Efficiency Optimization, Asset Management & SRF Funding: *Essential Ingredients to Achieve Both Water Quality Improvements & Cost Reductions for Ratepayers*

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Twin Challenges Facing Clean Water Utilities

- Main Purpose – Provide clean, safe water to protect the environment and the public health
- But must also do so while minimizing the cost to ratepayers

Thus, utilities must always strike the proper balance between optimizing performance and minimizing cost.

Increasing Challenges for Utilities

- Environmental
  - Increasing population ✚ finite resources ⇨ increasing environmental pressures (“shrinking planet effect”)
  - Increasing environmental pressures ⇨ more stringent environmental regulations
  - Pressures from climate change ⇨ need for more resiliency
- Economic
  - Aging infrastructure ✚ increased economic pressures ⇨ larger gap between needs & resources
- Demographic
  - Aging workforce ⇨ potential loss of institutional knowledge

Thus, Utility Managers must:

- Improve environmental performance
- Replace aging capital
- Arrange for succession planning
- Improve resiliency & reduce vulnerability to climate change
- All, while keeping rates as low as possible!

Proposed Solutions

1) Increase Operational Efficiency
   - the public utility must adopt the private sector focus on efficiency and optimization and harness it to the public good
   - implementation of an Environmental Management System (EMS) is an excellent tool to optimize efficiency toward achieving core missions

Proposed Solutions *(cont'd)*

2) Asset Management
   - timely replacement of capital facilities can significantly improve environmental performance while also reducing annual O&M costs
   - utilizing the low interest loans offered by State Revolving Funds (SRF's) significantly lowers the annual debt service burden

Camden County Municipal Utilities Authority (CCMUA)

- Services 500,000 customers in Southern New Jersey
- Design Flow: 80 MGD
- Average Flow: 58 MGD
- Secondary, pure oxygen activated sludge treatment
- Discharges to Delaware River

Goals

CCMUA has four fundamental goals that are critical to its success:

- Optimization of Water Quality Performance
- Optimization of Air Quality Performance
- Cost Minimization
- Contribute to Long-Term Sustainability (infrastructure, environment and community)

Initial Conditions

- CCMUA obliged to raise rates by 22½%, from $275 per household to $337
- Numerous odor complaints from neighboring residents
- Plant struggling to meet state discharge limits, despite receiving only 70% of rated capacity

Corrective Action Plan

- Implemented Environmental Management System (EMS) to:
  - Optimize internal efficiency
  - Improve environmental performance
  - Improve community service including, but not limited to, odor minimization
  - Maximize cost efficiency
  - Identify required capital improvements
- Utilized NJ Environmental Infrastructure Trust (NJ's SRF) to implement capital improvements to treatment plant & interceptor system

Recent Capital Improvements Funded via SRF

- Upgrade of Sedimentation Tanks- $10 million
- Aeration System Upgrade- $15 million
- Sludge Drying Facility- $30 million
- Odor Control Upgrades- $15 million
- Interceptor System Expansion- $50 million
- Green & Gray Infrastructure- $ 5 million

$125 million

Environmental Benefits

- Effluent Quality Improved by 40-50%
  - 22ppm TSS in 1999 to 4ppm in 2015
  - 25ppm BOD in 1999 to 1ppm in 2015 Sludge Removed Improved by 45%
  - 11,000 dry tons removed in 1999 to 16,000 dry tons in 2015
- Odor Violations down from 16 in 1997/98 to 5 from April 1998 to December 2015

Economic Benefits

- O&M costs reduced by 25% (inflation adjusted)
- Staffing requirements reduced by 40% (from 230 to 130) due to automation
- User Fee held for 17 years, from 1996-2013
- Today's user fee only 5% higher than in 1996 ($352/yr vs. $337/yr) in nominal dollars and 30% **lower** in real, inflation-adjusted dollars

Achieving operational efficiency & using the SRF for capital improvements resulted in both improved environmental performance and cost savings to ratepayers

Sustaining Infrastructure, Environment and Rates

- CCMUA replaced and upgraded all of the major process units of its treatment plant through the SRF
- Replacing under performing process units results in improved operational performance and reduced O & M costs
- Rate increases avoided by
  - Choosing projects for which operating cost savings exceed marginal debt service
  - Benefitting from lower cost state revolving funds which significantly reduce debt service requirements

Vital Importance of SRF

- Capital project of $20M; Annual O&M Savings- $2 million
- Funding through SRF- $1.5M in annual debt service

  -net annual savings of $0.5M
- Conventional Funding- $3.25M in annual debt service

  -net annual deficit of $0.75M
- SRF Financing is often the **difference between a "go" or "no go" for important environmental initiatives**

