Water Program Management

Discussion Outline

- Introduction
- Water Program Management
- Auditing Methodology
- Water Balance and Metrics
- Water Conservation Practices
- Goal Setting
- Recommendations

Introduction

- **Primary Goal: Water Use Elimination/Reduction**
  - **Considerations:**
    - **Obvious Reductions**
    - **Cost / ROI / Payback**
    - **Specification / Quality**
    - **Volume Reduction**
    - **Water Reductions**
    - **Availability**
    - **Environmentally Responsible**

Water Program Management

- **Driving Forces**
  - **Importance to the operation**
  - **Cost of Doing Business**
  - **Effort *vs.* Benefits *vs.* Culture**
- **Location**
  - **New England is “Water Rich”**
  - **Climate Conditions**
  - **Population**
- **Regulatory**
  - **Basic Federal Baseline**
  - **Stringent State and Local**
  - **Ordinances / Controls / Bans**

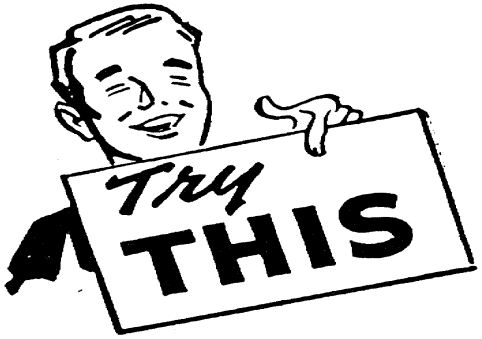
Water Program Management

Start By Asking the Following:

- **Why am I considering this?**
- **Is water used in the most efficient manner?**
- **Is my inventory assessment correct: In *vs.* Out?**
- **How accurate are my measurements?**

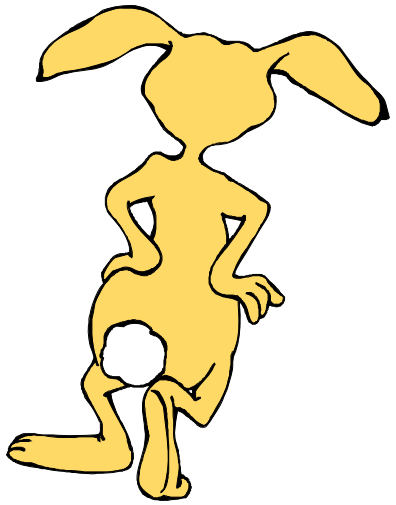
Auditing Methodology

- **Site Visit / Site Evaluation**
  - **Preparation, Planning**
- **Source Evaluation and Inventory**
  - **Comprehensive or Project Specific**
- **Conservation Opportunities**
  - **Consider All**
- **Payback Analysis**
  - **Rough / Refined**



Auditing Methodology

- **Process Changes**
  - **BWADITW**
- **Water Use Analysis**
  - **Specification vs. Operating Standard**
- **Audit Report**
  - **Defined Summary**
- **Implementation Period**
  - **Set Completion Goals**
- **Follow Up**
  - **Results Confirmation**



Water Balance and Metrics

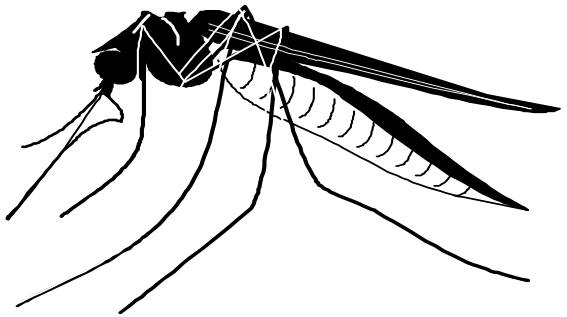
- **Identify all known water use sources**
- **Team with knowledgeable site resources**
  - **Obvious**
  - **No So Obvious**
  - **That Uses That Much Water???**

Water Balance and Metrics

- **Measuring Methods**
  - **Metering**
  - **Flow Rates**
  - **Equipment Specifications**
  - **Bucket Method**
  - **Vessel Sizing**
  - **Guess-timate**
  - **Note Variable Tendencies**

Water Balance and Metrics

- **What Condition is the Water/Wastewater in?**
  - **Water for Reuse / Recycle**
  - **Water for Irrigation / Sanitary**
  - **Needs Significant Pretreatment**
  - **Process Specification / Requirements**
  - **Health and Safety Concerns**



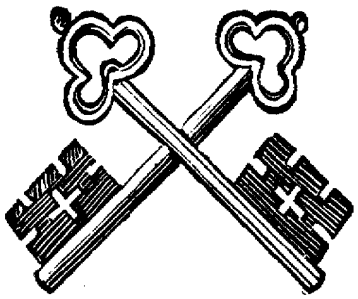
Water Balance and Metrics

- **WATER BALANCE IS THE KEY!**

  - Serves as the Basis for Accuracy

  - Confirms Assumptions

  - Verifies Expenditures



  - Not Necessarily Perfect to the “Gallon”

