


**Do Water Budget  
Rate Structures  
Improve Water  
Efficiency?**



**Water Efficiency**



# Rate Structure Continuum



## City of Boulder

*Do Water Budget Rate Structures Improve Water Efficiency?*

January 26, 2012

Ken Baird – Utilities Financial Manager  
Erin Kintzle – Rate/Data Analyst

## Background

- After 2002 drought City Council requested staff to investigate changing to an alternative billing methodology.
- Water Budgets were approved in December 2004 by City Council.
- Water Budgets were implemented in January 2007.

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## Why Water budgets?

- Water is a limited resource.
- Water Budgets encourage conservation.
- The water budget system allows the city to be responsive to unexpected emergencies and prolonged drought.



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## City of Boulder – Utility Info

- Total Water customer Accounts (28,519)
  - Single-Family - 22,556
  
- 2011 Total Water Consumption/Revenue
  - 5.34 billion gallons
  - \$20 million
  
- Water resources
  - Surface water

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## Four Types of Customer Accounts

### 1. Single-Family Residential:

- Monthly Water Budget = indoor allotment (7,000 gallons) + outdoor allotment (based on customer-specific irrigable area and seasonal watering needs).

### 2. Multifamily Residential:

- Monthly Water Budget = indoor allotment (4,000 gallons per living unit – for 2 bedrooms) + outdoor allotment (based on customer-specific irrigable area and seasonal watering needs).

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## Four Types of Customer Accounts

### 3. Commercial-Industrial-Institutional (CII):

- Average Monthly Use = 100 percent of average monthly use (based on 2005 or 2006 actual average monthly use).
- Historical Monthly Usage = rolling 3 year monthly usage average
- Indoor/Outdoor = indoor allocation (AWC) and an outdoor water allocation
- Efficiency-Standard = customized water budget based on professional engineers recommended indoor budget

### 4. Irrigation-Only:

- Monthly Water Budget = outdoor allotment (based on customer-specific irrigable area and seasonal watering needs).

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## Water Budget Rate Structure

BLOCK (Budget = Blocks 1 + 2)	USE (% of monthly budget)	RATES per 1,000 gallons (2012 rates)
Block 1	0-60%	(3/4 X Base Rate) \$2.25
Block 2	61 - 100%	(Base Rate) \$3.00
Block 3	101 - 150%	(2x Base Rate) \$6.00
Block 4	151 - 200%	(3x Base Rate) \$9.00
Block 5	>200%	(5x Base Rate) \$15.00

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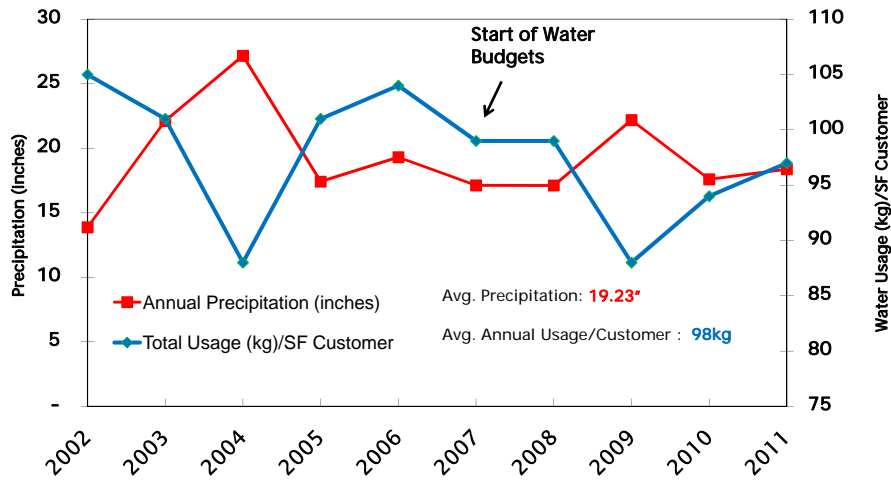
# Bills by Blocks Vs. Usage by Blocks

Example : Budget of 10 (Kgals)

