

# Town of Beaufort Water Asset Management Plan Project



## Purpose

- Survey Valves & Hydrants
- Create GIS File for Water System
- Inspect Wells & WTPs
- Asset Condition Assessments w/ Town Staff
- Identify Needs w/ Cost Opinions
- Prioritize Needs w/ Town Staff
- Develop 10-Year CIP for Water System
- Develop Water System Asset Management Plan

# Town of Beaufort

## Water Asset Management Plan Project



## Funding

NCDEQ-DWI Grant: \$150,000

Local Matching Funds: \$7,500 (5%)

- Administrative Grant Fee: \$2,250 (1.5%)

# Town of Beaufort

## Water Asset Management Plan Project

# GPS Survey / ArcGIS Mapping



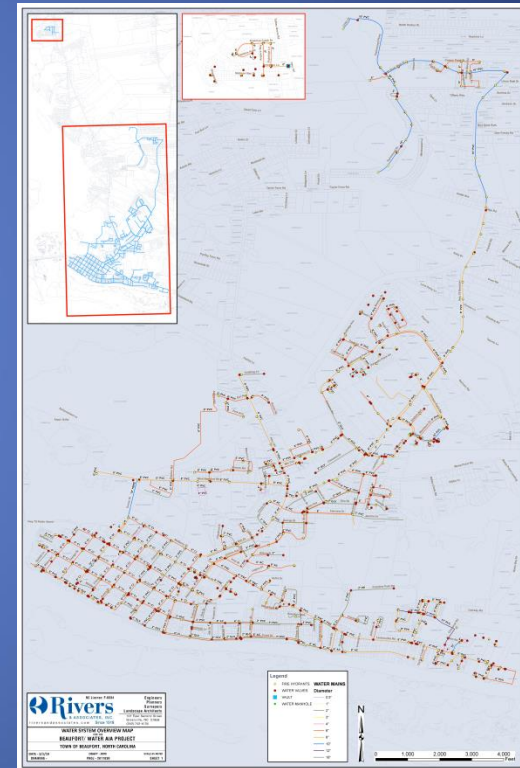
Survey-Grade Global Positioning Survey (GPS)

Valves Surveyed = 888

Hydrants Surveyed = 278

Pipelines Mapped (47.9 miles):

- 1" = 1,842 LF
- 2" = 51, 998 LF
- 3" = 855 LF
- 4" = 4,430 LF
- 6" = 100, 172 LF
- 8" = 73,979 LF
- 10" = 17,693 LF
- 12" = 2,192 LF



# Town of Beaufort

## Water Asset Management Plan Project



## Water Supply Assets

4 Wells (Ages: 6/ 7/33/42)

Permitted Groundwater Withdrawal = 1.872 MGD

12-Hr Permitted Well Capacity = 1.494 MGD

- ✓ Average Day = 0.471 MGD (2017)
- ✓ Max Day = 0.743 MGD (2017)



Town of Beaufort

Water Asset Management Plan Project



## Water Treatment Assets

Permitted Capacity (2 plants) = 1,440,000 GPD

- ✓ 2017 Average Day = 471,000 GPD (2017)
- ✓ 2017 Max Day = 743,000 GPD (2017)

# Town of Beaufort

## Water Asset Management Plan Project



# Water Treatment Assets

## Pine Street WTP

3 Structures (30 – 100 yrs. age)

4 Softeners (30 yrs. age)

Brine Storage Tank (age: 6)

Aerator / 10K Gallon Clearwell

Chlorine Disinfection / Fluoride

2 High Service Pumps (ages: 6 / 64)

NPDES Permit: Process Waste Discharge





# Town of Beaufort

## Water Asset Management Plan Project



# Water Treatment Assets

## Glenda Drive WTP

2 Structures (33 yrs. age)

On-Site Generator

2 Softeners (ages: 13 / 33)

Brine Storage Tank (age: 6)

Aerator / 300K Gallon Clearwell

Chlorine Disinfection / Fluoride

2 High Service Pumps (ages: 33 yrs.)

NPDES Permit: Process Waste Discharge



# Town of Beaufort

## Water Asset Management Plan Project



# Water Storage Assets

Installed Capacity = 710,000 Gallons

- 2 Ground Storage Tanks (300,000 / 10,000 gal)
  - 2 Elevated Storage Tanks (200,000 gal each)
    - Ages (32 / 42 yrs.)
- ✓ Regulatory Requirement (1/2 day supply)  
= 236,000 Gal.





Town of Beaufort

Water Asset Management Plan Project



## Water Distribution Assets

47.9 miles: 1" – 12" Pipe (CIP/GLV/ACP/PVC/DIP)

888 Valves

278 Hydrants

83% < 50 Yrs. In Age

17% > 50 Yrs. in Age

- CIP & GLV - Mostly in Historic District
- ACP - Mostly North of Cedar St. & East of Live Oak St.

