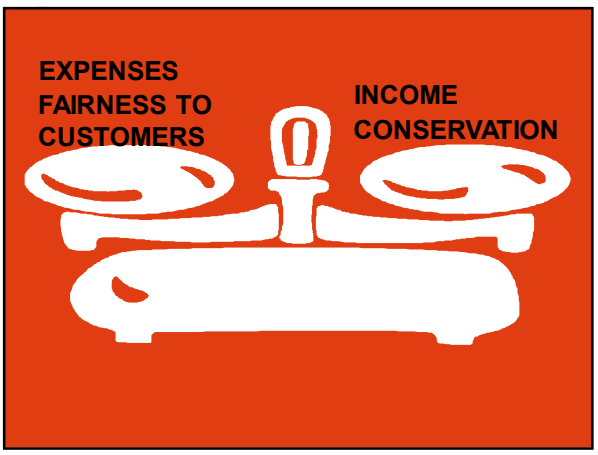
How to Set Proper Water Rates

Spring 2014

System Rates Basics

- True and Full Cost Pricing
- Rates Must be Fair and Equitable
- Self-Sufficient
- Water Rates have a short life span
- Good rates are based on actual accurate financial info and good customer records
- Rate should be easy to administer and easy to understand

Rates are a delicate Balancing Act



Cost, Price, and Value: Not the Same

- Cost
  - Refers to the expense of producing and/or delivering a unit of water
- Price
  - Refers to the rate charged to a customer for the unit of water delivered
- Value
  - Maximum willingness to pay

Value

Oscar Wilde said,

"Some people know the price of everything and the value of nothing"

Successful Water Systems

- Operates according to sound business practices
- Fair & Equitable Prices
- Rates must be sufficient to meet present and future needs.

Proper Rate Setting and Water System Capacity

Water System Capacity

- The ability to plan for, achieve, and maintain compliance with drinking water standards, thereby ensuring the quality and adequacy of the water supply.
- Capacity has three components
- Technical, Managerial, Financial

Technical Capacity

- Physical infrastructure and operational abilities
- Proper Rate Setting increases your technical capacity by giving you the means to invest in your system's physical infrastructure and to make necessary repairs.

Managerial Capacity

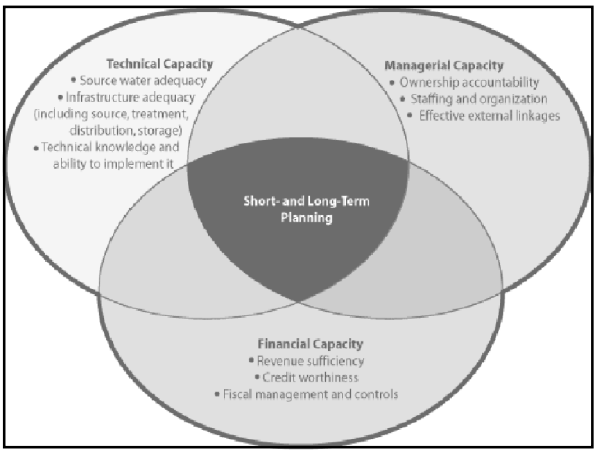
- A system's management and administrative capabilities
- Proper Rate Setting increases your managerial capacity by enabling you to attract, retain, and continually train certified operators and other working staff.

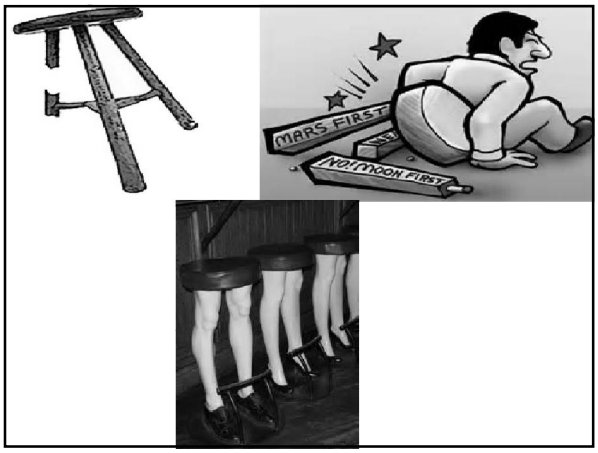
Financial Capacity

- Ability to acquire and manage financial resources
- Proper Rate Setting increases your financial capacity by increasing your available resources and improving your credit worthiness.

Proper Rate Setting and Water System Capacity

- The most important benefit will be financial stability and security, which will ensure that your system has adequate capacity and long term sustainability.





Truths Concerning Ratepayers

1. Ratepayers need their service.
2. Ratepayers want their service relatively inexpensive.
3. Almost 100% of your ratepayers don't want to think about you or the utility at all.
4. A persistent, tiny minority of your ratepayers want to think about you all the time, and not in a good way, regardless of what you do or say.

Why water systems need to increase incomeé

- Increasing Operating Expenses
- System Expansion or renovation
- Changes in Customer Base
- Water Quality Issues
- Rules and Regulations
- Replacing Aging Infrastructure

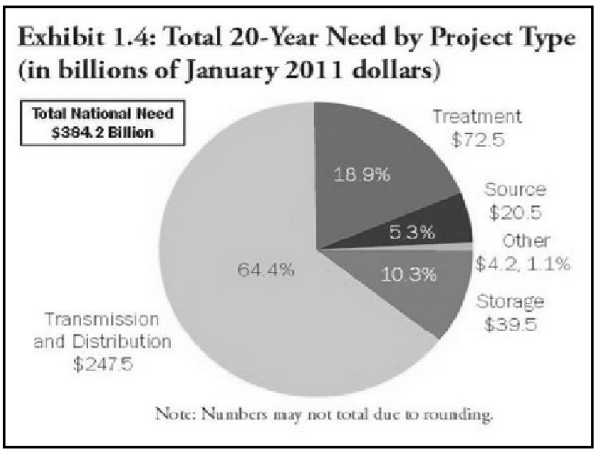
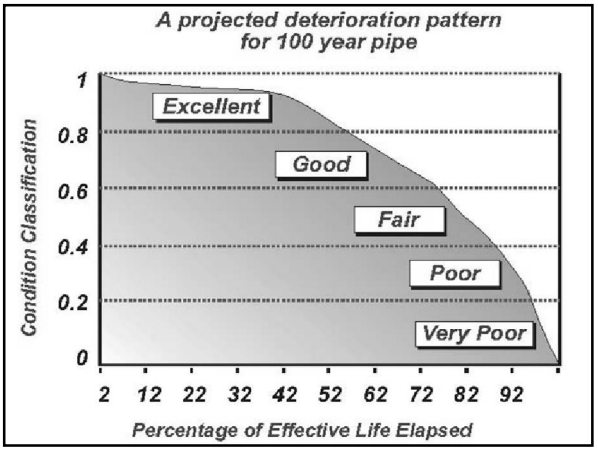
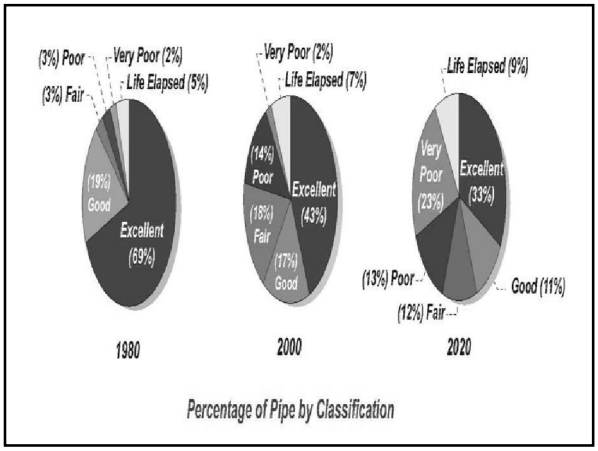
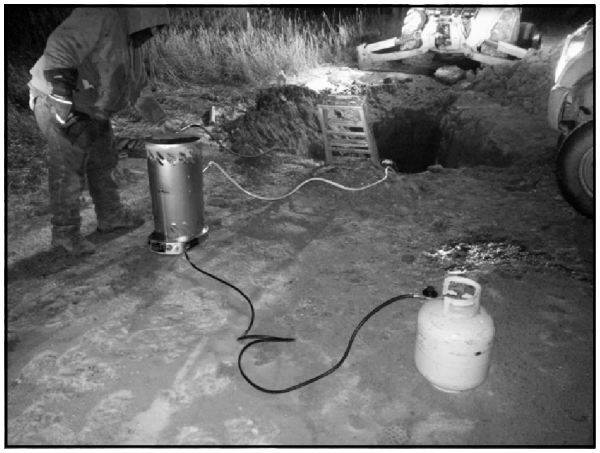


