• Bartle Wells Associates
• Study Objectives
• Proposition 218
• Rate Study Process
• Cost of Service Methodologies
• Allocation of Costs
• Rate Structure Alternatives
• Reserve Fund Targets
• Conservation Trends and Assumptions
• Next Meeting
• Schedule
Bartle Wells Associates

- Independent public finance advisory firm founded 1964
- Services: financial plans, rate & fee studies, project financing
- Assisted over 500 public agencies
- Developed over 2,000 financing plans & 1,000 utility rate studies
- Secured over $4 billion in project financing
- Charter Member: National Association of Independent Public Finance Advisors (NAIPFA)

*BWA specializes in water & wastewater rates & finance*
Study Objectives

- Work closely with Staff, WAC, City Council, and others to develop new water rates through a transparent process.
- Develop fair and equitable rates based on the cost of service.
- Review allocation of expenses between fixed and variable charges and realign rates to reflect actual costs.
- Develop rates that meet annual revenue requirements and provide revenue stability.
- Phase-in multi-year rate increases to minimize impacts on ratepayers.
- Develop long-range financial plan for the water system.
- Prepare a user-friendly computer rate model for future updates and evaluation “what-if” scenarios.
Proposition 218

- **Cost of Service**: Fees cannot exceed the cost of service

- **Intended Purpose**: Revenues derived from the fee or charge can only be used for the purpose for which the fee was imposed

- **Proportional Cost Recovery**: The amount of the fee or charge levied on any customer shall not exceed the proportional cost of service attributable to that customer

- **Recent Court Decisions**: Palmdale case
Prop. 218 Procedural Requirements

- **Noticing Requirements**: Must mail notice of proposed rate increases & info on public hearing to affected property owners.

- **Public Hearing**: Hold public rate hearing at least 45 days after the notice is mailed.

- **Rate Increases Subject to Majority Protest**: Rates cannot be adopted if more than 50% of ratepayers submit written protests.
Rate Study Process

Develop Revenue Requirements

Allocate revenue requirements to cost components

Determine unit cost

Allocate costs to user classes and between fixed meter and variable consumption charges

Conduct tier analysis and set breakpoints and pricing

Calculate impact on customers

Sensitivity analysis--conservation/drought scenarios

Final rate recommendation

Conduct comparison survey of rates in surrounding areas
Cost of Service Methodologies

- Allocate costs between residential, commercial, industrial, and other classes

- Run cost of service model
  - Base extra capacity method
  - Commodity demand method
  - Simplified fixed vs. variable costs method

- Choose cost method that is most appropriate for Davis
Cost Allocation

- **Fixed vs. Variable Charges**
  - Fixed “readiness to serve” charges recover costs necessary to provide basic service regardless of consumption
  - Variable charges recover expenses based on the amount of water sold, i.e. electricity, chemicals, water purchases
  - Calif. Urban Water Conservation Council (CUWCC) Best Management Practice (BMP) recommends:
    Revenue Recovery - 70% Variable / 30% Fixed
    (may be adjusted based on actual cost profile)

- **Balance of competing objectives**
  - Revenue stability vs. conservation

- **Allocation of costs to various customer classes – various methodologies**
Rate Structure Alternatives

- 100% Fixed Rates
- 100% Variable Rates
- Uniform Block Consumption
- Inclining Block Consumption
  - Gradually inclining rates
  - Steeply inclining rates
- Declining Block Consumption
- Water Budget-Based Rates
- Seasonal Rates
- Drought Rates
## Current Rates—Fixed Charges

<table>
<thead>
<tr>
<th>Meter Size</th>
<th>Bi-Monthly Base Rate</th>
<th>Ratio</th>
<th>Bi-Monthly Meter Retrofit Charge</th>
<th>Ratio</th>
<th>Bi-Monthly Total Fixed Charge</th>
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<tbody>
<tr>
<td>5/8&quot; or 3/4&quot;</td>
<td>$23.00</td>
<td>1.0</td>
<td>$4.92</td>
<td>1.0</td>
<td>$27.92</td>
</tr>
<tr>
<td>1 inch</td>
<td>$32.40</td>
<td>1.4</td>
<td>$8.22</td>
<td>1.7</td>
<td>$40.62</td>
</tr>
<tr>
<td>1½ inch</td>
<td>$55.80</td>
<td>2.4</td>
<td>$16.38</td>
<td>3.3</td>
<td>$72.18</td>
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<tr>
<td>2 inch</td>
<td>$84.00</td>
<td>3.7</td>
<td>$26.22</td>
<td>5.3</td>
<td>$110.22</td>
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<tr>
<td>3 inch</td>
<td>$160.00</td>
<td>7.0</td>
<td>$52.48</td>
<td>10.7</td>
<td>$212.48</td>
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<tr>
<td>4 inch</td>
<td>$244.00</td>
<td>10.6</td>
<td>$81.98</td>
<td>16.7</td>
<td>$325.98</td>
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<tr>
<td>6 inch</td>
<td>$476.00</td>
<td>20.7</td>
<td>$163.92</td>
<td>33.3</td>
<td>$639.92</td>
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<tr>
<td>8 inch</td>
<td>$758.00</td>
<td>33.0</td>
<td>$262.28</td>
<td>53.3</td>
<td>$1,020.28</td>
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</table>

