



**Energy 2003
Water Resources Management Track
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AMERICAN WATER
RESOURCES ASSOCIATION

Community, Conversation, Connections

WATER RESOURCE MANAGEMENT

Without safe adequate long
term water supply a facility
is worthless.



Water in the 00's and beyond

- Rapidly Escalating Water Rates (5% - 10 % per year)
- Federal assistance to water and sewer utilities is reduced.
- Federal Clean Water laws are driving up the cost of treatment and distribution/collection. Will add \$1 billion annually to the cost of water.
- Growth areas, and older cities require investment in sewer treatment - new infrastructure drives prices up.
- 35 States are depleting ground water levels faster than being replenished.
- Florida, California, Texas and Western States are operating at capacity limits of water available.



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***Market Assessment for Capturing
Water Conservation Opportunities in
the Federal Sector***

www.pnl.gov/buildings/WaterConservOpps.pdf



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Summary of Market Assessment:

“The life-cycle cost-effective water conservation potential in the federal sector, based on appropriate off-the-shelf technologies is estimated to be

... \$196 million/year”



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Summary of Market Assessment:

“All off-the-shelf water conservation technology retrofits, are life-cycle cost-effective – at a combined water/sewer cost of

\$2/1,000 gallons or greater.”



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PUBLIC WORKS MODERNIZATION

Utility Systems (Water, Sewer, Storm Water)
are being upgraded to current standards.

therefore

Utility rates will rise dramatically in small to
mid-size cities.



Corporate Overview

- A. Based in Alexandria, VA
- B. Offices in Nashville, Denver, Virginia Beach & San Diego
- C. WMI created in 1980
- D. Acquired Water Management Services 2002
- E. Pioneered Water-based Performance Contracting (1982)
- F. Hundreds of Projects Completed in 20 + State
- G. Approximately 60 employees



What Is The Process?

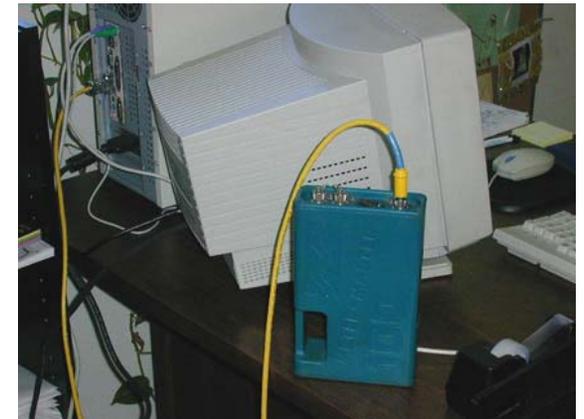
- Water audits
- Consumption analysis
- Design
- Project management
- Financing options
- Implementation and construction
- Measurement and verification
- Training
- Savings guarantee



