



## Post Oak Savannah Groundwater Conservation District WaterWise Program



RESOURCE ACTION PROGRAMS®

### WaterWise 2008 Program Summary Report

# Post Oak Savannah Groundwater Conservation District WaterWise™ Program

Sponsored by:



## Program Summary Report 2007-2008

Submitted By:

**Resource Action Programs®**



**August 2008**

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## EXECUTIVE SUMMARY

This report summarizes the Post Oak Savannah Groundwater Conservation District WaterWise Program. The Program is designed to facilitate installation of resource efficient technologies in homes and build knowledge of environmental issues yielding a variety of measurable energy and water savings results using the best messengers - students. The Program was funded by Post Oak Savannah Groundwater Conservation District and implemented in their service territory. The recipients of the 2007-2008 Program were fourth and fifth graders and their families at Caldwell Intermediate, Cameron Elementary, Gause Elementary, Snook Elementary and Somerville Elementary School. The secret to the Program is combining a turnkey set of classroom activities with hands on home projects to install high efficiency devices and introduce resource conscious behavior to students and their families. Program Materials were distributed to three hundred forty-one (341) fourth and fifth grade students and their families. An overview of the results from the Program appears below, with greater detail in the attached report.



*As part of the program, students receive a kit full of high efficiency devices.*

**Participant Satisfaction:** A significant piece of a successful Program is participant satisfaction. Program participants must support program activities and be provided with a forum to express their opinions. Therefore, as part of the Program students, teachers and parents are asked to evaluate the Program. Some highlights include:

- **100% of participating teachers indicated they would conduct the Program again given the opportunity.**
- **100% of participating teachers indicated they would recommend this program to other colleagues.**

(A summary of responses can be found in Appendix C)

**Knowledge Gained:** Identical surveys (tests) were taken by students prior to the Program, and again upon its completion to measure knowledge gained. Scores and subject knowledge improved from **56% to 92%**.

**Audit Information Obtained:** Household audits (customer surveys) were performed by students and their families as part of the program activities. Important customer information was collected to better understand trends and usage.

Some highlights include:

- **78% rated the WaterWise® Program as good or great.**
- **72% reported they changed the way they use water.**
- **94% reported they worked with their family on the Program.**

(A summary of responses can be found in Appendix B)

**Measures Installed:** Students completed retrofit activities as part of the Program, and reported the measures they installed in their own homes. Some highlights include:

- **50% reported they installed the kitchen aerator.**
- **53% reported they installed the new high efficiency showerhead.**

(A summary of responses can be found in Appendix B)

**Resource Savings Results:** As a part of the Program and while working with parents, students measured the current devices in their homes, installed high efficiency devices and measured to calculate savings that they generated. Savings from these activities will continue for many years to come. The table below shows the projected savings from the Program, based upon information gathered by the students.

## Projected Resource Savings

(A list of assumptions and formulas used for these calculations can be found in Appendix A)

### **Projected Annual Savings**

**3,416,564 gallons of water saved**  
**14,941 therms of gas saved**  
**94,853 kWh electricity saved**  
**3,416,564 gallons wastewater saved**

### **Projected Average Annual Savings per Home**

**10,019 gallons of water saved**  
**44 therms of gas saved**  
**278 kWh electricity saved**  
**10,019 gallons wastewater saved**

### **Projected Ten Year Savings**

**30,276,111 gallons of water saved**  
**132,405 therms of gas saved**  
**840,544 kWh electricity saved**  
**30,276,111 gallons wastewater saved**

### **Projected Average Ten Year Savings per Home**

**88,786 gallons of water saved**  
**388 therms of gas saved**  
**2,465 kWh electricity saved**  
**88,786 gallons wastewater saved**



## PROGRAM OVERVIEW

For more than fourteen years, Resource Action Programs (RAP) has designed and implemented resource efficiency and education programs – changing household energy and water use while delivering significant, measurable resource savings for program sponsors. All RAP programs feature a proven blend of innovative education, comprehensive implementation services, and hands-on activities to put new knowledge to work in the program participants' homes.

