

**PASQUOTANK COUNTY, NORTH CAROLINA
OCTOBER 5, 2020**

The Pasquotank County Board of Commissioners met today in a special meeting on Monday, October 5, 2020, in Courtroom C in the Pasquotank County Courthouse.

MEMBERS PRESENT: Jeff Dixon, Chairman
Lloyd E. Griffin, III, Vice-Chairman
Cecil Perry
Frankie Meads
Charles H. Jordan
Sean Lavin (*arrived 2:15 pm*)
Barry Overman

MEMBERS ABSENT: None

OTHERS PRESENT: Sparty Hammett, County Manager
Sheri Small, Finance Officer
David Smithson, Water Superintendent
R. Michael Cox, County Attorney
Lynn Scott, Clerk to the Board

The meeting was called to order at 2:00 PM by Chairman Jeff Dixon.

Chairman Dixon called on Rodney Tart of Green Engineering to present an overview of the Water & Sewer Master Plan Study.

1. WATER AND SEWER COMPREHENSIVE EVALUATION & MASTER PLAN 2020-2040:

Mr. Tart thanked the Board for the opportunity of presenting. In late December of last year, the Board commissioned Green Engineering to look at a system wide evaluation of the County's utilities, as well as look at how to shape out a master plan going forward into the next 20-year planning horizon.

Mr. Tart presented the following PowerPoint presentation:

Today's Key Topics

- Presentation of Water System Evaluation
- Acquisition and Merger of South Mills (Newland)
- Halstead Blvd. and other Growth Areas
- Water and Wastewater Master Plan

1.1 General

- Hold outreach meetings for public input
- To evaluate the systems, policies, legal, risk management & efficiencies
- To provide a sustainable framework
- Develop a Water and Sewer Master Plan

1.2 Historical Significance

- The oldest assets are now 40 years old
- The county now owns over 40 million dollars in asset, with a replacement cost of 100 million dollars
- County owns and operates two water plants, Elizabeth City owns one
- Pasquotank County provides the highest quality of drinking water
- RO water quality will be the primary driver over the next Safe Drinking Water Act Amendment
- Pasquotank's Water system will be a major player in the local economy
- Developing a strong plan and implementing is paramount to achieving success

1.3 Vision and Mission

- Vision: Our Vision is to become the recognized source of safe, reliable drinking water and environmental protection for all citizens of Pasquotank County through a unified system.
- Mission: To provide the highest quality of drinking water and wastewater services to its customers at the lowest possible cost while protecting the environment and maintaining its assets for a sustainable future.

1.5 Water Supply Conventional System

- Yorktown Aquifer
- Today's current supply capacity 1.944 mgd
- 2019 WSP 1.970 mgd
- 1999 water supply capacity 3.32 mgd
- 30 shallow wells with average capacity 64,800 gpd
- Yorktown Aquifer is shallow and porous
- Has a high recharge rate
- Is subject to more contamination
- Develop a Well Field Management Plan
- Upgrade wells with static level gauges and flow meters
- Reassess all well outputs and determine what action will be required to achieve plant requirements

1.6 Water Supply – Reverse Osmosis System

- Castle Hayne Aquifer
- Today's current supply capacity 2.666 mgd
- 25% loss net supply plant output is 2.0 mgd/24
- 4 active deep wells each rated 666,000 gpd based on a 12-hour day, with 12-hour rest
- Recharge rate is very low
- Water quality is poor, high dissolved solids
- Current water quantity is high
- Well pump intakes lowered to 260 ft. deep

1.6 Water Supply – Reverse Osmosis System Master Plan (Action Items)

- Develop a Well Field Management Plan
- Engage a professional Hydrologist and develop a 3-dimensional hydrological model
- Determine the most cost-efficient direction and potential sites for new wells
- Reassess Test Well sites including reconditioning the Ownley and Cherry Glade Sites
- Determine the most cost effective next well field expansion to minimize raw water main transmission cost

