
Urban Water Conservation Implementation Challenges and Opportunities

Prepared for

California Urban Water Agencies

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FINAL REPORT

Foreword

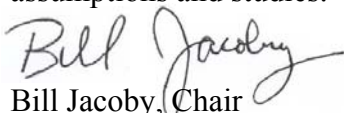
California Urban Water Agencies
Board of Representatives

This study was authorized by the CUWA Board to focus greater attention on the challenges of implementing urban water agency-funded conservation programs.

Over the past year there has been much discussion about the potential for urban water conservation savings, particularly in public forums of both the CALFED Bay-Delta Program and the update to the California Water Plan. There has been little or no consideration of the real-world challenges of implementing urban water conservation programs. Under the California Urban Conservation Council's *Memorandum of Understanding* and the *CALFED Record of Decision*, urban water purveyors have specific responsibility for implementing conservation programs. As such, they are well suited to evaluating the success of current and past programs as well as suggesting potential measures for overcoming historic barriers to implementation.

A& N Technical Services conducted the study with direct guidance from CUWA's Conservation Committee, which served as the project advisory committee. Most of the information evaluated in this report derives from written surveys and personal interviews with water conservation program staff from CUWA member agencies. The study provides excellent qualitative information and insights on the challenges faced by urban water agencies for different conservation programs – both in the residential and commercial sectors. The identified challenges will help urban water agencies focus on more effective means for achieving additional, significant “real water” savings from water conservation programs. A better understanding of problems should lead to better solutions. Chapter 2 concludes with a list of “lessons learned” from the survey respondents, providing a good start at identifying opportunities to improve the success of water conservation programs. Chapter 3 contains four recommendations: (1) promote collaborative action among urban water agencies to improve program success; (2) promote better communication among stakeholders regarding implementation challenges so that solutions can be implemented; (3) encourage follow-up research to better identify implementation challenges and potential solutions; and (4) reinforce the need for a continuing state and federal role in supporting water conservation programs.

We recommend that CUWA send this report to the Bay-Delta Authority and the Department of Water Resources so that it can be used as a contribution along with further research in helping to estimate realistic future water conservation savings, and to improving the cost-effectiveness of already successful programs. We also recommend that the study be sent to the California Urban Water Conservation Council as information that may be valuable in developing future savings assumptions and studies.



Bill Jacoby, Chair
CUWA Water Conservation Committee

Preface

Members of the CUWA Conservation Committee served as the Project Advisory Committee:

Bill Jacoby, Chair	San Diego County Water Authority
Angela Anderson	City of Sacramento
Brandon Goshi	Metropolitan Water District of Southern California
Cheryl Munoz	San Francisco Public Utilities Commission
Chris Dundon	Contra Costa Water District
Dana Haasz	San Francisco Public Utilities Commission
Dick Bennett	East Bay Municipal Utility District
Doug Wallace	East Bay Municipal Utility District
Hossein Ashktorab	Santa Clara Valley Water District
Jerry De La Piedra	Santa Clara Valley Water District
Luis Generoso	City of San Diego
Mike Hollis	Metropolitan Water District of Southern California
Mike Ti	Metropolitan Water District of Southern California
Richard Harris	East Bay Municipal Utility District
Tim Blair	Metropolitan Water District of Southern California
Tom Gackstetter	Los Angeles Department of Water and Power
Vana Phibbs	Alameda County Water District
Steve Macaulay	California Urban Water Agencies

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1. Introduction

Study Objectives

The California Urban Water Agencies (CUWA) sponsored this study of water conservation implementation challenges. The study objectives were to:

- Identify general implementation constraints to water conservation programs
- Identify and explain the challenges of implementing urban water conservation programs by customer type (e.g., residential versus nonresidential) and end use categories (e.g., indoor versus outdoor)
- Develop findings and general recommendations regarding implementation challenges.

