



# Pricing Water for Conservation

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# Webinar Objectives

- Understanding conservation as a water system objective
- Explore ways that water can be priced to encourage conservation
- See how different rate structures impact different types of customers

<http://efcnetwork.org/events/webinar-encouraging-customers-to-conserve-pricing-and-non-pricing-approaches/>



The image shows a YouTube video player interface. The video title is "Encouraging Customers to Conserve Pricing and Non-Pricing Approaches". The video is from the "Energy Efficiency Network" channel. The video description includes the date "Thursday, May 11, 2017" and the duration "1:00:00". The video is part of a series titled "ENERGY EFFICIENCY NETWORK". The video is currently at 0:00. The video player includes standard YouTube controls like play, pause, and volume. The video is embedded in a page with a blue header and a white background.

Energy Efficiency Network

Encouraging Customers to Conserve Pricing and Non-Pricing Approaches

Thursday, May 11, 2017

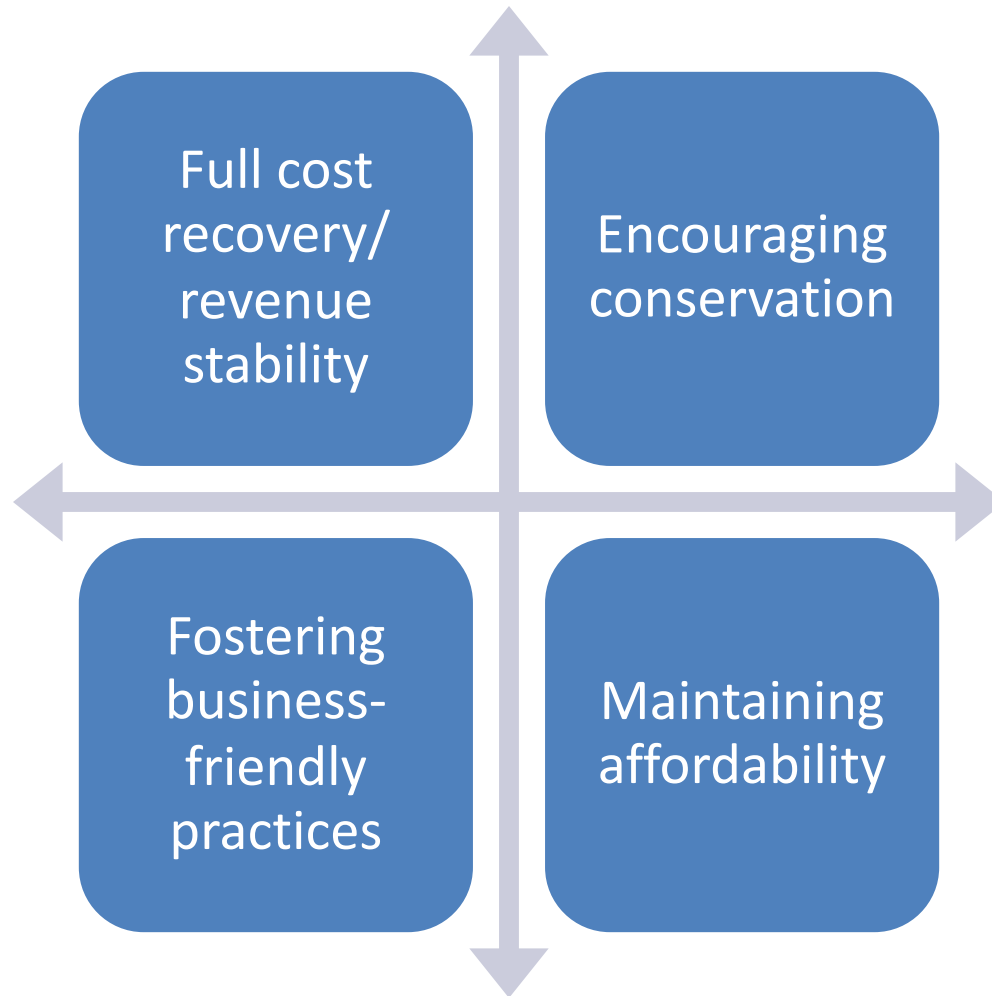
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ENERGY EFFICIENCY NETWORK