Table 2-1 - Useful Life Matrix

Years	Component
	Clean Water
80 - 100	Collections
50	Treatment Plants - Concrete Structures
15 - 25	Treatment Plants - Mechanical & Electrical
25	Force Mains
50	Pumping Stations - Concrete Structures
15	Pumping Stations - Mechanical & Electrical
90 - 100	Interceptors
	Drinking Water
50 - 80	Reservoirs & Dams
60 - 70	Treatment Plants - Concrete Structures
15 -25	Treatment Plants - Mechanical & Electrical
65 - 95	Trunk Mains
60 - 70	Pumping Stations - Concrete Structures
25	Pumping Stations - Mechanical & Electrical
65 - 95	Distribution







How can a system increase income without raising rates?

- Revise system policies
  - Front End Charges
    - Connection, Tap, Impact, Membership Fees
  - Deposits
  - Late Payments
  - Shut-off Policy
  - Disconnect & Reconnect Policy

Do you have problem with Seasonal Users?

- ôCustomer, did you borrow money to buy your house, cabin, hunting shack? Sure you did. Do you only make your loan payments on that property during the month(s) you are here? I donôt think so. Your bankerôs loan made it possible for you to come here whenever you want. The debt the city or district incurred on your behalf, makes it possible for you to turn on the tap and get water or flush the toilet and have it go away whenever you want. It has nothing to do with when, if ever, you actually use those facilities.ô

How can a system increase income without raising rates?

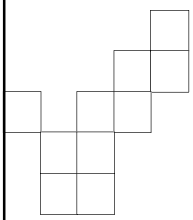
- Reduce Expenses
  - Upgrade your billing system
  - New Meters
  - AMR
  - Perform an energy audit
  - Purchase items in bulk
  - Make cooperative purchases

How can a system increase income without raising rates?

- Conduct a water audit
  - Errors
  - Unmetered connections
  - Water Theft
    - Water Theft Letter
  - Leak Detection
    - Leak Detection Letter

Decision Makers should aské

- ñHow much water did we produce or buy and how much did we sellò?
- The Answer affects operation, income and the rates you set.



An Introduction to Water Audits

Do these statements sound familiar?

- The records show that way more water enters the system than leaves it.
- The meters register more water "in" than water "outñ
- It seems that some water just disappears!

It might be time for a Water Audit

How much water loss is acceptable?

- Industry standard of 10-15%
- 30% is not uncommon
- 2011 Report
  - 7 billion gallons per day of drinking water just disappears

What is a Water Audit?

- A water audit is a management tool
  - Measures the volume of water that enters
  - Measures the volume of water that leaves
- Can show how efficiently your system is operating
- Will also show where some of your losses may be occurring

What is involved in a water audit?

- Collecting records for a water audit review period (such as the past 12 months)
- Short time span- billing and volumes do not jive!
- Calculating how much water entered and left the system during the review period
- Testing meters for accuracy
- Estimating the amount and cost of "unaccounted for" water
- Analyzing the data

Where to begin a water audit?

- Begin in the system office
  - Choose a water audit review period
  - Collect the records for that period
- Find the amount of "Water Inò
  - Groundwater
  - Surface water
  - Purchased water
  - Total Water In

Conducting a water audit

- Find the metered amount of "Water Outò
  - What amount of water the customers have received
  - A customer is any metered user
    - Regardless of billing arrangements
  - Every water system should have a written meter installation, calibration and replacement policy
  - They are the cash registers of your system

Conducting a water audit

- Customers include:
  - Free accounts
  - City facilities
  - Community facilities
  - Bulk sales
  - Fire fighting
  - Special events
  - Maintenance equipment and procedures

Water audit worksheet

- Record the data you collect on a worksheet

Water Audit Worksheet

A. Water In
- Groundwater _____
- Surface water _____
- Purchased water _____
- Total Water In _____

B. Water Out
- Metered _____
- Unmetered accounts _____
- Theft _____
- Leaks _____
- Total Water Out _____

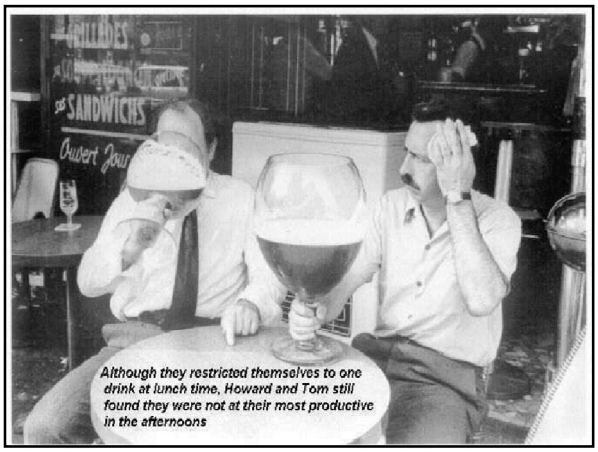
C. Unaccounted For Water
- (A-B) _____

Analyzing the data

- Finding the amount of "unaccounted for" water

Total Water In
- Total Water Out
Unaccounted For Water

- Water has been given away, stolen, or leaked into the ground

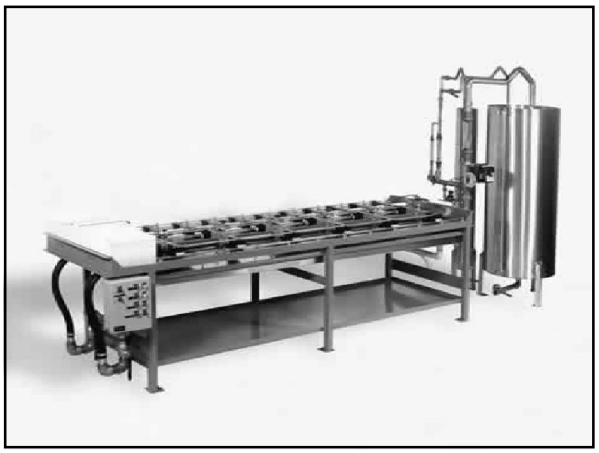


Questions?

- Has the water leaked into the ground?
- Are the meters wrong?
- Is the water being stolen?
- Has there been an arithmetic mistake?
- Does the system have mistakes in records and problem with water loss?

