

Continual Improvement Framework for Effective Utility Management

Andrew Kricun, P.E.

**Executive Director / Chief Engineer
Camden County Municipal Utilities Authority
Camden, New Jersey**

Tom Pedersen

**Senior Vice President and Director of Sustainability
CDM
Cambridge , Massachusetts**



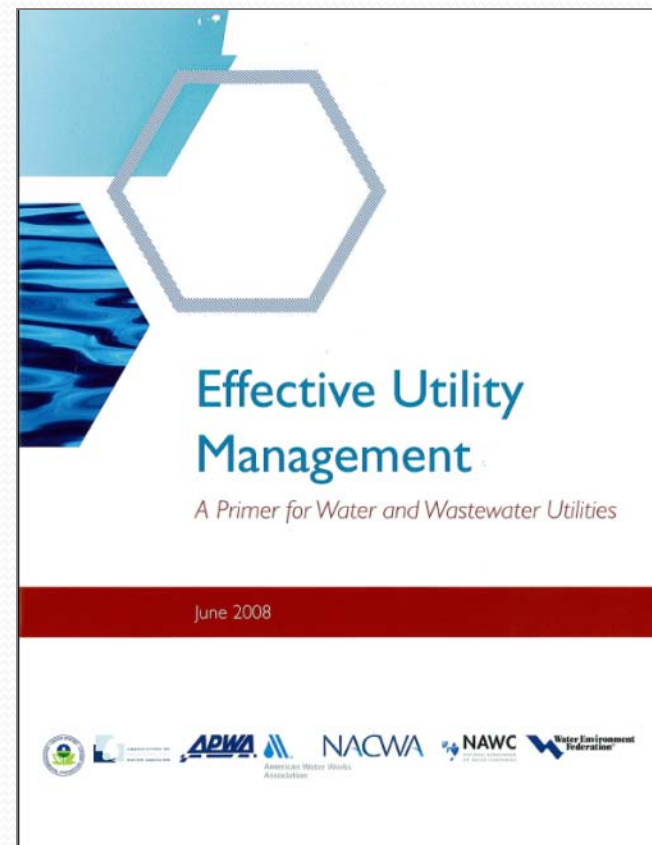
Presentation Outline

- Overview of Continual Improvement Management Framework
- CI Implementation Approach
- Camden County Municipal Utilities Authority
 - Case Study
 - Benefits Derived
- Conclusions

What is a Continual Improvement Management Framework?

One of the 5 keys to
Effective Utility Management

1. Leadership
2. Strategic Business Planning
3. Organizational Approaches
4. Measurement
5. Continual Improvement Management Framework



What is a Continual Improvement Management Framework?

- Not a computer program or IT system
 - But technology tools support its implementation
- Not a set of procedures
 - But documented procedures are part of CI framework
- Not a Report
 - But the CI framework is described and communicated using documents and/or web based tools



What is a Continual Improvement Management Framework?

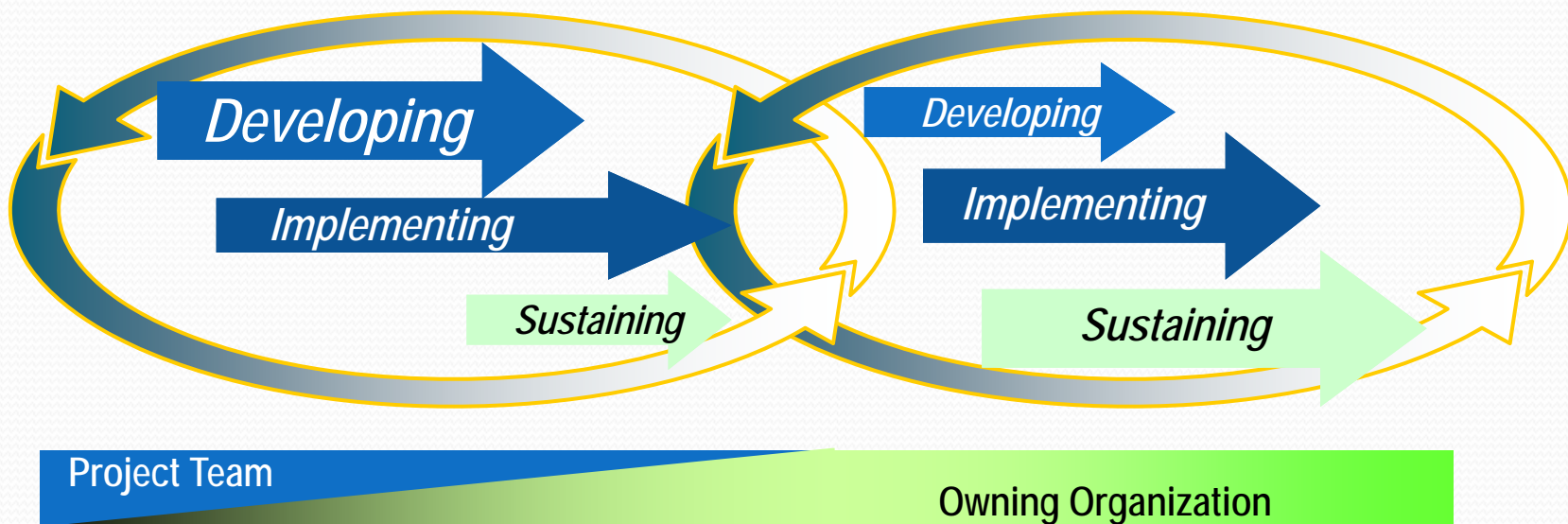
- A system to empower human capital to engage in day-to-day business decisions and practices.