Approach

To address the identification and explanation of water conservation's implementation challenges, a survey was developed with input from the CUWA Project Advisory Committee. The survey instrument can be found in Appendix A of this report. The survey was directed to the CUWA participating water agencies. It asked each water agency about their experience regarding the water conservation programs implemented. It then included more detailed questions about specific programs. Each water agency was asked to provide program-specific responses about at least two water conservation programs.

The surveys were distributed electronically and responses were received electronically, with coordination by CUWA staff to check on the status of completion. Telephone follow-up was conducted by the research team where needed, to clarify responses or to collect additional information from other water agency staff or documents. It should be noted that the sampling for the survey is not a scientific sample, in the classical sense. We attempted to exhaust the population of CUWA agencies and received responses to most

items from the majority of the agencies; no formal randomization and sample selection was attempted. The findings from this survey should not, therefore, be viewed as universally definitive. Specifically, its conclusions may not apply to water utilities outside of California, nor to water utilities that were not in our sampling. Though, the inference derived from the survey responses is necessarily delimited, it may nonetheless prove useful for shedding insight and shaping questions about the nature of water conservation implementation challenges.

The research team also interviewed some conservation professionals—conservation program implementers, contractors, and topic experts—for additional insight into the nature of implementation challenges. The research team also reviewed published literature in pursuit of some implementation issues. We believe that several key topics in implementation of effective water conservation programs deserve more analysis than can be covered within the scope of this project. We hope to clarify some productive lines of inquiry. The next section discusses the different phases of implementing water conservation programs.

The Lifecycle of Conservation Programs

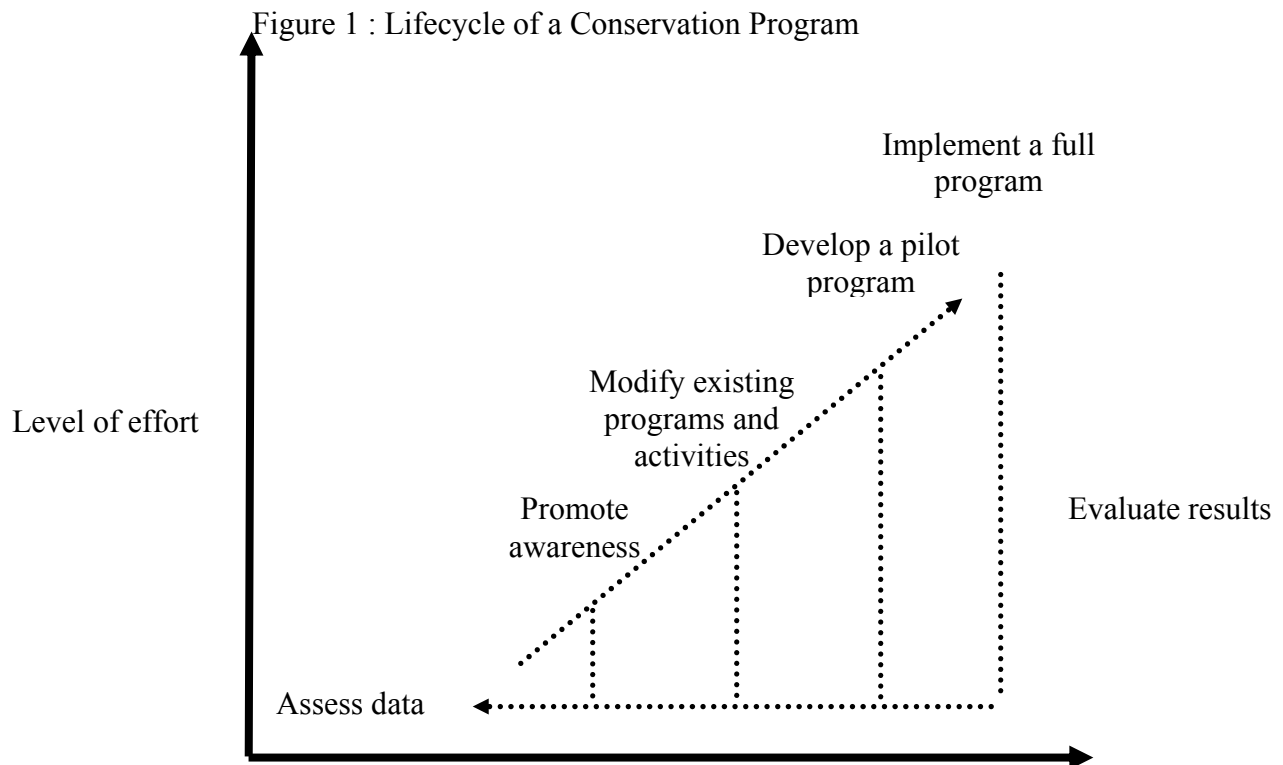
To understand the challenges of implementing water conservation programs, it is important to understand how full-scale conservation programs are developed. There are different phases involved in implementing a full-scale water conservation program.