RAP Programs serve more than 150,000 households each year through elementary school, middle school and adult programs. Our forty person staff manages the implementation process and program oversight for nearly 200 individual programs annually. Recognized nationally as a leader in water and energy efficiency education and program design, RAP has a strong reputation for providing an unusual level of client service to its sponsors as part of a wide range of conservation and resource efficiency solutions for municipalities, utilities, states, community agencies and corporations.

All aspects of program design and implementation is completed from the Program Center in Modesto, California. This includes graphic and web design, print production, warehousing and distribution, kit production, marketing, program tracking, data tabulation and reporting.

The school-based WaterWise Program is fully implemented and designed to generate immediate and long-term savings by incorporating interactive “real world” practices at home. The Program staff identifies and enrolls students and teachers within the designated service territory. Enrolled participants receive educational materials designed to build participant knowledge and demonstrate simple ways to save, by not only changing habits, but also changing devices. Materials meet state and national educational standards, which allow the Program to easily fit into teachers' existing schedules and requirements.

The Program begins with classroom discussions teaching the importance of using water and energy efficiently, followed by hands-on, creative problem solving. Next, participants take home a Resource Action Kit that contains high efficiency devices. With the help of their parents, they install the devices in their home and complete a home audit report. By taking new technologies home, installing and monitoring them, students are able to effectively measure the results of what they learned resulting in the community actually saving water, energy, and money! The WaterWise staff tabulates all responses, including home audits, teacher responses, student input, parent responses and generates a Program Summary Report.



*RAP Programs serve more than 150,000 households each year through elementary school, middle school and adult programs.*

Each participant receives a Resource Action Kit containing efficiency technologies for their home and materials to perform the hands-on activities. Program materials include:

### Each student/teacher receives:

- Student Guide
- Home Water Use Workbook
- Parent Introduction Letter\*
- Home Audit Form
- Pre & Post Surveys
- Certificate of Achievement
- Computer Lab Activity
- Resource Action Kit containing:
  - High Efficiency Showerhead
  - Kitchen Aerator
  - Bathroom Aerator
  - Drip / Rain Gauge
  - Digital Water Thermometer
  - Toilet Leak Detector Tablets
  - Flow Rate Test Bag
  - Natural Resource Fact Chart
  - Mini Tape Measure
  - Parent Comment Card

'GetWise' Wristband

Interactive Program Website

Toll-Free Telephone Support

### Each teacher/classroom receives:

- WaterWise Teacher Guide
- Step-by-Step Program Checklist
- Lesson Plans
- Program Evaluation
- WaterWise Program Video (VHS & DVD)
- Supplemental Activities\*
- State Education Standard Correlation Chart
- Pre/Post Survey Answer Keys
- Water Poster for classroom
- Self Addressed Postage Paid Envelope



\*Provided in both English & Spanish



The WaterWise Program followed the subsequent implementation schedule:

1. Identification of State Education Standards & Benchmarks
2. Curriculum Development
3. Curriculum Correlation to State Education Standards & Benchmarks
4. Incentive Program Development
5. Teacher / School Identification
6. Program Introduction to Teachers
7. Teachers Enrolled in the Program
8. Implementation Dates Scheduled with Teachers
9. Program Material Delivery
10. Delivery Confirmation
11. Periodic Contact to Ensure Implementation and Teacher Satisfaction
12. Program Completion Incentive Offered
13. Results Collection
14. Program Completion Incentive Delivered to Qualifying Participants
15. Thank-you Cards Sent to Participating Teachers
16. Data Analysis
17. Program Summary Report

Participating teachers may implement the Program to coincide with their lesson plans. The table on the next page is a comprehensive list of fourth and fifth grade classrooms that participated during the 2007-2008 school year.



School	Teacher	Teachers	Students
Caldwell Intermediate	Abigail Gerlak	1	26
Caldwell Intermediate	David Broadhurst	1	20
Caldwell Intermediate	Karen Speck	1	22
Caldwell Intermediate	Lisa Hahn	1	25
Caldwell Intermediate	Rachel Winn	1	20
Caldwell Intermediate	Suzan Napier	1	19
Cameron Elementary	Megan Taylor (4)	1	110
Gause Elementary	Beverly Renner	1	17
Snook Elementary	Sarah Collins	1	40
Somerville Elementary	Mary Foster	1	32