0:00



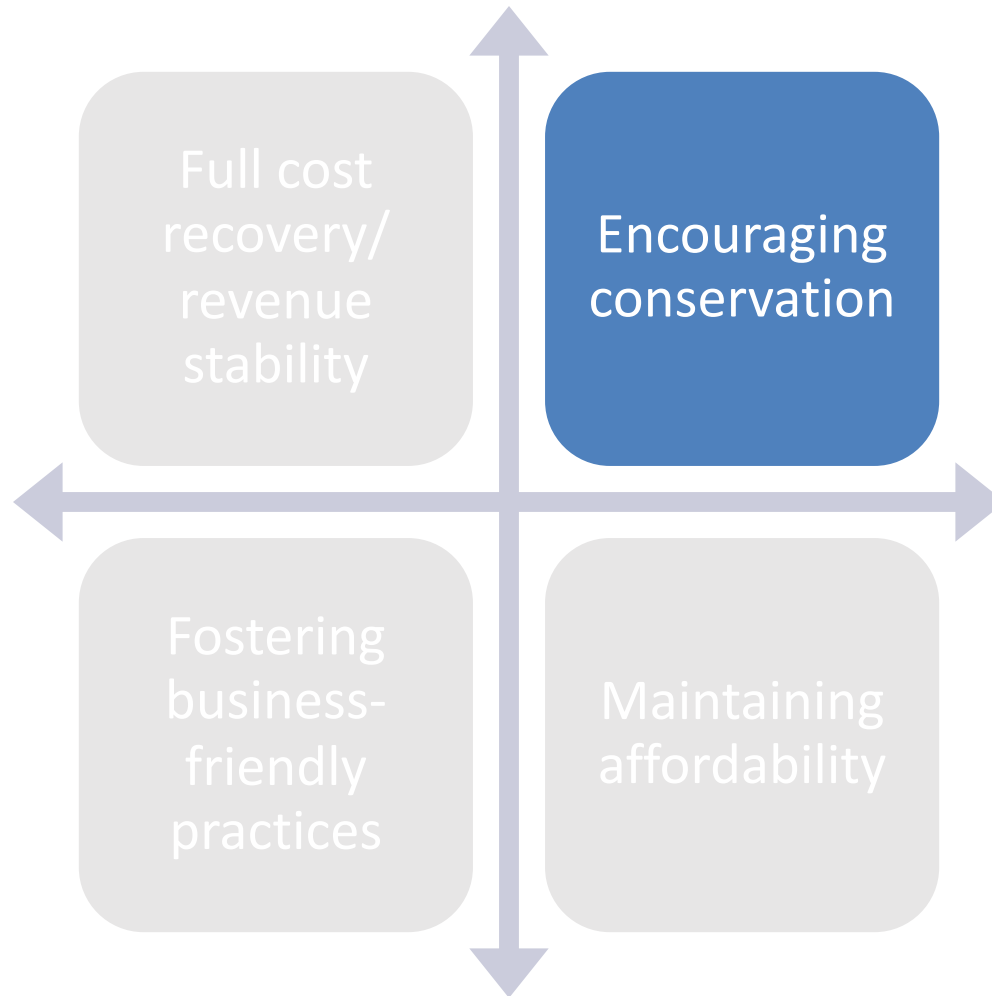
# Water System Objectives





# Polling Questions

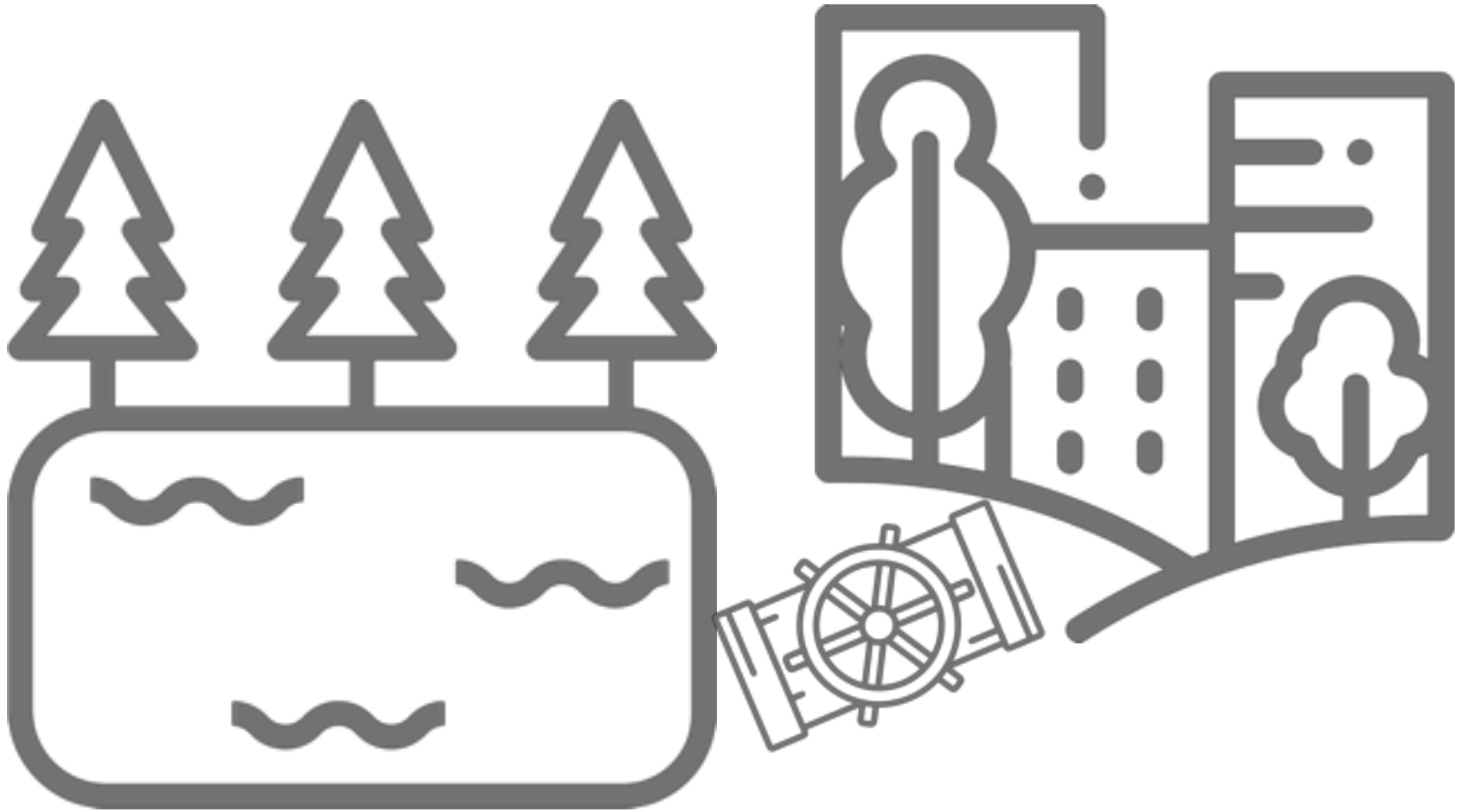
# Encouraging Conservation



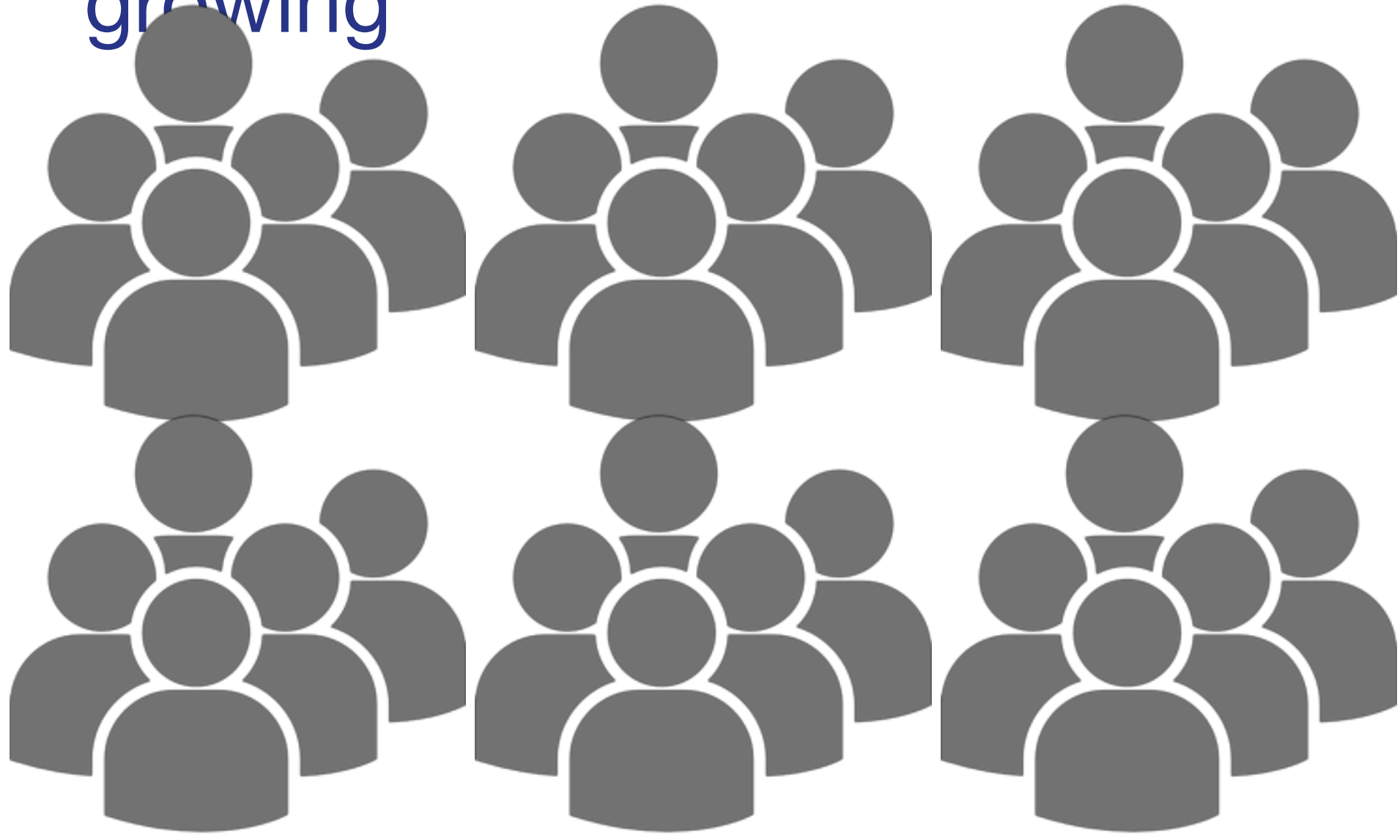