Though not all water agencies emphasize or enact each phase in the same way, much of their implementation can be usefully categorized as follows:

1. **Program Inception:** The impetus for conservation programs can arise from different areas—response to water scarcity, water delivery constraints, wastewater restrictions, or independent policy motivations. Public information programs to build awareness of the need to conserve are often among the first steps taken prior to building a full-scale conservation program.
2. **Program Design:** Once the need for a program has been established, a program must be designed to fill that need. Data are collected and assessed to choose among program alternatives.
3. **Pilot Program:** Often, initial conceptions for design of a conservation program are field tested in a pilot study to assess the program pragmatics—does the technology work? Will customers use and accept

- water efficient devices and methods? Are the costs and savings in line with prior expectation?
4. **Implement Full Program:** Based on lessons learned in a pilot program or on programs implemented in other areas, a water agency may decide to implement a full-scale program.
 5. **Program Evaluation and Adaptation:** Evaluation of program implementation occurs on an ongoing basis, providing feedback on areas in need of improvement and suggestions for fundamental changes in program operations.

Figure 1 illustrates a typical path moving through the above phases toward implementing a full program. Ongoing evaluation can help water agency managers assess impacts and adapt programs over time. Each movement through these phases requires an additional level of effort and raises specific implementation issues. In the following section we develop a comprehensive list of these issues.



Source: *Socioeconomic Impacts of Conservation*, AwwaRF 2001.

Types of Implementation Challenges – A Comprehensive List

Water conservation programs involve a host of implementation issues—the lack of good planning and information on end use efficiency measures, legal constraints, multiple benefits accruing to multiple institutions, marketing challenges, and consumer communication hurdles, to name but a few. More insight can be gained by examining the issues associated with the movement toward implementing a water conservation program.

Table 1: Implementation steps and issues

Basic steps	Associated issues
Assess internal data	<ul style="list-style-type: none"> Availability of data Quality of data Coordination within utility Consumer privacy issues Spatial presentation of data Training needs Establishment of baseline success measurements
Build awareness	<ul style="list-style-type: none"> Awareness throughout organization Coordination among departments Community outreach and feedback
Modify existing programs and activities	<ul style="list-style-type: none"> Assess current programs in terms of intended and unintended outcomes Compare existing efforts to those of nearby or similar utilities (benchmarking) Introduce conservation component to assistance efforts Define a broad range of programmatic alternatives
Conduct a pilot program	<ul style="list-style-type: none"> Define the target Customer involvement Data collection Evaluation criteria and tools Qualitative and quantitative assessment
Implement a full program	<ul style="list-style-type: none"> Eligibility requirements Funding Partnering Staffing and organization Regulatory issues Cost effectiveness Revenue impacts

Source: *Socioeconomic Impacts of Conservation*, AwwaRF 2001.

The findings in the following chapter highlight some of the issues in Table 1 that the survey suggested have posed significant challenges to implementing water conservation programs.

2. Findings

Overall

The survey responses, time and again, confirmed a key overall finding: good water conservation programs are neither quick nor easy. Staff in water agencies struggle to create, maintain, and improve the implementation of cost-effective conservation programs.