<i>Totals</i>	10	331
<i>Total Participants</i>	341	

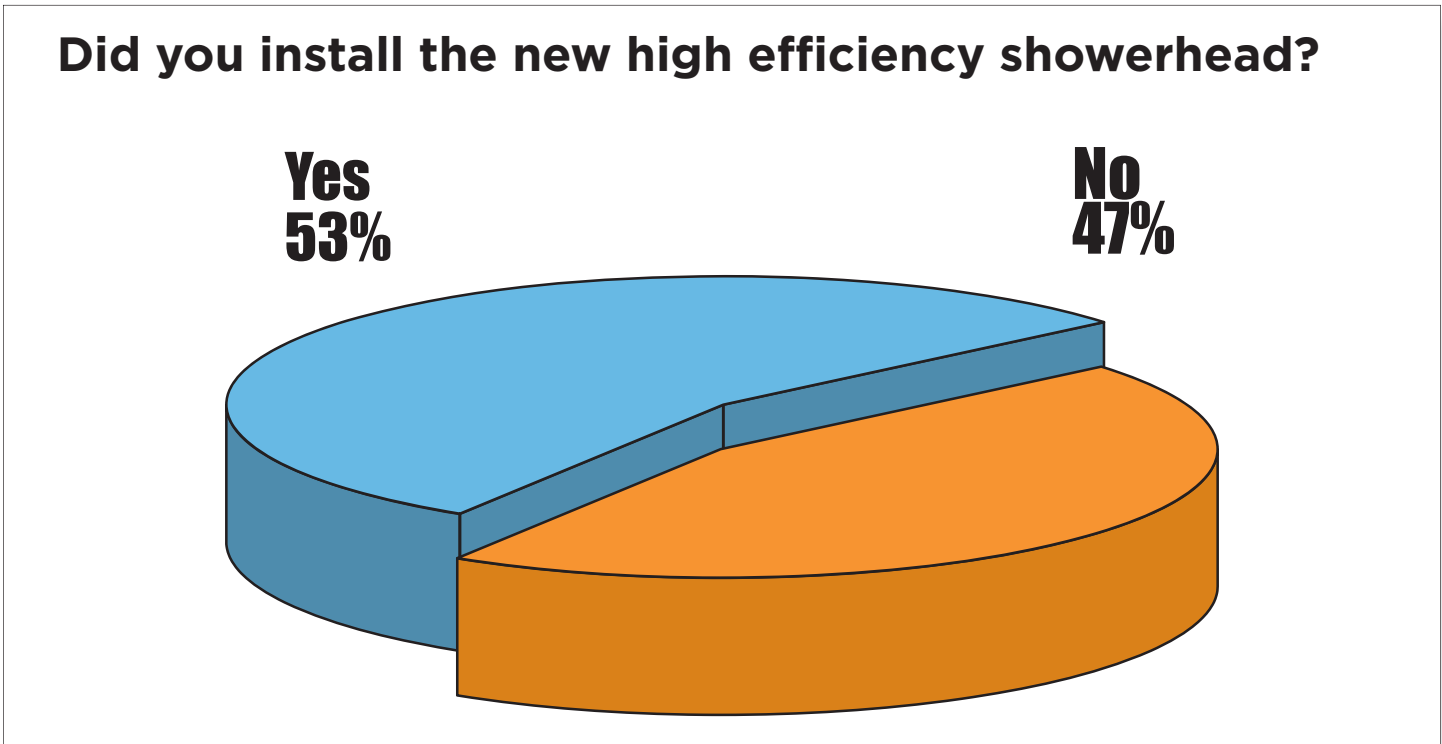


The Post Oak Savannah Groundwater Conservation District WaterWise Program has had a significant impact within the community. As illustrated below, the Program successfully educated a portion of the community about water and energy efficiency while installing resource efficient technologies in homes and collecting data to better understand future trends and usage. The following results were compiled:

### **A. Home Audit**

Upon completion of the Program, participating families are asked to complete a Home Audit to assess their resource use, verify product installation, provide demographic information and measure participation rates. A few samples of questions asked are below while a complete summary of all responses is included in the appendices.