What causes "unaccounted for" water

- Three causes
  1. Errors
     - Meter Inaccuracy
     - Estimations
     - Broken Meters
     - Meter Reading-3 to 5 day window
     - Accounting Errors
     - Sometimes called ñApparent Lossesò



What causes "unaccounted forò water

2. Water Loss
   - Water that leaves the system without passing through a meter
   - Could be stolen
     - Unauthorized Unmetered Connections
     - Drought brings out thieves
   - May have leaked out of the system
   - ñReal Lossesò

What causes "unaccounted forò water

3. Authorized, unmetered uses:
   - City Facilities
   - Pools and Parks
   - Firefighting/Fire Hall
   - Street Cleaning
   - Water and Sewer Flushing
   - Water Plant Needs
   - Churches

Benefits of a water audit

- Finding errors in records and meters
  - Billing for all the water the customer uses
- 1st step in solving water loss
  - How serious is it?
  - Lower water loss = Lower operating costs
  - Rate Stability for customers
    - Good public relations

Benefits of a water audit

- Protection of public health
  - Fixing leaks could lower the risk of a cross-connection
- Helps conserve a precious resource
  - Potentially expand service area
  - Set an efficient water use example with customers

Estimating lost revenue

- Minimum cost of unaccounted for and lost water
  - Electricity, Treatment, Purchase Price, Distribution
    - Production/Distribution Cost
  - Divided by Total Water In
  - Equals Cost/Gallon
  - Multiple by Unaccounted For Water

Estimating lost revenue

- Maximum cost of unaccounted for water
  - Multiplies the amount of unaccounted for water by your customer billing rate
- A water system sells water at $4.00/1000 gallons. A loss/theft of 4,000,000 gallons could mean:

  4,000,000 x $4.00/1000 gallons = $16,000.00

Planning the next step

- Find the reasons for water loss
  - Is it really worth the effort?
- Direct Benefits
  - $$$$$$$$$$
  - Can your system afford the loss?
- Indirect Benefits
  - Reduced operating costs, increased profits, no water rationing, expanded service, no new wells, no rate increases, improved public relations, preservation of a limited resource

AWWA Water Audit Software

- Rate Training 08\AWWA WaterAudit.xls

Table 1. Water Balance Table

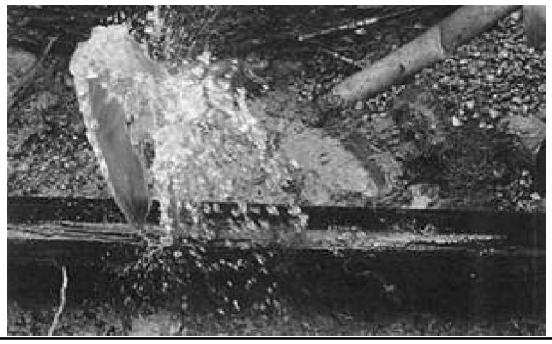
System Input Volume	Authorized Consumption	Billed Authorized Consumption	Billed Metered Consumption	Revenue Water
			Billed Un-metered Consumption	
		Unbilled Authorized Consumption	Unbilled Metered Consumption	
			Unbilled Un-metered Consumption	
	Water Losses	Apparent Losses (Commercial Losses)	Unauthorized Consumption	Non Revenue Water (NRW)
			Customer Meter Inaccuracies and Data Handling Errors	
		Real Losses (Physical Losses)	Leakage in Transmission and Distribution Mains	
			Storage Leaks and Overflows from Water Storage Tanks	
			Service Connections Leaks up to the Meter	

Financial Drain

- Unaccounted for water is a financial drain on any water utility
- You must decide if the drain is ¾ or 36 inches in diameter

You have done a Water Audit, what is the next step?

Does Your System Have A Leak ?



Does Your System Have A Leak ?

Does Your System Have A Leak?

Does Your System Have A Leak?

Does Your System Have A Leak ?

- Unmetered Locations- Pools, Parks, Ball Fields, Fire Halls ?
- Meter Inaccuracy - Master, Users, Applications?
- Record Keeping, Billing Problems ?
- Theft, Unauthorized Connections ?

Unaccounted for Water

- Water Plant Needs-Backwashing, Chemical Makeup Water
- Hydrant Flushing

Question: We plan to flush our distribution system this spring. We have often wondered if there is an easy way to determine approximate flow rates from fire hydrants?

Answer: Place a pressure gauge on a 2 1/2" nozzle. Use the chart below to determine gallons per minute (GPM) discharge through the other 2 1/2ò nozzle.

FIRE HYDRANT FLOW - 2 1/2" NOZZLE

Residual (PSI)	Flow (GPM)	Residual (PSI)	Flow (GPM)
	0	30	920
2	240	32	950
4	340	34	980
6	410	36	1010
8	480	38	1030
10	530	40	1060
12	580	42	1090
14	630	44	1110
16	670	46	1135
18	710	48	1155
20	750	50	1180
22	790	52	1205
24	820	54	1230
26	860	56	1250
28	890	58	1275
		60	1300

Possible Problem Areas

- Empty Houses
- Buildings That Have Been Removed
- New Construction Areas
- Curb Stops

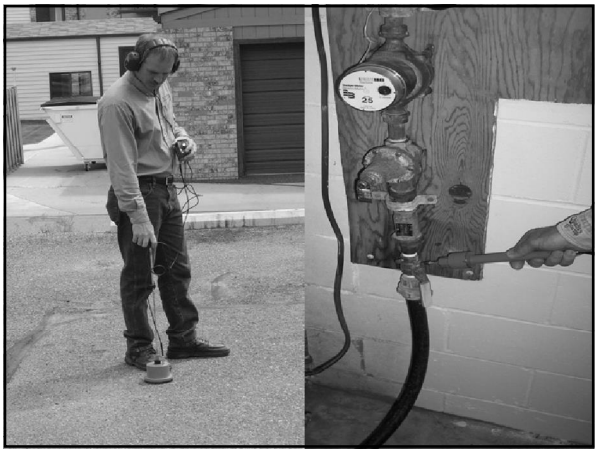
Other Possible Problems

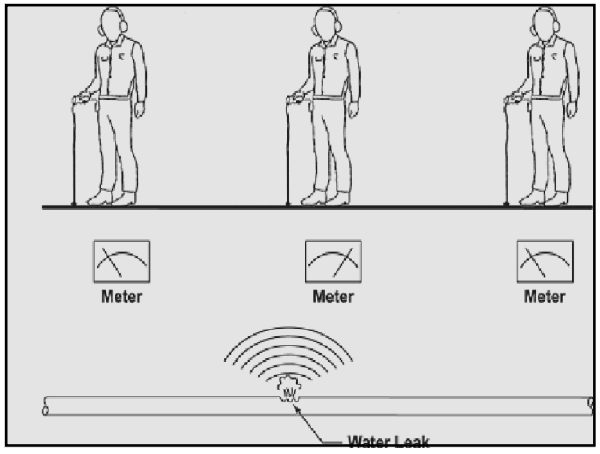
- Customer Complaints
- Low Pressure
- Noise