Another key overall finding is how implementation challenges are specific to the context of implementation:

- Staff in retail water agencies report different types of implementation challenges than do those in wholesale water agencies;
- Conservation programs implemented directly by the utility face a different set of implementation issues than do those implemented by a contractor; and
- Conservation programs targeting residential customers run into different types of implementation challenges than do those targeting commercial end uses.

The reader should note that an implementation challenge may be unique to the utility and may not occur elsewhere. The possibility also exists that a different respondent at the same water agency might have responded differently.

Utility respondents did not always rank budgetary constraints as the most important implementation hurdle: program design and marketing challenges were ranked higher on average. Contractors, by contrast, often point to budget limitations as the key implementation challenge to conservation programs.

Water utility staff ranked staff constraints about equally with budget constraints: some mentioned not being able to fully implement all budgeted programs due to staffing limitations. Many utility staff did, however, note the difficulties imposed by an uncertain and varying budget for conservation programs. One respondent dryly referred to this as a “dynamic planning environment.”

Implementation Challenges by Customer Type

Water conservation programs differ from other water resource alternatives in that the implementation must occur through customers. This “distributed” implementation must, at a minimum, occur with a customer’s permission and typically requires active customer participation. How can customers be induced to voluntarily participate in conservation programs? How can water utilities induce customers to change water-using behaviors? This fundamental implementation challenge requires effective customer communication, skillful marketing, and the proper incentives.¹ It is no surprise that many implementation challenges depend directly on the type of water customer involved.

Residential

Residential conservation programs critically depend on customer participation to work. Ideally, the program will induce interest in conservation on the part of customers who would otherwise not participate. Similarly, the utility generally wants to limit the number of free riders—customers who partake of program offerings who would have implemented the conservation measure anyway. Adjusting the scale of the program is one way to address concerns about free-ridership: a program that continues at a low level for a long period of time is likely to end up funding more free-riders than is one that concentrates its’ effort in a short period of time. Addressing the attractiveness of the program to utility customers was a key issue with residential conservation programs. Some respondents cited the positive impact of changes in water rate structures to making conservation programs easier to market to customers; other respondents cited the lack of a sufficient price signal as a significant impediment to securing customer participation.²

¹ There is also prior work, co-funded by CUWA, that examines the analysis of appropriate incentive levels for conservation. See *A Guide to: Customer Incentives for Water Conservation*, A report prepared by Barakat and Chamberlain, February 1994.

² The reader should note prior work on efficiency pricing for water utilities—supported by participants from California Urban Water Agencies—is available from the CUWCC: *Designing, Evaluating, and Implementing Conservation Oriented Rate Structures*, July 1997.

Commercial Industrial Institutional (CII)

Conservation programs targeting CII customers presented a very different set of implementation challenges. Some of the respondents argued that CII programs were intrinsically more difficult because CII end uses are more complicated and vary much more. These programs require a higher level of technical knowledge to implement or oversee. Conservation programs targeting residential customers, by contrast, appeared to be easier to routinize. Larger agencies were more likely to have the expertise in-house to either implement or oversee CII programs.³

Implementation Challenges by Program Type

In this section we identify the key implementation challenges that are associated with specific programs, based on responses to the survey. Note that, as before, not every implementation challenge applies everywhere. Nonetheless, there are systematic differences in the importance of implementation challenges that vary by program type. Table 2 lists some of these key implementation challenges organized by program type. Note that this list reflects comments received and should not be interpreted as either a comprehensive list or as universally applicable in every service area.