1.7 Conventional Water Treatment

- Current Plant is stated to be rated at 2.7 mgd; however, there is no record of this plant being officially rate at 2.7 mgd
- Treatment is oxidation and green sand filtration to remove iron and manganese
- Plant runs at 2700 gpm max rate, which run for 12 continuous hours per day, would yield 1.944 mgd
- Water quality is fair, but has high hardness, which can't be removed with present equipment
- Develop a Well Field Management Plan
- Upgrade wells with Static/Plumbing Level gauges and flow meters
- To minimize future risk from ground water contamination and improve water quality, convert conventional Weeksville Plant to Nanofiltration technology.

1.8 Reverse Osmosis Water Treatment

- Current Plant is officially rated at 2.0 mgd
- Plant runs on average 9-13 hours per day pending seasonal changes
- Produces the highest quality in the county
- Plant is expandable in current building footprint to 3.0 mgd
- Seasonal increase in demand causes Plant to be vulnerable due to no back up filtration in standby when breakdowns occur
- Provided the South Mills Merger occurs, the plant will experience an additional 200,000 gpd demand during peak season, which could add an additional 2.4 hours per day of run time
- Upgrade plant to 3.0 mgd with first phase being third train in standby
- Once 3-dimensional hydrological model has been completed, develop two more wells with connecting transmission

1.9 Water Storage

- 15A NCAC 18C .0805 CAPACITIES: Total Storage of finished water shall be a minimum of one-half day’s supply of average annual daily demand.
- Current elevated storage..... 1.1 MG
- Current ground storage3.0 MG
- Total storage is.....4.1 MG
- Total peak day.....2.3 MGD
- Days storage.....1.78 days
- Average daily flow.....1.61 MGD
- Average day storage.....2.55 days
- Currently there is adequate storage

1.10 Water System Transmission/Distribution

PIPE SIZE	FEET All Types Pipe	MILES All Types Pipe	MATERIAL			FEET		
			PVC	OTHER	PVC	DIP	CIP	PE
3/4"	225,000	42.61		PEP	0			225,000
1.5"	2,825	0.54	PVC		2,825			
2"	145,665	27.59	PVC		145,665			
3"	2,287	0.43	PVC		2,287			
4"	341,143	64.61	PVC		341,143			
6"	656,386	124.32	PVC	DIP	656,355	30		
8"	229,646	43.49	PVC	CIP	229,635		10	
10"	66,999	12.69	PVC		66,999			
12"	12,046	2.28	PVC		12,046			
16"	86,299	16.34	PVC	DIP	76,677	9,622		
24"	26,912	5.10		DIP	0	26,912		
TOTALS	1,795,211	340.00			1,533,635	36,564	10	225,000

1.10 Water Transmission/Distribution Upgrades

- Transmission Master Plan
- Model existing system
- Replace approximately 15,000 LF of 10-inch with 16-inch to remove bottle neck in the cross-county transmission main from E. Trinkaloe Road to Oak Stump Road
- Install 30,000 LF of 12-inch transmission main Corporate Dr. to water tank on Fire Tower Road
- Connect Parsonage St. to Casey St. and eliminate dependency of City Supply (2,700 LF 6-inch PVC)

1.11 System Service Areas to Expand

- Weeksville Water Zone
- RO Water Zone
 - Mega Industrial Site
 - Proposed Growth Zone
 - South Mills/Newland Area
- Regional Interest
 - Perquimans County
 - South Mills (Camden Territory)

1.12 System Growth Potential

- In the last ten years, Pasquotank County has lost population
- All other contiguous counties have grown
- What are those factors that cause this
- Industrial jobs, Coast Guard, or University
- How do you turn this around
- Developing a Master Plan in Infrastructure
- Providing high quality water (NT)
- Providing enhanced Fire Protection (NT)
- Promoting the County through other planning
- Improving policy
- Implementing a plan