Equipment Used by NDRWSA

Heath Aqua Scope

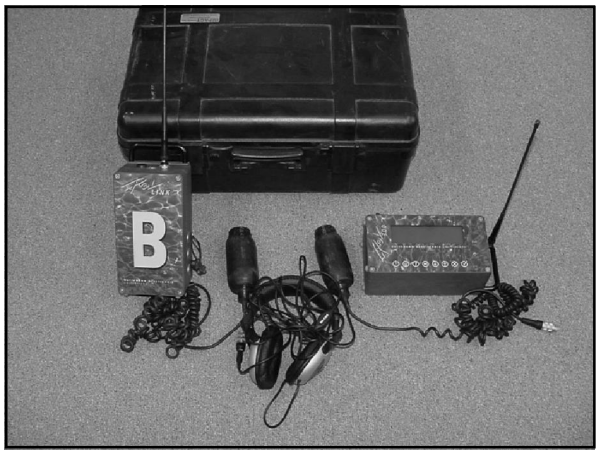
- Used for Shorter Distance
- Spot Testing of Hydrants, Valves, and Service Lines





PAL 300

- Water Main Correlator
- Capable of Testing Longer Distances
- Works Best on A.C. or Cast Iron Pipe
- Works on PVC Pipe but Shorter Distances



MARS METER ANALIZER

- Checks and Analyzes Meters
- Checks Accuracy of Household Meters

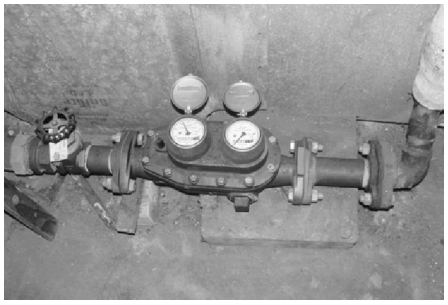
ALL MATRIALS LOCATOR

- Locates PVC pipes and PE Pipes.
- It will also locate nearly any subsurface material with an edge including plastic, metal, wood, cable and concrete.

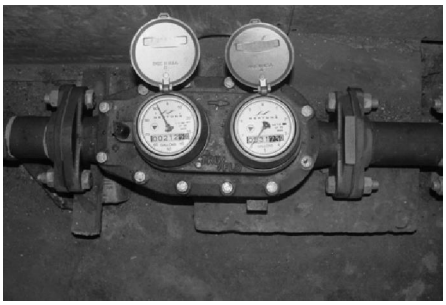
Inaccurate Meters

- Source Meters
  - Iron and Manganese in Raw Water
  - Other Corrosions
- Residential Meters
  - Age and Volume
  - Water Quality
- Large Commercial Meters
  - Business, Car Washes, Factories, Schools, Hospitals
  - Compound Meters

Compound Meter



Compound Meter



Meter Testing Recommendations

- Suggested schedule per AWWA is as follows: 5/8ò every 10 years, ¾ò every 8 years, 1ò every 7 years, 2ò every 5 years, 3ò every 4 years, 4ò every 2 years, 6ò or larger every year.
- Meter Replacement Program

Some Things To Consider

- How Much Pressure Is On The System
- How Much Water Are You Losing
- Small Leak- High Pressure, Noisy And Loud
- Large Leak-Low Pressure, No Noise
- Pipe Material
- Chlorine or Fluoride Residuals

Some Things To Consider

- How Deep Is The Pipe
- Type Of Soil
- High Water Table Muffles Sound
- Traffic Or Wind Effect Locating Equipment

Now Comes the Work

- Unexplained Heavy Flow into Sewer System or Storm Sewer
- Unusual Green Spots or Areas that Sunken
- Tracking Losses through AMR
- Meter inspections ï Pulse Read Meters

Now Comes The Work

- Use Your Customers
- Use Public Notice or Mail Stuffers
- Know Your System
  - Which Valves Work
  - Which Valves Control Which Areas
  - Valve Replacement
- Can you shut the tower off and run on demand?
- You Must Have Good Records

System Maps

System Maps

- Can you find them?
- Different blue prints for different parts of the system from different engineers?
- Are they a mix of the old system and the new system?

System Maps

- Are the line and gate valve locations accurate?
- Is the size of the line correct?
- Are the line size and material correct?

System Maps

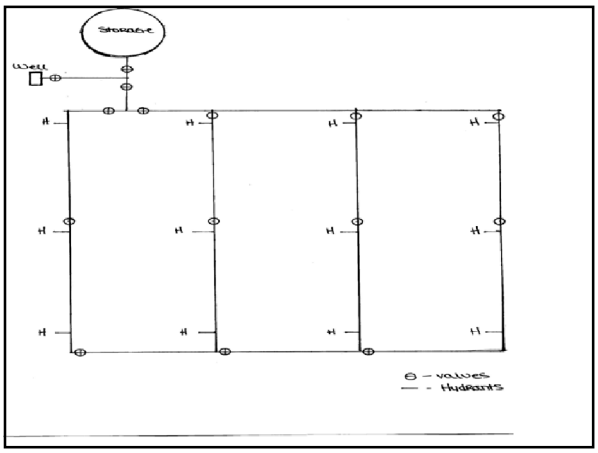
- Is the hydrant location correct?
- Has there been any construction done on the system that was not engineered and not put on the map?
- Are service lines and curb valve locations on the map?

System Maps

- Secondary maps for curb valves, ----recipe cards---individual address maps
- Construction maps, service line repair of replacement, sewer line repair----pictures, dates, construction company name, reason for repair, materials used, measurements.
- Map location storage, can someone else make heads or tails of you maps?

Now Comes The Work

- Check At The Right Time
- Isolate Areas of the Distribution System



Now Comes the Work

- Give Leak Detection the time it deserves
- Money Savings
- Capacity Savings
- Wastewater lagoon savings
- Salary Increase???

So you found a leak, How much water did you actually lose?

- Leak Loss Charts
- 2.8 x Area(sq. in) x (Sq. Root of 148 x psi) = gpm

GRANVILLE LEAK CASE STUDY

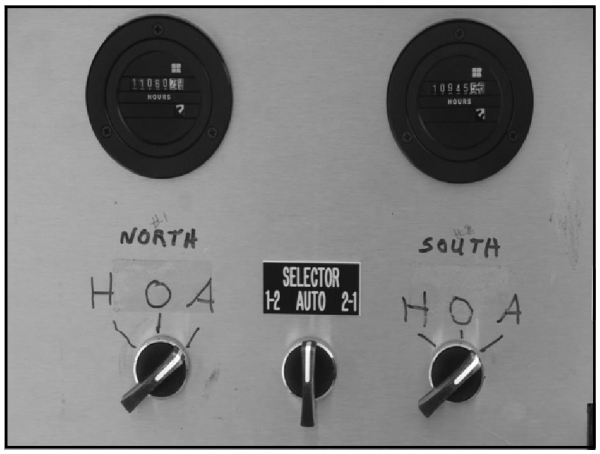
Granville Leak Background

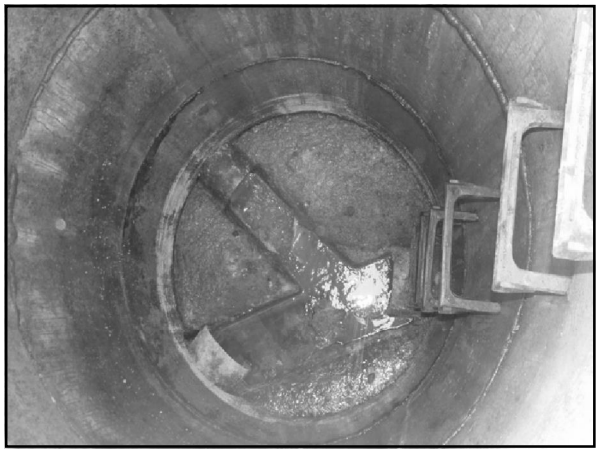
- Began purchasing water in Fall of 2006
- 30% Unaccounted for Water was common
- Began replacing old meters
- 33 Blocks of 1956 Cast Iron water main
- Unaccounted for Water reached a height of 66% in August of 2009
- 19 gal/min, 27,360gal/day
- 820,800 gal/month, 9.85 MG/year

