

Sandy City Public Utilities Dept.

Seasonal Conservation Rates

Sandy City Public Utilities Department serves the community of Sandy, Utah, located west of the Wasatch Mountains, and south of Salt Lake City in Salt Lake County. According to Utah Demographics and Statistics, the approximate population of Sandy is 89,319¹. As of the 2000 Census, median household income in Sandy was \$66,458².

UTILITY DEMOGRAPHICS

The total service area of the Utilities Department is 24.6 square miles. The population of this service area is 100,000. As of 2004, Sandy City Public Utilities Department's customers' water use was 216 gallons per capita per day (gpcd).

Sandy City Public Utilities Department has a total of 26,870 connections in its service area. Of these connections, 24,861 are single family residential, 483 are multifamily residential, 1,064 are commercial, 96 are irrigation, 248 are parks/landscape, 42 are school, 34 are municipal, and 42 are unmetered connections.

SEASONAL CONSERVATION RATES	
Type of Program:	Rate Structure
Eligible Customers:	ALL
Customers Analyzed:	ALL
Program Years:	2001
Years Analyzed:	2001

UTILITY RATE STRUCTURE AND PRICES

Sandy City Public Utilities Department uses a seasonal rate structure. The monthly base rate for service is \$15.33 for single family customers, which includes 8,000 gallons of water. Single family residential usage charges are as follows: ≥8,001 gallons

APRIL—SEPTEMBER	\$0.93 per 1,000 gallons
OCTOBER—MARCH	\$1.68 per 1,000 gallons

CURRENT CAPACITY AND WATER SOURCES

Sandy City Public Utilities Department has a storage capacity of 32.4 million gallons. The utility's current water sources are groundwater and surface water.

SEASONAL RATE STRUCTURE—DESCRIPTION

Sandy City Public Utilities Department adopted its conservation rate structure in April, 2001. It replaced a uniform rate structure. The new structure is a seasonal rate structure; the variable rate is 81% higher in the summer months (\$1.68 per 1,000 gallons April through September) than in the winter months (\$0.93 per 1,000 gallons October through March). The first 8,000 gallons of water are included in the customer's base charge throughout the year.

Around the time that the utility implemented the seasonal rate structure, there were additional factors that may have also affected water use

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¹ U.S. Bureau of the Census, Sub county Population Estimates 2000-2003.

² U.S. Census Bureau, American Fact Finder.

among utility customers. In 2001, a coalition formed by Utah's governor expanded Jordan Valley Water Conservancy District's Slow-the-Flow

water conservation campaign statewide. The Division of Water Resources distributed a second version of Utah's M&I Water Conservation Plan in 2001. In May 2001, Sandy City Public Utilities Department updated its water conservation plan. There was also a continuing drought in the area.

OTHER SANDY CITY CONSERVATION PROGRAMS

Audits, 1999-present
Administered by Utah State University Extension.

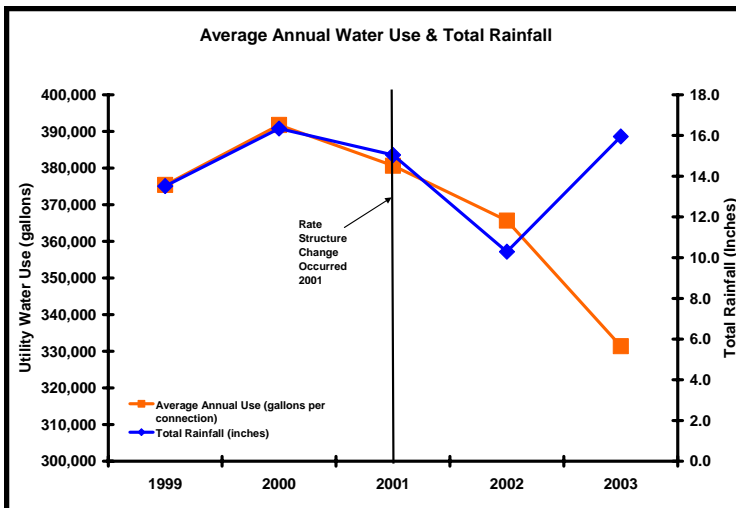
Conservation Ordinances, 2001-present
In 2001, a landscape ordinance was amended to include a time of day watering restriction.