Blocks	Thresholds	Usage (7 Kgal)	Usage (18 Kgal)	Usage (23 Kgal)
1	6	6	6	6
2	10	1	4	4
3	15		5	5
4	20		3	5
5	>20			3

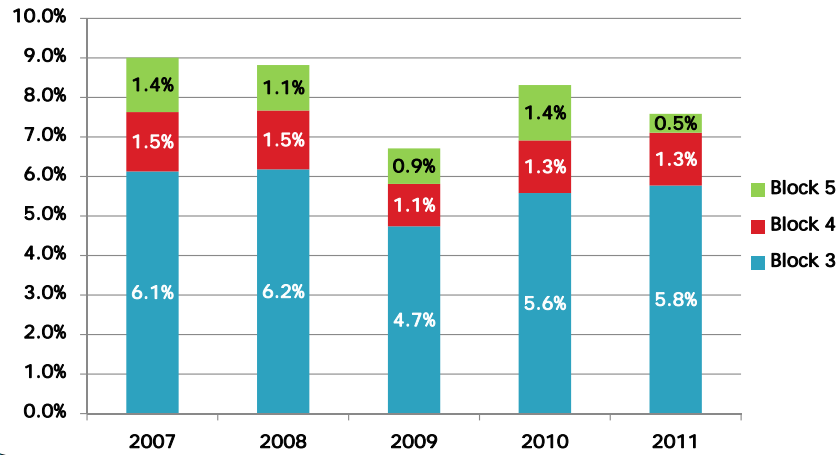
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Comparison of Single-Family Annual Water Consumption /Customer to Boulder Area Precipitation 2002-2011



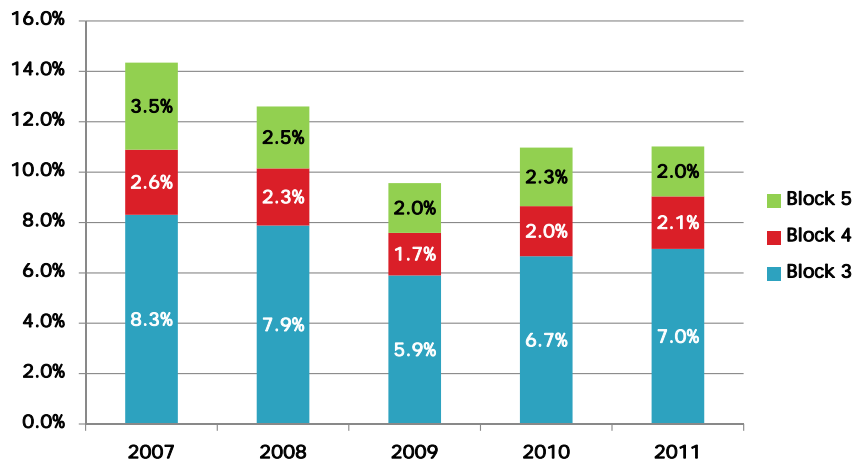
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### Single-Family Annual Percentage of Usage in Blocks 3-5 (over budget)



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### Total All Customers Annual Percentage of Usage in Blocks 3-5 (over budget)



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# Water Budget Initiatives



- Water Monitors**
- \$75 each
  - Refrigerator magnet
  - Provides updated readings

**My Boulder Utility Bill**

- MYBUB
- Online website
- Pay bill
- History
- Water budget info



Service	Rate 1,000 gal	Used 1,000 gal	Cost
Water Use Charge			6.25
0 - 14,000 gal	2.26	6	13.56
14,001 - 28,000 gal	2.75	14	38.50
28,001 - 42,000 gal	3.25	28	91.00
42,001 +	3.75	42	157.50
Wastewater Use Charge			3.88
Wastewater	3.88	8	31.04
Stormwater/Flood Mitig			1.50
Total Water			\$18.03
Total Wastewater			19.96
Total Stormwater			7.10
Total Current Charges			\$45.09

**Account Summary**  
 (LAW Notice)  
 Current use: 7 Budget for bill cycle: 25  
 Use last year: 8  
 Estimated water budget next bill cycle: 25  
 Avg. monthly winter usage (Oct-Mar): 0

**Please Note:**  
 PLEASE REPORT BY SERVICE  
 SAVE WATER  
 Visit www.bouldercitywater.com and learn to save water inside and outside your home and business. June, July and August are months with the highest use. Conserve water and lower your bills by irrigating less, installing low flow fixtures and using water wisely. The efficient use of water not only will decrease your water bill, but also help support a sustainable community.

