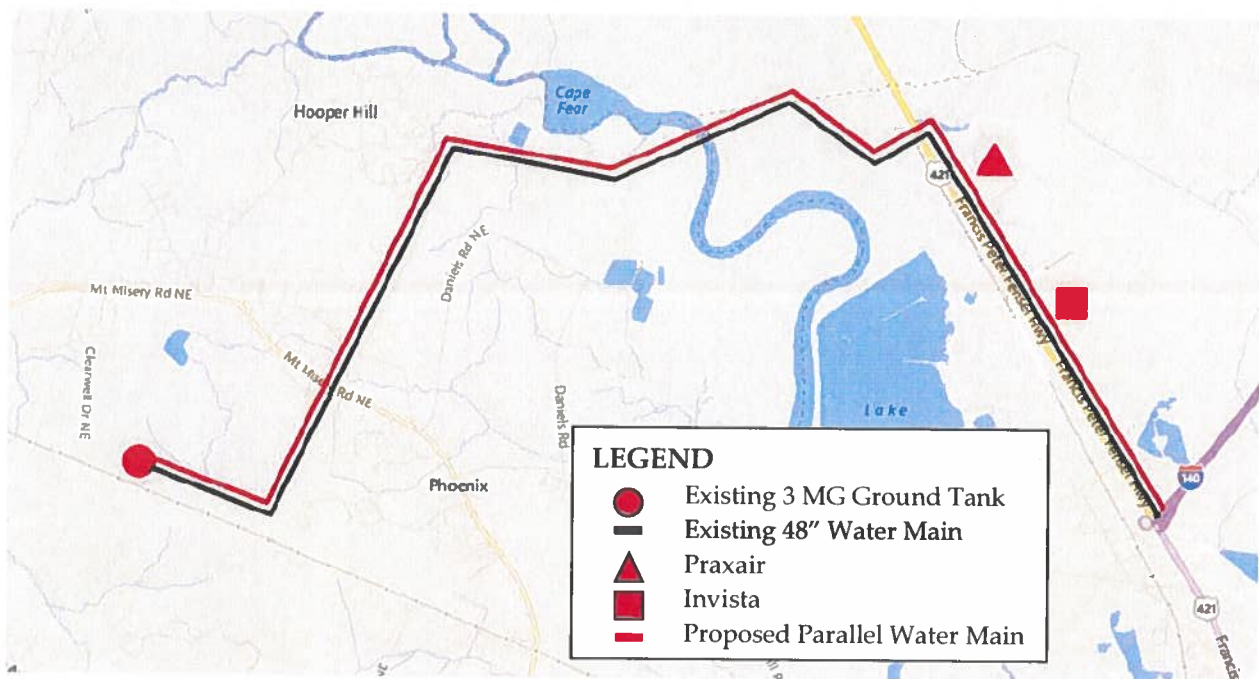
KING'S BLUFF RAW WATER FACILITIES

PROJECT TITLE	48-Inch PCCP Inspection and Pig-Ground Tank to US-421		KB 10
CATEGORY:	Renewal/Rehabilitation, Efficiency	EXPENDITURE CATEGORY:	Maintenance
Summary: <ul style="list-style-type: none"> Pig 48" pipeline from 3 MG ground tank to CFPUA's Water Treatment Plant including installation of pig launcher/retrieval system. Repair and/or replace air release valves and blow-offs. Inspection to existing 48-inch PCCP pipe from the existing 3 MG ground tank to US-421. 			
Justification: <ul style="list-style-type: none"> Pipe and appurtenances require routine inspection, maintenance, and repairs. Recent evaluation indicated build -up of sediment in the 48" line. Pigging will maintain a clean pipeline free of sediment, silt, and debris. Improves efficiency of pumps by reducing frictional characteristics of the pipeline 			
Consequence of No Action: <ul style="list-style-type: none"> Current loss of capacity and/or clogging due to sediment buildup. Loss of efficiency and higher electrical costs 			
Criticality: <div style="display: flex; justify-content: space-around; align-items: center;"> </div>			
DURATION (MONTHS)	15		
REQUIRED COMPLETION	2028		
TOTAL ESTIMATED COST	\$2,810,000		
FISCAL YEAR	ANTICIPATED FISCAL YEAR EXPENDITURE		
2026 - 2027	\$2,600,000		
2027 - 2028	\$210,000		



KING'S BLUFF RAW WATER FACILITIES

PROJECT TITLE	48-Inch PCCP Repairs		KB 11
CATEGORY OF NEED:	Renewal/Rehabilitation, Maintenance	EXPENDITURE CATEGORY:	Maintenance
Summary: <ul style="list-style-type: none"> Repair existing 48" raw water main based on findings from KB 11 – 48-Inch PCCP Inspection from the 3 MG ground tank to US-421 			
Justification: <ul style="list-style-type: none"> Pipe requires routine maintenance, inspection, and repairs. 			
Consequence of No Action: <ul style="list-style-type: none"> Increased risk for pipeline break. 			
Criticality: <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="background-color: green; width: 33%; text-align: center; color: white;">1</div> <div style="background-color: yellow; width: 33%; text-align: center; color: black;">2</div> <div style="background-color: red; width: 33%; text-align: center; color: white;">3</div> </div>			
DURATION (MONTHS)	12		
REQUIRED COMPLETION	2027		
TOTAL ESTIMATED COST	\$300,000		
FISCAL YEAR	ANTICIPATED FISCAL YEAR EXPENDITURE		
2026 - 2027	\$300,000		



KING'S BLUFF RAW WATER FACILITIES

PROJECT TITLE	1.3 MW Solar Power Installation		KB 12
CATEGORY OF NEED:	Efficiency/Redundancy	EXPENDITURE CATEGORY:	Expansion
Summary: <ul style="list-style-type: none"> Installation of solar panels to provide an additional power source at the pump station 			
Justification: <ul style="list-style-type: none"> Improves reliability and efficiency of the station by providing a redundant power source 			
Consequence of No Action: <ul style="list-style-type: none"> Increased risk for power failure during emergency scenarios 			
Criticality: ▼			
1		2	
3			
DURATION (MONTHS)		12	
REQUIRED COMPLETION		2031	
TOTAL ESTIMATED COST		\$2,500,000	
FISCAL YEAR		ANTICIPATED FISCAL YEAR EXPENDITURE	
2030-2031		\$2,500,000	

