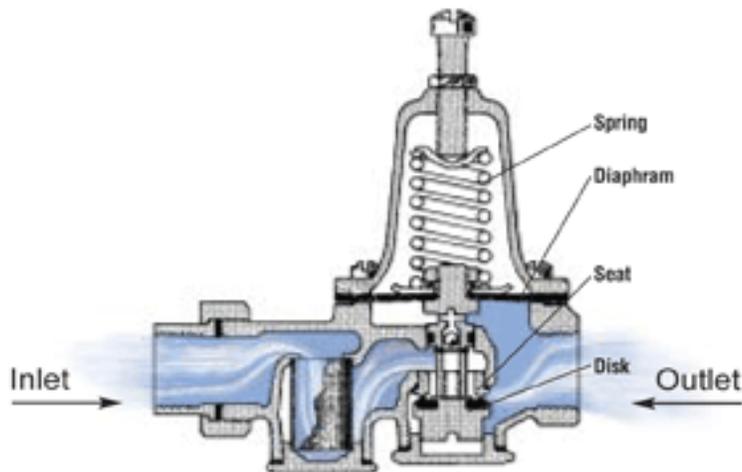


**2004  
Water Use Efficiency  
Grant Proposal**



**Pressure Regulator Incentive Pilot Program**

**Submitted by the  
City of San Diego**



# 2004 Water Use Efficiency Proposal Solicitation Package

## APPENDIX A: Project Information Form

Applying for:

Urban

Agricultural

1. (Section A) **Urban or Agricultural Water Use Efficiency Implementation Project**

(a) implementation of Urban Best Management Practice, # \_\_\_\_\_

(b) implementation of Agricultural Efficient Water Management Practice, # \_\_\_\_\_

(c) implementation of other projects to meet California Bay-Delta Program objectives, Targeted Benefit # or Quantifiable Objective #, if applicable \_\_\_\_\_

(d) Specify other: \_\_\_\_\_

2. (Section B) **Urban or Agricultural Research and Development; Feasibility Studies, Pilot, or Demonstration Projects; Training, Education or Public Information; Technical Assistance**

(e) research and development, feasibility studies, pilot, or demonstration projects

(f) training, education or public information programs with statewide application

(g) technical assistance

(h) other: Rebate for Device

3. Principal applicant (Organization or affiliation):

City Of San Diego

4. Project Title:

Pressure Regulator Incentive Pilot Program

5. Person authorized to sign and submit proposal and contract:

Name, title

Frank Belock, Jr.

Mailing address

Water Department Director

600 B Street, MS 913

Telephone

San Diego, CA 92101

Fax.

(619) 533-7555

E-mail

(619) 533-7589

[fbelock@sandiego.gov](mailto:fbelock@sandiego.gov)

6. Contact person (if different):	Name, title.	Pamela Carreon, Senior Management Analyst
	Mailing address.	600 B Street, MS 913
		San Diego, CA 92101
	Telephone	(619) 533-7517
	Fax.	(619) 533-7589
	E-mail	pcarreon@sandiego.gov

7. Grant funds requested (dollar amount): \$138,501  
*(from Table C-1, column VI)*

8. Applicant funds pledged (dollar amount): \$ 43,214

9. Total project costs (dollar amount): \$181,715  
*(from Table C-1, column IV, row n )*

10. Percent of State share requested (%): 76%  
*(from Table C-1)*

11. Percent of local share as match (%):  
*(from Table C-1)*

12. Is your project locally cost effective?  
*Locally cost effective means that the benefits to an entity (in dollar terms) of implementing a program exceed the costs of that program within the boundaries of that entity.*  (a) yes  
*(If yes, provide information that the project in addition to Bay-Delta benefit meets one of the following conditions: broad transferable benefits, overcome implementation barriers, or accelerate implementation.)*  (b) no

13. Is your project required by regulation, law or contract?  (a) yes  
 If no, your project is eligible.  (b) no

If yes, your project may be eligible only if there will be accelerated implementation to fulfill a future requirement and is not currently required.

*Provide a description of the regulation, law or contract and an explanation of why the project is not currently required.*

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14. Duration of project (month/year to month/year):	07/05 to 06/08
13. State Assembly District where the project is to be conducted:	73,75,76,79
14. State Senate District where the project is to be conducted:	38,36
15. Congressional district(s) where the project is to be conducted:	50,53
16. County where the project is to be conducted:	San Diego
17. Location of project (longitude and latitude)	32/-117
18. How many service connections in your service area (urban)?	283,173
19. How many acre-feet of water per year does your agency serve?	236,268 AF

20. Type of applicant (select one):
- (a) City
  - (b) County
  - (c) City and County
  - (d) Joint Powers Authority
  - (e) Public Water District
  - (f) Tribe
  - (g) Non Profit Organization
  - (h) University, College

- (i) State Agency
- (j) Federal Agency
- (k) Other
  - (i) Investor-Owned Utility
  - (ii) Incorporated Mutual Water Co.
  - (iii) Specify \_\_\_\_\_

21. Is applicant a disadvantaged community? If 'yes' include annual median household income.  
(Provide supporting documentation.)