# Environmental benefits



Lack of adequate supply for the population served



Your service population is  
growing



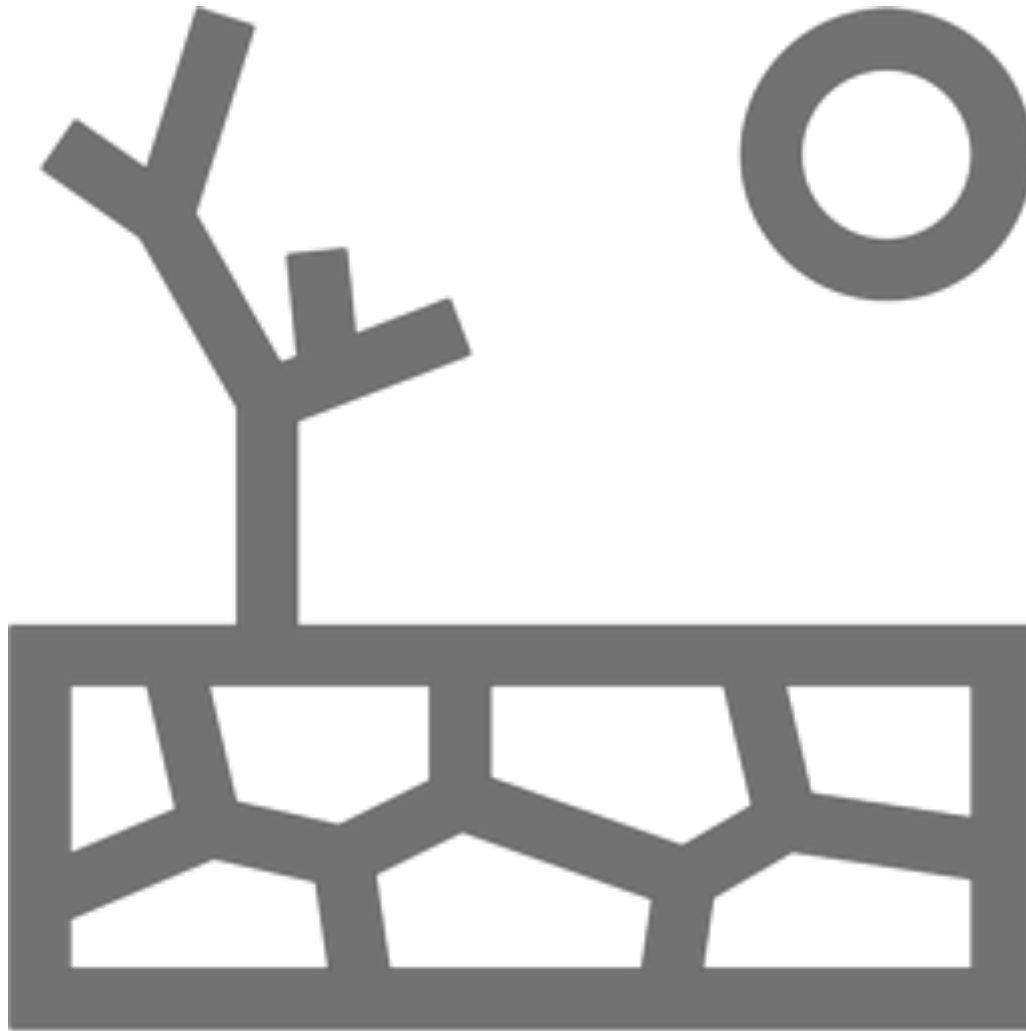


Nearing your storage or treatment capacity, or the limits of your withdrawal permit or water rights