Management systems sustain the synergistic integration of business elements in developing, implementing, reviewing, and achieving vision, mission and strategy.

Implementation Principles

- Build on existing management system elements
- Use an appropriate continual improvement framework
- Engage the organization in designing, developing, implementing and sustaining the system

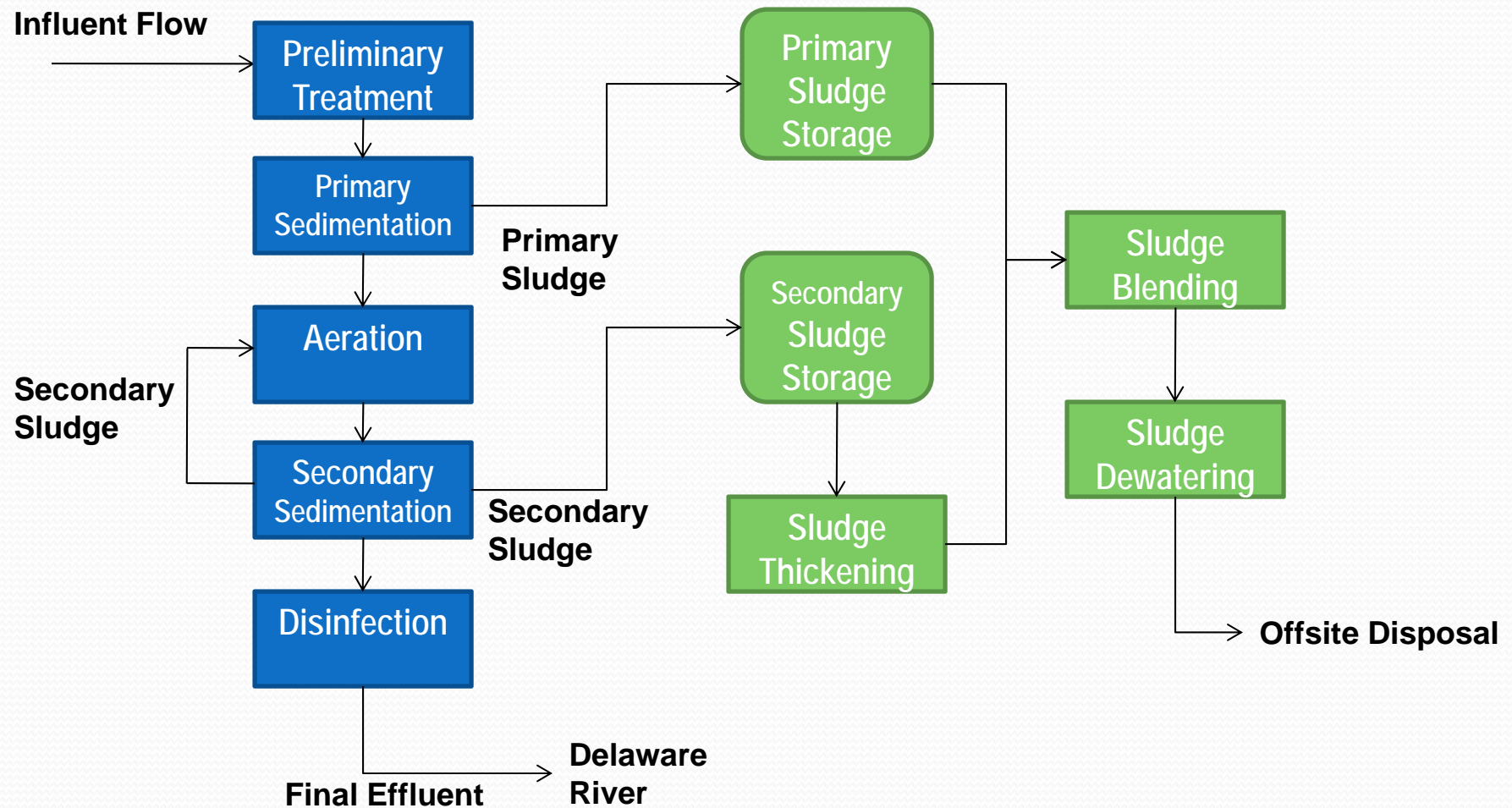


Camden County Municipal Utilities Authority

- 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



Process Diagram



CCMUA has three fundamental goals that are critical to its success

- Optimization of Water Quality Performance
- Optimization of Air Quality Performance
- Cost Minimization