- (a) yes, \_\_\_\_\_ median household income
- (b) no

**2004 Water Use Efficiency Proposal Solicitation Package**  
**APPENDIX B: Signature Page**

By signing below, the official declares the following:

The truthfulness of all representations in the proposal;

The individual signing the form has the legal authority to submit the proposal on behalf of the applicant;

There is no pending litigation that may impact the financial condition of the applicant or its ability to complete the proposed project;

The individual signing the form read and understood the conflict of interest and confidentiality section and waives any and all rights to privacy and confidentiality of the proposal on behalf of the applicant;

The applicant will comply with all terms and conditions identified in this PSP if selected for funding; and

The applicant has legal authority to enter into a contract with the State.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Name and title

\_\_\_\_\_  
Date

## **Statement of Work, Section 1: Relevance and Importance -**

### **Proposed Study - Relevance and Importance**

The City of San Diego (City) imports as much as 90% of its potable water. This percentage varies with the amount of local rainfall, which has been below average for the past five years, resulting in increased expenditures for imported water. While the availability of imported water is fairly stable, with an estimated two-year supply in storage statewide, the cost of these purchases will continue to increase over time. The City is actively pursuing solutions that will increase local storage capacity and diversify its water portfolio, resulting in lower operating costs. Water conservation programs reduce the City's expenditures for imported water.

The City is an original signatory of the Memorandum of Understanding (MOU) Regarding Urban Water Conservation in California since 1991. The MOU defines Best Management Practices (BMP's) which are proven water conservation programs that promote long-term water savings and help to maximize State water supplies. The Water Department's water conservation programs have worked to maximize available water resources since 1985. These conservation programs are widely recognized for their effectiveness and innovation in providing water management and achieving significant water savings, while also meeting or exceeding BMP requirements.

BMP #1 requires audits for residential customers. BMP #5 requires commercial landscape or large turf audits. The City has conservation programs which address both BMP's #1 and #5. Since 1992, the City has completed more than 38,000 residential and 630 commercial audits. During the course of these audits, 27% per 1,000 homes have high or low water pressure. Water pressure on a site affects all of the water-use appliances inside the occupancy and at a site including the irrigation system. Water pressure has a direct relationship to water consumption.

Water pressure may be affected by many factors. Agency water main pressure has a direct impact on site pressure. Additional development on an existing distribution zone with no capital improvements, such as no pumping plant upgrades, result in lower pressures throughout the zone. Conversely, capital improvements such as pumping plant upgrades do result in higher pressures throughout the zone.

Pressure regulators are also required at commercial landscape sites with high pressure and dedicated irrigation meters. By maintaining uniform water pressure and the appropriate irrigation devices, including but not limited to pressure compensating irrigation heads, there is better water management on site. Benefits include more efficient uniform irrigation distribution, lowering of the amount of irrigation water necessary and produce less site run-off. Less run-off means that less water will get into the storm water system.

Lowering the amount of irrigation water applied will also reduce the amount of fertilizers, herbicides and pesticides required at a site, and reduce the amount of green waste produced on the site. When a site produces less green waste, less man-hours are needed to maintain the site. Additionally, any water run-off will contain less pollutants and contaminants.

It has been the City's audit experience that sites with two or more leaks frequently have high water pressure. This may be the result of there being no pressure regulator on site, a malfunctioning or faulty pressure regulator, or the wrong range (low-medium-high) of pressure regulator at the site. Frequently when these situations are identified during audits, single-family and multi-family customers with mixed use meters, as well as customers with dedicated irrigation meters, have requested assistance to install or replace pressure regulators. To date, there is no water use efficiency assistance program for these customers.

In irrigation systems, water pressure has a direct relationship on water consumption demand. For every ten pounds of pressure, there is an approximate increase of ten to fifteen percent increase in the gallons per minute of water distributed through the same irrigation device. Uniform and lower pressure results in lower water consumption.

The California Urban Water Conservation Council (CUWCC) is currently studying a potential future BMP for a pressure regulator water conservation program. A pressure regulator is a cost-effective device that can save water and assist in maintaining uniform water flows.

Based on each of the situations described above, there is a compelling need to assist customers to install pressure regulators. It is understood that new construction would not be eligible for this assistance.

### Program Specifics

The City of San Diego maintains two databases that will be used to track water consumption at the participating sites; the Water Resources Landscape Database (WRLD) and the Consolidated Water Conservation Database (CWC). The CWC contains historical water consumption records for the City's 215,446 single-family meters and 29,366 multi-family meters for more than ten years. The CWC contains field data from Residential Surveys performed from 1992 through the current month and is updated weekly. There are approximately 38,000 residential customers, consisting of both single-family and multi-family accounts, who have had a Residential Survey where data is summarized in the CWC. We have significant data on more than 38,000 of 244,800 customers (15.5%). Each of these 38,000 records has up to 196 data fields per customer record.

Using the CWC for data modeling and new program design, a series of database questions to summarize pressure regulator field observations were queried for this proposal. During Fiscal Year (FY) 2004, covering the period from July 1, 2003 through June 30, 2004, the City completed 1,250 Residential Surveys. Pressure readings were consistent with those recorded in past years for other survey program participants. Concerning pressure readings recorded at the primary dwelling or residential occupancy:

- 88 of 1,250 surveys (7%) have pressure of less than or equal to ( $\leq$ ) 40 pounds per square inch (p.s.i.). This translates into 70 per 1,000 customers have low pressure.
- 250 of 1,250 surveys (20%) have pressure of equal to or greater than ( $\geq$ ) 80 p.s.i. This translates into 200 per 1,000 customers have high pressure.