Projected Population change in North Carolina Counties: 2020-2030

County	Total Population		Population Change		Components of Change			
	July 2020 Projection	July 2030 Projection	Numeric	Percent	Births	Deaths	Natural Increase	Net Migration
Camden	10,717	11,266	549	5.1	1,099	1,139	-40	589
Gates	12,165	12,254	89	0.7	1,047	1,464	-417	506
Pasquotank	39,685	39,591	-94	-0.2	4,767	4,406	361	-455
Perquimans	13,637	13,923	286	2.1	1,307	2,114	-807	1,093

Projected Population Change in North Carolina Counties: 2030-2039

County	Total Population		Population Change		Components of Change			
	July 2030 Projection	July 2039 Projection	Numeric	Percent	Births	Deaths	Natural Increase	Net Migration
Camden	11,266	11,403	137	1.2	924	1,250	-326	463
Gates	12,254	12,261	7	0.1	792	1,531	-739	746
Pasquotank	39,591	39,588	-3	0	4,393	4,365	28	-31
Perquimans	13,923	14,340	417	3	1,166	2,135	-969	1,386

1.13 RO & Weeksville Plants Integration

- Water Quality Issues
 - Disinfection by products
 - Hardness & Iron
- Water zones and chemistry corrections
 - Chloramines/hardness/carcinogens
- Master Plan provide compatible water quality for redundancy/ support
- Phase I – increase RO Plant to 3.0 MGD
- Phase II – Convert Weeksville Plant to a 2.4 MGD Nanofiltration Plant
- Phase III – Interconnection transmission with system modeling

1.14 System Controls

- Elevated tank controls
 - Altitude valve vaults above ground
 - Add one altitude valve at tank 4
- Zone controls
- SCADA control (Supervisory Control & Data Acquisition)
- Controls Master Plan
 - Upgrade all altitude valves
 - Develop SCADA master plan
 - Integrate both water plants
 - Provide staff with remote access

1.15 Risk Management

- Promote Interconnectivity
- Reduce ground water risk
 - 3-dimensional hydrological model
 - Develop well field management plan
 - Update current well head protection plan
- Reduce risk by third party liability insurance assessment
- Conduct a third-party legal audit of all policies and contracts

1.16 Rates Evaluation Master Plan

- Over the last 10 years inflation has risen 1.85%/year
- Over the next 20 years PCDPU CIP is projected to be \$48,696,500
- Rates will need to be adjusted to service new debt
- Consider annual rate adjustments consistent with the consumer price index or CPI.
- Consider removing the first 1,000 gallons in the flat rate and use the minimum to recover debt service
 - Last flat rate change was 12-01-2013 from 2,000 gallons at \$15.00
- The last commodity charge was July 2014 from \$5.34 to \$6.00 per 1,000 gallons
- Consider modifying Commercial flat rates to residential equivalents based on size of service
- Consider adding an Institution billing class to your rates for Correctional Facilities

1.17 Capital Improvement Plan

- This plan covers the next 20 years of infrastructure needs.
- The Projects List is not all inclusive, but our best estimate
- The first 10 years are the most important
- Some of the projects proposed in the first 10 years will be pushed back into the second 10-year phase pending funding
- It is paramount that the staff and Board review and prioritize the planning matrix
- Once these priorities are set, then a more in-depth rate review will be required in order to project the revenues to service the new debt
- For detail on the Capital Improvement Plan turn to Section 17, spread sheet before page 109 to review the projects proposed over the next 10 years (full plan)

1.18 Rules and Regulations

- Master Plan recommendations
- The current regs should be replaced with a new Water and Sewer Ordinance
- This new ordinance will include rates, operations policies, line extensions, system development fees, meter calibrations, and tampering language
- The staff and County Attorney should write the modifications of the regs in ordinance format
- These new policies should be updated annually, if nothing more than the rates, if there are changes

- The current Water Conservation Ordinance was written before the RO plant was built. In reviewing this plan, Green Engineering recommends that the department head and his top managers review and update to today's conditions
- Included in appendix M of the Report is draft Water Conservation Ordinance to use as a template for updating