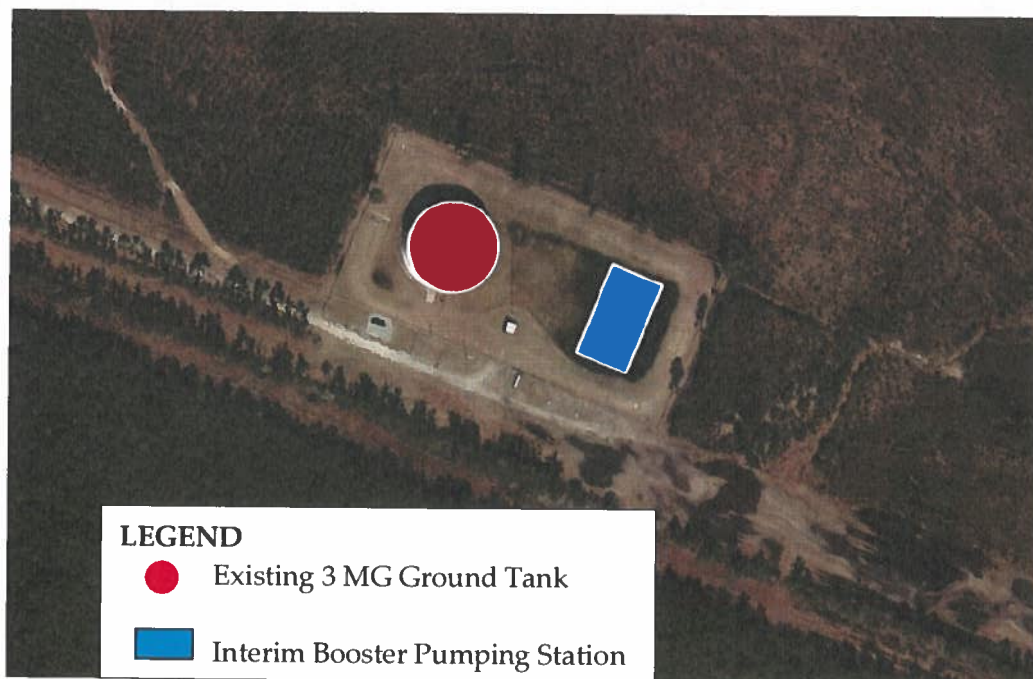


KING'S BLUFF RAW WATER FACILITIES

**Kings Bluff Raw Water Facilities
Capital Improvements
Cost Sharing Projects
FY 2024-2049**

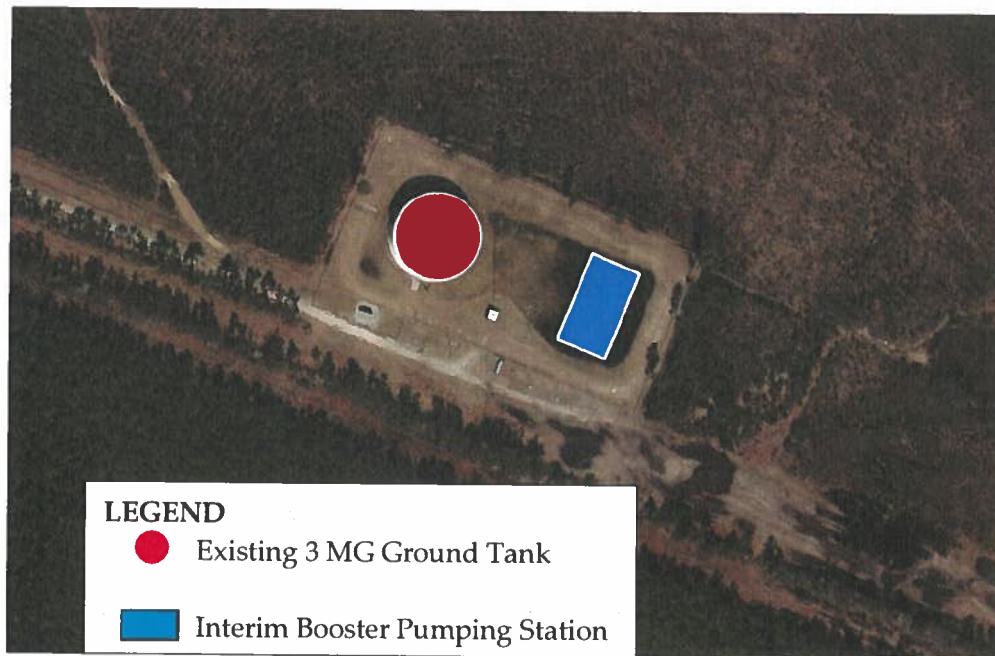
KING'S BLUFF RAW WATER FACILITIES

PROJECT TITLE	Intermediate Booster Pump Station Shelter		CS 1
CATEGORY OF NEED:	Maintenance/Efficiency	EXPENDITURE CATEGORY:	Maintenance
Summary: <ul style="list-style-type: none"> Addition of protective shelter at the Intermediate Booster PS 			
Justification: <ul style="list-style-type: none"> Required to protect existing pumps, equipment, gear from elements Provides improved maintenance access during inclement weather 			
Consequence of No Action: <ul style="list-style-type: none"> Equipment potentially suffers degradation due to exposure to the elements to include freezing conditions, and sun damage. 			
Criticality: <div style="text-align: right;">▼</div> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="width: 33%; height: 20px; background-color: #4f81bd; border: 1px solid black; text-align: center; color: white;">1</div> <div style="width: 33%; height: 20px; background-color: #ffcc00; border: 1px solid black; text-align: center; color: black;">2</div> <div style="width: 33%; height: 20px; background-color: #cc0000; border: 1px solid black; text-align: center; color: white;">3</div> </div>			
DURATION (MONTHS)	12		
REQUIRED COMPLETION	2026		
TOTAL ESTIMATED COST	\$850,000		
FISCAL YEAR	ANTICIPATED FISCAL YEAR EXPENDITURE		
2025 - 2026	\$850,000		



KING'S BLUFF RAW WATER FACILITIES

PROJECT TITLE	Intermediate Booster Pump Station Upgrade		CS 2
CATEGORY OF NEED:	Capacity	EXPENDITURE CATEGORY:	Expansion
Summary: <ul style="list-style-type: none"> Infrastructure upgrades to the existing booster pump station. Diesel pumps to be replaced with new, larger capacity pumps. 			
Justification: <ul style="list-style-type: none"> US 421 area demands will exceed the current 29 MGD capacity in approximately 2037. Recommend upgrade to 37 MGD capacity. 			
Consequence of No Action: <ul style="list-style-type: none"> Booster Pump Station will not be able to fully serve the projected demands and system pressure for the US 421 area. 			
Criticality: <div style="text-align: right;">▼</div> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="width: 33%; height: 20px; background-color: #4f81bd; border: 1px solid black;"></div> <div style="width: 33%; height: 20px; background-color: #ffcc00; border: 1px solid black;"></div> <div style="width: 33%; height: 20px; background-color: #cc0000; border: 1px solid black;"></div> </div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <div style="width: 33%; text-align: center;">1</div> <div style="width: 33%; text-align: center;">2</div> <div style="width: 33%; text-align: center;">3</div> </div>			
DURATION (MONTHS)	24		
REQUIRED COMPLETION	2035		
TOTAL ESTIMATED COST	\$8,600,000		
FISCAL YEAR	ANTICIPATED FISCAL YEAR EXPENDITURE		
2033 - 2034	\$1,100,000		
2034 - 2035	\$7,500,000		



KING'S BLUFF RAW WATER FACILITIES

PROJECT TITLE	New 5 th Pump at King's Bluff Raw Water Pump Station		CS 3
CATEGORY OF NEED:	Capacity	EXPENDITURE CATEGORY:	Expansion
Summary: <ul style="list-style-type: none"> Provide a fifth raw water pump at King's Bluff Pumping Station to meet projected demands. (See #2 on legend in graphic below) Projected demands will exceed station firm capacity by 2062 			
Justification: <ul style="list-style-type: none"> Decrease load and run times on existing pumps to extend life and improve reliability. 			
Consequence of No Action: <ul style="list-style-type: none"> The projected demands at the station will exceed the firm capacity and the station will not be able to serve the project customer demand. 			
Criticality: <div style="text-align: right; margin-right: 50px;">▼</div> <div style="display: flex; justify-content: space-around; background-color: #0056b3; color: white; padding: 5px;"> 1 2 3 </div>			
DURATION (MONTHS)	24		
REQUIRED COMPLETION	2047		
TOTAL ESTIMATED COST	\$9,400,000		
FISCAL YEAR	ANTICIPATED FISCAL YEAR EXPENDITURE		
2044 - 2045	\$2,000,000		
2045 - 2046	\$5,100,000		
2046 - 2047	\$2,300,000		