**Water Budget vs. Actual Use**

Month	Water Budget	Actual Use
1	10	10
2	10	10
3	10	10
4	10	10
5	10	10
6	10	10
7	10	10
8	10	10
9	10	10
10	10	10
11	10	10
12	10	10
13	10	10
14	10	10
15	10	10
16	10	10
17	10	10
18	10	10
19	10	10
20	10	10
21	10	10
22	10	10
23	10	10
24	10	10
25	10	10
26	10	10
27	10	10
28	10	10
29	10	10
30	10	10
31	10	10

Customer No.	Account No.	Due Date	Balance Forward	Amount Due	Amount Estimated
[REDACTED]	[REDACTED]	08/15/08		\$45.09	\$

**CITY OF BOULDER**  
 City, Billing/Rate Dept  
 Dept 0075  
 Denver, CO 80202-0075

# Lessons Learned

- Commercial/Industrial/Institutional
- Public outreach critical
- Customized billing system
- Rate modeling and revenue analysis
- Administrative impact

## Do Water Budget Rate Structures Improve Water Efficiency?

- Ongoing analysis
  - Five years of data
  - Single-Family Accounts
- Other variables impact consumption
- Education benefit

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## Single-Family Water Budget Indoor/Outdoor Allocation

Family Members	Indoor Allocation (Kgal)
4 or less	7
Extra person	1

Note: 2011 Single-Family  
¾" AWC – 4

Irrigable Area Square Feet	Annual Outdoor Application Rate
5,000	15 gpsf*
9,000	12 gpsf
>14,000	10 gpsf

\*gallons/square foot

**Example July Outdoor Budget:**  
Irrigable area = 5,000 square feet  
1.  $5,000 * 15 = 75\text{kg}$  annual budget  
2.  $75\text{kg} * .20 = 15\text{kg}$

Month	Outdoor Allocation %
Jan	0%
Feb	0%
March	1%
April	7%
May	14%
June	20%
July	20%
Aug	18%
Sept	12%
Oct	7%
Nov	1%
Dec	0%
Total	100%

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## Contact Info

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### *Do Water Budget Rate Structures Improve Water Efficiency?*

The Castle Rock Experience

January 26, 2012



Billie Owens, Town of Castle Rock

## Town Background

### Location

- Douglas County
- 35 Miles south of Denver

### Weather

- Semi Arid (13" precip/year)

### Water Resources

- Groundwater

### Capital Improvement Plan

- \$500 Million next 20 years

### Water Service Characteristics

- Population - 48,500
- @17,000 customers
- Water production-1.8 Billion Gallons



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## Steps to a more Sustainable Supply

- Groundwater dependent: mining a non-renewable resource
- Water resources strategic master plan
  - >\$500 million for renewable water and facilities
  - Satisfies current and future water demands
- Water conservation master plan
  - Demand per capita per day 165 gpcd
  - Build-out goal sustained 135 gpcd
  - Goal 18% overall reduction in demand

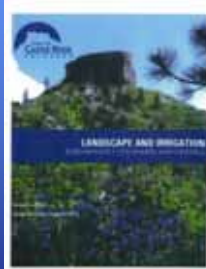


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# Conservation & Water Budgets