# Drought



# Emergency



## Montgomery County Environmental Services - Ohio



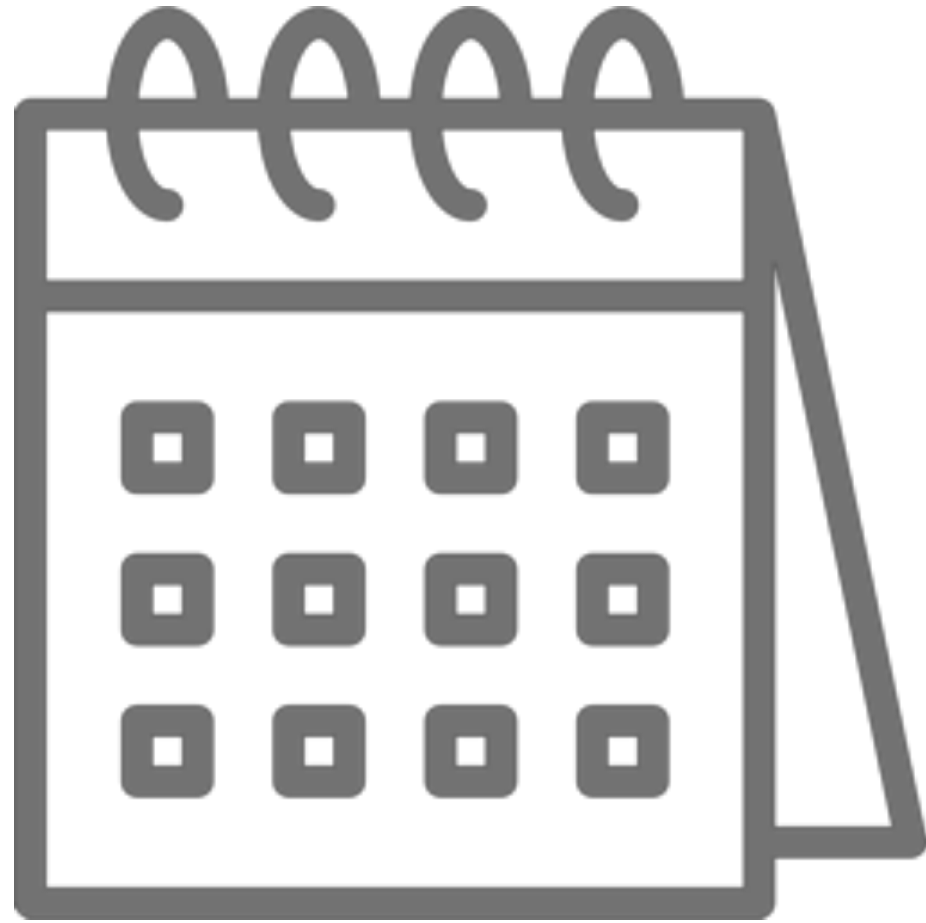
13 February at 19:36 · 🌐

Due to the widespread water service interruption, all Montgomery County and city of Dayton residents are urged to conserve water or avoid using water while the system is under evaluation.

👍 🤔 😬 20

13 Comments 65 shares

# Short Term vs. Long Term



# Two Approaches to Conservation



Pricing signals  
through your rates



Non-price strategies

# Non-Pricing Strategies



<https://efcnetwork.org/events/webinar-encouraging-conservation-an-in-depth-look-at-non-pricing-approaches/>

## WEBINAR | Encouraging Conservation – An In-Depth Look at Non-Pricing Approaches

### Date/Time

Serial - 08/23/2018

2:00 pm - 3:00 pm

[Click to add to your calendar](#)

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Fill out form below to register for this event.

### Categories

- Conservation
- Webinars

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**2:00PM-3:00PM EDT**

8:00pm-2:00pm CDT, 12:00pm-1:00pm MDT, 9:00am-12:00pm PDT



# The Problem with Conservation

- We are in the business of selling water
- If we want customers to use less water, what impact does that have on our revenues?



When you conserve water,  
we have a deficit... Do I  
have to raise your rates?