KING'S BLUFF RAW WATER FACILITIES

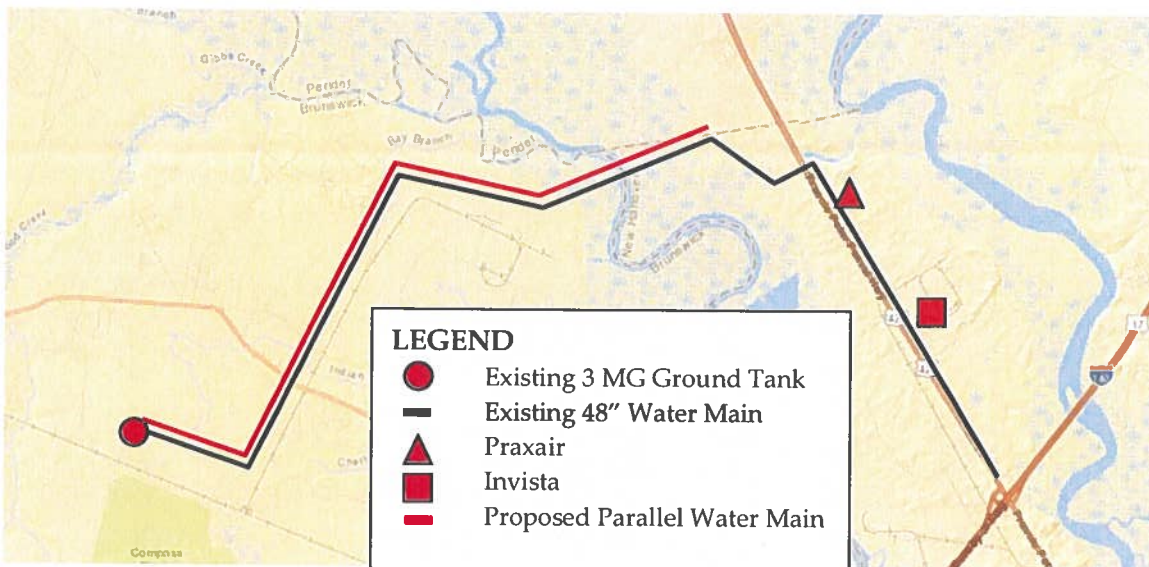
PROJECT TITLE	20 MG Ground Tank		CS 4
CATEGORY:	Capacity/Efficiency	EXPENDITURE CATEGORY:	Expansion
Summary: <ul style="list-style-type: none"> Design & construction of a new 20 MG ground tank in close proximity to the existing 3 MG ground tank with sufficient acreage to construct a future 20 MG ground tank. 			
Justification: <ul style="list-style-type: none"> Increase in available system storage. Provide a more consistent supply for safe and efficient operation of the adjacent interim booster pump station. 			
Consequence of No Action: <ul style="list-style-type: none"> Minimal system storage as system demands continue to increase Increased cycling of pumps at the intermediate booster pump station. 			
Criticality: <div style="text-align: center;">▼</div> <div style="display: flex; justify-content: space-around; background-color: #0056b3; color: white; padding: 5px;"> 1 2 3 </div>			
DURATION (MONTHS)	24		
REQUIRED COMPLETION	2038		
TOTAL ESTIMATED COST	\$ 23,700,000		
FISCAL YEAR	ANTICIPATED FISCAL YEAR EXPENDITURE		
2036 - 2037	\$5,500,000		
2037 - 2038	\$18,200,000		



KING'S BLUFF RAW WATER FACILITIES

PROJECT TITLE	7-Mile Parallel Raw Water Main from 3 MG Ground Tank to Pender Vault		CS 5
CATEGORY OF NEED:	Capacity	EXPENDITURE CATEGORY:	Expansion
Summary: <ul style="list-style-type: none"> Design and construction of approximately 7-miles of 48-inch raw water main from 3 MG ground tank to Pender County vault. Pipe would parallel the existing 48-inch raw water main in this area. 			
Justification: <ul style="list-style-type: none"> Provides additional system capacity. Reduces reliance on intermediate booster pump station. Improves reliability with a parallel main to serve major customers. 			
Consequence of No Action: <ul style="list-style-type: none"> The system may not have the capability to meet long-term customer demands. The existing 48-inch main is a single point of failure from the 3 MGD ground tank to the Pender County vault. 			
Criticality: <div style="text-align: center;">▼</div> <div style="display: flex; justify-content: space-around; background-color: #0056b3; color: white; padding: 5px;"> 1 2 3 </div>			
DURATION (MONTHS)	24		
REQUIRED COMPLETION	2026		
TOTAL ESTIMATED COST	\$35,600,000*		
FISCAL YEAR	ANTICIPATED FISCAL YEAR EXPENDITURE		
2024 - 2025	\$15,000,000		
2025 - 2026	\$20,600,000		

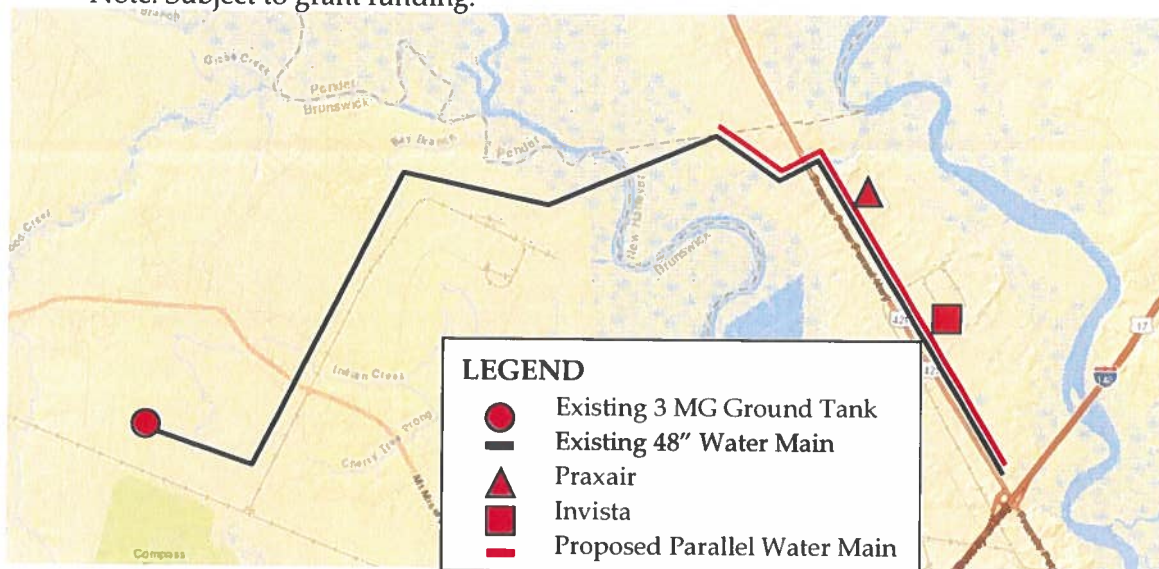
*Note: Subject to grant funding.



KING'S BLUFF RAW WATER FACILITIES

PROJECT TITLE	3-Mile Parallel Raw Water Main from 3 MG Pender Vault to CFPUA Vault		CS 6
CATEGORY OF NEED:	Capacity	EXPENDITURE CATEGORY:	Expansion
Summary: <ul style="list-style-type: none"> Design and construction of approximately 3-miles of 48-inch raw water main from the Pender County vault to the CFPUA vault. Pipe would parallel the existing 48-inch raw water main in this area. 			
Justification: <ul style="list-style-type: none"> Provides additional system capacity. Reduces reliance on intermediate booster pump station. Improves reliability with a parallel main to serve major customers. 			
Consequence of No Action: <ul style="list-style-type: none"> The system may not have the capability to meet long-term customer demands. The existing 48-inch main is a single point of failure from the 3 MGD ground tank to the US 421 service area. 			
Criticality: <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="width: 30%; height: 15px; background-color: #006633; margin: 2px;"></div> <div style="width: 35%; height: 15px; background-color: #FFCC00; margin: 2px;"></div> <div style="width: 35%; height: 15px; background-color: #CC0000; margin: 2px;"></div> </div>			
DURATION (MONTHS)	24		
REQUIRED COMPLETION	2027		
TOTAL ESTIMATED COST	\$25,250,000*		
FISCAL YEAR	ANTICIPATED FISCAL YEAR EXPENDITURE		
2025 - 2026	\$6,500,000		
2026 - 2027	\$18,750,000		

*Note: Subject to grant funding.



