STATE OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES

2004 Water Use Efficiency Program

City of Cathedral City
Urban Water Use Efficiency Project

City of Cathedral City

68-700 Avenida Lalo Guerrero
Cathedral City, California 92234

January 11, 2005

STATE OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES
2004 Water Use Efficiency Program

City of Cathedral City
Urban Water Use Efficiency Project

Table of Contents

2004 Water Use Efficiency Proposal Solicitation Package

Project Information Form

Applying for: X Urban ❑ Agricultural

1. (Section A) **Urban or Agricultural Water Use Efficiency Implementation Project**
   - X (a) implementation of Urban Best Management Practice, # **V**
   - ❑ (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

3. Principal applicant (Organization or affiliation): **City of Cathedral City**

4. Project Title: **Landscape Irrigation System Upgrade**

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

Name, title	Deanna C. Pressgrove
Mailing address	68-700 Avenida Lalo Guerrero
	Cathedral City, CA 92234
Telephone	760-770-0369
Fax.	760-202-2520
E-mail	dpressgrove@cathedralcity.gov

6. Contact person (if different): Name, title.

Mailing address.

Telephone

Fax.

E-mail

7. Grant funds requested (dollar amount): $36,900

(from Table C-1, column VI)

8. Applicant funds pledged (dollar amount): $54,450

9. Total project costs (dollar amount): $91,350

(from Table C-1, column IV, row n)

10. Percent of State share requested (%) 40%

(from Table C-1)

11. Percent of local share as match (%) 60%

(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.)

X (b) no

11. Is your project required by regulation, law or contract?
If no, your project is eligible.

❑ (a) yes

X (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.

12. Duration of project (month/year to month/year): 1/06 – 12/06

13. State Assembly District where the project is to be conducted: 80

14. State Senate District where the project is to be conducted: 37

15. Congressional district(s) where the project is to be conducted: 41

16. County where the project is to be conducted: Riverside

17. Location of project (longitude and latitude) 33.838° N Lat.
-116.467° W Long.

18. How many service connections in your service area (urban)? na

19. How many acre-feet of water per year does your agency serve? na

20. Type of applicant (select one):

- **X** (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
- X (b) no

2004 Water Use Efficiency Proposal Solicitation Package
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

Deanna C. Pressgrove, Environmental Conservation Manager
Name and Title

_____
Date

Statement of Work, Section One: Relevance and Importance
(Section A Projects: 10 Points)

1. Goals and Objectives of the Project

The proposed Landscape Irrigation System Upgrade project is a water management and conservation project for the City of Cathedral City, California.

H20 Strategies of Manhattan Beach, California was asked to assist Cathedral City in its water management and conservation efforts. H2O Strategies will install its MCS 1000 Irrigation Control System (MCS 1000). The MCS 1000 was developed, tested and patented by H20 Strategies. The MCS 1000's patented technology regulates water usage in automated irrigation systems. The MCS 1000 will help Cathedral City meet its goals to prevent over-watering of city landscapes, increase the efficiency of its existing irrigation systems, and conserve both water and power.

The MCS 1000 Irrigation Control System will be installed in three city parks: Panorama Park, Century Park and 2nd Street Park. Each park is a public use facility and contains play and picnic areas. The terrain of each park is slightly undulating with no severe sloping. The landscape consists primarily of turf with some trees. The parks total 16.3 acres.

There are approximately 106 automated irrigation valves at the three parks combined. The installation of MCS 1000 Moisture Sensor and Irrigation Control System in various locations, environments, and soil types within the parks will increase the efficiency of the automated irrigation systems.

The project will achieve the following objectives:

- ☑ Reduce irrigation water usage by 35%
- ☑ Reduce waste-water run-off from over irrigation
- ☑ Reduce soil erosion from over irrigation
- ☑ Improve the quality of landscape through elimination of turf damage resulting from over irrigation.
- ☑ Enhance overall water conservation efforts through more effective water management practices
- ☑ Encourage the adoption of best water management policies in the public and private sectors.

2. Explanation of the Need for the Project

With increasing population and urbanization in the Coachella Valley, it is vital that the limited and valuable resource of water is conserved. This can be achieved through innovative technology. Such technology is H20 Strategies MCS 1000 Irrigation Control System. The primary portion of the project involves the installation of real-time moisture sensor units designed for use in automated irrigation systems.