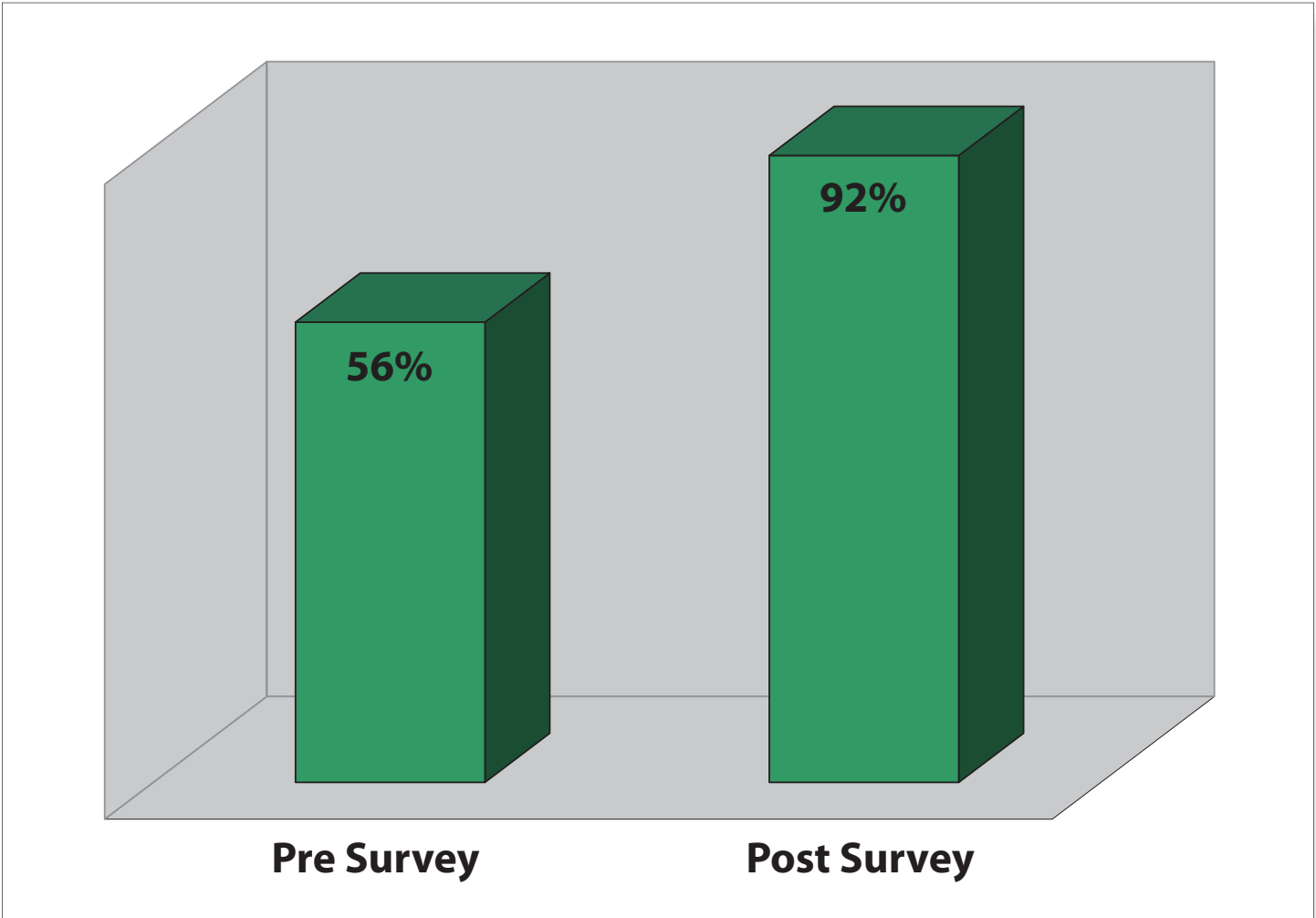
- Did you install the new high efficiency showerhead?      Yes - 53%**
- Did you work with your family on this Program?      Yes - 94%**
- Did you and your family change the way you use water?      Yes - 72%**



**B. Pre/Post Survey**

Students were asked to complete a 10 question survey before the Program was introduced and then again after it was completed to determine the learning impact and the knowledge gained through the Program. The average student answered 5.6 questions correctly prior to being involved in the Program and then improved to answer 9.2 questions correctly following participation.