* outside City of Davis city limits = 20% surcharge
# Current Consumption Rates

<table>
<thead>
<tr>
<th>Class Code</th>
<th>User Classification</th>
<th>Use Tiers (Bi-Mo)</th>
<th>Unit Charges</th>
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<tbody>
<tr>
<td>SF</td>
<td>Single Family Residential</td>
<td>Tier 1: 0 - 36 ccf</td>
<td>$1.50/ccf</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tier 2: over 36 ccf</td>
<td>$1.90</td>
</tr>
<tr>
<td>MF</td>
<td>Multi-Family Residential</td>
<td>Tier 1: 0 - 14 ccf</td>
<td>$1.42</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tier 2: over 14 ccf</td>
<td>$1.90</td>
</tr>
<tr>
<td>CO 01-03</td>
<td>Small Commercial/Industrial up to &amp; including 1 1/2&quot; meter</td>
<td>Tier 1: 0 - 115 ccf</td>
<td>$1.41</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tier 2: over 115 ccf</td>
<td>$1.90</td>
</tr>
<tr>
<td>CO 04-09</td>
<td>Large Commercial/Industrial 2&quot; or larger meter</td>
<td>Tier 1: 0 - 619 ccf</td>
<td>$1.51</td>
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<tr>
<td></td>
<td></td>
<td>Tier 2: over 619 ccf</td>
<td>$1.69</td>
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<tr>
<td>WI</td>
<td>Irrigation **** (ccf used per acre)</td>
<td>Tier 1: 0 - 363 ccf</td>
<td>$1.41</td>
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<tr>
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<td>Tier 2: over 363 ccf</td>
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<tr>
<td>CC</td>
<td>Only used for La Buena Vida Homeowners Association Location 10963</td>
<td>Tier 1: 0 - 36 ccf ***</td>
<td>$1.50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tier 2: over 36 ccf</td>
<td>$1.90</td>
</tr>
</tbody>
</table>

*** per dwelling unit: meter (base) charges are at 80%, domestic and irrigation meters

**** 50% of acre size (1 acre = 43,560 Square Feet)

CCF = hundred cubic feet (748 Gallons = 1CCF)
# 100% Fixed / 100% Variable Rates

## 100% FIXED RATES

### PROS
- Simple, easy to administer
- Stable revenue source

### CONS
- No conservation incentive
- May not be technically legal in Davis
- Poor cost-of-service nexus

## 100% VARIABLE RATES

### PROS
- Charges proportional to use
- Strong conservation incentive

### CONS
- Unstable revenues
- Poor cost-of-service nexus
Uniform Block Rates

- All water sold at same price per unit
- Provides some conservation incentive

Example: Rate for all water use = $2.61
Uniform Block Rates

**PROS**

- Very easy to understand
- Easiest to administer
- Least complaints from high water users

**CONS**

- Less effective than inclining rates in reducing demand
- Conservation incentive does not change regardless of use
- Perceived as less fair by low water users
Inclining Block Rates

- **Price per unit increases as water use increases**
  - Example: 0–10 units: $2, 11–30 units: $3, >30 units: $4

- **Same block breakpoints & rates apply to all residential customers**

- **Block breakpoints can be set based on City’s demand characteristics**

![Inclining Block Rates Graph](image)
PROS
- Provides more conservation incentive on high water use
- Keeps bills lower for customers with low water use
- Consistent block breakpoints for all residential customers
- Easy to adjust in response to escalating drought conditions
- Easy to understand
- Easy to administer

CONS
- High water users will see larger rate impacts
- Application of block rates to commercial & multi-family classes can be difficult to make fair & equitable
Declining Block Rates

- Rate decreases for higher levels of use
- Price per unit increases as water use increases
  - Example: 0–10 units: $4, 11–30 units: $3, >30 units: $2
- Common structure in areas with plentiful water

**PROS**
- Volume discounts benefit high users

**CONS**
- Weak conservation message
- Not appropriate in areas with limited supplies
Each customer provided a water budget “based on needs”
- Indoor budget (based on # of people): *lowest rate*
- Outdoor budget (based on lot size & weather): *middle rate*
- Use over budget: *highest rate*

Price per unit increases as water use exceeds budget

Often applied to landscape irrigation customers only
Water Budgets

PROS

- Each customer pays lower rates for water used within their budget
- Provides strong conservation incentive and clear price signals
- Budgets may be tailored to each property type
- Can be structured to provide reliable revenue stream