Town of Beaufort

Water Asset Management Plan Project



# Asset Evaluation Process

Approximate Asset Age

Material Type

Maintenance Records

Prior Special Reports

Institutional Knowledge / Known Susceptibility to Failures

Visual Inspection

Condition Assessments w/ Staff

# Town of Beaufort

## Water Asset Management Plan Project

# Condition Assessment Summary



### Water Supply

- ✓ Adequate Capacity for Existing Demands
- ✓ Redundancy (2 wells for each WTP)
- ✓ Five Test Wells Previously Tested
- x Two Wells (# 2 & #3) At or Nearing Expected Service Life (ages: 33 / 42 yrs.)

### Water Treatment

- ✓ Adequate Capacity for Existing Demands
- ✓ Redundancy (2 WTPs)
- x Rusting Electrical Gear
- x Challenges w/ NPDES Waste Stream Discharge (metals & TSS)
- x Nearing or Exceeding Expected Service Life (ages: 33 - 64 yrs.)
- x High Service Pump Age - 64 yrs. (Pine Street WTP)
- x Space Limitations (Pine Street WTP)

# Town of Beaufort

## Water Asset Management Plan Project



# Condition Assessment Summary

### Elevated Water Storage

- ✓ Tank Maintenance Contract
- ✓ Good Condition (currently being painted)

### Ground Water Storage

- x Pine Street Clearwell - Very Small Volume (Short Pump Cycle Times)

### Distribution System

- x Older Valves - Inoperable
- x Replacement Parts for Older Hydrants, No Valves
- x CIP & GLV Prone to Leakage / ACP is Brittle & Prone to Failure (17.1%, 8.1 miles)
  - x Replace Asbestos Cement Pipe (ACP) = 10,000 +/- LF (4.1%)
  - x Replace Galvanized Steel Pipe (GLV) = 7,800 LF +/- (3.1%)
  - x Replace Cast Iron Pipe (CIP) = 25,000 LF +/- (9.9%)

# Town of Beaufort

## Water Asset Management Plan Project



# Specific Recommendations (Wells)

Well No. 2 - Replace Starter w/ Soft-Start Solid-State Starter

Well Nos. 2 & 3 - Monitor for Diminishing Flow

# Town of Beaufort

## Water Asset Management Plan Project



## Specific Recommendations (WTPs)

- Pine Street WTP - Monitor Performance of High Service Pump No. 1
- Pine Street WTP - Monitor Need to Upsize Clearwell Based on Pump Cycle Times
- Perform Interior Inspection of Softener Vessels per Manufacturer's Recommendation
- Replace Aged & Rusting Electrical Gear
- Monitor O&M Cost Trends vs. Investing in New Consolidated Facility
- ✓ Implement Pipe Connection of Waste Discharge to Sewer System (interim NPDES response)



Town of Beaufort

Water Asset Management Plan Project



# Specific Recommendations (Storage)

- Maintain Prescribed Maintenance per Contract

Town of Beaufort

Water Asset Management Plan Project



# Specific Recommendations (Distrib.)

Routinely Update New GIS Water Database

Use GIS as Tool to Increase O&M Efficiency & Effectiveness

Replace Older Hydrants Subject to Lack of Parts \*

Replace Inoperable Valves \*

Replace Older Piping by Staff Priorities

1. Asbestos Cement Piping (ACP) (10,000 LF) \*
2. Galvanized Steel Piping (GLV) (7,800 LF) \*
3. Cast Iron Pipe (CIP) (25,000 LF) \*

\* *“When” is driven by Staff Knowledge of Condition, Need & Potential Paving Schedules*

# Town of Beaufort

## Water Asset Management Plan Project

### Cost Opinions (> \$25,000)



#### Distribution Upgrades (replace ACP, GLV, CIP)

	<u>Est. Cost</u>	<u>FY *</u>
1. Crescent Dr. / Campen Rd.	\$203,000	FY 20
2. Live Oak S./Chestnut Dr./Circle Dr./Second St./Legion Dr.	\$2,851,000	FY 21
3. Live Oak/Mulberry/Pine St.	\$3,434,000	FY 22
4. Cedar St./Moore St.	\$374,000	FY 19 **
5. Downtown	\$4,934,000	FY 23
6. W. Ann St./Queen St.	\$2,648,000	FY 24
7. Front St./Broad St. (Marsh to Gordon)	\$1,408,000	FY 25
8. Front St./Broad St. (Gordon to Belle Air)	\$2,493,000	FY 26
9. Front St./Broad St. (Belle Air to Island View)	\$788,000	FY 27
10. E. Ann St.	<u>\$194,000</u>	FY 28
	<b>\$19,327,000</b>	

\* Based on Staff Priority Rating

\*\* Driven by NCDOT Proposed Resurfacing

# Town of Beaufort Water Asset Management Plan Project



## Deliverables

Water System Database on ArcGIS Platform  
10-Yr Water System CIP  
Water System Asset Management Plan

*Town's Toolbox (editable electronic document files)*

# Town of Beaufort

## Water Asset Management Plan Project



# Possible Actions

## No Action

### Adopt 10-Year\* Water CIP & Update as Required

- Gains Points in Competitive Funding Applications
- 5-Yr. Projects Can be Imported into Town 5-Yr. CIP

*\* Grant Requirement*

### Adopt WAMP & Update as Required

- Gains Points in Competitive Funding Applications
- Use of Established Assessment Methodology Provides Transparent Analysis

# Town of Beaufort Water Asset Management Plan Project



*Questions!*