Pressure problems lead to poor water use efficiency, or results in water management issues. For residential interiors, high pressure results in more frequent leaks and usually more than two leaks per dwelling unit. High pressure at occupancies, result in higher water consumption which also requires more energy to produce more hot water.

For exteriors, high pressure problems have direct impact on water consumption identified by over-watering while irrigating, greater amounts of evaporation due to high pressure misting when irrigating, more site runoff, more damage to property improvements, and several landscape maintenance issues. Over-watering at the site creates a greater need or consumption of fertilizers, herbicides, pesticides, and result in a greater production of green waste. There is also a need for more site maintenance. Air quality adjacent and above the site may be impacted. The ground water table or runoff may contain contaminants.

### **Explanation of the need for the project as related to critical local, regional, Bay-Delta, State or federal water issues.**

The City is located in a semi-arid coastal desert environment, receives 9 to 10 inches of rain annually, and imports 90% of its water from the State Water Project (SWP) and Colorado River. Approximately 32% of the City's imported water comes from the SWP. In fiscal year 2001-2002 the City used a total 219,170 acre feet of water. Of that 70,134 acre feet were imported from the SWP. Due to the City's heavy dependence on imported water, its supplies are only as reliable as those available to the wholesale agencies that serve the City, namely the San Diego County Water Authority and Metropolitan Water District of Southern California. These organizations continue to work on a number of key issues that would improve the long term reliability and cost of the City's imported water supplies. An important source of new water for the City is water saved through conservation (demand management) incentive programs. The City's conservation programs, all considered Best Management Practices in California, directly resulted in over 23,407-acre feet of potable water savings in FY 2004.

Indirect Bay-Delta system benefits can be obtained through the implementation of water conservation (demand management) projects demonstrating a potential for achieving California Bay-Delta Program goals. These goals include reducing water demand through "real water" conservation; improving water quality by altering volume, concentration, timing and location of return flows; improving ecosystem health by increasing in-stream flows where necessary to achieve targeted benefits. By reducing water waste, pressure regulators decrease the amount of water demanded locally. Their widespread use can translate to a reduction in the amount of SWP water demanded by the City, leaving more water available to the Bay-Delta system at all times during the year.

Per the 2000 Record of Decision defining the Water Use Efficiency Program, water savings benefits derived from the widespread use of pressure regulators:

1. would be "transferable to other parts of the State" if determined effective through the pilot proposed herein;

2. would likely result in actions taken by the City to increase the use of these devices through a rebate program (as opposed to regulatory based program);
3. would increase the overall volume of available water in the Bay Delta System.

As such, the proposed program supports CALFED Water Use Efficiency Program goals and objectives.

**Describe how this project would be consistent with local or regional water management plans or other integrated resource management plans.**

The City has a structured and documented water conservation effort. In 1982, the City Council adopted and implemented a Water Conservation Plan and Work Program. The Work Program allocated the financial resources necessary to retrofit City buildings and facilities with water-conserving plumbing fixtures, update the existing City landscape and irrigation systems, initiate a public information program, proposed a low-water use demonstration garden, and recommended developing an emergency plan for distributing water during a shortage. The City Council updated and incorporated the Water Conservation Plan and Work Program into Council Policy 400-11, entitled an “Action Plan for Implementation of Water Conservation Techniques”, adopted in 1987. The Action Plan requires the preparation of an annual report which reviews the water conservation activities undertaken by the City during the previous year.

All of the above mentioned conservation efforts and others have been, and continue to be carried out with success by the City. The proposed project aligns with the City’s current Strategic Plan (please see below) and the Water Conservation Plan and Work Program, which call for increased conservation levels and continued exploration of new and innovative water saving technologies, such as pressure regulators. The proposed project is also consistent with the efforts of other incentive based programs currently administered by the City, including the Residential Ultra Low Flush Toilet and H-Axis Washing Machine Voucher Programs.

**Document the implementation of water demand management activities that have been identified in urban or agricultural water management plans.**

In compliance with State legislation, the City prepared its first Urban Water Management Plan and Conservation Program in 1985. The City’s updated 2000 Urban Water Management Plan water conservation goal is to reduce the City’s dependency upon imported water. In order to accomplish this goal, the City has worked to create a water conservation ethic, adopted policies and ordinances designed to promote City-wide water conservation practices, and implemented a comprehensive public information and education program. In addition, the City adopted the Strategic Plan for Water Supply (Strategic Plan), which outlines the preferred alternative to meet existing and ongoing demand for water from 1997 - 2015. Water conservation is integrated into this Strategic Plan for supplying water to meet forecast needs. The Strategic Plan identifies the goal of achieving 26,000-acre feet per year of water savings through conservation programs by the year 2005. Specific new programs identified in the Plan include: turf management, targeting

large landscaped commercial accounts, irrigation incentives, H-axis clothes washer incentive program, facility repair and replacement, and enhanced public information program.

**Describe how the project will further implement existing water management activities or initiate new ones.**

Data obtained through this pilot program would provide a basis for program evolution or establish the basis for an expanded implementation. Regionally, and statewide, this data could be used to create a data model for similar programs to be implemented throughout California. This is not yet a BMP, but is an area of study by the California Urban Water Conservation Council Residential and Landscape Committees as a future BMP. The City of San Diego would be willing to share the data and findings with any water agency or regulatory policy agency to affect conservation statewide.