KING'S BLUFF RAW WATER FACILITIES

PROJECT TITLE	100 MGD Reservoir		CS 7
CATEGORY OF NEED:	Efficiency	EXPENDITURE CATEGORY:	Expansion
Summary: <ul style="list-style-type: none"> Design & construction of a new 100 MG reservoir. Optimal location and operation of the reservoir to be determined by future engineering study. 			
Justification: <ul style="list-style-type: none"> Increase in available system storage. Allows for temporary redundancy of supply in the case of an emergency (line break, power outage, etc.). 			
Consequence of No Action: <ul style="list-style-type: none"> Minimal system storage as system demands continue to increase. Loss of regular supply under emergency conditions. 			
Criticality: ▼			
1		2	3
DURATION (MONTHS)	24		
REQUIRED COMPLETION	2033		
TOTAL ESTIMATED COST	\$55,549,000		
FISCAL YEAR	ANTICIPATED FISCAL YEAR EXPENDITURE		
2023 - 2024	\$49,000		
2031 - 2032	\$8,100,000		
2032 - 2033	\$47,400,000		



KING'S BLUFF RAW WATER FACILITIES

Annual Fiscal Year Budget Breakdown – Capital Projects (In Millions of Dollars)

Project No.	Description	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032	FY 2033	FY 2034	FY 2035	FY 2036	FY 2037	FY 2038	FY 2039	FY 2040	FY 2041	FY 2042	FY 2043	FY 2044	FY 2045	FY 2046	FY 2047	FY 2048	FY 2049	Totals	
KB 1	New 4th Pump at King's Bluff (KBPS)					\$3.85	\$1.30																					\$5.15	
KB 2	Rebuild High Service Pump Motor													\$0.50														\$0.50	
KB 3	New Generators												\$2.20	\$19.30														\$21.50	
KB 4	Pig 48" Water Main (KBPS to 3 MG Tank)																	\$2.10										\$2.10	
KB 5	Pig 54" Water Main												\$1.80															\$1.80	
KB 6	Walkway and Air Backwash Building Replacement		\$2.40																									\$2.40	
KB 7	Replace Raw Water Pumps 1, 4, 5							\$4.60					\$5.30			\$5.80												\$15.70	
KB 8	New Surge Tank at KBPS																					\$1.30						\$1.30	
KB 9	5 ROW Acquisitions	\$0.10	\$0.10	\$0.11																								\$0.31	
KB 10	48-Inch PCCP Inspection and Pig – Ground Tank to US 421				\$2.60	\$0.21																						\$2.81	
KB 11	48-Inch PCCP Repairs				\$0.30																							\$0.30	
KB 12	1.3 MW Solar Power Installation								\$2.50																			\$2.50	
Cost Sharing Projects																													
CS 1	Intermediate-Booster Pump Station Shelter*																												
CS 2	Intermediate-Booster Pump Station Upgrade*																												
CS 3	New 5th Pump at King's Bluff																						\$2.00	\$5.10	\$2.30			\$9.40	
CS 4	20 MG Ground Tank															\$5.50	\$18.20											\$23.70	
CS 5	7-Mile 48" Parallel Raw Water Main		\$15.00	\$20.60																								\$35.60	
CS 6	3-Mile 48" Parallel Raw Water Main			\$6.50	\$18.75																							\$25.25	
CS 7	100 MGD Reservoir	\$0.05								\$8.10	\$47.40																	\$55.50	
Total Fiscal Year Expenditure		\$0.15	\$17.50	\$27.21	\$21.65	\$4.06	\$1.30	\$4.60	\$2.50	\$8.10	\$47.40	\$0.00	\$9.30	\$19.80	\$5.50	\$24.00	\$0.00	\$0.00	\$2.10	\$0.00	\$0.00	\$1.30	\$2.00	\$5.10	\$2.30	\$0.00	\$0.00	\$205.82	

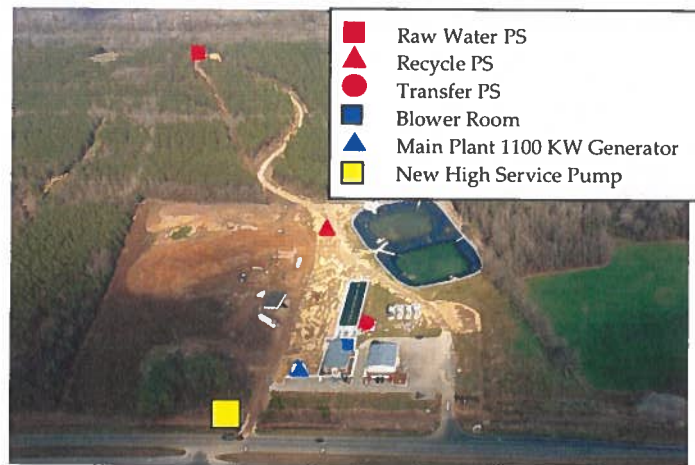
* Projects are no longer required due to expedited schedules of CS5 & CS6

BLADEN BLUFFS REGIONAL SURFACE WATER FACILITY

**Bladen Bluffs Regional
Surface Water Treatment Facility
Capital Improvements Projects
FY 2024-2049**

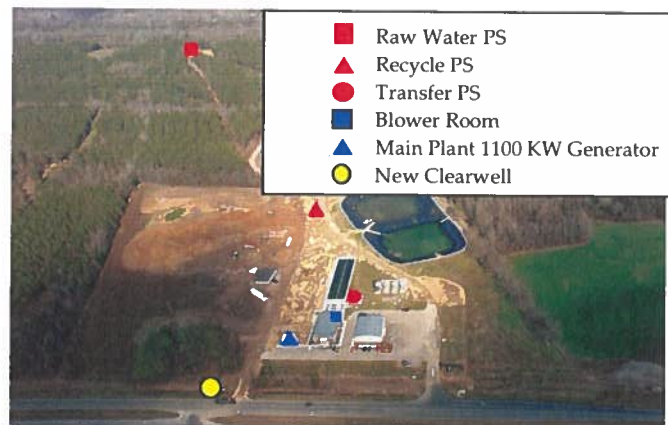
BLADEN BLUFFS REGIONAL SURFACE WATER FACILITY

PROJECT TITLE	New High Service Pump Station		BB 1
CATEGORY OF NEED:	Capacity	EXPENDITURE CATEGORY:	Expansion
Summary: <ul style="list-style-type: none">Construct a new high service pumping station to increase capacity.			
Note: Currently Smithfield Farmland Company (SFC) provides all operation and maintenance of the Bladen Bluffs Regional Surface Water Treatment Facility. The CIP project described on this sheet would only be required if the LCFWSA assumed full operation of the facility from SFC. Until such time all capital improvements and/or maintenance requirements are solely the responsibility of SFC.			
Justification: <ul style="list-style-type: none">Required to serve new customers.Construction of new high service pump station would only be required when additional customers are identified to be served by the Bladen Bluffs Regional Surface Water Treatment Facility.			
Consequence of No Action: <ul style="list-style-type: none">The system will not have the required capacity to meet new customer demands.			
Criticality: <div>▼</div> <div><div>1</div><div>2</div><div>3</div></div>			
DURATION (MONTHS)	24		
REQUIRED COMPLETION	2029		
TOTAL ESTIMATED COST	\$5,740,000		
FISCAL YEAR	ANTICIPATED FISCAL YEAR EXPENDITURE		
2027-2028	\$790,000		
2028-2029	\$4,950,000		



