The Unique History of Charleston Water System’s Sewer Collection and Treatment Facilities

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Kin Hill, P.E., CEO
Charleston Water System
Welcome to Charleston!

- Voted by CONDÉ NAST TRAVELER Magazine as the #1 tourist destination 10 years in a row
- Great Food
- Great Scenery
- Great Beaches
- Great History
Will focus on the history of CWS, and especially the history of our wastewater system

- How we morphed from a water only utility to a water and wastewater utility
- Show some unique aspects
- Give you some data on our compliance track record, etc.
How it all started:

- **1917** Charleston Commissioners of Public Works formed; later name changed to Charleston Water System (CWS)
  - Assumed assets of the Charleston Water & Light Company
  - Operated a surface water treatment plant and water distribution system for over 40 years

- **1961** City of Charleston transferred ownership, operations, maintenance and control of City’s wastewater collection system to Charleston CPW.
  (No WWTP in existence; just a collection system)
Collection System “Evolution”

- Between 1865 – 1896 City Council's Health and Drainage Committee recommended the construction of separate sanitary sewers and removal of wastes from the storm drain system by means of a TIDAL Drain System.

- TIDAL Gate Keepers operated slide gates in sync with tidal cycles to flush out the storm drains.

- This system was kept operational until early 1960’s. (Both systems discharged to the Ashley and/or Cooper Rivers)
What wastewater assets did CWS assume in 1961?

- Original wastewater collection lines installed in early 1800’s
- All pipes flowed to Ashley or Cooper Rivers (untreated)
- By 1840 such system was deemed “defective and offensive.”
- By 1854 City public health reports stated: “The evil was radical, and the remedy must be radically administered, or the large number of causes of disease and death will continue to increase with the augmenting population.”
October 1961 – City Transfers Ownership to CWS

(What happened next?)


• 1965 – Charleston Harbor declared “dead” by SC Pollution Control Authority, the predecessor of SC DHEC

• Fish Kills and zero dissolved oxygen events prevalent in Charleston Harbor

• June 1965 – Plans announced for a $9.2 million wastewater treatment plant project on 14 acres at Plum Island, the former site of historic quarantine “pest houses” in Charleston
1960’s Media Records of Charleston Harbor

Bad NEWS Everywhere!
Charleston Harbor Badly Polluted!
1968 – CWS begins construction of Plum Island WWTP
Associated with Plum Island WWTP was 7 miles of deep collection system tunnels (11 miles ultimately)

- 90 – 130 feet deep for gravity conveyance in the cooper marl formation
FIGURE 2.—Arrangement of interceptor tunnel system.
Why a gravity tunnel for conveyance?  
3 Reasons

1. Least disruption to historical areas of Charleston
2. Great Geology for Tunnelling (Cooper Marl)
3. Past Experience (Water Tunnel)
There is an "underground" in Charleston, South Carolina. Not a group of latter day radicals, but one that's been there for millions of years...just waiting to benefit this colorful, historic Southern City.

That "underground" is a geological rarity called Cooper marl. Soft enough that tunnels can be cut through it easily. Dense enough that those tunnels can be used to transport water...

_Mueller Record, Spring, 1978._
Apollo 11  July 20, 1969
Plum Island WWTP goes online for the first time, November 1971

- Primary Treatment Only
- Later upgraded to secondary treatment in 1984 at a cost of $13 million
Plum Island Today, 2022

36 MGD Conventional Activated Sludge Treatment Plant
New Tunnel System Today, 2022
So How Has Plum Island Performed Since 1971 (50 Years)?

Answer: PHENOMINALLY!


25 times!

including numerous individual WEF Awards for CWS Staff!
Charleston Harbor Today

• Fishable
• Swimmable
• Loveable!

*Kathleen Wilson, CWS Commissioner (Long Distance Swimmer)
Enjoy our wonderful City!

Thanks to Plum Island and the FANTASTIC CWS “Team” it is even more enjoyable!