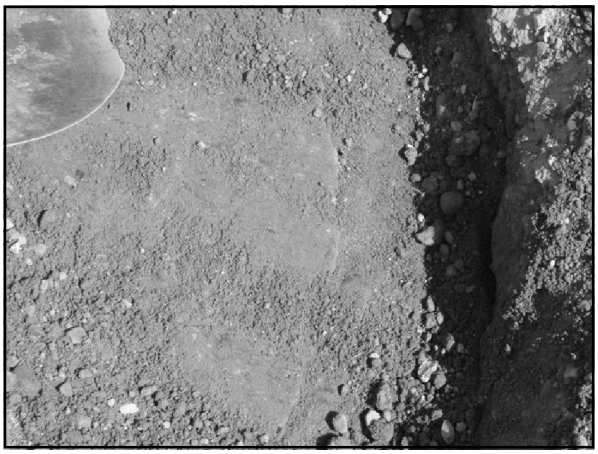
Granville Leak Background

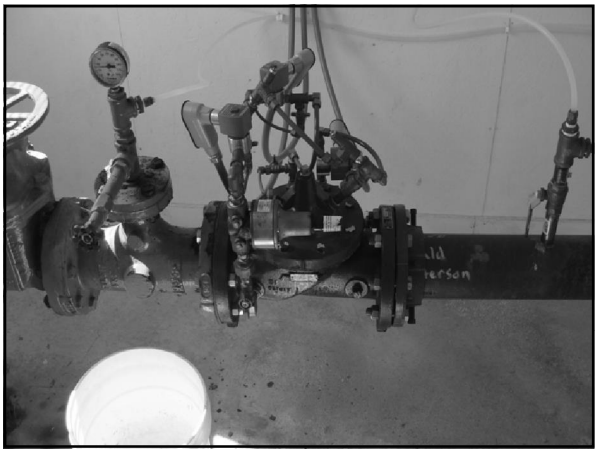
- 820,800 gallons/month
- $3.75/1000 gallons
- $3078/month
- $36,936/year

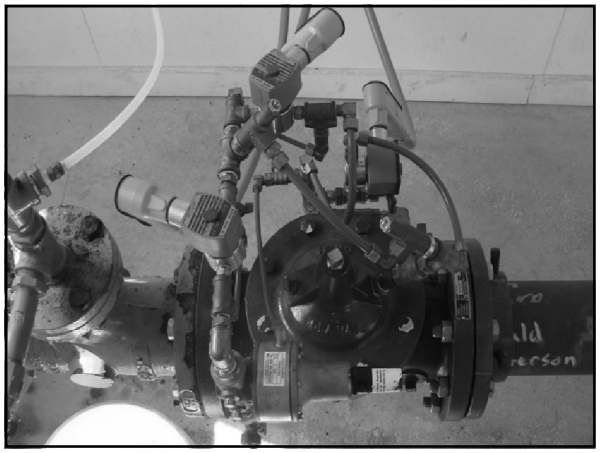

ABS
PUMPS 1-800-832-7055


NORTH
H O A
SELECTOR
1-2 AUTO 2-1
SOUTH
H O A



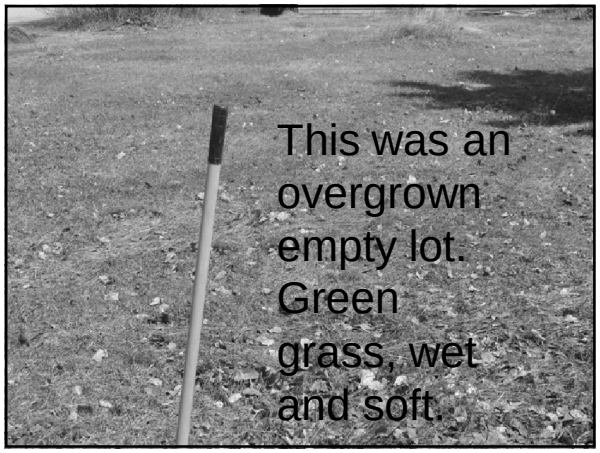


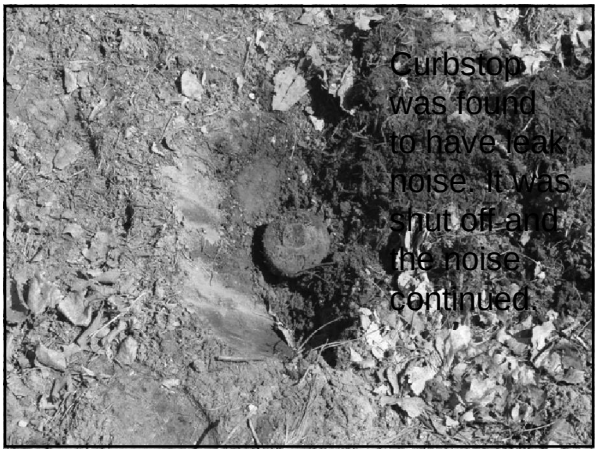




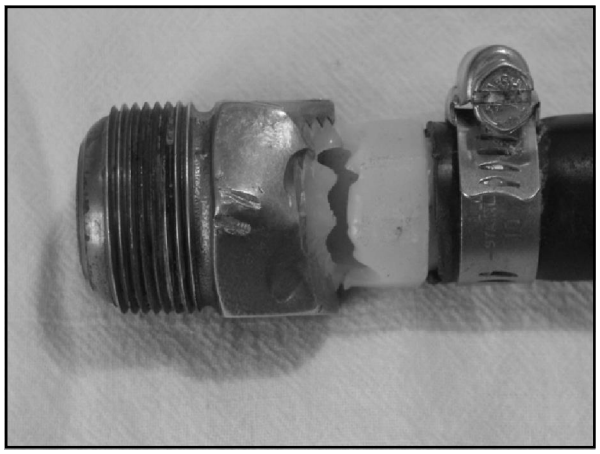

Total
(kgal)
Daily Flow
(kgal)
Discharge
25908
7
MAIN F5
PREV F9
NEXT F10
F6
F7
F8
F9
F10


HYH 661


This was an overgrown empty lot. Green grass, wet and soft.


Curbstop was found to have leak noise. It was shut off and the noise continued.

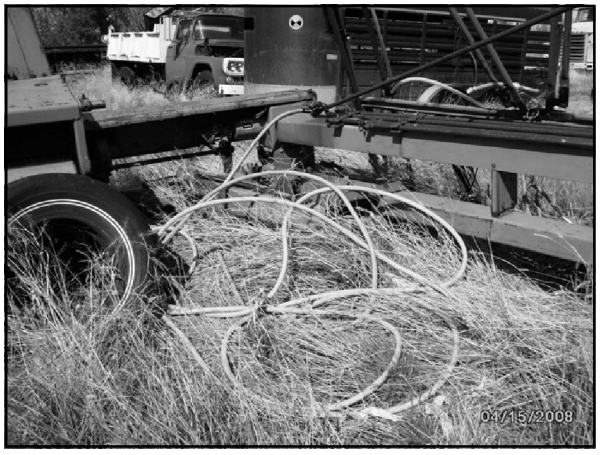

Customer had pressure issues for quite sometime



Leak Detection Success

- Large Leak
- Small Leak on Trailer
- New Meters
- 12% and getting better

WATER THEFT

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Increasing income by raising ratesé the last resort?