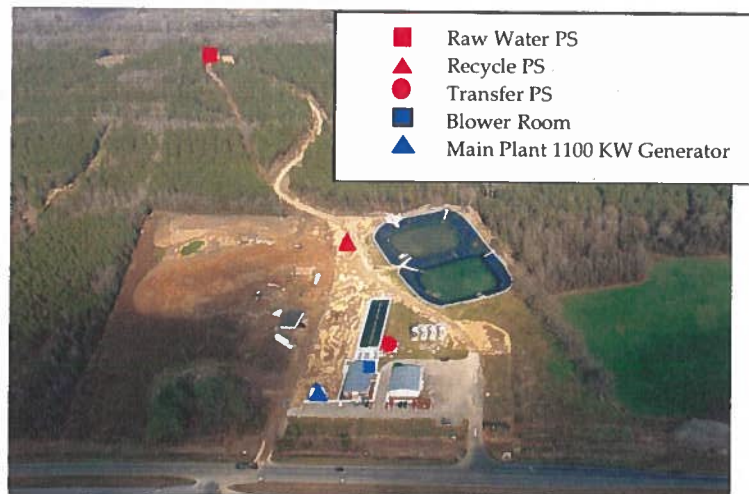
BLADEN BLUFFS REGIONAL SURFACE WATER FACILITY

PROJECT TITLE	Construct New 1 MG Capacity Clearwell		BB 2			
CATEGORY OF NEED:	Capacity	EXPENDITURE CATEGORY:	Expansion			
Summary: <ul style="list-style-type: none">Construct clearwell to meet future customer finished water storage capacity.						
<i>Note: Currently Smithfield Farmland Company (SFC) provides all operation and maintenance of the Bladen Bluffs Regional Surface Water Treatment Facility. The CIP project described on this sheet would only be required if the LCFWSA assumed full operation of the facility from SFC. Until such time all capital improvements and/or maintenance requirements are solely the responsibility of SFC.</i>						
Justification: <ul style="list-style-type: none">Required to serve new customers.Clearwell would only be required when additional customers are identified to be served by the Bladen Bluffs Regional Surface Water Treatment Facility.						
Consequence of No Action: <ul style="list-style-type: none">The system will not have the required capacity to meet new customer demands.						
Criticality: <div>▼</div> <table><tr><td>1</td><td>2</td><td>3</td></tr></table>				1	2	3
1	2	3				
DURATION (MONTHS)	24					
REQUIRED COMPLETION	2029					
TOTAL ESTIMATED COST	\$4,090,000					
FISCAL YEAR	ANTICIPATED FISCAL YEAR EXPENDITURE					
2027-2028	\$790,000					
2028-2029	\$3,300,000					



BLADEN BLUFFS REGIONAL SURFACE WATER FACILITY

PROJECT TITLE	Replace Three (3) Pumps at the Raw Water Pump Station		BB 3										
CATEGORY OF NEED:	Renewal/Rehabilitation	EXPENDITURE CATEGORY:	Maintenance										
Summary: <ul style="list-style-type: none">Routine replacement of three (3) aging pumps at Raw Water Pumping Station. <p><i>Note: Currently Smithfield Farmland Company (SFC) provides all operation and maintenance of the Bladen Bluffs Regional Surface Water Treatment Facility. The CIP project described on this sheet would only be required if the LCFWSA assumed full operation of the facility from SFC. Until such time all capital improvements and/or maintenance requirements are solely the responsibility of SFC.</i></p> Justification: <ul style="list-style-type: none">Pumps will be approximately 20 years old by 2032 and approaching end of useful service life. Consequence of No Action: <ul style="list-style-type: none">The likelihood of failure of the pumps increases due to age and wear of the existing pump. Criticality: <div><div>1</div><div>2</div><div>3</div></div> <table><tr><td>DURATION (MONTHS)</td><td>12</td></tr><tr><td>REQUIRED COMPLETION</td><td>2032</td></tr><tr><td>TOTAL ESTIMATED COST</td><td>\$480,000</td></tr><tr><td>FISCAL YEAR</td><td>ANTICIPATED FISCAL YEAR EXPENDITURE</td></tr><tr><td>2031-2032</td><td>\$480,000</td></tr></table>				DURATION (MONTHS)	12	REQUIRED COMPLETION	2032	TOTAL ESTIMATED COST	\$480,000	FISCAL YEAR	ANTICIPATED FISCAL YEAR EXPENDITURE	2031-2032	\$480,000
DURATION (MONTHS)	12												
REQUIRED COMPLETION	2032												
TOTAL ESTIMATED COST	\$480,000												
FISCAL YEAR	ANTICIPATED FISCAL YEAR EXPENDITURE												
2031-2032	\$480,000												



BLADEN BLUFFS REGIONAL SURFACE WATER FACILITY

PROJECT TITLE		Replace Blower in the Blower Building		BB 4							
CATEGORY OF NEED:		Renewal/Rehabilitation		EXPENDITURE CATEGORY: Maintenance							
Summary: <ul style="list-style-type: none">Routine replacement of aging blower in blower building.											
Note: Currently Smithfield Farmland Company (SFC) provides all operation and maintenance of the Bladen Bluffs Regional Surface Water Treatment Facility. The CIP project described on this sheet would only be required if the LCFWSA assumed full operation of the facility from SFC. Until such time all capital improvements and/or maintenance requirements are solely the responsibility of SFC.											
Justification: <ul style="list-style-type: none">Blower will be approximately 25 years old by 2032 and approaching end of useful service life.											
Consequence of No Action: <ul style="list-style-type: none">The likelihood of failure of the blower increases due to age and wear of the existing blower.											
Criticality: <div>▼</div> <table><tr><td colspan="2">1</td><td colspan="2">2</td><td colspan="2">3</td></tr></table>						1		2		3	
1		2		3							
DURATION (MONTHS)		12									
REQUIRED COMPLETION		2032									
TOTAL ESTIMATED COST		\$190,000									
FISCAL YEAR		ANTICIPATED FISCAL YEAR EXPENDITURE									
2031-2032		\$190,000									



BLADEN BLUFFS REGIONAL SURFACE WATER FACILITY

PROJECT TITLE	Replace Three (3) Pumps at the Recycle Pump Station		BB 5										
CATEGORY OF NEED:	Renewal/Rehabilitation	EXPENDITURE CATEGORY:	Maintenance										
Summary: <ul style="list-style-type: none">Routine replacement of three (3) aging pumps at the Recycle Pumping Station. <p><i>Note: Currently Smithfield Farmland Company (SFC) provides all operation and maintenance of the Bladen Bluffs Regional Surface Water Treatment Facility. The CIP project described on this sheet would only be required if the LCFWSA assumed full operation of the facility from SFC. Until such time all capital improvements and/or maintenance requirements are solely the responsibility of SFC.</i></p> Justification: <ul style="list-style-type: none">Pumps will be approximately 20 years old by 2032 and approaching end of useful service life. Consequence of No Action: <ul style="list-style-type: none">The likelihood of failure of the pumps increases due to age and wear of the existing pump. Criticality: <div><div>1</div><div>2</div><div>3</div></div> <table><tr><td>DURATION (MONTHS)</td><td>12</td></tr><tr><td>REQUIRED COMPLETION</td><td>2035</td></tr><tr><td>TOTAL ESTIMATED COST</td><td>\$330,000</td></tr><tr><td>FISCAL YEAR</td><td>ANTICIPATED FISCAL YEAR EXPENDITURE</td></tr><tr><td>2034-2035</td><td>\$330,000</td></tr></table>				DURATION (MONTHS)	12	REQUIRED COMPLETION	2035	TOTAL ESTIMATED COST	\$330,000	FISCAL YEAR	ANTICIPATED FISCAL YEAR EXPENDITURE	2034-2035	\$330,000
DURATION (MONTHS)	12												
REQUIRED COMPLETION	2035												
TOTAL ESTIMATED COST	\$330,000												
FISCAL YEAR	ANTICIPATED FISCAL YEAR EXPENDITURE												
2034-2035	\$330,000												