# Two Approaches to Conservation

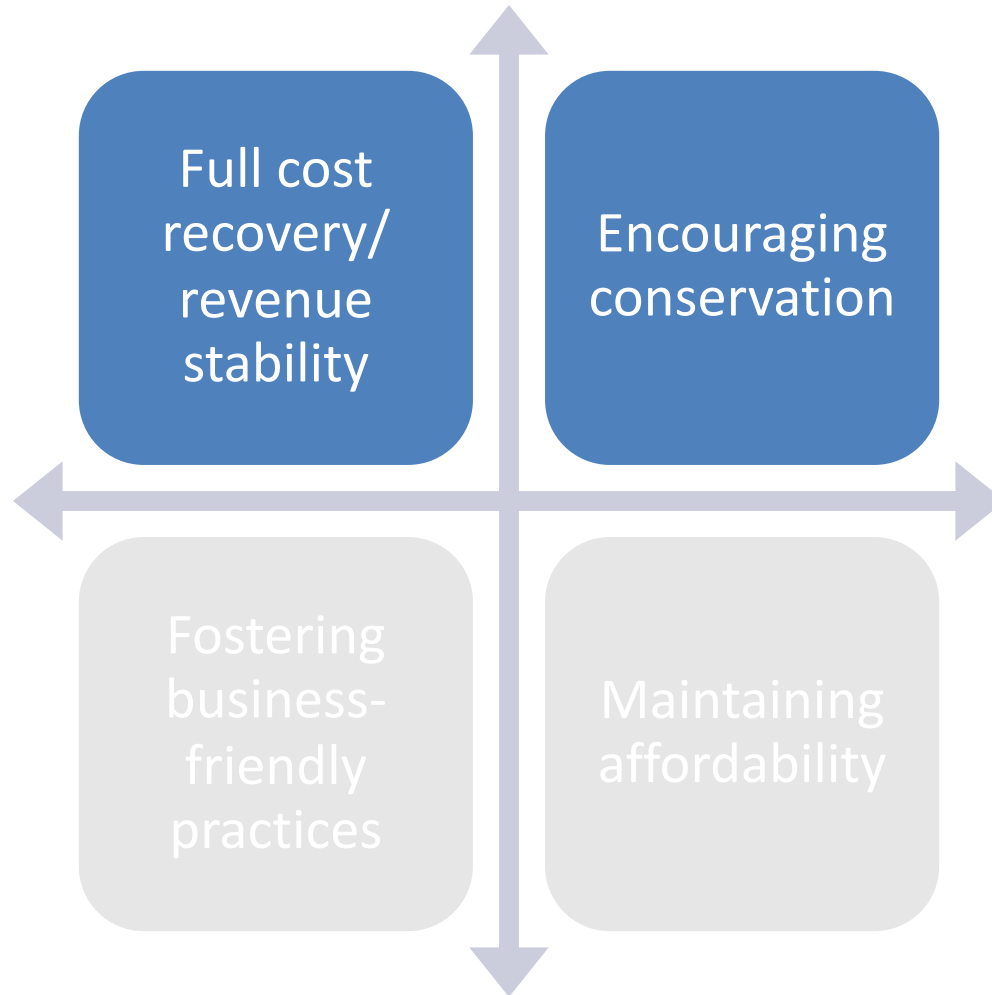


Pricing signals  
through your rates



Non-price strategies

# Balancing Objectives





# Pricing Strategies

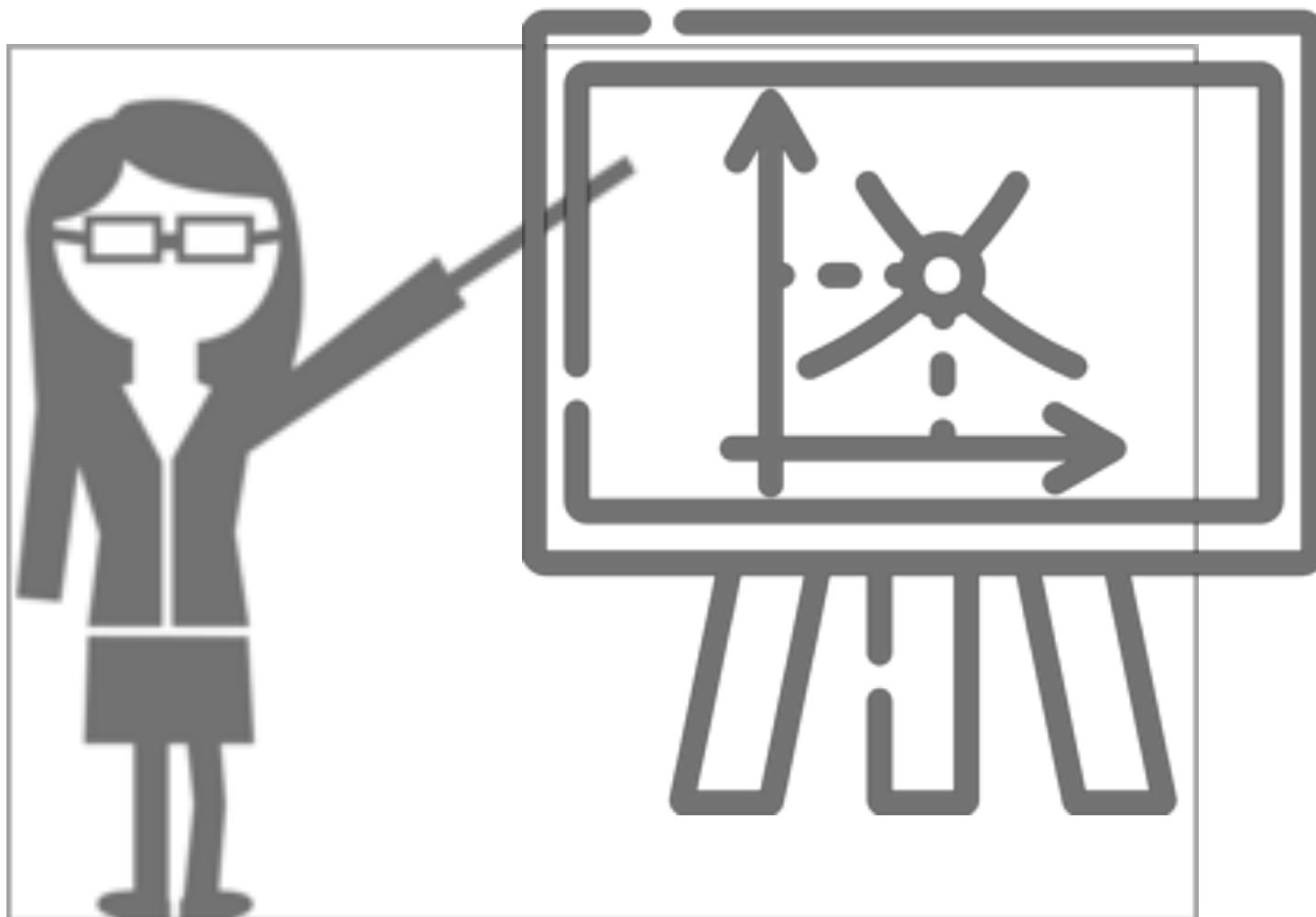
- There is no single rate structure that can be called a conservation rate structure
- Many different rate designs can be used to encourage conservation. The devil is in the details



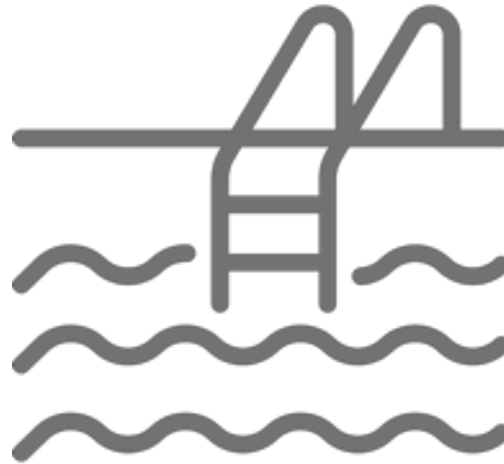
# Pricing Strategies

- The rate level may matter more than the rate structure
- Consider higher rates at average usage levels in addition to high levels, though be aware of affordability issues

# ECON 101



# Discretionary Water Use



<https://efc.sog.unc.edu/project/california-multi-agency-analysis-relationship-between-water-sales-and-pricing-during-drought>



How Important was Water Pricing in Achieving Conservation Goals During the California Drought?



Mar 2018

UNC

Center for the Study of the Environment  
Environmental Finance Center



# Some Ideas of Rate Structures

- High uniform rates
- Increasing block rates
- Budget based rates
- Irrigation rates
- Seasonal rates
- Surcharges when supply is low/drought



So.....

What does this mean in the real world? What would conservation pricing actually look like?





# Irwindale, USA

Small town with a water and wastewater system



Population: 1,100



Service Connections: 450



MHI: \$24,432



# Annual Budgeted Revenues

Account	Type	Amount
30-371-01	Water Charges	\$214,423
30-371-02	Sewer Charges	\$262,072
30-373-02	Service Charges	\$12,500
30-378-00	I&I Study Grant - Commerce	\$12,000
30-336-00	Fund Balance Appropriated	\$9,188
30-374-00	Online W/S Payment Fee	\$1,600
30-373-00	Tap Connections	\$1,500
30-373-04	Impact Fees	\$1,000
30-385-00	Sale Of Assets	\$0
30-386-00	Transfer From Other Fund	\$0
<b>Total</b>		<b>\$514,283</b>



# Irvindale's Customers



4,000 gallons/month  
(all indoor)



15,000 gallons/month  
(4K indoor; 11K outdoor)



15,000 gallons/month  
(all indoor)



34,000 gallons/month  
(all indoor)



# Exercise

Let's figure out some rates for Irvindale that promote conservation and see how those rates impact different types of customers



# High Volumetric Uniform Rates

- What information do we need to make this calculation?
- Total revenue needed from rates
- Total gallons sold



# High Volumetric Uniform Rates

\$214,423

*Total Needed Revenue*

**x 1,000 =**

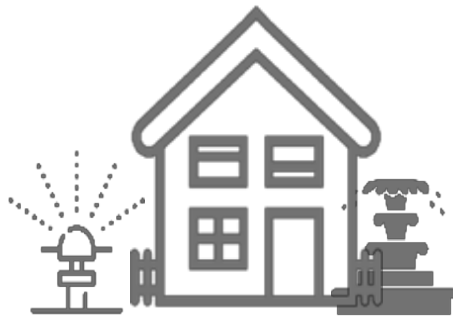
\$6.52

32,877,590

*Total Gallons Sold*

*Price per 1,000 Gallons*

# All Volumetric Uniform Rates



\$26.09

\$97.83

\$97.83

\$221.74



# Increasing Block Rates

- What information do we need to make this calculation?
- Total revenue needed from rates
- Total gallons sold, broken out by customer per billing period for ideally multiple years