- A rate analysis should be conducted to find what rate will best fit your specific needs.

Rate Analysis

- When was the last time your system analyzed rates?
  - Never
  - Donôt Know
  - I just started last month, I think we need HELP!
- Rule of thumb
  - If the answer is in plural ñyearsò your system may be in trouble

Why Analyze?

- More or less to find out if your current rates are adequate
  - Now and into the future

Why Analyze? EPA Definition

- *The cost to provide service changes over time. A rate analysis should be conducted periodically to ensure that rates cover the full cost of providing a service. The rate analysis should determine whether the current rate structure is covering current costs and whether the rate will need to be changed to meet future costs.*

Rates Background

- Proper Rate Setting is a difficult task
- If a line or valve needs repair ï the operator simply gets the job done
- Rate Settings is a different story
  - Very involved

What is a boardôs job?

- ñThe boardôs job is to keep rates down!ò
- ñTheyôd vote us out if we raised rates!ò
- We havenôt raised rates in 15 years, and weôre proud of it!ò
- We have a lot of folks on fixed incomes who canôt afford to pay more!ò

3 Main Questions to Ask

- Where are we?
- Where do we want to be?
- How do we get there?

More Questions?

- Do our rates cover current costs?
- Will our rates cover future costs?
- Are our rates fair to our customers?
- Are we fully funding reserve accounts?
- Are we going to apply for grants and loans?
- What if the economy, inflation and interest rates change?
- Is our population growing or declining?
- Do operating revenues meet or exceed operating cost?

Rates Background

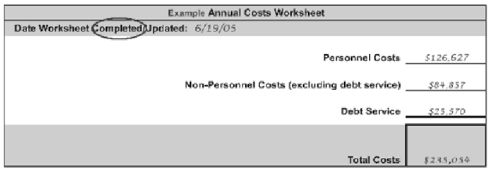
- Monthly Minimum
  - This should account for your fixed cost
  - Does not depend on the amount of service a customer receives
  - Covers non-production costs
- ñAvailability Costò
  - Customers being able to turn on the tap
  - Billed to all customers equally

Rates Background

- Usage Charge (per 1000 gallons)
  - Should cover the variable costs
  - Variable costs occur because the system gets used
- The more volume a customer uses the more variable costs they should pay
- Assessed on each 1000 gallons of water usage as a unit charge

Developing Water Rates

1. Determine the full cost of doing business by calculating your costs
   - Fixed, Variable, Debt



Example Annual Costs Worksheet

Date Worksheet Completed/Updated: 6/19/05

Personnel Costs	$126,627
Non-Personnel Costs (excluding debt service)	$84,857
Debt Service	$25,370
Total Costs	$245,034

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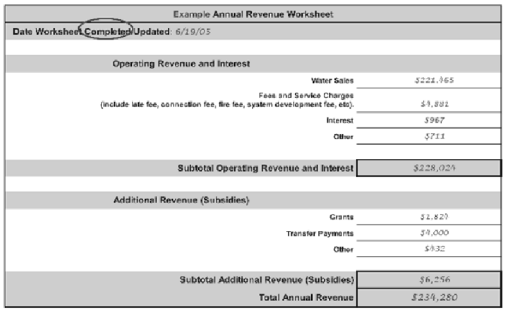
Developing Water Rates

2. Determine Your Current Revenue



Example Annual Revenue Worksheet

Date Worksheet Completed/Updated: 6/19/05

Operating Revenue and Interest	
Water Sales	$221,365
Fees and Service Charges (include late fee, connection fee, fire fee, system development fee, etc).	$1,881
Interest	$967
Other	$711
Subtotal Operating Revenue and Interest	$228,024
Additional Revenue (Subsidies)	
Grants	$1,820
Transfer Payments	$3,000
Other	$932
Subtotal Additional Revenue (Subsidies)	$6,256
Total Annual Revenue	$234,280

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Developing Water Rates

3. Set Aside Reserves, Asset Repair and Replacement, CIP
   - Will we have money to handle repairs, replacements and unexpected expenses?

Example System Inventory Worksheet

Date Worksheet Completed/Updated: 8/19/02

Asset	Expected Useful Life	Condition	Service History	Adjusted Useful Life	Age	Remaining Useful Life
Well 1 (1983)	30	Good		30	9	21
Well 1 pump	10	Good	Rehab (1996)	10	9	1
Well 2 (1993)	30	Good		30	9	21
Well 2 pump	10	Good	Rehab (1998)	10	9	1
Pumphouse (1993)	30	Good		30	9	21
Electrical components	10	Some corrosion	Rehab (1998)	10	9	1
Chlorinator (1993)	10	Good	Rehab (1998)	5	3	2
Storage tank 1 (1993)	40	Good	Rehab (2000) - $12,000	40	9	31
Storage tank 2 (1993)	40	Good	Rehab (2000) - $17,000	40	9	31
Storage tank 3 (2000)	40	Almost new		40	2	38
Distribution System:						
Hydrants (15)	40	Unknown		40	9	11
Valves (45)	40	Unknown	6 valves don't work	40	9	11
6-inch (PVC)	60	Unknown		60	9	51
4-inch (PVC)	60	Unknown		60	9	51
2-inch (PVC)	60	Unknown	Rebar breaks (2/year)	60	9	51

Capital Improvements Plan Example

YEAR	PROJECT	ESTIMATE OF COST	SOURCE OF FUNDING
2014 -2015	Water Plant Improv.	$ 800,000	SRF Loan
2015 - 2016	Seal Coat & Overlay	$ 300,000	G.O. Bond
2017 - 2018	City Pavement Impr.	$ 1,450,000	G.O. Bond
2019 - 2020	WTP Residuals Impr.	$ 3,000,000	SRF Loan
2021 - 2022	Main Street Impr.	$ 3,200,000	G.O. Bond

Repair and Replacement

WANTS

- 4 Cylinder Liquid Cooled, 56 hp
- Hydrostatic Transmission
- Four Wheel Drive
- Power Steering
- Disk Brakes
- Roll-Guard
- 60 inch mower

NEEDS

Developing Water Rates

4. Determine Actual Revenue Required from Your Customers

Example Short-term Revenue Required from Your Customers Worksheet

Date Worksheet Completed/Updated: 6/29/05

	Year: 2006	Year: 2007	Year: 2008	Year: 2009	Year: 2010
Annual Operating Costs:	$245,058	$258,555	$289,250	$312,000	$342,850
Annual Reserve Fund Contribution:	$87,400	$89,350	$83,300	$85,670	$82,670
Total Annual Cost of Business:	$322,454	$347,905	$367,550	$397,670	$425,520
Total Additional Revenue (subsidies):	$6,256	$8,100	$7,900	$8,000	$8,600
Total Annual Revenue Needed: (Total Annual Cost of Business - Total Additional Revenue)	$316,198	$339,805	$359,650	$389,670	$416,920
Projected Revenue:	$228,024	$230,500	$235,820	$239,600	$245,200
Revenue Surplus or Deficit:	($88,174)	($109,305)	($123,830)	($150,070)	($171,720)
Cumulative Surplus/Deficit:	($88,174)	($197,479)	($321,309)	($471,379)	($643,099)