Residential programs always require careful consideration of incentive levels in order to drive effective marketing and to minimize free-ridership. Residential programs targeting outdoor end uses have been held back by an uncertainty surrounding expected water savings; customer follow-up is essential to establish persistent water savings. Public Information programs have experienced wide variation in funding levels; building awareness of the need for water conservation, though a necessary first step, may not have easily quantified water savings. Conservation programs targeting large landscapes confront several implementation challenges: the bill payer may not directly manage or control irrigation water uses; the measurement of irrigable landscape area—needed to

³ An example of an analysis of implementation challenges for one commercial end use—Ultra Low Flush Toilets—can be found in the CUWA co-funded study: *Ultra Low Flush Toilets in Commercial Installations*, A report by A & N Technical Services for CUWCC and CUWA, February 1994.

define a water budget of efficient and appropriate water use—may not be easy nor inexpensive to establish; and questions of water savings persistence may still apply.

Programs that target public end uses can face similar incentive issues as well as other constraints (e.g., staffing, cash flow, etc.). Water utilities have been instrumental in helping to revise plumbing codes to reflect more efficient standards. These efforts have been and continue to be difficult work requiring persistence and a willingness to work with manufacturers. Water rate structures are a decidedly local issue. Attempts to reform water rates to develop more efficient price signals must always confront politically difficult and risky implementation challenges. Water system leak detection programs are very service area specific and can yield uncertain benefits. Water utilities have, nonetheless, been implementing leak detection programs more aggressively in the last decade as water supply constraints have increased.

Table 2: Key Implementation Challenges by Program Type	
Program Type	Key Implementation Challenges
Residential Indoor Programs	Marketing; incentive levels; net freeridership; language barriers
Residential Outdoor Programs	Persistence of water savings; uncertain reliability; follow-up is key; language barriers
Public Information	Lack of direct savings estimates; communication barriers and the need to update information on a regular basis
CII programs	Lack of reliable savings estimates; lack of in-house technical skills to handle all CII-end uses; adversity to changes in any working process; language barriers; water can be a low priority for some businesses.
Large Landscape Programs	Incentive issues (the hand on the spigot may not pay the bill); area measurement; persistence of water savings; language barriers
Programs targeting public end uses	Incentives – some public entities do not directly pay for the water; schools may have cost-effective opportunities but no cash to implement
Plumbing Codes	Lack of coordinated effort to rationally revise; institutional inertia
Water Rates/Efficiency Pricing	Changes to rate structures are a local issue; intrinsically political and risky
Leak Detection Programs	Can be expensive to detect; Uncertain requirements for retrofit or rehabilitation

A Sampling of Survey Responses

While we collected a great deal of data from the survey, we also received many qualitative comments and observations through both the survey and follow-up interviews. Selections of some of these unattributed yet valuable comments are provided below to give a better feel for some of the implementation challenges:

Was this program difficult or straightforward to design and implement?

(CII Ultra-Low Flush Toilet Program) Rebate program was fairly straightforward to design, however had its difficulties in implementation, most notably in coordinating with our water retailers.

Are there additional program modifications that are being considered?

(CII Technical Assistance) Yes. Consideration of incentives for new construction, increasing the maximum incentive amount to \$100,000, offering of water use audits for the foreseeable future, emphasis on cooling tower water use.

(Clothes Washer Program) The newest phase of the program will include a tiered rebate structure based on the new BMP 6 language. Another change is a shift in the program's use of Energy Star branding since there will be a great reliance on the Consortium for Energy Efficiency's rating structure.

Is there a need to continue the program over time?

(Clothes Washer Program) There is a new state standard on deck related to maximum water factors for clothes washers. If this legislation makes it through final approvals then there will no longer be a need for this BMP. However, there could also be a shift in the BMP's language to continue to incentivize the purchase of the highest efficiency washers on the market.

(Home Survey Program) Yes, there is a need to continue the program as it is a very effective tool in increasing residential water use efficiency. The Water Wise House Call program is the district's flagship water conservation program and provides an opportunity for face-to-face interaction with community and a chance to market other water conservation programs.

What were the most important barriers to the program's success?

(Residential Home Survey Program) Adding new positions to the City's budget.

(Residential ULFT Program) The political selection of a vendor to process the rebates.

(CII ULFT Replacement Program) Customer acceptance of ULFTs and Customer taking the time to install.