  - Serves Dual Purpose to Permit Confirmations

Water Conservation Practices

- **Use/Reuse Caution!… Factors for Consideration**
  - **Health and Safety**
  - **Quality Considerations**
  - **Volume / Make Up**
  - **Pretreatment Requirements / Permitting**
  - **Equipment Needs**
  - **Widget Requirements**
  - **Back Up Supply**

Water Conservation Practices

- **Industry Specific and Cross Functional**
- **Use Percentages Can Vary Greatly**
- **Industry Examples**
  - **Metal Finishing**
  - **Research Laboratory**
  - **Pulp and Paper Mills**
  - **Health Care and Academic Institutions**
  - **Food Processing**
  - **Energy**
  - **Office**

Water Conservation Practices

Industrial, Municipal, Health & Academic:

- **Wash Systems**
- **Spray Systems**
- **Glass Cleaning**
- **Rinse Tanks**
- **Chiller / Cooling Towers**
- **Energy Operations**
- **Irrigation**
- **Boiler Systems**

Water Conservation Practices

Case Study Examples

- Spray Nozzles – To HPLV
- Free Flow – Solenoid Valve / Timers / Shutoff
- Process Modification – Clean/Wetting/Drain
- Flow Identification – Meter Installations
- Process Modification – Hand Wipe vs. Hose
- Equipment Exchange – Ultrasonic vs. Spray

Water Conservation Practices

Case Study Examples

- Rinse Tanks – Counter Current Rinsing
- Irrigation – Reduce and/or Collection Tank
- Once Through Cooling – Closed Loop System
- Reject Reuse – Blowdown and RO Reject
- Equipment Exchange – Air Cooled vs. Water
- Process Modification – Batch vs. Flow

Water Conservation Practices

Case Study Examples

- Process Modification – Hang vs. Drag Out
- Lab Sink – Aerators
- Equipment Exchange - Geothermal
- System Capacity – Maximize Efficiency
- Stormwater Reuse – Cooling Tower/Sanitary
- System Cycle – Operations Cycle Reductions

Water Conservation Practices

Case Study Examples

- Process Elimination – Unnecessary Function
- Computerization – Automated *vs.* Manual
- Thermal Removal – Sink Modifications
- Process Modification – Rinse Tank *vs.* Spray
- Equipment Alterations – Adding Tank Covers
- Fixtures & Equipment – Low/No Flow Option

Goal Setting

- **Estimate Maximum Initially**
- **Down to Zero?**
- **Estimated Average Reduction**
  - **Important For Cost Analysis**
  - **Allows For Planning Purposes**
  - **Permit Allowances**
  - **Balances Expectations**

Goal Setting

- **Based on the Analysis, Decisions Can Be Made**
- **Project Can Be Tabled for Future Review**
- **Employee Training**
- **Facility Maintenance***
- **Smart Fixes**
- **Action Plan**

Goal Setting

- **General Business Target Cost Analysis**
  - **Example: Plus Hidden Costs**
  - ***Project Identification:***
    Washer Operations – Equipment Retrofit
  - ***Proposed Actions:***
    Retrofit/Upgrade Equipment Systems
  - ***Existing Water Consumption:***
    9,690 gpd, 2,422,500 gpy

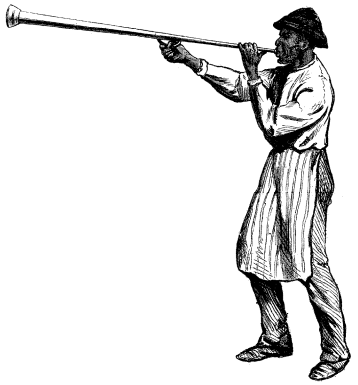
  - ***Estimated Water Consumption Post Conservation:***
    Estimate a 20% overall flow reduction 7,752 gpd, 1,938,000 gpy
  - ***Water Savings:***
    1938 gpd, 484,500 gpy
  - ***Cost Savings:***
    484,500 gpy = 64,773 c.f. = 647.73 c.c. = @$8.48/c.c. X 647.73 = $5,493/year
  - ***Estimated Project Cost:***
    20 systems at $575 average per system = $11,500
  - ***Simple Pay Back (in years):***
    $11,500/$5,493 = 2.1 years

Recommendations

- **Driving Forces: Rating / Prioritizing**
- **Location: Water Availability**
- **Regulatory: Decision Making Implications**
- **Cost Savings**
- **Capital Costs**
- **Operating Costs**
- **Not This Year Does Not Mean Never**

Recommendations

- **Target Elimination / Reduction**
- **Be Realistic – Accuracy Counts**
- **Involve All Resources**
- **Much Good Information Available**
- **Reinventing Wheel Not Necessary**
- **Make Noise About Your Accomplishments**



Questions:

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