Other Benefits from Improved Performance

- Reduced Risk of:
  - Adverse impact to environment and public health
  - Fines from regulatory agencies
  - Public complaints or lawsuits
- Improved relations with Regulatory Agencies & Neighbors
- Creation of Positive Environmental Culture
- Capture of Institutional Knowledge

Sustaining Our Community

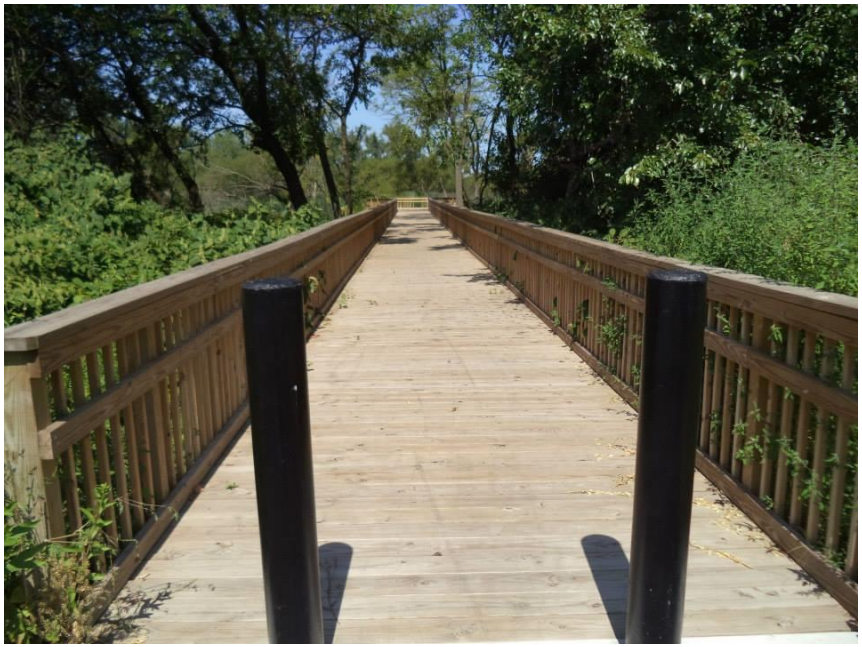
- Host Community Benefit provided to Camden City Residents
- Creation of City Parks
- Implementation of Green Infrastructure Program thru the NJEIT
- Creation of Camden Collaborative Initiative

Waterfront South Rain Gardens-

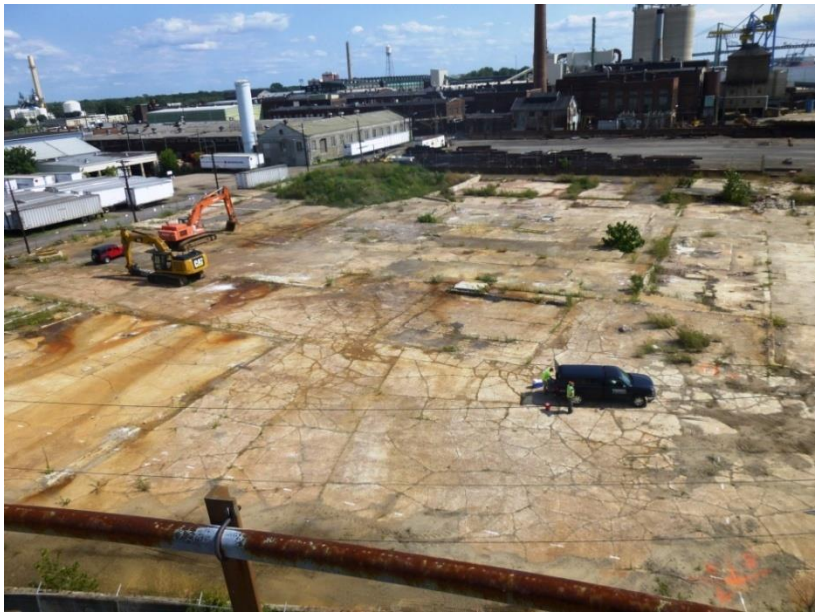
Green Infrastructure on Brownfield Sites- *Before & After …*

Baldwin's Run Stream Daylighting Project- *Before….*

Baldwin's Run Stream Daylighting Project- *After…*



Phoenix Park Project- *Before…*



Phoenix Park Project- *After…*

Improving Resiliency & Reducing Vulnerability to Climate Change/History

- Energy Conservation
- Solar Panels
- Sewage to Heat
- Digestion/Combined Heat & Power

Conclusions

- Utility managers face ever-increasing challenges
- The clean water utility of the future can optimize environmental performance, improve resiliency and reduce costs to ratepayers through:
  - operational efficiency realized through Environmental Management Systems (EMS)
  - judicious use of capital improvements to improve performance and reduce O&M costs
  - use of SRF's to minimize annual debt service costs

Thanks for Listening!

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