(Large Landscape Water Budget) Technology and cost

(CII Survey Program) The most important barriers to the Program's success are customer education/outreach, initial capital outlay for retrofit installation and rebate levels that do not completely cover the out-of-pocket expense for the retrofit.

(CII Technical Assistance) Apparent low status of water cost amongst business owners' business priorities, lack of sustained audit services and follow-up needed to "drive" customers to implement projects.

(Residential Home Survey Program) Getting over the hurdles of attitude of the community. Water savings is not always real high on the to-do list of priorities.

What is your impression of the program's effectiveness in achieving water savings?

(CII Ultra-Low Flush Toilet Program) The program is and can be very successful at achieving water savings. It can be expensive (i.e. direct installations), but if you target the right commercial sectors, you can get a lot of water savings.

In percentage terms, what level of water use reduction would you expect among participating customers?

(CII Incentive Program) This is a very difficult question to answer. Customer types include offices, schools, retail stores, laundromats, multifamily facilities, hotels/motels, etc. The interior water conservation measures (ULFTs, urinals, HEWs, flush valve kits) have different savings rates depending on the type of facility in which they are installed.

Implementation Lessons Learned by Respondents

Respondents shared the following “Lessons Learned” from their wide experience in implementing water conservation programs.

In-house Implementation versus Contracting Out

- Check with in-house legal expertise regarding liability issues with any program
- Think twice about getting involved in the direct installation business (not the expertise of most water utilities.)
- Be very careful selecting a well-qualified vendor as they can resolve many problems that arise.

Designing Programs for Effective Implementation

- Make your program as easy as possible for customers (all incentives are not financial)
- Simplicity is key
- Be willing to negotiate hard for volume discounts where appropriate
- Provide customers with guidance on water efficient fixtures (exclude those that do not work well.)
- Services areas containing less than 500 landscape sites can enact area measurements by hand measure, owner supplied, or heads up digitizing.
- Multi-spectral imaging may not be cost-effective for small to medium landscape sites.
- Rebates must be sufficient to catch the attention of customers.
- Check with other city departments (regarding permits required)
- Check with sanitation utility to understand their system constraints (potential funding partner)

Marketing and Enacting Programs

- Customer surveys must provide valuable service; this helps word of mouth marketing.
- Understand the incentive effects of your rate structure and use it to communicate with customers.
- Customizing the market approach for each sector and region is critical.
- Sales events can be staff intensive; Rebate programs can get intense around deadlines.
- Coordinate and publicize across conservation programs.
- Find out what customers want—make the incentives match
- Emphasize a high level of customer service
- Conduct field evaluations of surveyors to improve process validity
- Compare notes with other agencies; check with CUWCC for general advice and referrals to other agencies with program experience.

3. Recommendations

Collaborative action by water agencies can address some of the implementation challenges of developing water use efficiency programs. Conservation programs that do not make sense for one agency to implement, may make sense if all benefiting agencies collaborate—water agencies, wastewater utilities, energy utilities, and other environmental agencies. The CUWA and CUWCC are examples of forums for improved communication among water agencies for collaborative action on water conservation. CUWA member agencies could seek opportunities to work collaboratively on plumbing code reform, landscape standards, and other water efficiency legislation or regulation that can be cost-effective approaches to overcoming implementation challenges.

CUWA should promote better communication with stakeholders, state and federal agencies, the Bay-Delta Authority and others regarding the challenges of implementing conservation programs. There is a widely held, incorrect view that funding is the only significant limiting factor to achieving urban water conservation savings. This study indicates that there are numerous other factors including program design and marketing, effective education and outreach, adequate available expertise, and developing successful incentives at the customer level. It is essential that the implementation issue receive attention by decision makers who fund or promote conservation programs, and that such programs recognize implementation challenges in setting program goals, work plans and levels of support.