**Scores improved from 56% to 92%**





### C. Resource Savings Summary

As part of the program and working with parents or guardians, students installed resource efficiency technologies in their homes. They also measured the pre-existing equipment to calculate savings that they generated. Using the family habits collected from the customer survey information as the basis for this calculation, three hundred forty-one (341) Post Oak Savannah Groundwater Conservation District WaterWise Program households are expected to save the following resource totals. Savings from these activities will continue for many years to come.

## Projected Resource Savings

Total Number of Participants:

341

Annual

Lifetime

Reduction from showerhead retrofit: Product Life: 10 years	2,638,658 11,540 73,256	26,386,580 gallons 115,395 therms 732,560 kWh
Reduction from kitchen aerator retrofit: Product Life: 5 years	388,953 1,701 10,798	1,944,766 gallons 8,505 therms 53,992 kWh
Reduction from bathroom aerator retrofit: Product Life: 5 years	388,953 1,701 10,798	1,944,766 gallons 8,505 therms 53,992 kWh
<b>TOTAL PROGRAM SAVINGS:</b>	<b>3,416,564</b> <b>14,941</b> <b>94,853</b>	<b>30,276,111 gallons</b> <b>132,405 therms</b> <b>840,544 kWh</b>
<b>TOTAL PROGRAM SAVINGS PER HOUSEHOLD:</b>	<b>10,019</b> <b>44</b> <b>278</b>	<b>88,786 gallons</b> <b>388 therms</b> <b>2,465 kWh</b>

## D. Participant Response

Program improvements are based on the feedback from participants. Therefore, as part of the program Students, Teachers and Parents are asked to evaluate portions of the programming. Each response is reviewed for pertinent information to both the Program and the Program Sponsor. The following is a sample of feedback collected during the Program.

### Teacher Response

(A summary of responses can be found in Appendix C)

100% of participating teachers indicated they would conduct the Program again given the opportunity.

100% of participating teachers indicated they would recommend this program to other colleagues.

#### **In my opinion, the thing the students like best about the materials / program was:**

*"...the kits. I noticed that this year's booklets were slightly different than last year's booklets. I think the changes were great. These booklets were easier for students to understand."*

Beverly Renner, Gause Elementary



## **E. Program Enhancements**

In addition to increasing resource awareness and efficiency, the Program strengthens bonds between sponsors and their communities. The Program has been designed from start to finish with this in mind. Some of the steps taken to ensure our sponsors receive the greatest possible exposure are as follows:

**Custom Branding:** Each Resource Action Kit was labeled with the Post Oak Savannah Groundwater Conservation District logo. In addition to the Resource Action Kit, the Introduction to Parent Letter and Program Evaluation featured sponsor branding..



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## Estimated Savings from Showerhead Retrofit

Average household size:	2.50 people <sup>3</sup>
Average length of use:	8.00 minutes <sup>4</sup>
Product life:	10.00 years <sup>1</sup>
Average showerhead has a flow rate of:	4.00 gallons per minute <sup>4</sup>
Retrofit showerhead has flow rate of:	2.00 gallons per minute
Flow reduction:	2.00 gallons per minute

### Water:

Average showerhead requires:	80.00 gallons
Retrofit showerhead requires:	40.00 gallons
Showerhead produces an <b>annual</b> reduction of:	14,600.00 gallons
Showerhead produces a <b>lifetime</b> reduction of:	146,000 gallons

### Gas:

Average showerhead requires:	0.47 therms
Retrofit showerhead requires:	0.23 therms
% of water heated by gas:	75%
Showerhead produces an <b>annual</b> reduction of:	64 therms
Showerhead produces a <b>lifetime</b> reduction of:	638 therms

### Electricity:

Average showerhead requires:	8.88 kWh
Retrofit showerhead requires:	4.44 kWh
% of water heated by electricity:	25%
Showerhead produces an <b>annual</b> reduction of:	405 kWh
Showerhead produces a <b>lifetime</b> reduction of:	4,053 kWh

Number of participants:	341
Installation / participation rate of:	53%

### Total reduction from showerhead retrofit:

<b>Annual:</b>	2,638,658 gallons
	11,540 therms
	73,256 kWh
<b>Lifetime:</b>	26,386,580 gallons
	115,395 therms
	732,560 kWh

1. Product life taken from manufacturer.  
 3. U.S. Census Bureau, 2003. Population Division, Fertility and Family Statistics Branch  
 4. Ridge & Associates, 2001. Southern California Edison: Evaluation of 2000-2001 School Programs.