**Statement of Work, Section 2: Technical/Scientific Merit, Feasibility –**

**Project Plan, Methods, Procedures, Equipment, and Facilities.**

The City of San Diego (City) wishes to implement a Pilot Pressure Regulator Rebate Program for customers that have had a Residential or Commercial Water Survey where the finding is that the customer has very high pressure (equal to or greater than 80 psi). This program will be administered and managed in-house by the City’s Water Resources Management Program staff. Based on our expertise in the Residential Water Survey Program and the Commercial Landscape Survey Program, we have trained staff who can implement this program and will not need assistance from outside vendors for daily program management. We will employ the services of a vendor to process rebate checks. However, without assistance from Proposition 50 Funds, it would not be possible to embark on program implementation, grant rebates to customers and initiate an evaluation process.

**Proposed Task list, Work Plan, Schedule, Start/End Dates, Projected Costs.**

The following is the task list, work plan, schedule, start/end dates and projected costs suggested for the proposed Pressure Regulator Pilot Program (PR Program):

Date of Program: FY 06 through FY 08 beginning July 1, 2005 concluding June 30, 2008

Costs:	\$125,910 in Grant Requested Funding
	<u>\$ 39,285 in City In-Kind Contribution</u>
Total:	\$165,195

## **Task 1: Program Start-up and Implementation**

Date: July 1, 2005 through June 30, 2006

Cost: \$49,170 from Grant  
\$19,255 from City In-Kind  
\$68,425 first phase

In the first phase of the PR Program pilot beginning in FY 06, 250 residential and 50 commercial pressure regulators (PR) would be rebated. The customer would first have a Residential or Commercial Landscape Water Survey. If the customer has low or high pressure, they would be informed at the conclusion of the on-site survey of the Pilot Pressure Regulator Rebate Program and offered program participation.

During this start-up phase, the City's CWC database (described previously in the Statement of Work, Section 1, Program Specifics) would concurrently be modified to capture the field data that will be gathered during on-site verifications. A vendor for the rebate check processing would be secured.

The rebate would be a partnership between the City and the customer. For residential customers, the typical meter size and piping size for the pressure regulator would be a ¾" to 1" PR. The going plumbing rate in the San Diego area for this size is between \$185 and \$250 for the PR and installation. The customer would be rebated up to \$50 of the cost of the device, with no reimbursement for labor. PR's at commercial sites may vary based on water size, with a typical site at 1" to 1 ½" PR required. A rebate of up to \$150 towards the device cost would be reimbursed via rebate. A pressure regulator device costs vary based on the size of the water meter to the property, and range from approximately \$67 to more than \$181 for the device.

After the survey, if a customer installs a pressure regulator via the rebate program, a surveyor would return to the site and verify installation of the device. The surveyor would also take several pressure readings on the site to verify that the initial finding "problem pressure" has been corrected. The site would then be indexed in the CWC database. In this way, we will be able to track the consumption history one year before installation and compare it with the actual consumption or "real time use" after one year has passed.

Please Note: Rebates, which are passed directly through to customers, would account for \$20,000 of first year costs.

## **Task 2**

Date: July 1, 2006 through June 30, 2007

Cost: \$38,370 from Grant  
\$10,015 from City In-Kind  
\$48,385 second phase

In FY 07 phase 2 would begin with an additional increment of 250 residential and 50 commercial pressure regulators (PR) that would be rebated. Data analysis would also begin. Rebates, which are passed directly through to customers, would account for \$20,000 of second year costs.

During the comparison of historical water consumption, from one year before and one year after PR installation, real time data would identify actual savings. This data would provide a basis for program evolution or adjustment if necessary, and establish the basis for an expanded PR Program implementation. Regionally, and statewide, this data could be used to create a data model for similar programs to be implemented throughout California. This is not yet a BMP, but is an area of study by the California Urban Water Conservation Council Residential and Landscape Committees as a future BMP. The City of San Diego would be willing to share the data and findings with any agency or regulatory policy agency to affect conservation statewide.

### **Task 3**

Date: July 1, 2007 through June 30, 2008

Cost: \$38,370 from Grant  
\$10,015 from City In-Kind  
\$48,385 third phase

In FY 08, phase 3 would offer an additional increment of 250 residential and 50 commercial PR's that would be rebated. Rebates, which are passed directly through to customers, would account for \$20,000 of third year costs. Data analysis would continue and initial findings would be published. Any independent evaluation by the Proposition 50 grant administrator via audits of finding could be initiated.

### **Environmental Documentation:**

Not applicable. This is not a "project" as defined by CEQA.

### **Statement of Work, Section 3: Monitoring and Assessment –**

The average City of San Diego residential customer uses 324 gallons per home per day (gpd). Approximately 50% of that water consumption is used inside the home and 50% is used on the exterior primarily on the landscape.

When evaluating pressure and water waste, scientific formulas already exist with mathematical formulas that compute the relationship between increases of pressure and resultant water waste multipliers when irrigating.