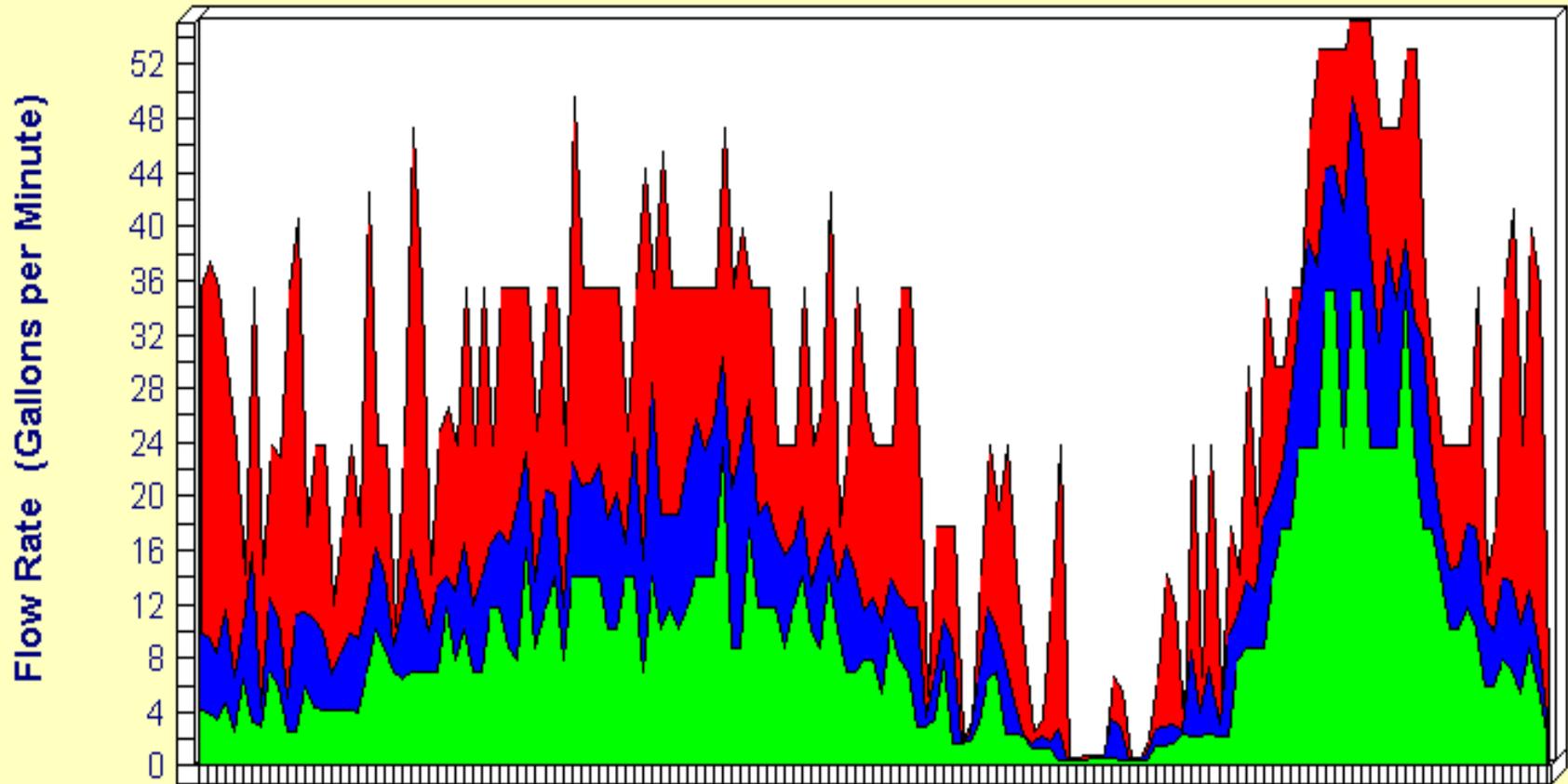
WATER AUDIT FACTORS

WATER METER ASSESSMENT
3 YRS WATER/SEWER CONSUMPTION
OCCUPANCY & CENSUS
FIXTURE TYPE
CURRENT REPAIR PRACTICES
INFRASTRUCTURE CONDITION
MAINTENANCE COSTS & PRACTICES

Meter Master Flow Recorder



Virginia Square Plaza



05/13/2003 1:01:09 PM to 05/14/2003 9:17:09 AM
8 minute intervals



METERING

REQUIRED FOR LONG TERM
MEASUREMENT AND VERIFICATION
AND PROPER ALLOCATION OF COSTS

- MAIN METERS
- LOCALIZED BUILDING METERING
- POINT OF USE METERS



WHAT UPGRADES ARE COST EFFECTIVE?

- TOILETS
- FAUCET REPLACEMENT
- SHOWERHEADS
- FAUCET FLOW CONTROLS
- RECYCLING SYSTEMS
- COOLING TOWER SYSTEMS
- LAUNDRY SYSTEMS



STANDARDS

- Toilets 1.6 gallons / flush
- Urinals 1.0 gallon / flush
- Showerhead 2.5 gpm @ 80 psi
- Sink faucet 2.2 gpm @ 60 psi
- Lavatory (public) 0.5 gpm @ 80 psi
- Lavatory (metering) 0.25 gallons / cycle

Pressure Assist Toilets



Flow Controls

**Flow
Controls/Restrictors
are not always
aerators**



Shower Heads



Faucets



Pressure Regulators





“Engineered Solutions” Reuse, Reclaim, Recycle

Use water wisely where possible





Cooling Tower Measures

1. Non-chemical water treatment
2. Advanced Chemical Treatment
3. Sewer “deduct” meters
4. Float Valve adjustment/replacement



Laundry Measures

- 1. Ozone laundry systems**
- 2. Water recycling/reuse**
- 3. Heat recovery**
- 4. High efficiency commercial dryers**
- 5. Horizontal axis washers
(residential)**



“Once Thru” Systems

- 1. Medical vacuum pumps & air compressors**
- 2. Refrigeration/air conditioning systems**
- 3. Boiler/Steam/condensate**
- 4. Efficient irrigation**
- 5. Leak detection**



MEASUREMENT & VERIFICATION

- USE ACTUAL METER READINGS FROM UTILITIES
- M & V EACH MEASURE FOR COMPLIANCE
- AUTOMATED METER READING EQUIPMENT QUICKLY IDENTIFIES PROBLEM AREAS



EXCESS SAVINGS

**A WELL DESIGNED WATER EFFICIENCY
PROGRAM WILL GENERATE EXCESS
DOLLAR SAVINGS OVER TIME FOR
EVEN THE BEST RUN FACILITIES**



WHAT TO USE EXCESS FOR

- Energy Upgrades
- Other Water Upgrades
- The Bottom Line
- Attend Energy 2004



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Water is today, what Energy was in 1980

- New technologies in water efficiency
 - Deliver a positive ROI
 - Have a positive impact on operations
 - Benefit the environment