



**Border Environment Cooperation Commission  
Comisión de Cooperación Ecológica Fronteriza**

# ***Operation and maintenance of wastewater treatment facilities: Challenges and opportunities***



**Binational Border Sanitation and Water  
Quality Summit  
San Antonio, Texas  
March 18, 2011**

**1994**

**2009**



# Challenges: Institutional Capacity

- **WWTP Operators Training & Certification**
  - Inadequate training of WWTP operators.
  - High Turn-Over rate of WWTP staff.
  - Lack of a WWTP operators certification program.
- **Change of Administration in local authorities (Municipal/water utilities).**
  - Change of priorities.
  - Allocation of resources for WWTP operation and maintenance.
  - Consequently, there is an inadequate operation and maintenance of WWTP facilities.

# Challenges: Regulatory Framework

- Change of regulations during the construction phase of a WWTP.
- Differences of standards that apply to a binational water body. (CPDs, TMDLs, etc.)
  - 30/30 versus 75/75
  - Chlorination/de-chlorination , UV versus chlorination
- Pretreatment: Municipal jurisdiction versus Water Utility Jurisdiction.
- More stringent regulations to control the maximum loads of contaminants to water bodies.

## Challenges: Financial and Socioeconomic

- When wastewater flows have reached the 75% WWTP design capacity planning to increase the treatment capacity of a plant is required.
- More stringent regulations to control the maximum loads of contaminants to water bodies will be required.
- Lack of funds impedes water utilities to improve their wastewater treatment plants in accordance with the population growth.

## Challenges: Financial and Socioeconomic

- Pretreatment versus Socioeconomic Development.
- Lack of pretreatment programs or lack of enforcement.
- Not initially considered industrial wastewater loads are affecting the operation of wastewater treatment plants and the quality of its effluent.
- Population growth not as expected (oversized facilities)

# Meeting the Challenge

- **Sufficient Investment in Planning**
  - Identify Funding Sources
    - US-Mexico Border Water Infrastructure Program - PDAP
    - Green Building Guidelines
  - Inspiring Community Participation / Education Outreach
- **Local Initiatives and Partnerships**
  - Capacity Building at all levels – “Best Practices”
  - Water and Energy Audits / Benchmarking
  - Enhanced Rate Structures
- **Policy Consideration**
  - Funding Source Prioritization Schemes
    - US-Mexico Border Water Infrastructure Program - BEIF/PDAP
    - State Revolving Fund – Capitalization Policies
    - Pretreatment enforcement

# Opportunities: Institutional Capacity

- Keep periodic training of WWTP operators.
- Promote actions to reduce Turn-Over rate of WWTP staff.
- Develop a WWTP operators certification program.
- Promote workshops with new municipal/water utilities authorities (Municipal/water utilities).
  - To keep allocation of resources for WWTP operation and maintenance.
  - To balance pretreatment enforcement and needs of economic development.
  - To keep/improve institutional capacity of utility.

# Opportunities: Regulatory Framework

- Better planning considering near future change of regulations .
- In order to protect binational water bodies and in accordance with local regulations, promote a scheme to achieve effluent quality based on modeling.
- Promote agreements between Municipal governments and water utilities to develop and enforce pretreatment programs.
- Promote investment from three levels of government to upgrade WWTPs to comply with more stringent regulations to protect water bodies.

## FOCUS: Water Infrastructure Strategies

- Infrastructure Planning
  - Green Building Guidelines
- Water Management:
  - Demand Management
  - Conservation Practices
  - Financial Sustainability
- Energy Management:
  - Water Demand Reduction
  - Capacity Strengthening
  - Clean and Renewable Energy

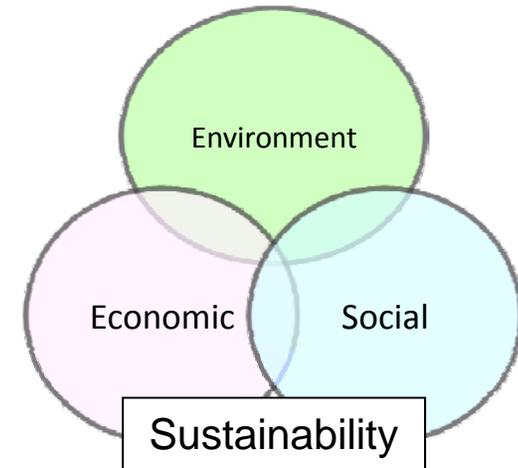


**Potential Impact: Improved Resource Management, Reduced Operational Costs, Reduced Greenhouse Gases**

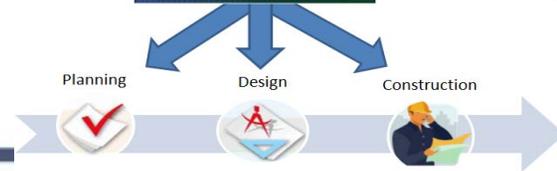
# Planning - Green Building

- Key sustainability principles for applying green building concepts, include:

- Designing for Operating Efficiency
- Seeking to Not Overbuild
- Using Local Materials
- Looking Beyond Initial Costs



- Support the achievement of an efficient use of resources - energy, water, and materials.
- In coordination with EPA, BECC developed a set of guidelines to incorporate green building decision-factors in all phases of the project cycle.



# Planning - Green Building

- Planning – Activities for selecting a process, site, system layout, product, and materials – supported by Life Cycle Costing methods.
- Design – Activities to promote operating efficiency, determine appropriate capacity, and evaluate the use of green products and practices.
- Construction: Activities supported by formal construction specifications – adapted, whenever possible, to reflect green building practices and supplemented by additional “green” decisions that may be determined in coordination between the owner, designer and contractor before and during construction.

## Conservation and Efficiency

- **Demand Reduction**
  - Water Resource Management
- **Capacity Strengthening**
  - Energy Audits
  - Facility and Process Lighting
  - Equipment Replacement
  - Load Management / SMART software
- **Clean and Renewable Energy:**
  - Wind, Solar
  - Biomass

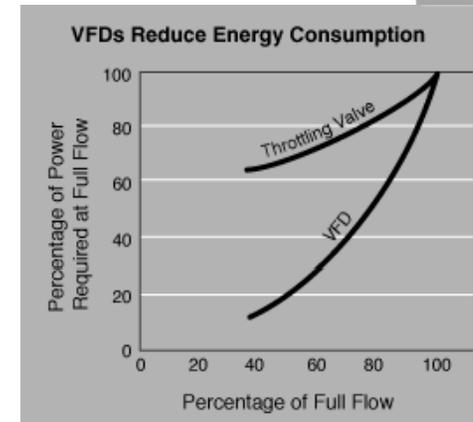


Figure 1. Energy consumption of VFDs and throttling valves.



- **Evaluate Constructed/Operational Conditions vs Anticipated Conditions at Certification**
  - Were all outputs (construction works) completed?
  - Is the infrastructure operating as expected?
    - Technical – flows, energy, quality, operator training
    - Financial – connections/hook-ups, revenue
  - Were anticipated outcome targets achieved?
- **Influences for any Deviations**
  - Identify what may have influenced the deviation
    - Insufficient Funding / Fluctuating Costs
    - Design or Operation issues
    - Unanticipated conditions – climate, land, customer characteristics
    - Slow connections, unmet population projections, etc
- **Creating a Feedback Loop**
  - Identify if the lessons can improve the project development or expectations of the next project



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**Thank You.**

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