“Bernoulli’s equation is used in engineering to predict fluid pressures within a body, for example, water pressures within an operating spray head. As pressure changes within a spray head, the spray pattern changes, resulting in less efficient utilization of the water flowing through the spray head.” Excerpt from Robertson/Crowe, *Engineering Mechanics* (Fourth Edition), Houghton Mifflin Company, Boston, MA, 1990, as quoted in Rain Bird “Cost Savings Analysis for Rain Bird 1800-PRS Upgrade”.

Using Bernoulli's equation, in this example, a reduction in pressure of 10 pounds per square inch (p.s.i.) will result in a corresponding reduction in flow of approximately 10-15%. Based on the installation of 250 residential pressure regulators and 50 commercial pressure regulators per year, the total savings is projected to be 36.7 Acre Feet (AcFt) per year.

The following is an explanation of how this amount of water savings was calculated:

An average home exterior in San Diego uses 162 gpd, with uniform pressure from a pressure regulator, the resultant savings would be 16 to 24 gpd per participating household.

162 gpd x 10% – 15% savings per day = 16 to 24 gpd per home

16 to 24 gpd per home x 250 homes participating

= 4,000 to 6,000 gpd water savings.

4,000 to 6,000 gpd water savings

X 365 days per year = 1,460,000 to 2,190,000 gpy.

OR, 4.5 to 6.7 Acre Feet (AcFt) per year.

Plus

The size of commercial properties varies significantly. For this projection, an average commercial property would be approximately one acre or the size of a football field. A property this size would use 4.4 AcFt to water annually. With uniform pressure regulation, the projected savings would be 0.4 to 0.6 AcFt per site.

0.4 to 0.6 AcFt per site x 50 sites per year

= 20 to 30 AcFt per year in savings.

Plus

There will be additional interior savings for the residential homes, which have many variables effecting accurate prediction of water savings.

Thus, the total savings from a pilot project of 250 residential and 50 commercial pressure regulators per year would exceed 24.5 AcFt to 36.7 AcFt per year. Savings persistency would be 7 to 10 years per site. Each subsequent phase, years 2 and 3, would also show these additional increments of savings.

Using the above model to determine whether the PR Program would be cost effective, several considerations were examined and applied to the model as follows:

Each Phase:	250 residential and 50 commercial PR's would save 36.7 AcFt
x	3 phases (each year has 300 PR Rebates)
x	7 years of sustainability
x	<u>\$780 per AcFt for treated water in the City of San Diego</u>
=	\$600,722 cost of water that would be saved without conservation

Total PR Program Costs including Grant Funds of	\$125,910
and City in-kind contribution of	\$ 39,285
=	<u>\$165,195</u>

Costs of Water Saved with Conservation = \$214 / AcFt vs. \$780 / AcFt

Lifetime Water Savings for 900 devices in the 3 phases of the program  
= 770 AcFt

The savings potential in the City of San Diego when projected across our customer base would be significant; if projected across all of California would significantly impact demand statewide.

Actual historical consumption savings will be captured by the CWC database.

Because residential sites have less potential water savings than commercial sites, and considering the differences in the costs of the regulators for the larger sized meters at commercial sites, the rebates were calculated at \$50 for residential customers and \$150 for commercial customers.

### **Qualifications of the Applicants and Cooperators –**

#### 1. Resumes of the project managers

Mark Broder is the Residential Survey Program Manager for the City of San Diego since the program's inception in 1992. Mark designed the program and manages all phases of the program including the day-to-day operations and training of field surveyors. Mark also co-designed the City's Commercial Landscape Survey Program, and is a certified landscape irrigation auditor. Mark currently serves as the Co-Chairperson for the CUWCC's Residential Programs Committee which evaluates proposed BMP's for all California water providers.

Daniel Carney is a Landscape Architect for the City of San Diego since 1998. Dan was instrumental in developing the City's Landscape Watering Calculator and the Water Resources Database. The Landscape Calculator is featured on water web sites used extensively throughout California to create water budgets. Dan is also a college instructor and guest speaker with expertise on landscape and water requirements issues. (Please see resume attached.)

Complimenting this management team are 2 Field Representatives and 3 Landscape Technicians, a Conservation Specialist who supports marketing efforts, and a survey scheduler/data entry operator.

#### 2. Identify and describe the role of any external cooperators that will be used for this project.

The City will employ the services of our in-house San Diego Data Processing Corporation (SDDPC) to modify the existing database fields and create the data summary report.

The City will initiate an RFP to secure the services of a vendor to process the rebate checks upon selection for this proposal. Currently, we have an agreement with Honeywell DMC for our other rebate and voucher programs.

3. Describe briefly any previous water use efficiency grant projects in which the applicant has participated. Consideration will be given to the applicant's performance in prior water use efficiency programs.

The City of San Diego Water Resource Management Program has received 14 local, state and national awards for conservation program design, development and implementation in the past 14 years. These programs include public education and outreach to promote water conservation and implementation of new technologies. Some of these programs which reduce water consumption include:

#### Ultra Low-Flush Toilet Voucher Program (ULFT)

Incentive program which replaces existing high-volume City toilets with ULFTs. It serves as a model to encourage Commercial, Industrial and Institution (CII) water customers to retrofit building using low water use plumbing fixtures. Qualcomm Stadium was previously retrofitted, replacing 365 toilets and 196 urinals. The City Facilities ULFT Retrofit Program accounted for water saving of 201,756 in FY02.