CONS

- Cost, time, and effort to implement & maintain / most staff intensive
- Needs a billing application that can support the rate structure
- Provides customers with large lots more water at lower rates
  - Less incentive to reduce outdoor demand with drought-tolerant plants, etc.
  - Higher water costs for all others (zero sum game)
- Equity issue: 2 neighbors pay different amounts for same amount of water
- Process for managing variances needed
  - More people in households
  - Pools
  - Large animals
  - Special needs/cases
Water Allocations

- Customers allocated water based on historical use
  - e.g. allocation = 90% of 3-year historical use
  - Tiers can be based on prior use

- Higher rates or penalties for use over water allocation

- Often used during droughts
Water Allocations

**PROS**
- Conservation incentive based on each customer’s historical use
- If customer doesn’t reduce use from prior years, they pay more
- Can provide a strong conservation incentive
- Puts conservation incentive on all customers regardless of use

**CONS**
- Penalizes customers who have already conserved
- Rewards customers for high historical water use
- Backwards looking; doesn’t account for current conditions
- Significant administrative effort
- High potential for customer requests for variances
Seasonal Rates

- Higher water use in summer (hot) months due to irrigation
- Irrigation is typically more discretionary than indoor use
- Seasonal rates can be structured as larger tiers in the summer and/or higher rates
- Seasonal rates can be designed to impact only the top tiers

**PROS**
- Tracks seasonal use profile more closely

**CONS**
- More complicated than basic tiered rates
Drought Rates

- Usually kicks in when agency declares a drought and requests cutbacks
- Cutbacks mean lower water sales
- Some type of drought surcharge is placed on rates to make up revenue shortfall
- Impacts of drought vary from agency to agency based on water supply profile
- Drought rates should be considered as part of any rate study
Setting Reserve Fund Targets

- **Reserves allow the utility to:**
  - Function smoothly throughout the year, year in and year out
  - Meet unexpected revenue shortfalls/expenses
  - Minimize debt financing
  - Improve its credit-worthiness

- **Reserve targets are unique to each agency**
  - Based on risk profile
  - Drought exposure
  - Natural disasters
  - System reliability
  - Billing method and other factors
Conservation Assumptions

- **Statewide Trends in Water Conservation** –
  - Significantly lower use (10 - 30%) over past few years

- **Why?**
  - Bad economy
  - Foreclosures
  - Conservation programs
  - Mild weather
  - More efficient fixtures/appliances

- **What’s Next?**
  - Economy may improve
  - Can’t control the weather – 2012 has been dry so far
  - SB7x7 (20% conservation by 2020)
Typical Indoor Use

Price Elasticity of Water Rates

- Price elasticity measures the sensitivity of water use relative to changes in the price.

- Price elasticity: the percentage change in quantity of water consumed for each percent change in price.

- If price elasticity = -1, then a 1% increase in price would result in a 1% decrease in demand.

- Most residential water use is considered to be relatively insensitive to price (price inelastic).
Typical Price Elasticity Values

- From 50+ water demand studies:
  - Price elasticity of total residential demand
    = -0.2 to -0.4
  - Price elasticity for indoor residential demand
    = -0.06 to -0.8
  - Price elasticity for outdoor residential demand
    = -0.7 to -1.6

Source: Peter Mayer, PE – Aquacraft Inc.
Many variables can influence elasticity:
- Region and climate
- Prior year’s weather and current season
- Fixed charges and rate design
- Local demographics
- Price has least effect on residential and most commercial demand

In general, moderate adjustments to rates do not equal large immediate increases in conservation with residential users

Best used with long-term demand forecasting rather than incentivizing conservation
Next Meeting- March 8, 2012

- Revenue requirements
- Financial assumptions
- Debt service for rate model
- Review consumption/user data
- Proposed customer classes
## Preliminary Schedule

<table>
<thead>
<tr>
<th>TASK</th>
<th>Feb-12</th>
<th>Mar-12</th>
<th>Apr-12</th>
<th>May-12</th>
<th>Jun-12</th>
<th>Jul-12</th>
<th>Aug-12</th>
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<tbody>
<tr>
<td>Task 1. Project Kickoff Meeting &amp; Data Collection</td>
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<td>Task 2. Cost of Service Analysis</td>
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<td>Task 4. Rate Design Analysis</td>
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<td>Task 5. Draft and Final Report and Analytical Rate Model</td>
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<td>Task 6. Meetings, Outreach, Education Program, &amp; Prop 218 Noticing</td>
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### KEY DATES:

- **April 12**: Draft Report delivered to WAC
- **April 17**: Update to City Council or progress meeting
- **May 24**: Final Water Rate Study Report to WAC
- **June 12**: Final Water Rate Study Report to City Council
Questions and Comments