# Usage and Peaking

- Determine the average of the lowest non-zero period of usage for all customers, and figure out what percentage of billing periods are above or below this number
- Determine which percentage of customers have a period of usage twice their lowest non-zero period of usage



# Usage and Peaking

	Low Peak	High Peak
Low User	27%	11%
High User	39%	23%



# Increasing Block Rates

For block rate structures to be effective:

- Decide on the correct number of blocks
- Decide on where the blocks should end/start
- Set significant rate differentials between blocks

# Increasing Block Calculations

**Water & Wastewater Rates Analysis Model**  
Version 2.6.2 (last updated August 4, 2015)

**UNC**  
UNIVERSITY OF NORTH CAROLINA  
Environmental Finance Center

Developed by the Environmental Finance Center at the University of North Carolina Chapel Hill  
Supported by the U.S. Environmental Protection Agency under the Public Water Supply Section of the North Carolina Department of Environment and Natural Resources

**Get Started**  
Download a copy of the model populated with data from an example utility

**DESCRIPTION**  
A do-it-yourself, simplified financial model to assist utility managers and private system owners in setting water and wastewater rates.

**FEATURES**  
Comparisons of annual fund balance projections for up to 20 years under proposed new rates vs. staying with existing rates  
Adjust rates for the next 1-5 years  
Up to 12 rate structures  
Uniform or block rates (up to 10 blocks)  
Model changes to accounts and water use  
Customizable list of operating and capital expenses  
Building up reserves through rates  
Compare monthly bills under new rates vs. existing rates  
Assess revenue sufficiency and fund balance  
Error notifications

**INSTRUCTIONS**

1) Navigate using worksheet tabs at bottom of screen or following arrows and clicking on buttons

2) In the green "Data Input" worksheets, input data in the dark green cells

Watch out for red "Error" messages describing where data entry errors



# Increasing Block Calculations

Upper tiers will be priced above this

**\$6.52**

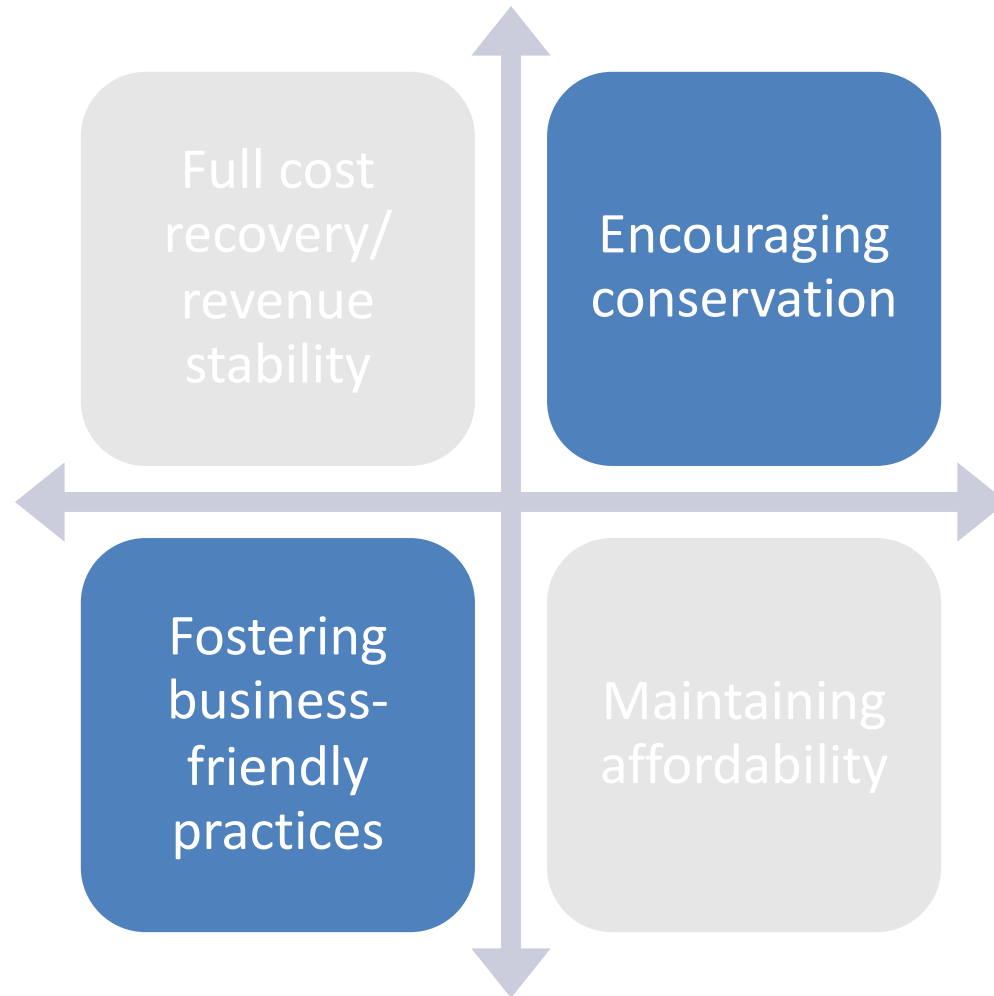
Lower tiers will be priced below this

# Increasing Block Considerations



34,000 gallons/month  
(all indoor)

# Competing Objectives



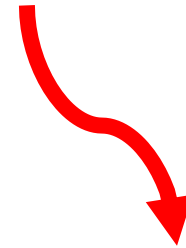
# Increasing Block Considerations



15,000 gallons/month  
(all indoor)

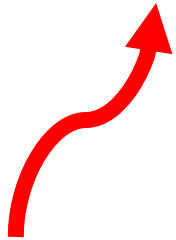
Vs.