1.19 Long Range Financial Plan (LRFP)

- The LRFP is a Guide for future financial planning
- The PCDPUD has experienced an excellent financial position with limited resources
- Over the next 20-year planning horizon it will be important to retain and improve strong financial policy to prepare for the sustainment of the utility with continued growth in financial position
- Over the next year the Utility Department with the help of the Finance Department, should strengthen its chances for grant and low interest loans by:
 - Maintain an active CIP no older than two years
 - Implement an Asset Management Plan
 - Apply annually for Asset Inventory and Assessment Grants
 - Continue to maintain an Operational Ratio over 1.1
 - Maintain a current approved Well Head Protection Plan
 - Continue to Maintain Water Loss under 10%
 - Implement Water Conservation incentive rate structure

(The above items will score needed points in loan and grant applications. Most recipients awarded funds have these System Management achievements.)

1.21 Water/Sewer Contract Evaluation

- Conduct a Legal Review of all contracts and insure that they are compatible with the proposed water and sewer ordinance

1.22 System Efficiencies

- Utility System Staff levels are very lean with an average of 2.38 per 1,000 connections Industry benchmarks at 3 persons/1,000
- The South Mills Water Association merger will require some additional staffing
- There are operational and administrative space needs at the Weeksville Plant and the Administrative Office
- Promote County Utilities with an enhanced web page
- Continue to embrace applicable technologies to keep staff ratios within standards
- Modernize SCADA with Management Plan
- Include a phased AMR/AMI in the new CIP
- Continue to expand cost centers for tracking true cost of O and M
- Continue to improve on the monthly Water Loss Audit
- Develop a valve & hydrant maintenance program

1.23 Water System Master Plan Goals

- Water Supply Management Plans
- Water Treatment Upgrades
- Distribution Upgrades
- Rate Methodology Changes
- Operational Policy Changes
- Automation and Technology
- Water System (s) Acquisition
- Utility Planning for Commerce Park and Mega Park
- Risk Management/Legal Audits
- Become more proactive with grant application credits

- Achieve new Well Head Protection Plan
- Board approve Capital Improvement Plan
- Develop an Asset Management Plan
- Enhance Utility Web Site
- Approve Conservation Incentive Rate
- Update Backflow and Cross Connection Plan
- Update Water Conservation Ordinance

1.23 South Mills Merger Action Items

- Develop an engineering evaluation of worth for assets to be acquired (completed)
- Develop a list of improvements that PC Utility Department will make to the system (completed)
- Replace undersized piping on Mill Pond Road (to be determined)
- Run a hydraulic analysis to determine if a booster pumping station will be required to keep elevated water tank full under peak demand conditions
- Add SCADA Controls Booster Station, blow off hydrant, altitude, & MMV and change out all meters. Further evaluate small lines and fire suppression needs and altitude
- Establish a preliminary budget is \$1,062,000
- Seek Board authorization to make offer to SMWA Board (completed)
- Make an offer to SMWA Board (completed)
- Received/approve acceptance to offer from SMWA Board (pending)
- Develop a closing procedural list with SMWA attorney and set a tentative closing date
- SMWA holds a membership meeting for a vote to approve sale of assets to PC if required by SMWA legal counsel
- SMWA will pay off debt with USDA to issue free title
- SMWA to provide a detail customer information list to PC for setting up billing
- SMWA to make notice to its customer the official date of operational responsibility change over to PC
- SMWA indemnifies PC of any potential lawsuit as a result on anything pending or rising out of the sale of the proposed assets.
- SMWA warrants to PC all easements, right of way, and land associated with the transfer of the system assets
- SMWA transfers all engineering drawings, and digital files of the water system
- Once the closing date has been set by each party, notify NC Water Supply Regional Office in Washington, NC of the acquisition and the RO system ID that the merger will operate under
- Develop a project ordinance for the appropriation and request Board approval
- Set PC Utility billing system up, create new customer list, and start operating on day of closing
- Make PC Utility Department operations budget changes for additional operating expenses
- Develop a public relations notice to all South Mills/Pasquotank customers and promote high quality water and future improvements