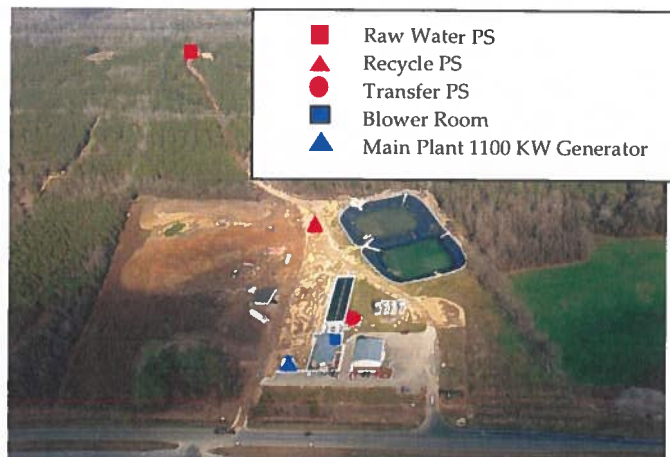
BLADEN BLUFFS REGIONAL SURFACE WATER FACILITY

PROJECT TITLE		Replace Three (3) Pumps at the Transfer Pump Station		BB 6	
CATEGORY OF NEED:		Renewal/Rehabilitation		EXPENDITURE CATEGORY: Maintenance	
Summary: <ul style="list-style-type: none">Routine replacement of three (3) aging pumps at the Transfer Pumping Station.					
<i>Note: Currently Smithfield Farmland Company (SFC) provides all operation and maintenance of the Bladen Bluffs Regional Surface Water Treatment Facility. The CIP project described on this sheet would only be required if the LCFWSA assumed full operation of the facility from SFC. Until such time all capital improvements and/or maintenance requirements are solely the responsibility of SFC.</i>					
Justification: <ul style="list-style-type: none">Pumps will be approximately 20 years old by 2032 and approaching end of useful service life.					
Consequence of No Action: <ul style="list-style-type: none">The likelihood of failure of the pumps increases due to age and wear of the existing pump.					
Criticality: <div>▼</div>					
1		2		3	
DURATION (MONTHS)		12			
REQUIRED COMPLETION		2035			
TOTAL ESTIMATED COST		\$550,000			
FISCAL YEAR		ANTICIPATED FISCAL YEAR EXPENDITURE			
2034-2035		\$550,000			



BLADEN BLUFFS REGIONAL SURFACE WATER FACILITY

PROJECT TITLE	Replace Two (2) Generators at the Site		BB 7
CATEGORY OF NEED:	Renewal/Rehabilitation	EXPENDITURE CATEGORY:	Maintenance
Summary: <ul style="list-style-type: none">Routine replacement of two (2) aging on-site generators.			
Note: Currently Smithfield Farmland Company (SFC) provides all operation and maintenance of the Bladen Bluffs Regional Surface Water Treatment Facility. The CIP project described on this sheet would only be required if the LCFWSA assumed full operation of the facility from SFC. Until such time all capital improvements and/or maintenance requirements are solely the responsibility of SFC.			
Justification: <ul style="list-style-type: none">Facility currently has two (2) generators on-site. Generators will be approximately 25 years old by 2037 and approaching end of service life.			
Consequence of No Action: <ul style="list-style-type: none">The current generators are undersized to accommodate long term demands.The existing generators are anticipated to become cost prohibitive to maintain.			
Criticality: <div>▼</div>			
1		2	
3			
DURATION (MONTHS)		24	
REQUIRED COMPLETION		2037	
TOTAL ESTIMATED COST		\$1,680,000	
FISCAL YEAR		ANTICIPATED FISCAL YEAR EXPENDITURE	
2035-2036		\$460,000	
2036-2037		\$1,220,000	



BLADEN BLUFFS REGIONAL SURFACE WATER FACILITY

Annual Fiscal Year Budget Breakdown (In Millions of Dollars)

Project No.	Description	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032	FY 2033	FY 2034	FY 2035	FY 2036	FY 2037	FY 2038	FY 2039	FY 2040	FY 2041	FY 2042	FY 2043	FY 2044	FY 2045	FY 2046	FY 2047	FY 2048	FY 2049	Totals
BB 1	New High Service Pump Station					\$0.79	\$4.95																					\$5.74
BB 2	Construct New 1 MG Capacity Clearwell					\$0.79	\$3.30																					\$4.09
BB 3	Replace (3) Pumps at Raw Water Pump Station									\$0.48																		\$0.48
BB 4	Replace Blower in Blower Building									\$0.19																		\$0.19
BB 5	Replace (3) Pumps at the Recycle Pump Station												\$0.33															\$0.33
BB 6	Replace (3) Pumps at the Transfer Pump Station												\$0.55															\$0.55
BB 7	Replace (2) Generators at the Site													\$0.46	\$1.22													\$1.68
Total Fiscal Year Expenditure						\$1.58	\$8.25			\$0.67			\$0.88	\$0.46	\$1.22													\$13.06

APPENDIX A – TOTAL ANNUAL FISCAL YEAR BUDGET

Total Annual Fiscal Year Budget Breakdown											
Item	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032	FY 2033	Totals
OPERATION PROJECTS BUDGET											
Surveying											\$0
ROW Maintenance	\$65,000	\$65,000	\$65,000	\$65,000	\$65,000	\$65,000	\$65,000	\$65,000	\$65,000	\$65,000	\$650,000
ROW Clearing	\$225,000										\$225,000
SCADA Improvements		\$125,000									\$125,000
Anti-Vortexing Improvements	\$50,000	\$50,000									\$100,000
Meter and Valve Upgrades/Replacements						\$125,000					\$125,000
VFD Replacements	\$250,000										\$250,000
Argo ATV											\$0
RR Trans	\$350,000	\$350,000									\$700,000
Miscellaneous	\$30,000	\$30,000	\$30,000	\$30,000	\$30,000	\$30,000	\$30,000	\$30,000	\$30,000	\$30,000	\$300,000
Total Operations Annual Fiscal Year Expenditure	\$970,000	\$620,000	\$95,000	\$95,000	\$95,000	\$220,000	\$95,000	\$95,000	\$95,000	\$95,000	\$2,475,000
CAPITAL PROJECTS BUDGET											
KB1 - New 4th Pump at King's Bluff (KBPS)					\$3,850,000	\$1,300,000					\$5,150,000
KB6 - Walkway and Air Backwash Building Replacement		\$2,400,000									\$2,400,000
KB7 - Replace Raw Water Pumps 1, 4, 5							\$4,600,000				\$4,600,000
KB9 - ROW Acquisitions	\$100,000	\$100,000	\$110,000								\$310,000
KB10 - 48-Inch PCCP Inspection and Pig - Ground Tank to US421				\$2,600,000	\$210,000						\$2,810,000
KB11 - 48-Inch PCCP Repairs				\$300,000							\$300,000
KB12 - 1.3 MW Solar Power Installation								\$2,500,000			\$2,500,000
CS5 - 7-Mile 48" Parallel Raw Water Main		\$15,000,000	\$20,600,000								\$35,600,000
CS6 - 3-Mile 48" Parallel Raw Water Main			\$6,500,000	\$18,750,000							\$25,250,000
CS7 - 100 MGD Reservoir	\$49,000								\$8,100,000	\$47,400,000	\$55,549,000
Total Capital Annual Fiscal Year Expenditure	\$149,000	\$17,500,000	\$27,210,000	\$21,650,000	\$4,060,000	\$1,300,000	\$4,600,000	\$2,500,000	\$8,100,000	\$47,400,000	\$134,469,000
Total Annual Fiscal Year Expenditure	\$1,119,000	\$18,120,000	\$27,305,000	\$21,745,000	\$4,155,000	\$1,520,000	\$4,695,000	\$2,595,000	\$8,195,000	\$47,495,000	\$136,944,000

AGENDA ITEM

To: CHAIRMAN KNIGHT AND BOARD MEMBERS

From: TIM HOLLOMAN, EXECUTIVE DIRECTOR

Date: May 13, 2024

Re: Budget Amendment #3

Background: Budget Amendment #3 is due to LCFWASA conducting a comprehensive review of its financial resources and identified a need for a budget amendment to transfer funds from the operating fund to the renewal and replacement fund. This strategic reallocation is essential to ensure the organization's long-term sustainability by adequately funding critical infrastructure maintenance, repairs, and replacement projects.

Action Requested: Motion to approve/disapprove.