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Developing Water Rates

- $88,174 or about $7,350/month
- Monthly Minimum
  - # of Customers
- Usage
  - # of Gallons Sold
- Combination
- Partial Reserves/Cut Costs

Developing Water Rates

5. Design a Rate to Cover Your Costs

Considerations for Choosing a Rate Structure

- Rate Stability
- Rate Predictability
- Number of Customers
- Customer Classes
- Water Use
- Customer Needs

Common Rate Structures

- Flat Rate or Fixed Fee
- Proportional to Use
- Uniform Rate or Single Block Rate
- Decreasing Block Rate
- Increasing Block Rate
- Seasonal Rates
- Surcharges
- Cost to Serve

Including a Usage Allowance

- ñGive Away Volumeòor ñFree Waterò
- $15 Monthly Minimum, 2000 gallons included, $4/1000 gallons after that
- Systems usually/should build part or all of the cost into their minimum
- Allowance should not exceed average usage

Usage Allowance

- Guarantees Revenue if done properly
- Discourages Conservation
- The ñLittle old Ladyò may actually pay a higher minimum
- Could end up favoring higher users

Developing Water Rates

6. Implementing the Rate
   1. Educating the Public
   2. Building Public Support
   3. Timing is key
   4. Rate Letter
7. Reviewing the Rate
   1. Remember that water rates have a short life span. Rates should be examined annually to determine if adjustments need to be made.

Justification

- A rate review will show you where to set the rates.
- It will justify them
- Makes it easier to gain public acceptance.
- The rates are not just numbers pulled out of a hat.

How often should a system adjust rates?

- When an Analysis shows it is time
- When circumstances occur
- Before you start losing money
- Rate Indexing to at least keep up with inflation

Long Inflation Definition

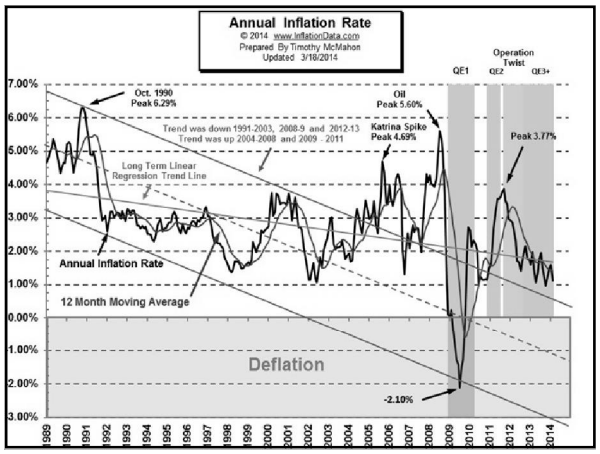
- In economics, **inflation** is a rise in the general level of prices of goods and services in an economy over a period of time. When the price level rises, each unit of currency buys fewer goods and services; consequently, annual inflation is also an erosion in the purchasing power of money ï a loss of real value in the internal medium of exchange and unit of account in the economy. A chief measure of price inflation is the inflation rate, the annualized percentage change in a general price index (normally the Consumer Price Index) over time.

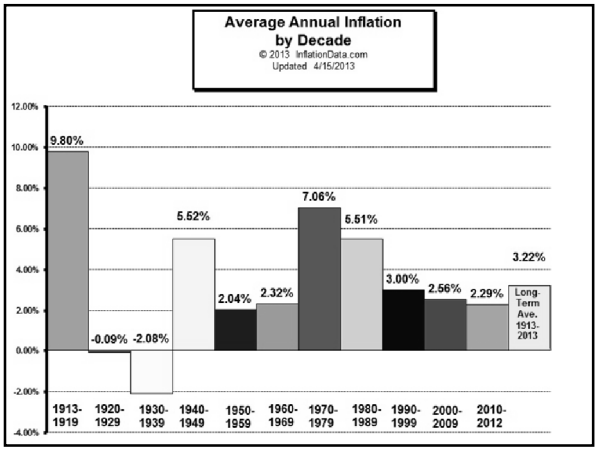
Short Inflation Definition

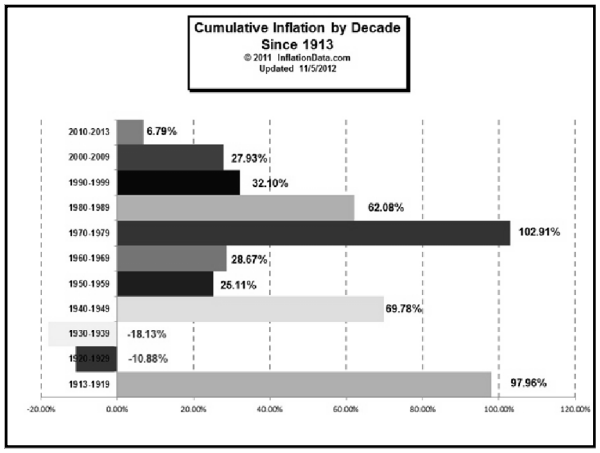
- A general and progressive increase in prices; "in inflation everything gets more valuable except moneyñ
- The inflation rate is calculated from the difference between Current Consumer Price Index and the Consumer Price Index a year ago.

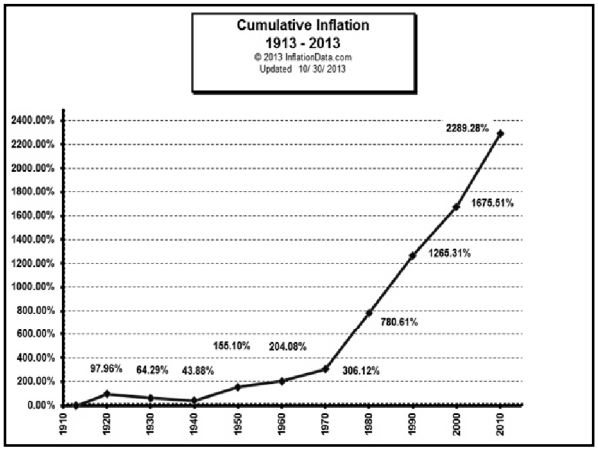
Consumer Price Index

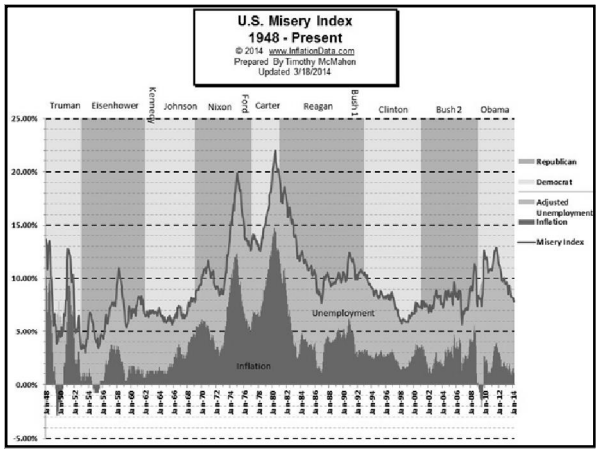
- The Consumer Price Index, or CPI, is a monthly/yearly measurement of inflation.
- It reports on the price changes of 80,000 items that represent a cross-section of goods and services purchased by urban households.
- These metropolitan consumers represent 87% of the U.S. population.