3. Consistency with Local and Regional Water Management Plans

The project is consistent with the water management plans of the Coachella Valley Water District and the Desert Water Agency, both of which seek to increase efficient water usage, water conservation and the adoption of best water management policies.

H20 Strategies will provide seven installation technicians and one on-site Project Supervisor to effect the installation of the MCS 1000 Units. In addition, two inspection technicians will conduct the preliminary site inspection and the final system check.

The project will be completed within forty-five business days. The Site Inspection will also include updating and/or creating system maps to accurately reflect the location of all valves and irrigation zones and MCS 1000 Moisture Sensor probe placement points.

4. Implementation of Existing and New Water Management Activities

The MCS 1000 will enhance the existing irrigation systems by preventing the automatic irrigation systems from activating if the landscape has absorbed enough moisture from pre-scheduled water cycles or precipitation. The MCS 1000 will not interfere with the controllers and timers that are already part of the previously installed irrigation system. The benefits of implementing this project are reduction in maintenance costs, optimization of water usage, water conservation promotion, financial savings, water savings, environmentally safe usage, and quick and easy installation. Additional benefits include reduction of electrical power used in irrigation systems, soil erosion, and waste-water run off from over irrigation.

The moisture sensor units regulate water usage in automated irrigation systems and are designed to:

1. Prevent or reduce over-watering of subject landscapes;
2. Increase the efficiency of automated irrigation systems; and
3. Save both water and power.

Statement of Work, Section Two: Technical/ Scientific Method,
(Section A Projects: 20 points)

1. Technical Description of Project

The MCS 1000 Moisture Sensor and Irrigation Control System (MCS 1000) incorporates a patented technology to regulate water usage in automated irrigation systems.

Each Moisture Sensor Unit consists of:

1. One Moisture Sensor Probe: 6" x ¼"
2. UL Approved Underground Cable
3. One Encapsulated Electronics Box: 2" x 2 ½" x 1"
4. Waterproof Wire Nuts/Petroleum Capsules

The Moisture Sensor Units are installed as follows:

1. The Moisture Sensor Probe is placed in the ground horizontally at or below the flora root level;
2. The Moisture Sensor Probe is connected to the Encapsulated Electronics Box;
3. The Encapsulated Electronics Box is connected to the irrigation valve, timer or controller

Once installed, the moisture sensor units control the amount of watering time as pre-set by the irrigation system timer or controller. Using the existing 24 VAC, which powers the irrigation system, the moisture sensor units interrupt the signal sent by the timer/controller whenever the probe "senses" there is sufficient moisture in the soil to promote proper growth. For example, if a timer/controller is pre-set to water a section of landscape for forty minutes and the soil becomes sufficiently irrigated after only ten minutes, the Probe will send an electronic signal to the Encapsulated Electronics Box and prevent the additional thirty minutes of watering time and thirty minutes of the electricity required to power the irrigation system.

The MSC 1000 units are designed to operate on a zone-by-zone basis. The individual moisture sensitivity settings allow the users to take into account differing ground elevations and depression and exposure to sunlight or shade.

The moisture senor units are adjustable to any soil classification or texture and can be easily disabled to permit periodic heavy irrigation to promote new growth, to leach the soil of impurities or for other purposes.

2. Project Task List and Schedule

H20 Strategies will provide seven installation technicians and one on-site Project Supervisor to effect the installation of the MCS 1000 Units. In addition, two inspection technicians will conduct the preliminary site inspection and the final system check.

The project will be completed within forty-five (45) business days. The Site Inspection will also include updating and/or creating system maps to accurately reflect the location of all valves and irrigation zones and MCS 1000 Moisture Sensor probe placement points.

	PROJECT TASK	START DATE	COMPLETION
1.	Sign agreement with DWR and receive authorization to proceed (ATP).	ATP	ATP
2.	Finalize Project Plans and Specifications.	ATP	ATP + 1 month
3.	Solicit and receive final proposal from H2O Strategies.	ATP + 1 month	ATP + 2 months
4.	Receive City Council approval to execute contract with H2O Strategies	ATP + 2 months	ATP + 3 months
5.	Execute contract.	ATP + 3 months	ATP + 4 months
6.	Submit applications and receive permit approvals. (internal)	ATP + 4 months	ATP + 5 months
7.	Oversee installation and testing of equipment	ATP + 5 months	ATP + 8 months
8.	Implement public education and awareness plan.	ATP + 5 months	ATP + 8 months
9.	Process all requests for reimbursements.	ATP + 8 months	ATP + 10 months
10.	Complete all reporting requirements.	ATP +10 months	ATP + 12 months

3. Preliminary Plans and Specifications

The preliminary plans and specifications for this project are included with this application.