Lower Cape Fear Water & Sewer Authority
Leland, North Carolina

BUDGET AMENDMENT #3
Fiscal Year 2023-2024

BE IT ORDAINED by the Board of Directors of the Lower Cape Fear Water & Sewer Authority that the following amendments are made to the FY 2023-2024 Annual Budget Ordinances as follows:

Section 1: To amend the **Operating Revenue** the appropriations are to be changed as follows:

Fund Balance Appropriated:	Increase
3006-01 Bladen Bluff Revenue	515,000.00
Bladen Admin Reimb	48,281.00
Total	563,281.00

Section 2: To amend the **Operating Expenses** the appropriations are to be changed as follows:

Operating Fund:	Increase
4501-00 Sales Tax Expenses – Other	15,000.00
4510-01 Bladen Bluffs Expenses	548,281.00
Total	563,281.00

Section 3: Copies of this Budget Amendment shall be furnished to the Budget Officer for direction in the carrying out of his duties.

Approved as to the availability of funds:

 Tim H. Holloman, Finance Officer

This Budget Amendment adopted this 13th day of May 2024.

 Harry Knight, Chairman

ATTEST:

 Scott Phillips, Secretary

AGENDA ITEM

To: CHAIRMAN KNIGHT AND BOARD MEMBERS

From: TIM H. HOLLOMAN, EXECUTIVE DIRECTOR

Date: May 13, 2024

Re: Executive Director's Report

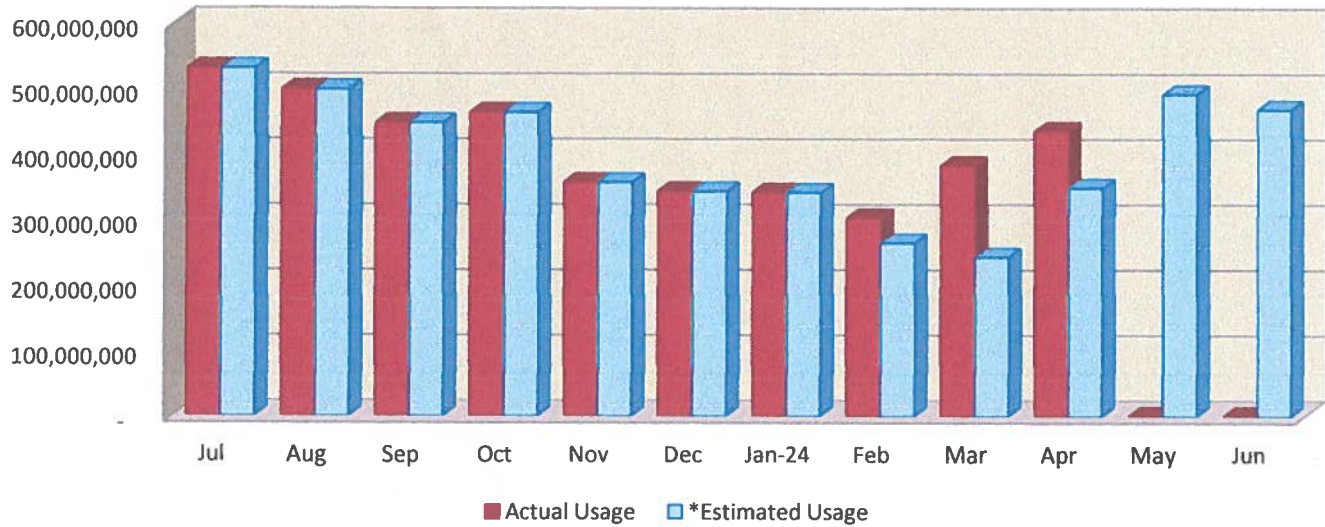
EDR1 - Comments on Customers' Water Usage and Raw Water Revenue for Fiscal Year to Date Ending April 30, 2024

EDR2 - Operating Budget Status, Ending March 31, 2024

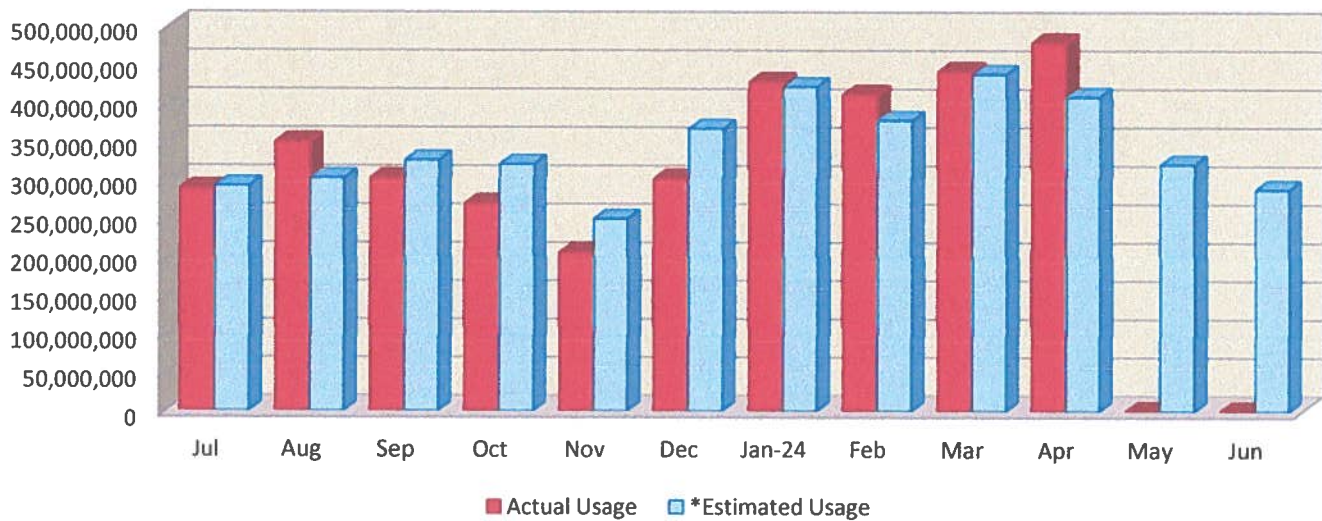
EDR3 - Summary of Activities.

Action Requested: For information purposes.