High use, high peak

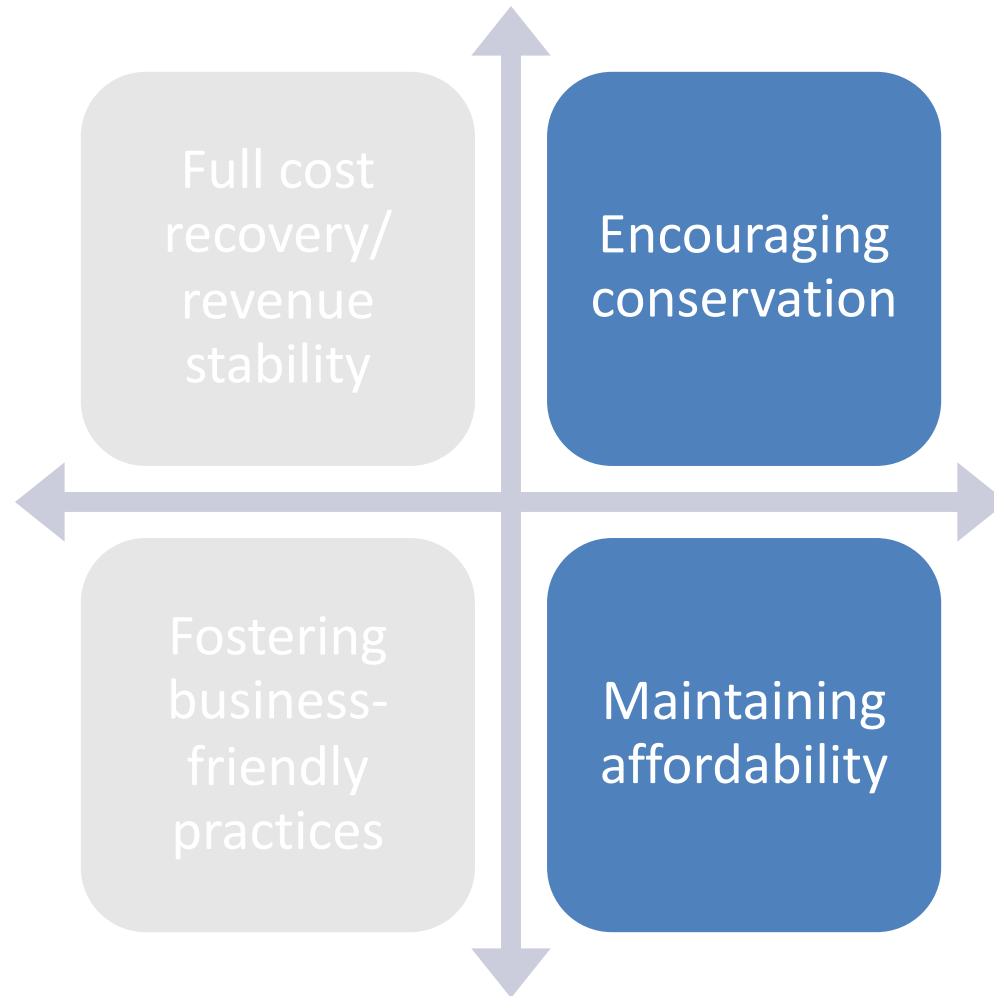


15,000 gallons/month  
(4K indoor; 11K outdoor)

High use, low peak



# Competing Objectives





# Possible Solution: Budget Based Rates

- Works like increasing block. The prices are the same for each customer, but the size of the block varies based on characteristics unique to each account
- For this, you definitely need a spreadsheet tool



# Possible Solution: Irrigation Rates

- Meter and charge a higher rate for outdoor water use than you do for indoor water use



# Irrigation Rates

- What information do we need to make this calculation?
- Total revenue needed from rates
- Total gallons sold *indoors*
- Total gallons sold *outdoors*



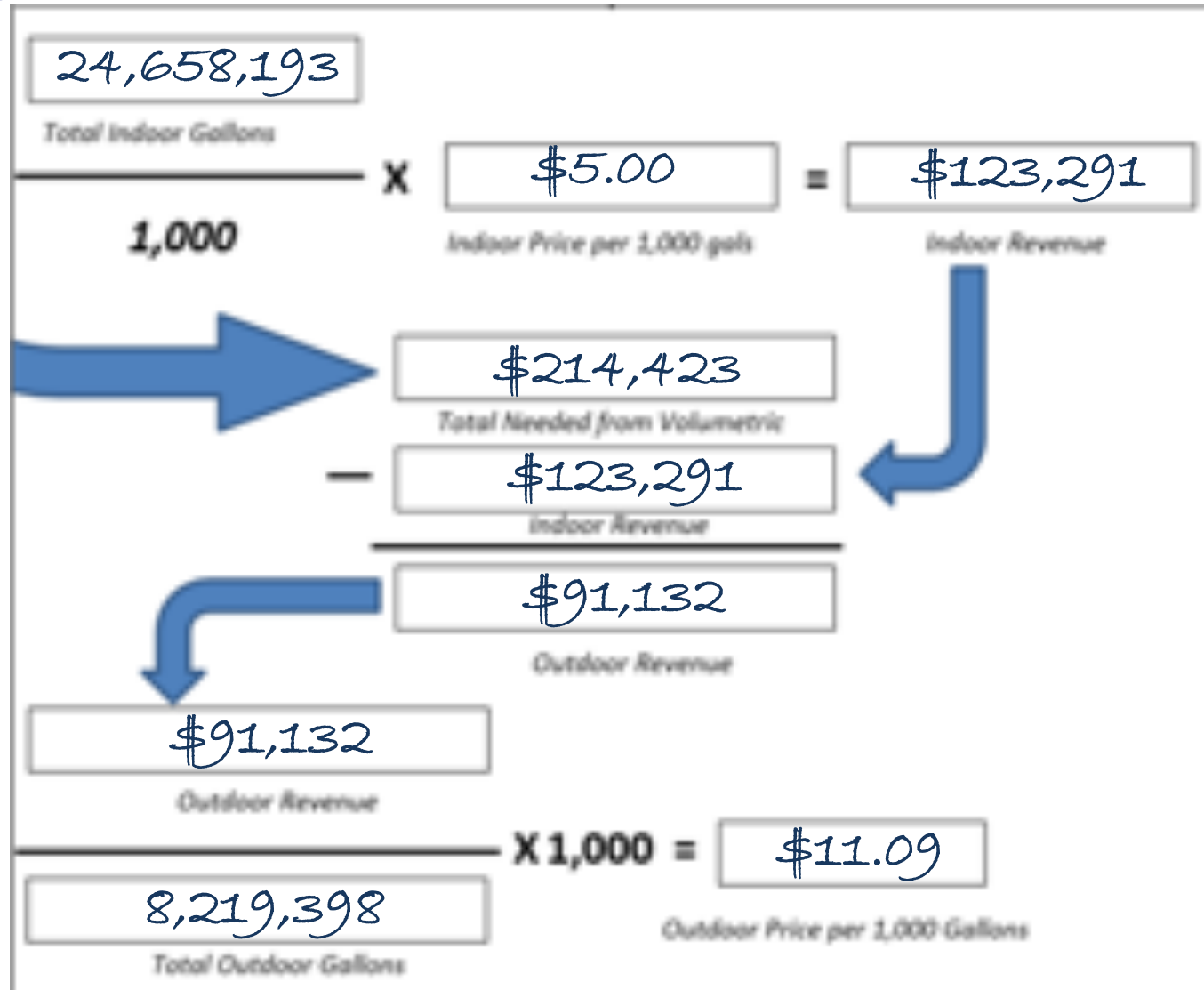
# Irrigation Rate Calculations

Outdoor rates will be priced above this

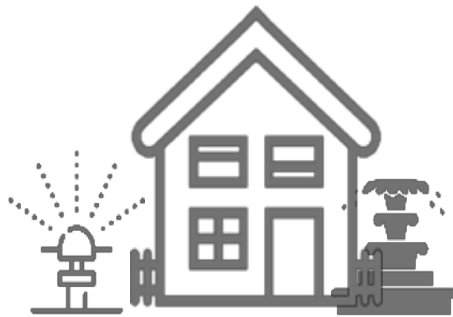
**\$6.52**

Indoor rates will be priced below this

# Irrigation Rates



# Irrigation Rates



\$20.00

\$141.99

\$75.00

\$170.00



# Seasonal Rates

- Charge a higher price to all customers during the months when overall water use is highest
- Again, watch out for the impacts on businesses and large families