## Estimated Savings from Kitchen Aerator Retrofit

Average household size:	2.50 people <sup>3</sup>
Average length of use:	2.50 minutes <sup>4</sup>
Product life:	5.00 years <sup>1</sup>
Average kitchen aerator has a flow rate of:	2.50 gallons per minute <sup>4</sup>
Retrofit kitchen aerator has flow rate of:	1.50 gallons per minute
Flow reduction:	1.00 gallons per minute

**Water:**

Average kitchen aerator requires:	15.63 gallons
Retrofit kitchen aerator requires:	9.38 gallons
Retrofit kitchen aerator produces an <b>annual</b> reduction of:	2,281 gallons
Retrofit kitchen aerator produces a <b>lifetime</b> reduction of:	11,406 gallons

**Gas:**

Average kitchen aerator requires:	0.09 therms
Retrofit kitchen aerator requires:	0.05 therms
% of water heated by gas:	75%
Retrofit kitchen aerator produces an <b>annual</b> reduction of:	10 therms
Retrofit kitchen aerator produces a <b>lifetime</b> reduction of:	50 therms

**Electricity:**

Average kitchen aerator requires:	1.74 kWh
Retrofit kitchen aerator requires:	1.04 kWh
% of water heated by electricity:	25%
Retrofit kitchen aerator produces an <b>annual</b> reduction of:	63 kWh
Retrofit kitchen aerator produces a <b>lifetime</b> reduction of:	317 kWh

Number of participants:	341
Installation / participation rate of:	50%

**Total reduction from kitchen aerator retrofit:**

<b>Annual:</b>	388,953 gallons
	1,701 therms
	10,798 kWh
<b>Lifetime:</b>	1,944,766 gallons
	8,505 therms
	53,992 kWh

1. Product life taken from manufacturer.  
 3. U.S. Census Bureau, 2003. Population Division, Fertility and Family Statistics Branch  
 4. Ridge & Associates, 2001. Southern California Edison: Evaluation of 2000-2001 School Programs.

## Estimated Savings from Bathroom Aerator Retrofit

Average household size:	2.50 people <sup>3</sup>
Average length of use:	2.50 minutes <sup>4</sup>
Product life:	5.00 years <sup>1</sup>
Average bathroom aerator has a flow rate of:	2.00 gallons per minute <sup>4</sup>
Retrofit bathroom aerator has flow rate of:	1.00 gallons per minute
Flow reduction:	1.00 gallons per minute

### Water:

Average bathroom aerator requires:	12.50 gallons
Retrofit bathroom aerator requires:	6.25 gallons
Retrofit bathroom aerator produces an <b>annual</b> reduction of:	2,281 gallons
Retrofit bathroom aerator produces a <b>lifetime</b> reduction of:	11,406 gallons

### Gas:

Average bathroom aerator requires:	0.07 therms
Retrofit bathroom aerator requires:	0.04 therms
% of water heated by gas:	75%
Retrofit bathroom aerator produces an <b>annual</b> reduction of:	10 therms
Retrofit bathroom aerator produces a <b>lifetime</b> reduction of:	50 therms

### Electricity:

Average bathroom aerator requires:	1.39 kWh
Retrofit bathroom aerator requires:	0.69 kWh
% of water heated by electricity:	25%
Retrofit bathroom aerator produces an <b>annual</b> reduction of:	63 kWh
Retrofit bathroom aerator produces a <b>lifetime</b> reduction of:	317 kWh

Number of participants:	341
Installation / participation rate of:	50%

### Total reduction from bathroom aerator retrofit:

<b>Annual:</b>	388,953 gallons
	1,701 therms
	10,798 kWh
<b>Lifetime:</b>	1,944,766 gallons
	8,505 therms
	53,992 kWh

1. Product life taken from manufacturer.

3. U.S. Census Bureau, 2003. Population Division, Fertility and Family Statistics Branch

4. Ridge & Associates, 2001. Southern California Edison: Evaluation of 2000-2001 School Programs.



## Home Audit Data

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### Section I - Home Check-up