Water Quality ➡ Seek “Supercompliance”

- Decided that merely meeting permit was unacceptable; effluent quality should be optimized
- Required that all systems must be maintained and available for service
- Installed new sludge thickening and dewatering facilities to improve plant’s sludge removal capability
- Plant bypasses no longer permitted without express NJDEP approval



Air Quality → Change Institutional Culture

- Closed odorous sludge composting facilities
- Odor inventory by independent consultant
- Installed new odor control systems at plant headworks
- Imposed zero tolerance policy with respect to odors from carelessness (doors left open; odor systems left off, etc)
- Numerous outreach attempts to neighboring community to improve relationship

Continual Improvement Framework Implementation Environmental Benefits

- Effluent Quality Improved by 40-50%
 - 22ppm TSS in 1999 to 8ppm in 2009
 - 25ppm BOD in 1999 to 5ppm in 2009
- Sludge Removed Improved by 45%
 - 11,000 dry tons removed in 1999 to 16,000 dry tons in 2009
- Odor Violations down from 16 in 1997/98 to 4 from April 1998 to December 2009



Continual Improvement Framework

Implementation Cost Impacts

- Did improved environmental performance result in cost increases or rate increases?

NO!

- EMS team managers were directed not to choose between performance improvements and cost savings, but rather to look for initiatives that would both improve performance and reduce costs



Continual Improvement Framework

Economic Benefits

- Reduced O&M Costs by 25% within three years
- Annual Savings of \$5,000,000 per year
- \$50,000,000 saved since 1999
- No rate increases since 1996, with three rate cuts

Achieving efficiencies in operations resulted in improved environmental performance and cost savings.



Continual Improvement Framework

Additional Benefits

- 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





Infrastructure

Environment

Rates

CCMUA will have replaced and upgraded the five major process units at the treatment plant by 2011

Replacing under performing process units results in improved operational performance and reduced O & M costs

Rate increase 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



Public and Private Sectors... Really Not So Different

Private Utility

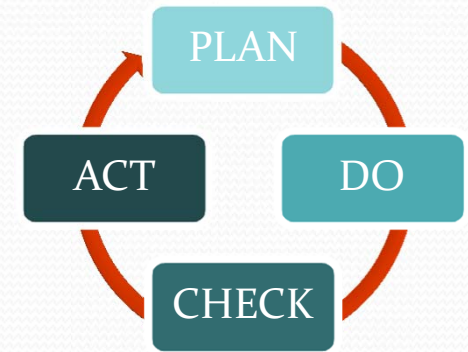
- Maximize Profit
- Optimize Product Quality
- Serve Customers
- Outside Competition

Public Utility

- Minimize Cost
- Optimize Environmental Performance
- Serve Ratepayers, and Environment
- Privatization or replacement

Key: Adopt private sector efficiency and
direct to public good

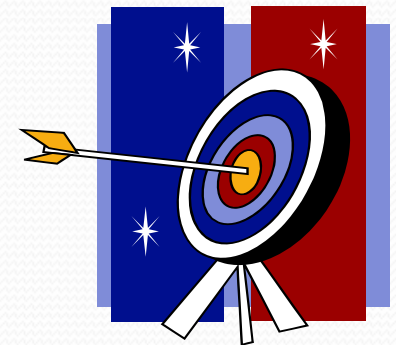
Continual Improvement Management Framework



- Provides structural framework:
 - To harness the company's internal capabilities
 - Organize it, and
 - Then direct it in an unified manner to address the organization's top priority objectives
- Ensure that:
 - Top goals are continually given top priority, at all levels of the operation, top to bottom
 - Ideas are followed up on, until they are implemented

Conclusion

- Increasing environmental and economic pressures require utilities to optimize efficiency to benefit ratepayers and the environment
- Continual improvement frameworks, like ISO 14001 and National Biosolids Partnerships Environmental Management Systems, help utilities optimize performance, achieve long term sustainability and deliver effective utility management





Thank you for your attention.

Andrew Kricun, P.E.

**Executive Director / Chief Engineer
Camden County Municipal Utilities Authority
Camden, New Jersey
856.583.1223
andy@ccmua.org**

Tom Pedersen

**Senior Vice President
Director of Sustainability
CDM
50 Hampshire Street
Cambridge, MA 02139
617.452.6272
pedersenta@cdm.com**