# Seasonal Rates

- What information do we need to make this calculation?
- Total revenue needed from rates
- Total gallons sold *during low months*
- Total gallons sold *during high months*



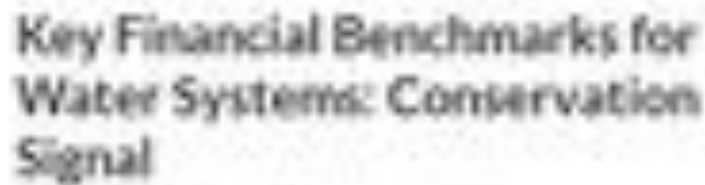
# Low Supply and Drought Surcharges

- Prices increase only when supplies of water are limited, encouraging conservation at crucial times



# Remember!

- If your pricing strategy is successful, and your customers do conserve, your assumptions about revenue may be wrong
- Best to anticipate lower usage when setting the rates, or to build in some contingency into the financial target



Received 24 June 2004; accepted 1 November 2004

These approaches are sufficient to generate the values reported for this study. However, as yet, no one has "typed" minerals at their synthetic growth system.

1. **Introduction**  
 2. **Background**  
 3. **Methodology**  
 4. **Results**  
 5. **Discussion**  
 6. **Conclusion**  
 7. **References**  
 8. **Appendix**  
 9. **Index**  
 10. **Table of Contents**  
 11. **Figure 1**  
 12. **Figure 2**  
 13. **Figure 3**  
 14. **Figure 4**  
 15. **Figure 5**  
 16. **Figure 6**  
 17. **Figure 7**  
 18. **Figure 8**  
 19. **Figure 9**  
 20. **Figure 10**  
 21. **Figure 11**  
 22. **Figure 12**  
 23. **Figure 13**  
 24. **Figure 14**  
 25. **Figure 15**  
 26. **Figure 16**  
 27. **Figure 17**  
 28. **Figure 18**  
 29. **Figure 19**  
 30. **Figure 20**  
 31. **Figure 21**  
 32. **Figure 22**  
 33. **Figure 23**  
 34. **Figure 24**  
 35. **Figure 25**  
 36. **Figure 26**  
 37. **Figure 27**  
 38. **Figure 28**  
 39. **Figure 29**  
 40. **Figure 30**  
 41. **Figure 31**  
 42. **Figure 32**  
 43. **Figure 33**  
 44. **Figure 34**  
 45. **Figure 35**  
 46. **Figure 36**  
 47. **Figure 37**  
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 50. **Figure 40**  
 51. **Figure 41**  
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 53. **Figure 43**  
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 57. **Figure 47**  
 58. **Figure 48**  
 59. **Figure 49**  
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 72. **Figure 62**  
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 75. **Figure 65**  
 76. **Figure 66**  
 77. **Figure 67**  
 78. **Figure 68**  
 79. **Figure 69**  
 80. **Figure 70**  
 81. **Figure 71**  
 82. **Figure 72**  
 83. **Figure 73**  
 84. **Figure 74**  
 85. **Figure 75**  
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 87. **Figure 77**  
 88. **Figure 78**  
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 90. **Figure 80**  
 91. **Figure 81**  
 92. **Figure 82**  
 93. **Figure 83**  
 94. **Figure 84**  
 95. **Figure 85**  
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 99. **Figure 89**  
 100. **Figure 90**  
 101. **Figure 91**  
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 140. **Figure 130**  
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 145. **Figure 135**  
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 147. **Figure 137**  
 148. **Figure 138**  
 149. **Figure 139**  
 150. **Figure 140**  
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 152. **Figure 142**  
 153. **Figure 143**  
 154. **Figure 144**  
 155. **Figure 145**  
 156. **Figure 146**  
 157. **Figure 147**  
 158. **Figure 148**  
 159. **Figure 149**  
 160. **Figure 150**  
 161. **Figure 151**  
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 167. **Figure 157**  
 168. **Figure 158**  
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 177. **Figure 167**  
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 180. **Figure 170**  
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 198. **Figure 188**  
 199. **Figure 189**  
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 201. **Figure 191**  
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 203. **Figure 193**  
 204. **Figure 194**  
 205. **Figure 195**  
 206. **Figure 196**  
 207. **Figure 197**  
 208. **Figure 198**  
 209. **Figure 199**  
 210. **Figure 200**  
 211. **Figure 201**  
 212. **Figure 202**  
 213. **Figure 203**  
 214. **Figure 204**  
 215. **Figure 205**  
 216. **Figure 206**  
 217. **Figure 207**  
 218

# Designing Rate Structures That Support Your Objectives

Free guide  
written for  
system  
managers

Available at:

<http://efc.sog.unc.edu/>



# Water and Wastewater Rates Analysis Model

<http://efc.sog.unc.edu> or <http://efcnetwork.org>

Find the most up-to-date version in Resources / Tools

The screenshot displays the 'Water & Wastewater Rates Analysis Model' interface. At the top, it shows the title 'Water & Wastewater Rates Analysis Model' and 'Version 2.8.2 (last updated August 4, 2015)'. Logos for UNC Environmental Finance Center and the U.S. EPA are visible. A 'Get Started' button is in the top right, with a link to download a pre-populated example utility. The 'DESCRIPTION' section states it is a do-it-yourself financial model for utility managers. The 'FEATURES' section lists capabilities like comparing annual fund balance projections, adjusting rates for 1-5 years, and customizing operating and capital expenses. The 'INSTRUCTIONS' section provides a two-step guide: 1) Navigate using worksheet tabs at the bottom of the screen, and 2) In the green 'Data Input' worksheets, input data in the dark green cells. A diagram shows the 'Data Input' tab selected, with arrows pointing to specific data entry cells. A warning icon and text 'Watch out for red "Error" messages describing where data entry errors' are shown at the bottom right.

Created by the Environmental Finance Center at the University of North Carolina, Chapel Hill  
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