Planning for Optimal Utility Performance in a Sustainable, Cost Effective, Manner

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Increasing Challenges for Water Utilities

- Environmental
  - Increasing population + finite resources → increasing environmental pressure (“shrinking planet effect”)
  - Increasing environmental pressures → more stringent environmental regulations

- Economic
  - Aging infrastructure + increased economic pressures → larger gap between needs and resources

- Demographic
  - Aging workforce → potential loss of institutional knowledge
Thus, Utility Managers must:

• Improve environmental performance

• Replace aging capital

• Arrange for succession planning

• **Without** raising rates!
Water treatment managers face great challenges but, correspondingly, also have a tremendous opportunity to make a positive difference.

- Water treatment
- Energy conservation
- Maintaining capital infrastructure
- Cost minimization
- Community service
• So, water treatment managers must integrate sustainability principles as they develop operational optimization and asset management plans.

• The USEPA’s new Planning for Sustainability Handbook for Water and Wastewater Utilities is an ideal resource for water treatment managers seeking sustained improvement for their utility.
• Four main planning elements

➢ Goal Setting

➢ Objectives and Strategies

➢ Alternatives Analysis

➢ Financial Strategy
Camden County Municipal Utilities Authorities (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
Planning Element No. 1 – Goal Setting
Camden County MUA’s Approach

• Implemented an Environmental Management System internally to identify agency’s most important objectives

• Engaged external environmental stakeholders

• Engaged neighboring community

• Engaged ratepayers
Engaging Stakeholders

• Meetings with Delaware River Basin Commission & New Jersey Department of Environmental Protection → Effluent quality, odor control, trackback of PCB’s

• Meetings with neighboring residential community, public hearings, formation of Community Services Task Force → odor control, reduction of truck traffic and creation of green space

• Public hearings for rate payers, issuance of quarterly newsletter, creation of interactive website → rate control & green energy practices
Camden County MUA’s Main Goals

• Water Quality Optimization
• Odor Control Optimization
• Cost Minimization
• Community Service
• Energy Minimization/reduction of carbon footprint
Planning Element No. 2 – Objectives and Strategies
Camden County MUA
Sustainability Objectives

• Water Quality – suspended solids concentration below 5 ppm by 2010 and sustain
• Odor Control – zero odor events by 2013
• Cost Minimization – upgrade five main plant processes by 2013 while holding rates
• Community Service- Eliminate truck traffic & create three new parks by 2014
• Energy Minimization – net zero by 2017
A. Water Quality

- Change institutional culture to require "supercompliance"
- Upgrade plant process units to improve performance
Strategies to Meet Sustainability Objectives

B. Odor Control

- Change institutional culture; implement “zero tolerance”

- Install new odor control equipment

- Replace sludge hauling with enclosed sludge drying
Strategies to Meet Sustainability Objectives

C. **Cost Minimization**

- Replace underperforming, high maintenance equipment with newer equipment (better performing/lower O+M cost)

- Utilize low interest State Revolving Fund Loans to reduce annual debt service

- Reduce staffing through automation and attrition
Strategies To Meet Sustainability Objectives

• Community Services
  – Pass ordinance reducing truck traffic
  – Convert brownfield sites into green space
  – Create rain gardens to beautify neighborhood and reduce flooding
Strategies to Meet Sustainability Objectives

E. Energy Minimization

- Reduce energy consumption
- Implement on-site green energy alternatives (solar panels, digestion, etc.)
- Procure off-site green energy sources
Planning Element No. 3 – Alternatives Analysis
Camden County MUA’s Alternative Evaluations

• Projects were chosen on the triple bottom line basis – economic, environmental, and social benefit

• Projects had to be rate neutral, if at all possible, then environmental and social benefits predominated the analysis
Alternative Analysis Case Study
Camden County’s Sludge Drying Facility

• Alternative 1 – No action (continue sludge hauling)

• Alternative 2 – Install sludge drying facility

• Alternative 3 – Install sludge drying facility & digestion
Alternative Analysis (continued)

<table>
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<tr>
<th>Alternative</th>
<th>Rate</th>
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<th>Green Energy</th>
<th>Effluent Quality</th>
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<td>1</td>
<td>Rate Neutral</td>
<td>No odor reductions</td>
<td>None</td>
<td>No change</td>
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<td>No change</td>
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<tr>
<td>3</td>
<td>Significant rate increase</td>
<td>Significant odor reduction</td>
<td>Green Energy Opportunities</td>
<td>No change</td>
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</table>

Based on this, CCMUA selected Alternative 2, sludge drying only, and is currently looking at a Power Purchase Agreement to add digestion in a rate neutral way.
Planning Element No. 4 – Financial Strategy
Camden County MUA’s Financial Strategy

- Continually seek cost saving opportunities through Environmental Management System (EMS)
- Seek grants wherever possible
- Utilize low interest State Revolving Fund (SRF) loans
- Select projects where near annual debt service is less than or equal to annual O&M cost savings from new equipment
- Reduce O&M costs through automation & attrition
- Charge connection fees to reduce rate burden to current customers
- Offer Host Community Benefit to Camden as part of environmental justice program
Results... So Far

• Water Quality – Solids removed increased by 40%; TSS down from 25 ppm to 5 ppm
• Odor Control – Odor violations reduced from one per month to 5 violations in the last 10 years
• Cost Minimization – 4 of 5 main plant process units upgraded; staff down from 230 employees to 130; annual rates lower today ($324 per household) than in 1996 ($337)
• Energy Minimization – 2 MW solar panel system installed; green energy RFP issued in 2012
Conclusion

• Increasing environmental and economic pressures require utilities to optimize environmental performance and cost efficiencies in a sustainable way

• Applying sustainability principles into all aspects of planning is an essential prerequisite to achieving a utility’s environmental performance, cost minimization and community service goals

• The USEPA’s new Plan for Sustainability Handbook for Water and Wastewater Utilities is a very valuable resource for utility managers
Thanks for Listening!

If you would like more information, please contact:

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