#### Residential High Efficiency Clothes Washing (HEW) Machine Voucher Program

The High Efficiency Clothes Washer (HEW) Voucher Program provides a point-of-purchase discount off the cost of a new qualifying HEW. These machines use 40% less water and 60% less energy per load than standard top-loading machines. HEWs are also credited with cleaning clothes more thoroughly, reducing detergent requirements, and reducing wear and tear of clothing.

#### Residential Interior/Exterior Water Surveys

This program offers residential customers an interior and exterior water use survey of their home. The service consists of analyzing water usage and flow rates of fixtures, checking for leaks, installing water-saving devices, and recommending efficiency improvements to landscaping and irrigation. A typical household participating in the program can reduce daily water consumption by 13%. This program is extremely popular, because surveyors can often identify hard-to-find water leaks that contribute to higher water and sewer bills. The Residential Survey Program accounts for water savings of 40 gpd for each survey.

4. If applicant is a disadvantaged community, provide geographic scope and the source of information documenting annual median household income.

Not applicable.

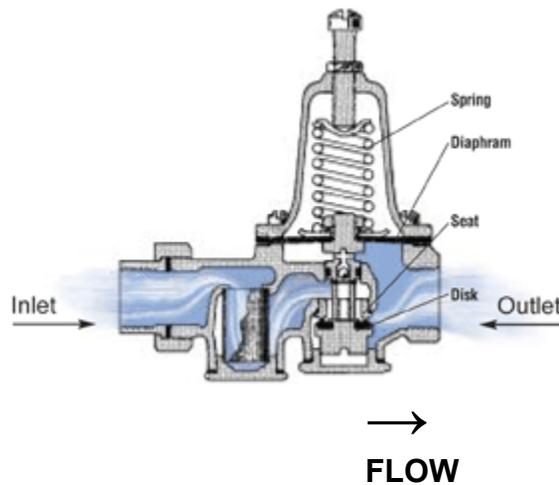
### **Outreach, Community Involvement and Acceptance –**

The results of this project will be made available on the City’s website and with a published final report. Results of the findings and study will also be reported in the WRMP’s monthly newsletter. The City will prepare a fact sheet about Pressure Regulators for distribution at Residential and Commercial Surveys, and to share with other interested agencies. Should the City decide to pursue a rebate program based upon results of the proposed pilot program, the WRMP will then develop a marketing and advertising program that disseminates information to all City Water Department customers about Pressure Regulators, the program, and how to get involved.

Please see Attachment A for support letter from San Diego County Water Authority.

### **Innovation –**

#### **How Does Direct Acting Water Pressure Reducing Valve Work?**



Installed in series directly after the water meter in homes, commercial buildings, and manufacturing plants, a water pressure reducing valve automatically reduces the pressure from the water supply to a lower more sensible pressure. Water entering the valve from municipal mains is constricted within the valve body and directed through the inner chamber controlled by an adjustable spring loaded diaphragm and disc. Even if the supply water pressure fluctuates, the pressure reducing valve ensures a constant flow of water at a functional pressure, as long as the supply pressure does not drop below the valve’s pre-set pressure.

## **Benefits and Costs –**

Please see Exhibits C-1 to C-3 for project costs.

### **Potential Benefits and Information to be Gained**

One of the City's goals is to reduce its high dependency on scarce and valuable imported water resources. This project is consistent with the efforts of the incentive based programs currently administered by the City. Information garnered through this study will assist in determining the feasibility of a future City-wide Pressure Regulator Water Conservation Program. Regionally, and statewide, the data obtained through this pilot program could be used to create a data model for similar programs to be implemented throughout California. This is not yet a BMP, but is an area of study by the California Urban Water Conservation Council Residential and Landscape Committees as a future BMP. The City Of San Diego would be willing to share the data and findings with any agency or regulatory policy agency to affect conservation statewide.

### **Benefits Realized and Information Gained Versus Costs**

Please refer back to Statement of Work, Section 3 - Monitoring and Assessment section on page 13 for benefits versus costs discussion.



## San Diego County Water Authority

4677 Overland Avenue • San Diego, California 92123-1233  
(858) 522-6600 FAX (858) 522-6568 [www.sdcwa.org](http://www.sdcwa.org)

January 5, 2005

Debra Gonzalez  
Office of Water Use Efficiency  
California Department of Water Resources  
1416 Ninth Street, Room 338  
Sacramento, CA 95814

#### MEMBER AGENCIES

Carlsbad  
Municipal Water District

City of Del Mar

City of Escondido

City of National City

City of Oceanside

City of Poway

City of San Diego

Fallbrook  
Public Utility District

Helix Water District

Olivewood  
Municipal Water District

Otay Water District

Padre Dam  
Municipal Water District

Camp Pendleton  
Marine Corps Base

Rainbow  
Municipal Water District

Ramona  
Municipal Water District

Municipal Water District

San Diego Water District

Santa Fe Irrigation District

South Bay Irrigation District

Vallecitos Water District

Valley Center  
Municipal Water District

Vista Irrigation District

Yuma  
Municipal Water District

#### OTHER REPRESENTATIVE

County of San Diego

**RE: City of San Diego Water Department Water Use Efficiency Grant Proposals  
Letter of Support**

Dear Ms. Gonzalez

The San Diego County Water Authority encourages and supports the following three (3) grant proposals for the City of San Diego Water Department:

- **San Diego State of the Urban Forest Report**

The goal of this study is to produce science-based information on the extent and value of the urban forest ecosystem. This will facilitate tracking future canopy cover and impervious surface change, serve as a baseline for developing comprehensive urban forestry, conservation, and storm water management programs applicable to all jurisdictions throughout the state. The project is also directly related to CALFED goals and objectives as well as the California Urban Water Conservation Council's (CUWCC's) Best Management Practices.