Public Education, 2001-present
Conservation packets, brochures, newsletter articles, booths at Exposition Centers, a water conservation garden, and teaching conservation in schools.

METHODOLOGY

Please see the General Methodology for the specific procedures and techniques used for all ECoBA analyses.

The methodology for this analysis is different from most of the cases in the study because no control group was available for comparison. This is because the rate change affected all of the utility's customers. Instead of using a control group, the water savings was calculated solely from the difference in pre- and post-measure water use of the participants (the entire utility). The pre-measure and post-measure time periods were two years each. The average yearly water savings from two years after the rate change was extrapolated for twenty years, the assumed lifespan of the rate change.



All quantified costs and benefits have been discounted to the first year of the analysis (2001) and inflated to 2004 dollars. The discount rate used in this analysis was 5.35%. The CPI values that were used in this analysis were the 2004 value of 188.9 and the 2001 value of 177.1.

It was not possible to follow the individual customers of the utility at the time of the rate change. Instead, the total number of connections at the utility was used as a proxy.

The number of connections varied by year. There were 25,642 in 1997, 26,351 in 1998, 25,945 in 1999, 26,217 in 2000, 26,360 in 2001, 26,595 in 2002, and 26,634 in 2003.

In addition to data collected to estimate water savings and perform cost benefit analysis, historical weather data was collected for additional

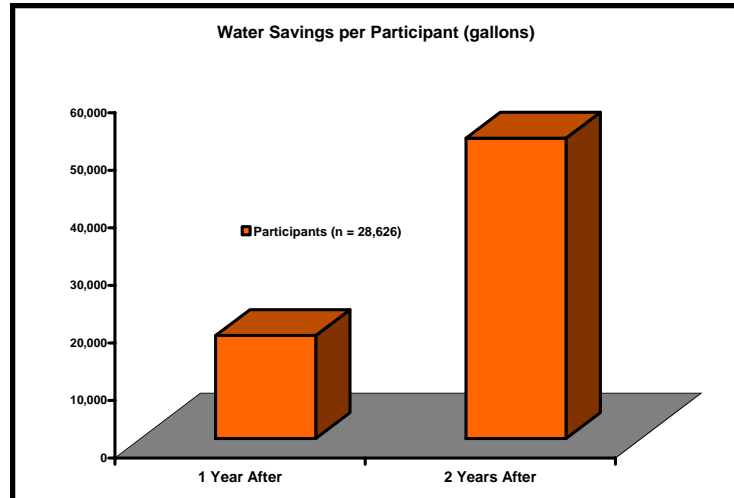
information. Two gauges of weather were gathered; mean annual temperature and total annual rainfall. This data was collected from the National Climatic Data Center, data file Surface Data, Monthly U.S. TD3220.

ASSUMPTIONS

Please see the General Assumptions for the specific conditions and rules underlying all ECoBA analyses.

The rate change occurred in April, 2001. However, the calculation of water savings and any benefits derived from water savings were not started until January 1, 2002.

The price of water used in the analysis was a weighted average of summer and winter rates, with summer use occurring at 6 times the amount of winter use. The resulting price was \$1.39 per 1,000 gallons in 2002, \$1.48 per 1,000 gallons in 2003, and \$1.57 per 1,000 gallons in 2004 (and assumed to be \$1.57 for the rest of the lifespan).



The number of connections at the utility in 2003 was unknown. The average increase in connections per year was determined. This figure was added to the number of 2002 connections to result in the assumed number of connections for 2003.

RESULTS -- WATER SAVINGS

The first year after the 2001 rate change, there was a water savings of 476,178,322 gallons, or 17,905 gpp (4.7% of pre-measure water use). The second year after the rate change, water savings were 1,389,969,644 gallons, or 52,188 gpp (13.6% of pre-measure water use). The average water savings per year was 933,073,983 gallons (2863.5 AF), or 35,046 gpp (9.1% of pre-measure water use). **The total water savings over the twenty year assumed lifespan of the rate change was 18,661,479,664.3 gallons (57,270.0 AF), or 651,918 gallons per participant.**

The directional change in water use from year to year marginally corresponds with the change in temperature from year to year. Two observations are not consistent with the pattern of the rest of the data.