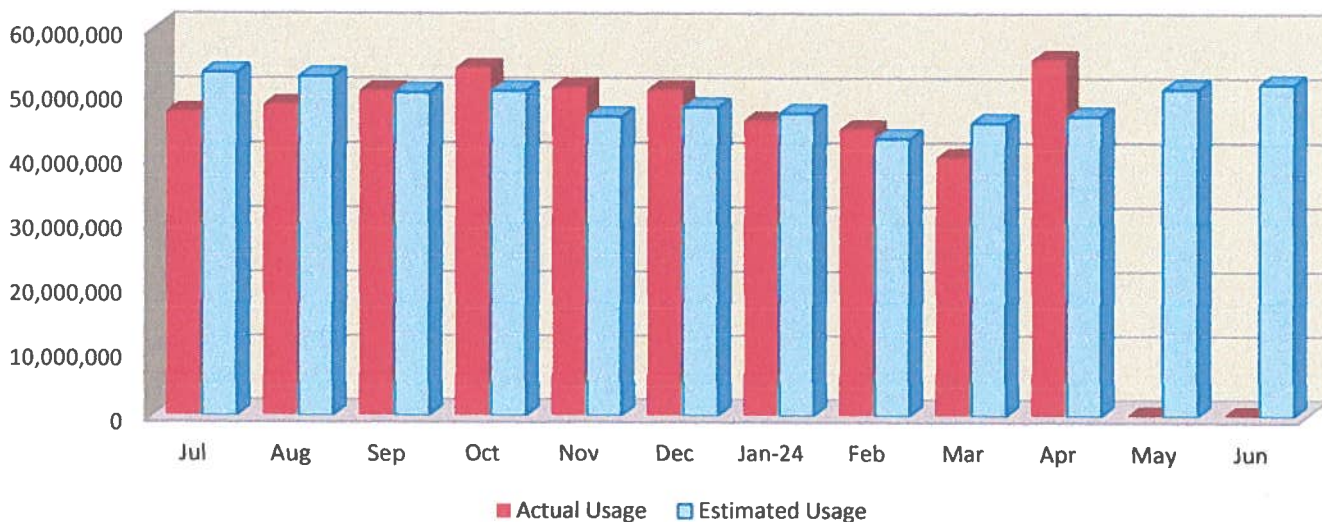
Brunswick County Water Usage FY 23-24



CFPUA Water Usage FY 23-24



Pender County Water Usage FY 23-24



OPERATING FUND BUDGET PERFORMANCE

Jul-1 through Mar 31

	Approved Annual Budget	Approved Annual Budget	Jul 1- Mar 31 Kings Bluff	Jul 1- Mar 31 Bladen Bluffs	Jul 1- Mar 31 OF BUDGET	Budget As of 03/31/2024
Income						
3000-01 · OPERATING REVENUE						
3001-01 · 01 Bruns County Public Utility	1,725,765	1,923,193	1,468,856		1,468,856	76%
3002-01 · 01 CFPUA	1,652,562	1,652,562	1,203,832		1,203,832	73%
3003-01 · 01 Pender County	234,160	234,160	172,881		172,881	74%
3004-01 · 01 HWY 421 - Invista	200,000	110,000	90,819		90,819	83%
3005-01 · 01 Praxair, Inc	100,000	15,784	11,314		11,314	72%
3006-01 · 01 Bladen Bluffs Revenue	4,938,603	5,453,603		4,588,246	4,588,246	84%
Bladen Admin Reimb	110,473	110,473		119,066	119,066	108%
3007-01 · Sales Tax Refund Revenue	100,000	100,000		106,041	106,041	106%
Total 3000-01 · OPERATING REVENUE	9,061,563	9,599,775	2,947,701	4,813,353	7,761,054	81%
3100-00 · OF NONOPERATING REVENUE						
3120-00 · Revenue-Other						
Interest & Investment Revenue	500	9,716	44,609		44,609	459%
FEMA Reimbursement	0	0	0		0	0%
Refunds / Insurance Proceeds/ Other	0	0	729		729	0%
3180-00 · SRF/Parallel Revenue	2,500,000	2,500,000	1,024,421		1,024,421	41%
3900-01 R&R Fund Appropriated	0	0	0		0	0%
2900-00 Fund Balance	0	0	0		0	0%
Total 3100-00 · OF NONOPERATING REVENUE	2,500,500	2,509,716	1,069,759	0	1,069,759	43%
Total Income	11,562,063	12,109,491	4,017,460	4,813,353	8,830,813	76%
Expense						
4000-01 · ADMINISTRATION EXPENDITURES						
4001-01 · Salary - gross	203,530	203,530	105,541	45,794	151,335	74%
4010-01 · Per Diem= mileage+per diem pay	64,001	64,001	26,836	14,400	41,236	64%
4012-01 · Vehicle Allowance	5,200	5,200	2,830	1,170	4,000	77%
4070-02 · Phone Allowance	520	520	283	117	400	77%
4015-01 · Payroll Taxes	20,953	20,953	10,256	4,714	14,971	71%
4029-01 · Retirement Employer's Part	26,153	26,153	12,538	5,884	18,423	70%
4035-01 · 401K Employer PD Contribution	11,312	11,312	5,477	2,545	8,022	71%
4036-01 · Payroll Processing Exp	2,900	2,900	2,284		2,284	79%
4038-01 · Insurance Group	40,176	40,176	19,462	9,040	28,501	71%
4039-01 · Insurance, Property	103,734	103,734	60,102	23,340	83,442	80%
4046-00 Professional Services General	15,000	3,800	0	0	0	0%
4046-01 · Attorney	50,000	40,000	27,787		27,787	69%
4047-01 · Auditor	8,000	8,200	5,400	2,800	8,200	100%
4048-01 · Engineer	300,000	290,000	38,859		38,859	13%
4049-01 Information Technology	16,000	50,428	15,499		15,499	31%
4055-01 · Office Maint/Repair	24,000	24,000	12,485		12,485	52%
4058-01 Office Utilities	5,000	5,000	1,513		1,513	30%
4059-01 Office Expense	14,000	16,000	10,794		10,794	67%
4062-01 Office Equipment	10,000	34,000	30,723		30,723	90%
4064-01 Printing & Advertising	5,000	8,000	4,630		4,630	58%
4065-01 Telephone and Internet	3,500	3,500	2,405		2,405	69%
4070-01 · Travel & Training	29,000	29,000	18,901		18,901	65%
4080-01 · Miscellaneous Expenses	20,000	20,000	12,310		12,310	62%
Total 4000-01 · ADMINISTRATION EXPENDITURES	977,979	1,010,407	426,916	109,805	536,722	53%
4500-01 · OPERATING EXPENDITURES						
4501-00 · Sales Tax Expense - Other	100,000	115,000		104,520	104,520	91%
4510-01 · Bladen Bluffs Expenses	3,324,385	3,824,385		2,984,733	2,984,733	78%
4520-01 · Utilities-Energy Pump Station	786,589	786,589	540,246		540,246	69%
4530-01 · Kings Bluff O&M Expenses	686,749	686,749	309,896		309,896	45%
4535-01 Kings Bluff Hurricane Other FEMA	0	0	0		0	0%
4543-01 · Series 2012 Bond Principal (ST)	0	0	0		0	0%
4544-01 · Series 2012 Bond Interest (ST)	0	0	0		0	0%
4545-01 · Series 2010 Bond Principal (BB)	970,000	970,000		970,000	970,000	100%
4546-01 · Series 2010 Bond Interest (BB)	450,000	450,000		351,436	351,436	78%
5180-00 · SRF/Parallel Expenditures	2,500,000	2,500,000		1,698,417	1,698,417	68%
7400-01 · Operating Capital Expense	1,286,360	1,286,360		83,593	83,593	6%
4998-05- Transfer to R&R- KB R&R Expense	380,000	380,000		380,000	380,000	100%
4998-05- Transfer to Enterprise Fund	100,000	100,000		100,000	100,000	100%
Total 4500-01 · OPERATING EXPENDITURES	10,584,083	11,099,084	850,142	6,672,698	7,522,841	68%
Total Expense	11,562,062	12,109,491	1,277,059	6,782,504	8,059,562	67%

Executive Director Highlighted Activities:

- Regular Monthly meeting with the Design Build Team and Owner's Advisor for the parallel line project.
- Worked with the Owner's Advisor to submit a request for drawing down the \$30 million for the 10-mile parallel project and the reservoir project exploration.
- Participated in weekly update meetings on the 10-mile parallel line.
- Delivered the Environmental presentation for Leadership Brunswick, hosted at LCFWASA.
- Continued work on the 2024-2025 fiscal year budget.
- Met with the CFPUA Team on transition of project lead and clarification of project delivery to limit the Authority's liability.
- Met with the New Hanover County Communications team and newest member Josh Smith to explain LCFWASA operations.
- Reviewed Property and Liability coverage for the Authority and Completed Renewal.
- Reviewed Worker's Compensation coverage for the Authority and Completed Renewal.
- Met with Brunswick County to further explore the Accounts Payable role.
- Staff met with an ARPA representative for our first Audit review.
- Attended Pender County Water Tower dedication.
- Attended a Presidential visit to Wilmington through the invitation of CFPUA, announcing the assistance for lead and pipe removal.
- Staff continued to work on planning the Groundbreaking for the 10-mile parallel line.
- Worked with Glenn Walker and McKim & Creed to assess what parts were needed and on hand for an emergency. Continue to work through purchase concerns to get the few parts required ordered expeditiously.
- Staff worked with Kyle Newton and James Kearns on Bladen Bluffs' leadership transition. A new reserve account for capital projects will be created.