## 4 Legs of Conservation

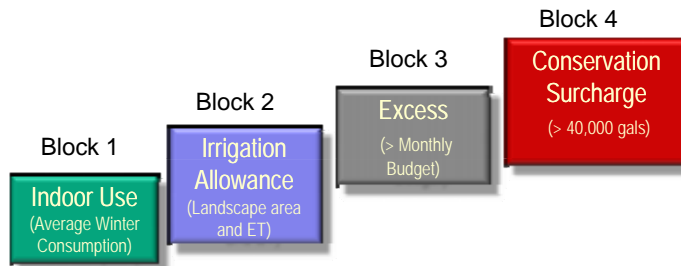
Regulations - Education - Customer Assistance Programs - Rates



- Water budget rate structure approved 2007
- Non-single family residential customers August 2008
- Single family residential customers August 2009



# Castle Rock's Water Budget Rate Structure



Residential (2012)	Block 1 AVMC (per Kgal)	Block 2 Irrigation (per Kgal)	Block 3 Excess (per Kgal)	Block 4 Surcharge (>40kgal)
Winter Season	\$2.65	N/A	\$5.23	\$7.86
Summer Season	\$2.65	\$5.23	\$7.86	\$7.86

Note: Residential irrigable area limit 7,000 sq.ft.



## Water Budget Rate Structure Impacts

Residential	2010	2011
Annual Use	106 kgal	94 kgal
AWMC	5 kgal	3 kgal
Average Irrigation Use	12 kgal	11 kgal

Note: Per Average Residential Customer

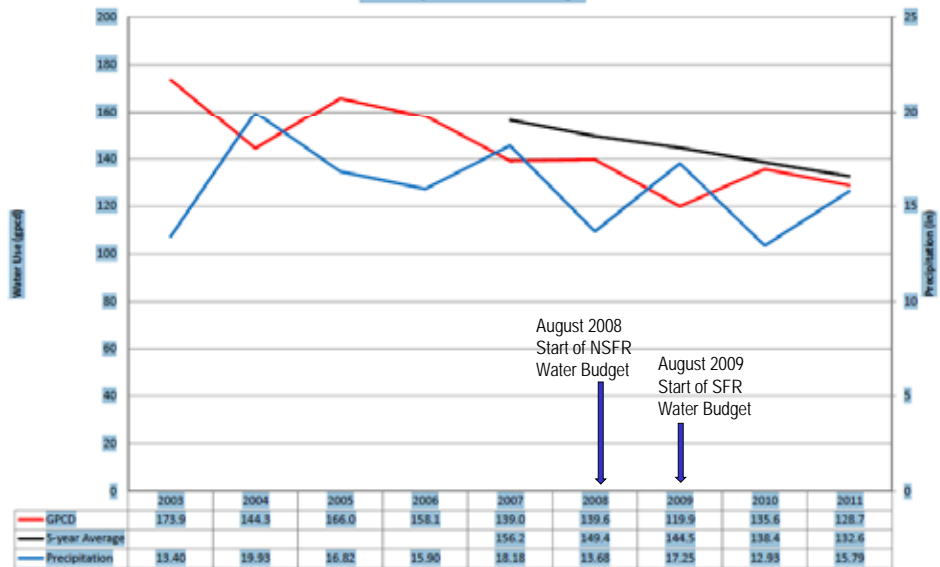
Percent of Usage Within Budget	
2010	2011
93.4%	95.0%



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## Water Budget Rate Structure Impacts

Per Capita Water Usage




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*Billing  
Software  
Change*

## Additional Related Initiatives




*Billing Statement Revisions*



**onemonthonebill**

*Meter Reading &  
Billing Timing  
Changes*

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## Lessons Learned

- Upfront strategies
  - Rate structure development
    - Cost of service, revenue neutral, conservation impact
  - Communication
    - Policy maker buy-in
    - Customer outreach
  - Administrative impacts
    - Irrigated area development & maintenance
    - Evapotranspiration development
    - Process for adjustments
    - Billing system
    - Customer service representative staffing/training

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## *Do Water Budget Rate Structures Improve Water Efficiency?*

- Ongoing evaluation
  - Impact of multiple factors
    - Weather
    - Economy
    - Customer behavior/awareness
  - Rate structure
    - Equity & cost allocation
    - Atypical customers
    - Conservation impacts
    - Upward pressure on rates
  - Achieve/sustain water resource goals



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