CUWA should promote follow up research regarding implementation challenges, and an ongoing need to evaluate program success. This study reflects data and information collected from 10 urban water agencies, and is necessarily a reconnaissance-level study. Study results point to the value of further research to gain a more complete understanding of implementation challenges, the methods of overcoming these challenges, and the differences in approach taken by a more extensive group of urban water agencies.

CUWA should reinforce the need for a continuing role for state/federal government support for water conservation programs. To the extent that water utilities do not accrue all the benefits produced by water conservation programs, they will not have the incentives to fund water conservation programs to the level that would maximize net benefits to society. The role for government may include:

- Support for research to reduce uncertainty surrounding emerging water conservation technologies
- Support for information sharing on how implementation challenges can and are being overcome
- Support for research to reduce uncertainty surrounding the demand reductions induced by water conservation programs

Direct funding for water conservation programs to accelerate implementation to levels that are justified by social costs and benefits

Appendix A. Survey Instrument

CUWA Survey of Conservation Program Implementation Challenges

Confidentiality Statement: YOUR RESPONSES TO THE FOLLOWING QUESTIONS WILL BE TREATED IN COMPLETE CONFIDENCE AND USED ONLY TO ASSESS THE CHALLENGES OF IMPLEMENTING CONSERVATION PROGRAMS IN YOUR SERVICE AREA. RESULTS OF THIS SURVEY WILL ONLY BE PRESENTED IN A SUMMARY FORM, TO PROTECT THE IDENTITY OF RESPONDENTS.

Survey Identification

Date:

Name of Water Agency:

Name of Respondent:

Job Title:

Conservation Program Descriptions

Please define and categorize each conservation program that your agency has implemented in the previous 5 years. (Urban Water Management Plans often contain much of this information.)

Name of Program	Category			
	Residential		Commercial, Institutional, Industrial (nonresidential)	
	(1) Indoor	(2) Outdoor	(3) Indoor	(4) Outdoor

Please choose a minimum of two conservation programs for the more detailed CUWA Survey Part II that follows. (You will need to print a minimum of two copies of Part II).

Part II - CUWA Survey of Program Specific Implementation Challenges

For each selected conservation program, please define the following information:

Name of Respondent:

Job Title:

1. Program identifiers and timing

Formal name of program

Approximate date of the program's formal inception

Duration

2. Staffing and Organizational Capabilities

Were you personally involved in the creation of the program?

Were you personally involved in the implementation of the program?

Did this program involve significant additional effort on your part?

If not you, then who did?

What type of staff skills are needed to make this program successful?

What other organizational capabilities are needed?

Were these skill and other capabilities available to your agency?

If the program implementation was contracted out, what capabilities were needed to administer and oversee the work?

3. Original program design and features

Describe the program as originally designed.

What are the goals of the existing programs?

Was this program difficult or straightforward to design and implement?

4. Modifications to program over time

What changes were made to the program in the first year? After?

How have existing programs been modified over time?

What motivated the changes?

Did the changes serve their intended purpose? Is the program better as a result?

Are there additional program modifications that are being considered?

What is the next phase of the program?

Is there a need to continue the program over time?

5. Financing of programs

How were the programs funded?

Was cost sharing involved with other agencies/sources (e.g., energy, waste water, or welfare agencies)?

Approximately what has been the program budget since its inception?

6. Effectiveness assessment (strengths and weaknesses)

On a 1 to 10 scale, how successful do you think the program was?

What were the most important barriers to the program's success?

What is your impression of the program's effectiveness in achieving water savings?

In percentage terms, what level of water use reduction would you expect among participating customers?

How confident are you in this estimate? Could you give a range of expected savings?

Besides water savings, what additional benefits would you attribute to the program?

Has the program been formally or informally evaluated?

7. Public relations

What is your impression of your customers' response to this program?
(1=very negative, 10 = very positive)

How would you describe the public relations benefits from the program (if any)?

Any public relations nightmares?

What has been the response in the press?

Other customer responses?

8. **Lessons learned** - advice to other agencies planning such programs
What advice would you give to other agencies contemplating similar programs?