From 1990-1991, the average yearly temperature decreased while average yearly water used increased. The converse occurred from 2002-2003—average yearly temperature increased while average yearly water use decreased. There are most likely other unaccounted for variables (which may or may not be quantified) that have impacted the average yearly water usage over the period of the analysis.

³ The savings on participants' water bills was calculated by multiplying the amount of water saved by the price of water (\$1.57 per 1,000 gallons) at Sandy City Public Utilities

In addition, the magnitude of change corresponds less closely. Utility water use is less correlated with yearly rainfall than with average yearly temperature. Both the direction and magnitude of change from year to year are varied.

RESULTS - COST BENEFIT ANALYSIS

Costs and benefits listed below represent the entire lifespan of the program (twenty years).

- ◆ The quantified cost to the utility was \$0.
- ◆ The quantified cost to the participants was \$0.
- ◆ The quantified benefit to the utility was \$0.
- ◆ The quantified benefit to the participants was \$3,983,524. This benefit includes the savings on participants' water bills, \$3,983,524 (\$139 per participant).

UTILITY PERSPECTIVE

Results of cost benefit analysis show a net benefit (net present value) of \$0 from the utility perspective. The quantified costs to the utility were equal to the quantified benefits to the utility. **The cost per acre-foot of water saved from the utility perspective was \$0.**

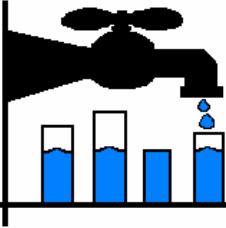
PARTICIPANT PERSPECTIVE

Results of cost benefit analysis show a net benefit (net present value) of \$3,983,524 from the participant perspective. The quantified costs to the participants were less than the quantified benefits to the participants. **The cost per acre-foot of water saved from the participant perspective was \$0.**

Quantified Costs and Benefits			
Utility		Participants	
Costs	Benefits	Costs	Benefits
Not Quantified		Not Quantified	Water Bill Savings \$3,983,524
			Total \$3,983,524

OVERALL PERSPECTIVE

Results of cost benefit analysis show a net benefit (net present value) of \$3,983,524 from an overall perspective. The quantified costs to the participants and utility were greater than the quantified benefits to the participants and utility. **The cost per acre-foot of water saved from an overall perspective was \$0.**



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Results of Cost Benefit Analysis-Lifespan (20 Years)			
	UTILITY	PARTICIPANT	OVERALL
<u>Present Value Costs</u>			
Costs to Utility	0	NA	0
Costs to Participants	NA	0	0
Costs to Others	NA	NA	0
Total Costs	\$0	\$0	\$0
<u>Present Value Benefits</u>			
Total Water Savings	57,269.90 AF	57,269.90 AF	57,269.90 AF
Benefits to Utility	0	NA	0
Benefits to Participants	NA	3,983,524	3,983,524
Benefits to Others	NA	NA	NA
Total Benefits	\$0	\$3,983,524	\$3,983,524
<u>Cost Benefit Calculations</u>			
Net Present Value (NPV) (Total Benefits - Total Costs)	\$0	\$3,983,524	\$3,983,524
Cost Effectiveness Analysis (CEA) (Total Costs ÷ Total Water Savings)	\$0 /AF	\$0 /AF	\$0 /AF

UNQUANTIFIED COSTS AND BENEFITS

Costs

- Administrative costs to develop the rate structure.
- Printing rate schedules.
- Inform customers.

Benefits

- Environmental benefits of reduced water use.
- Avoided cost of acquisition and distribution of water saved.
- Increased public awareness of the need to conserve water.
- Increased customer satisfaction with the utility.
- Reinforcing the need to conserve.
- Reduced groundwater depletion, surface water consumption.

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