<b>1</b> What type of home do you live in?		
Single family home	89%	
Multi-family (2-4 units)	6%	
Multi-family (5-20 units)	0%	
Multi-family (21+ units)	6%	
<b>2</b> Was your home built before 1992?		
Yes	31%	
No	69%	
<b>3</b> Is your residence owned or rented?		
Owned	78%	
Rented	22%	
<b>4</b> Does your home have an automatic sprinkler system?		
Yes	11%	
No	89%	
<b>5</b> How many kids live in your home?		
1	22%	
2	22%	
3	33%	
4	17%	
5+	6%	
<b>6</b> How many adults live in your home?		
1	6%	
2	72%	
3	17%	
4	6%	
5+	0%	
<b>7</b> Does your home have a dishwasher?		
Yes	56%	
No	44%	



# APPENDIX B

**8** How many half bathrooms are in your home?

0	83%
1	11%
2	6%
3	0%
4+	0%

**9** How many full bathrooms are in your home?

1	56%
2	44%
3	0%
4	0%
5+	0%

**10** How many toilets are in your home?

1	33%
2	67%
3	0%
4	0%
5+	0%

**11** How is your water heated?

Natural Gas	75%
Electricity	25%



Section II - Home Activities

<b>1</b> Did you install the high efficiency showerhead?	
Yes	53%
No	47%
<b>2</b> What is the flow rate of your old showerhead?	
0 - 1.0 gpm	0%
1.0 - 1.5 gpm	0%
1.5 - 2.0 gpm	41%
2.0 - 2.5 gpm	12%
2.5 - 3.0 gpm	18%
3.0+ gpm	29%
<b>3</b> What is the flow rate of your new showerhead?	
0 - 1.0 gpm	33%
1.0 - 1.5 gpm	50%
1.5 - 2.0 gpm	17%
<b>4</b> Was your toilet leaking?	
Yes	17%
No	83%
<b>5</b> Did you install the bathroom aerator?	
Yes	50%
No	50%
<b>6</b> What is the flow rate of your old bathroom aerator?	
0 - 1.0 gpm	12%
1.0 - 1.5 gpm	12%
1.5 - 2.0 gpm	59%
2.0 - 2.5 gpm	12%
2.5 - 3.0 gpm	0%
3.0+ gpm	6%
<b>7</b> Did you install the kitchen aerator?	
Yes	50%
No	50%



# APPENDIX B

<b>8</b> What is the flow rate of your old kitchen aerator?	
0 - 1.0 gpm	6%
1.0 - 1.5 gpm	19%
1.5 - 2.0 gpm	38%
2.0 - 2.5 gpm	0%
2.5 - 3.0 gpm	25%
3.0+ gpm	13%
<b>9</b> How many faucets are leaking?	
0	83%
1	6%
2	0%
3	6%
4+	5%
<b>10</b> Did you work with your family on this program?	
Yes	94%
No	6%
<b>11</b> Did you change the way you water outdoors?	
Yes	72%
No	28%
<b>12</b> Have you and your family changed the way you use water?	
Yes	72%
No	28%
<b>13</b> How would you rate the WaterWise program?	
Great	61%
Pretty good	17%
Okay	22%
Not so good	0%

## Teacher Program Evaluations

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<b>1</b> The materials were attractive and easy to use.		
Strongly Agree	100%	
Agree	0%	
Disagree	0%	
Strongly Disagree	0%	
<b>2</b> The materials and activities were well received by students.		
Strongly Agree	100%	
Agree	0%	
Disagree	0%	
Strongly Disagree	0%	
<b>3</b> The materials were clearly written and well organized.		
Strongly Agree	100%	
Agree	0%	
Disagree	0%	
Strongly Disagree	0%	
<b>4</b> The conservation technologies were easy for students to use.		
Strongly Agree	100%	
Agree	0%	
Disagree	0%	
Strongly Disagree	0%	
<b>5</b> Students indicated that their parents supported the program.		
Strongly Agree	100%	
Agree	0%	
Disagree	0%	
Strongly Disagree	0%	
<b>6</b> If you had the opportunity, would you conduct this program again?		
Yes	100%	
No	0%	
<b>7</b> Would you recommend this program to other colleagues?		
Yes	100%	
No	0%	

WaterWise

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