- **Pressure Regulator Incentive Pilot Program**

This project would begin promoting and assisting customers to install pressure regulators that have been identified as having high or low water pressure via audits through the City's Water Conservation Program. Benefits include more efficient irrigation distribution, lower water usage and less site runoff. The proposed project supports CALFED Water Use Efficiency program goals and objectives. Regionally, and statewide, the data obtained through this pilot program could be used to create a data conservation model for similar programs throughout California.

- **Recirculating Hot Water Systems Residential Survey and Feasibility Study**

This project is to conduct a survey, cost benefit analysis, and feasibility study on CUWCC's Potential Best Management Practice # 10. Results from this study would be relevant to regional and statewide water agencies exploring the viability of recirculating hot water systems as an indoor water saving conservation strategy. The study supports

CALFED Water Use Efficiency Program goals and would increase the volume of available water in the Bay Delta System.

The Water Authority views these submissions under Proposition 50 Chapter 7, Water Use Efficiency as having beneficial results locally and statewide. Examining additional water supply sources is an ongoing practice in our region and the information we obtain from these studies will be useful. The state also will benefit as it compiles data from various sources. If these studies ultimately result in the development of these water use efficiency projects, there will be a reduction in the demands on the state's imported water system.

These are prudent measures with potentially significant waters supply benefits to California. Again, the San Diego County Water Authority supports and respectfully requests your endorsement of these Water Use Efficiency Grant Proposals.

Sincerely,

A handwritten signature in black ink, appearing to read 'Maureen A. Stapleton', written in a cursive style.

Maureen A. Stapleton  
General Manager

cc: Frank Belock, Jr., City of San Diego Water Department Director

I:/vvd/letterofsupport.doc

Attachment A

**Applicant: City of San Diego - Pressure Regulator Incentive Pilot Program**

THE TABLES ARE FORMATTED WITH FORMULAS: **FILL IN THE SHADED AREAS ONLY**

Section A projects must complete Life of investment, column VII and Capital Recovery Factor Column VIII. Do not use 0.

**Table C-1: Project Costs (Budget) in Dollars**

	Category (I)	Project Costs \$ (II)	Contingency % (ex. 5 or 10) (III)	Project Cost + Contingency \$ (IV)	Applicant Share \$ (V)	State Share Grant \$ (VI)	Life of investment (years) (VII)	Capital Recovery Factor (VIII)	Annualized Costs \$ (IX)
	Administration <sup>1</sup>								
	Salaries, wages	\$47,850	4,785	\$52,635	\$23,760	\$28,875	0	0.0000	\$0
	Fringe benefits	\$0	0	\$0	\$9,504	-\$9,504	0	0.0000	\$0
	Supplies	\$19,140	1,914	\$21,054	\$0	\$21,054	0	0.0000	\$0
	Equipment	\$0	0	\$0	\$0	\$0	0	0.0000	\$0
	Consulting services	\$0	0	\$0	\$0	\$0	0	0.0000	\$0
	Travel	\$7,560	756	\$8,316	\$0	\$8,316	0	0.0000	\$0
	Other	\$9,045	905	\$9,950	\$9,950	\$0	0	0.0000	\$0
(a)	Total Administration Costs	\$83,595		\$91,955	\$43,214	\$48,741			\$0
(b)	Planning/Design/Engineering	\$0	0	\$0	\$0	\$0	0	0.0000	\$0
(c)	Equipment Purchases/Rentals/Rebates/Vouchers	\$60,000	6,000	\$66,000	\$0	\$66,000	10	0.0000	\$0
(d)	Materials/Installation/Implementation	\$0	0	\$0	\$0	\$0	0	0.0000	\$0
(e)	Implementation Verification	\$0	0	\$0	\$0	\$0	0	0.0000	\$0
(f)	Project Legal/License Fees	\$0	0	\$0	\$0	\$0	0	0.0000	\$0
(g)	Structures	\$0	0	\$0	\$0	\$0	0	0.0000	\$0
(h)	Land Purchase/Easement	\$0	0	\$0	\$0	\$0	0	0.0000	\$0
(i)	Environmental Compliance/Mitigation/Enhancement	\$0	0	\$0	\$0	\$0	0	0.0000	\$0
(j)	Construction	\$0	0	\$0	\$0	\$0	0	0.0000	\$0
(k)	Other (Vendor Check Preparation Fees)	\$10,800	1,080	\$11,880	\$0	\$11,880	0	0.0000	\$0
(l)	Monitoring and Assessment	\$0	0	\$0	\$0	\$0	0	0.0000	\$0
(m)	Report Preparation	\$10,800	1,080	\$11,880	\$0	\$11,880	0	0.0000	\$0
(n)	<b>TOTAL</b>	\$165,195		\$181,715	\$43,214	\$138,501			\$0
(o)	Cost Share -Percentage				24	76			

1- excludes administration O&M.