What would limit the applicability of your program to other areas?

What are the important lessons that you learned in the development and implementation of the programs?

What special features or design elements of the program are important for its operation and success?

9. **Conservation Program Implementation Challenges**

For each identified conservation program (minimum two) please describe the nature of implementation challenges, by the following categories

Lack of good planning information on reliable water savings potential or cost

Program design issues

Institutional constraints

staff constraints

budget constraints

administrative issues with contractor

multiple institution coordination issues

Marketing challenges

attractiveness to customer (cost-effectiveness versus other drivers.)

customer communication hurdles

Program evaluation and justification

Did the program achieve its intended effects?

Was sufficient information available on achieved water savings?

To what extent did program results help win or lose program support?

10. Ranking of Implementation Challenges by Program

Think about the water conservation programs that you know the most about: how would you rank the implementation challenges?

Formal Program Name			
Program Category (circle one)	Residential or NonResidential	Residential or NonResidential	Residential or NonResidential
Program End Use Focus	Indoor/Outdoor/Both	Indoor/Outdoor/Both	Indoor/Outdoor/Both
Rank	Rank	Rank	Rank
Impediment	1=not an impediment at all and 5=a major impediment	1=not an impediment at all and 5=a major impediment	1=not an impediment at all and 5=a major impediment
Lack of good planning info on water savings:			
Lack of good planning info on program costs:			
Program design challenges:			
Budget constraints:			
Staffing constraints:			
Contractor issues:			
Institutional coordination issues:			
Program marketing issues (post-design phase) :			
Attractiveness to customers:			
Customer communication:			
Program evaluation:			
Continued program justification:			
<u>Additional Observations</u> Please feel free to jot down additional observations about implementation challenges specific to each program			

Appendix B. Summary of Survey Responses

Agency ID	1	1	1	2	2	2	3	3	4	4	5	5	6	6	7	7	9	9	9	
Program Category (Residential(RES), NonResidential(NR), Both)	Both	RES	Both	NR	RES	NR	NR	NR	NR	Both	RES	NR	RES	Both	RES	Both	Both	NR	NR	
Program End Use Focus (Indoor (IN), Outdoor(OUT), Both)	IN	Both	IN	IN	Both	OUT	IN	Both	IN	Both	IN	OUT	IN	Both	Both	IN	OUT	Both	OUT	
Impediment	Rank 1=not an impediment at all and 5=a major impediment																			
Lack of good planning info on water savings:	2	3	2	2	3	3	1	3	2	3	1	1	1	5	1	3	3	3	4	2.42
Lack of good planning info on program costs:	2	3	2	1	1	3	1	2	3	3	1	1	1	5	5	5	4	2	4	2.58
Program design challenges:	3	3	2	1	2	4	2	3	4	3	2	1	4	5	2	5	4	3	5	3.05
Budget constraints:	4	3	3	1	1	2	4	3	3	3	1	2	5	2	2	5	4	3	4	2.89
Staffing constraints:	2	4	1	1	3	2	1	4	3	3	3	5	2	5	3	1	3	4	4	2.84
Contractor issues:	5	1	2	1	1	2	1	1	2	3	2	1	5	NA	1	1	4	4	1	2.11
Institutional coordination issues:	3	2	2	1	1	1	3	1	3	3	2	4	5	5	1	4	4	3	5	2.89
Program marketing issues (post-design) :	2	2	2	4	2	?	1	4	4	3	3	1	4	3	5	4	3	2	5	3.00
Attractiveness to customers:	2	1	1	5	2	1	3	4	2	1	1	3	1	5	5	5	3	2	5	2.74
Customer communication:	3	1	2	3	1	3	1	4	4	4	2	3	4	4	5	4	3	1	4	2.95
Program evaluation:	2	1	1	1	3	1	2	1	3	N/A	1	3	2	1	2	2	2	1	3	1.78
Continued justification:	4	2	2	1	3	2	1	1	3	3	1	1	4	1	1	1	1	1	1	1.79