1.24 Wastewater Evaluation & Master Plan

- Current WWTP capacity is 174,000 gpd
- Current revenue is \$480,000 annually
- Currently, 15 commercial customers & two County/City Schools
- Approximately 26,885 LF of gravity and FM main sewers are county assets
- Additionally, approximately 33,502 LF of 12" FM was previously gifted to the City for the transport of wastewater from the Commerce Park to the City WWTP
- 2019 Flow Reports show very low Infiltration/Inflow
- Current Assessment of County WWTP is that its incapable of land applying consistently its designed flow
- For 2019, the County WWTP only treated 25% of the total waste generated from its customer base
- Information received from the regional Environmental Director states that less than 1% of the land mass in Pasquotank County meets on-site septic disposal system code requirements

- County growth for the future will be dependent on adequate centralized wastewater disposal being provided for county utility customers
- County Planning Director projects the primary future growth area of the County to be north of Halstead Blvd to Morgan's Corner. See Appendix E on the report
- Both the Commerce Park and the proposed Mega Industrial Park will require adequate sewer service to accept development
- The proposed pump station and force main from Halstead Blvd to the existing County WWTP site is a first phase of the sewer infrastructure master plan
- Conduct a Water Quality Model for proposed wastewater discharge into Pasquotank River adjacent to existing County WWTP
- Conduct an Engineering Alternative Analysis of treatment disposal methods
- Secure 2.0 MGD NPDES Permit for wastewater discharge into the Pasquotank River
- Design and stage construct a 2.0 MGD tertiary WWTP with a 1.0 MGD first stage with related interceptor and outfall piping systems to be located on existing county WWTP property

1.25 Water & Wastewater Master Plan Summary

- Update web page and consider department name change
- Update policies and implement management strategies
- Update Hydrologic Model and Well Management Plan
- Upgrade water treatment mains
- Upgrade WTP's for systems integration & redundancy
- Implement South Mills merger
- Embrace technologies, system controls/management
- Adopt a Long-Range Financial Plan Policy
- Develop CIP and New Utility Rate Ordinance
- Conduct contract & system develop fee audit
- Enforce risk management practices
- Promote County economic development mission with water & wastewater infrastructure to support planned growth
- Promote and implement Water/Wastewater Utility Master Plan

Mr. Tart said Green Engineering would like to thank the Pasquotank County Commissioners, staff, and Project Committee for allowing his firm to be a part of its vision with improving, upgrading, and developing a business model and Master Plan which will facilitate the Board's mission in maintaining a sustainable utility system.

Mr. Tart noted that several of the things that need to be done can be done concurrently. The first and highest priority right now is to address the South Mills issues. Following right behind that is water treatment to meet the new demands and have a backup. Once the RO Plant is upgraded, then the County can dive into what they want to do with the Weeksville Plant. There will be enough water at that point to carry the County. He said they have not studied the Weeksville Plant in great detail, but they really feel like the plant will have to be shut down. He explained that the old antiquated pressure filters will be removed and nanofiltration will be put in, so that the water will be compatible from both side. All the water will be pumped in the grid and distributed to wherever it needs to go.

Once the Board decides on how it wants to prioritize and move forward, we need to start looking at addressing the rates in the revenue stream. It may be that some reclassifications and rate changes are necessary.

The Board thanked Mr. Tart for his work.

Motion was made by Barry Overman, seconded by Charles Jordan that the Board enter Closed Session to preserve the attorney client privilege. The motion carried unanimously.

Upon the end of Closed Session;

Motion was made by Cecil Perry, seconded by Sean Lavin that the Board return to Regular Session. The motion carried unanimously.

There being no further business;

Motion was made by Barry Overman, seconded by Frankie Meads to adjourn the meeting. The motion carried and the meeting was adjourned at 3:30 PM.

CHAIRMAN

CLERK TO THE BOARD