**EXHIBIT C-3  
PRESSURE REGULATOR INCENTIVE PILOT PROGRAM  
BUDGET**

Task 1: Start-up and Implementation

July 1, 2005 through June 30, 2006

**Direct Expenses (Grant Requested Funds)**

Start-up Costs (only)

San Diego Data Processing Corp.

Add Data Indexing to existing Conservation Database (one time charge)

30 hours x \$120/hr = \$ 3,600

Modify Conservation Database to add 4 tabbed summary fields (one time charge)

60 hours x \$120/hr = \$ 7,200

Annual Costs

Pressure Regulator Rebates to Customers

Residential 250 devices x \$ 50 per device = \$12,500

Commercial 50 devices x \$150 per device = \$ 7,500

Rebate vendor check processing fees (annual fees)

300 checks per year x \$12 per rebate = \$ 3,600

Staff Costs

No Load

Load

Post-installation on-site verification and data gathering

250 residential sites x 1.0 hrs x \$20/hr = \$ 5,000 \$ 7,000

50 commercial sites x 1.5 hrs x \$50/hr = \$ 3,750 \$ 5,250

Field Mileage Reimbursement to 300 sites per year

= \$ 1,800 \$ 2,520

**Task 1 Total from Grant**

= \$44,950 **\$49,170**

**In-kind Contribution (Non-grant Reimbursement)**

Program Manager activities at start up include staff training, quality control reviews on site, database review, rebate check vendor communication, customer follow-up and statistical summary reports (416 hrs of Management Analyst) = \$10,000 \$14,000

Clerical Support, customer field scheduling, mailing, etc.

300 appointments x 0.25 hr each x \$16 = \$ 1,200 \$ 1,680

Data Input 300 units x 0.083 hr each \$16 = \$ 400 \$ 560

Office Overhead Expense (proration)

= \$ 3,015

**Task 1 In-kind Total**

= \$19,255

**Pressure Regulator Incentive Pilot Program  
Budget**

Page 2 of 3

**Task 2: Continuing Rebates and Data Analysis  
Direct Expenses (Grant Requested Funds)**

July 1, 2006 through June 30, 2007

Annual Costs

Pressure Regulator Rebates to Customers

Residential	250 devices	x	\$ 50 per device	=	\$12,500	
Commercial	50 devices	x	\$150 per device	=	\$ 7,500	

Rebate vendor check processing fees (annual fees)

300 checks per year	x	\$12 per rebate	=	\$ 3,600	
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Staff Costs

No Load

Load

Post-installation on-site verification and data gathering

250 residential sites	x	1.0 hrs	x	\$20/hr	=	\$ 5,000	\$ 7,000
50 commercial sites	x	1.5 hrs	x	\$50/hr	=	\$ 3,750	\$ 5,250

Field Mileage Reimbursement to 300 sites per year

	=	\$ 1,800	\$ 2,520
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**Task 2 Total from Grant**

	=	\$34,150	<b>\$38,370</b>
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**In-kind Contribution (Non-grant Reimbursement)**

Program Manager activities include monitor staff and quality control reviews on site, database review, rebate check vendor communication, customer follow-up and statistical summary reports (120 hrs of Management Analyst)

	=	\$ 3,400	\$ 4,760
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Clerical Support, customer field scheduling, mailing, etc.

300 appointments	x	0.25 hr each	x	\$16	=	\$ 1,200	\$ 1,680
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Data Input 300 units

x	0.083 hr each	\$16	=	\$ 400	\$ 560
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Office Overhead Expense (proration)

	=	\$ 3,015
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**Task 2 In-kind Total**

	=	\$10,015
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**Pressure Regulator Incentive Pilot Program  
Budget**  
Page 3 of 3

Task 3: Continuing Rebates, Data Analysis, Summary Reports July 1, 2007 through June 30, 2008

**Direct Expenses (Grant Requested Funds)**

Annual Costs

Pressure Regulator Rebates to Customers

Residential 250 devices x \$ 50 per device = \$12,500

Commercial 50 devices x \$150 per device = \$ 7,500

Rebate vendor check processing fees (annual fees)

300 checks per year x \$12 per rebate = \$ 3,600

Staff Costs

No Load

Load

Post-installation on-site verification and data gathering

250 residential sites x 1.0 hrs x \$20/hr = \$ 5,000 \$ 7,000

50 commercial sites x 1.5 hrs x \$50/hr = \$ 3,750 \$ 5,250

Field Mileage Reimbursement to 300 sites per year = \$ 1,800 \$ 2,520

**Task 3 Total from Grant = \$34,150 \$38,370**

**In-kind Contribution (Non-grant Reimbursement)**

Program Manager activities include monitor staff and quality control reviews on site, database review, rebate check vendor communication, customer follow-up and statistical summary reports (120 hrs of Management Analyst) = \$ 3,400 \$ 4,760

Clerical Support, customer field scheduling, mailing, etc.

300 appointments x 0.25 hr each x \$16 = \$ 1,200 \$ 1,680

Data Input 300 units x 0.083 hr each \$16 = \$ 400 \$ 560

Office Overhead Expense (proration) = \$ 3,015

**Task 3 In-kind Total = \$10,015**

**TOTAL GRANT REQUEST PROGRAM (76.2%) = \$125,910**

**TOTAL IN-KIND CONTRIBUTION PROGRAM (23.8%) = \$ 39,285**

**TOTAL PROGRAM COSTS = \$165,195**