Inflation

- Average annual inflation rate is 3.22%.
- That doesn't sound too bad until we realize that at that rate prices will double every 20 years.
- **Current Inflation Rate 1.51%**

Social Security Cost-Of-Living Adjustments

- 2007 2.3%
- 2008 5.8%
- 2009 0.0%
- 2010 0.0%
- 2011 3.6%
- 2012 1.7%
- 2013 1.5%

Depreciation

- Decrease in value of an asset due to obsolescence or use

Depreciation

- **Depreciation** is a non-cash expense that reduces the value of an asset over time. Assets depreciate for two reasons:
- **Wear and tear.** For example, a vehicle will decrease in value because of the mileage, wear on tires, and other factors related to the use of the vehicle.
- **Obsolescence.** Assets also decrease in value as they are replaced by newer models. Last year's car model is less valuable because there is a newer model in the marketplace.

Water System Asset Depreciation

- Each time you operate a piece of equipment, you subject it to wear and tear, thereby reducing its value.

Water System Asset Depreciation

- Financial statements (revenue statements and balance sheets) use the concept of ñdepreciationò
- Unless you actually deposit the amount being depreciated into a savings account of some sort, depreciation is not real money.
- Equipment replacement scheduling, the real world equivalent of depreciation

Water System Asset Depreciation

- Depreciation can be a useful guide for determining the annual contribution to your reserve fund.

Depreciation Conclusion

- Build a Reserve Fund
- Annual contribution to a reserve fund.
- Failure to contribute to that reserve fund each year is a failure to properly calculate the ñFULLòcost of doing business.

Financial Indicators

- Operating Ratio
- Coverage Ratio
- Working Capital Goal
- Affordability Index

Operating Ratio

- Is a key financial health indicator
- An indicator of a systemôs ability to pay operating costs.
- 1.15 to 1.30, maybe higher 1.50
- 15-30% more operating revenue than operating expenses
- Does not include debt expenses
- Does not include Depreciation

Operating Ratio

$$\frac{\text{Total Operating Income and Operating Reserves}}{\text{Total Operating Costs*}}$$

*Not including debt or debt-related expenses

Operating Ratio

- Your system has $150,000 of total operating income & reserves and has a total operating cost of $100,000, what is your Operating Ratio?
- $150,000/$100,000 = 1.5

Coverage Ratio

- Compares revenue you have available for debt service with what debt you have or are planning to incur
- You should maintain at least a 1.25 coverage ratio, maybe as high as 1.90

Coverage Ratio

$$\frac{\text{Net Operating Income and Debt Reserves}}{\text{Debt and Debt-related Costs for That Year}}$$

Coverage Ratio

- Your system has $50,000 net operating income and $5,000 in debt reserves. The debt and debt related costs for that particular year is $27,500. What is the Coverage Ratio?
- ($50,000 + $5,000)/$27,500 = 2.0
- Less than 1.0 and you are not making your payments.

Working Capital Goal

- Working capital goal is a percentage of your Operating Costs.
- Working capital is the amount of funds you carry over just in case you have unexpected operating costs or a drop in operating income.
- Larger Systems: 15%
- Small Systems: as high as 50%

Working Capital Goal

- After paying your debt payment, the system has $27,500 net operating income. The system has a Working Capital Goal of 15%. How much is carried over to the next year and How much is placed in a Reserve Account?
- Operating Expenses= $100,000
- $100,000 X 15% = $15,000
- $27,500 - $15,000 = $12,500

Affordability Index

- Measures the ratepayerõs ability to pay their bills.
- Based on Annual Household Median Income (AHMI)
- EPA states that water service is affordable if the average connection pays between 1.5% and 2.5% of the AHMI
- Based on cost of 6,000 gallons (EPA)

Affordability Basics

- HMI = $30,000
- $30,000 x 1.5% = $450
- $30,000 x 2.5% = $750
- $37.50 - $62.50/month for water

Affordability Basics

$$\frac{\text{Annual Residential Bill for 6,000 Gallons/Month}}{\text{Annual Median Household Income}}$$

Affordability Levels

- North Dakota-$51,641 AHMI
- United States-$53,046 AHMI

- http://factfinder2.census.gov
- 2008-12 (5 year estimates)

Affordability Levels

- United States the 2008-12 HMI is $53,046
- Affordability index of 1.5%-2.5% would be represented by $795 to $1,326
- $66.25 to $110.50 per month
- Based on 6,000 gallons/month

Affordability Levels

- NDõs estimated 2008-12 HMI is $51,641
- Affordability index of 1.5%-2.5% would be represented by $775 to $1,291
- $64.58 to $107.58 per month
- Based on 6,000 gallons/month

ND City 2013 Survey

- Monthly Minimum
  - $20.11
- Gallons Given with Monthly Minimum
  - 1,163 (2/3 of cities)
- Usage Charge/1000 gallons
  - $4.26

ND City Survey

- Monthly Bill
  - $40.98
- Yearly Bill
  - $491.76

ND City Survey

- US AMHI Affordability Index
  - 0.93%
- ND AMHI Affordability Index
  - 0.95%

Rural Water Affordability (42 RW Phases)

- Monthly Minimum Avg
  - $39.66
  - 2 Systems included 1000-2000 gallons
- Usage Charge Avg
  - $5.44
- Avg Monthly Bill
  - $71.87
- Avg Yearly Bill
  - $862.39

Rural Water Affordability

- US AMHI Affordability Index
  - 1.63%
- ND AMHI Affordability Index
  - 1.67%

Affordability

- American Households spend, on average, only $474 per year on water and wastewater service.
- That same household spends $707 per year on refreshment beverages.

Affordability

- The United States has the lowest burden for water/wastewater when compared to the World's developed countries

Average price of water by country

Country	Avg. Price US$/gal
Germany	0.0084
Denmark	0.0083
UK	0.0057
Holland	0.0054
France	0.0053
Belgium	0.0047
Italy	0.0036
Spain	0.0033
South Africa	0.0032
Finland	0.0030
USA	0.0023
Canada	0.0020

Rate Odds and Ends

- Good Rate Structures are based on good budgets.
- Prices signal value to consumers and help determine whether consumers use water efficiently.

Rate Odds and Ends

- There is a tendency to set rates based more on politics, rather than on the costs of operations and planned capital improvements.
- Turning on the Tap: Is Water the Next Oil? Water is a $400 billion global industry.

Rate Odds and Ends

- Conservation
- Energy and Water Audits
- Run Your System Like a Good Business!
- Raising Revenues without Raising Rates

Final Thoughts

- Small increases are better than large increases
- Scheduled, small increases are even better

Think about thisé .

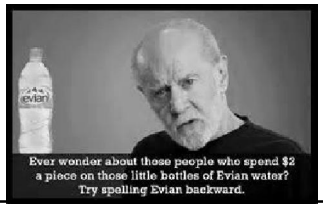
- An average American uses about 100 gpd
- An average European uses about 50 gpd
- The average use in Africa is about 5 gpd
- One in Six of the worldôs population lacks clean water!!!

So you think your water rates are too high?

Iced Tea @ 16 oz.	$12.40 per gal.
Fruit Juice @ 16 oz.	$12.72 per gal.
Sports Drink @ 20 oz.	$11.20 per gal.
Soft Drink @ 20 oz.	$ 9.92 per gal.
Beer @ 12 oz.	$26.67 per gal.

Perhaps this will help to put things in perspective

Gasoline	$ 3.87 per gal.
Bottled Water @ 20 oz.	$12.10 per gal.
Avg. USA Water	$.0023 per gal.



Show Me Ratemaker Software

- Show Me Water 2008.xls

ND Rates Program

Thank You!

Eric Volk, Executive Director
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