4. Environmental Documentation

This is not a “project” as defined by CEQA.

Statement of Work, Section Three: Monitoring and Assessment
(Section A Projects: 15 Points)

1. Description of Pre-project Conditions, Basic Assumptions, Data Accuracy

The Cathedral City parks receive heavy use. Although the overall quality of the landscape is good there is some inconsistent turf quality and brown spotting.

H2O Strategies will conduct a complete on-site inspection of the park property and the existing irrigation systems. The site inspection will include a physical inspection of the irrigation systems including wiring, timers/controllers, valves and sprinkler heads. The purpose of this inspection is to determine and document the current operating condition of the irrigation systems and to make recommendation for any needed repairs.

The data used and produced for this project will be accurate. Water usage and costs will be taken from invoices for irrigation meters at the parks. Already meter readings for each park have been analyzed for the past forty-six consecutive months. Water saving will be based on readings from the same meters.

2. Explanation of Monitoring Methodologies

The City of Cathedral City made available its invoices for the irrigation meters at the project parks for the past forty-six months. The invoices detailed water usage and water costs within the billing period. After excluding months where the water was shut off to the parks, a baseline period was established. For Panorama Park, a thirty-month baseline was established. For Century Park and 2nd Street Park, a twenty-six month baseline was established.

For this project, H2O Strategies will document water savings by comparing the actual water used for each billing period as detailed on the water bills received from Coachella Valley Water District and Desert Water Agency to the Baseline Period, as follows:

The Baseline Period will be compared to the current billing period. For example, if the billing period is monthly, the baseline for January will be compared to the total water actually used for January, the February baseline will be compared to the February total water actually used and so on.

The total water used shall be subtracted from the baseline amount for each billing period to determine the water savings. If the total water used is less than the baseline amount, the difference shall constitute the water savings for that billing period. If in the unlikely event the total water used is equal to or more than the baseline, there will be no water savings for that billing period.

For each billing period where there is a water savings, the amount of savings shall be calculated as follows: Water Savings x Current Water Rate(s) = Dollar Amount Saved.

Working in conjunction with H20 Strategies, Cathedral City will insure that proper water savings are realized and will conduct a complete on-site inspection of the MCS 1000 units on a monthly basis for eighty-four (84) months following installation.

H20 Strategies will request water bills and/or meter readings from Cathedral City for the twenty-four months prior to the installation on a per location basis. This new 24-month period will constitute the project Baseline Period.

3. External Factors to be Considered

The MCS 1000 units are designed to operate on a zone-by-zone basis. The individual moisture sensitivity settings allow the user to take into account differing ground elevations and depressions and exposure to sunlight or shade. The MCS 1000 units are adjustable to any soil classification or texture and can be easily disabled to permit periodic heavy irrigation to promote new growth, to leach the soil of impurities or for other purposes. The adaptability of the MCS 1000 will prevent external factors such as weather to hinder the efficiency and the effectiveness of this system. The system will continue to conserve and preserve water regardless of weather or other external factors.

4. Data Reporting

Cathedral City will collect and report data to the DWR. Data will include water usage savings and cost savings. All information will be available in electronic format.

5. Estimated Cost

The estimated cost for this project is $91,350.

Qualifications of the Applicants and Cooperators

(Section A projects: 5 points)

1. City of Cathedral City

The City of Cathedral City has the quality of employees and level of staffing to successfully implement and maintain the Landscape Irrigation System Upgrade project.

Deanna Pressgrove, Environmental Conservation Manager for the City, will serve as project manager. As Environmental Conservation Manager, Ms. Pressgrove is responsible for all services and activities of the environmental conservation program including solid waste and waste reduction, water conservation, energy conservation, pollution reduction, land use and wild life. She is also responsible to develop and implement programs that educate the public in order to facilitate the City in achieving federal, state, and local goals and statutes. Dale Boles, Public Works Supervisor, will handle the day-to-day implementation of the project. As Public Works Supervisor, Mr. Boles is responsible for the facility and vehicles management and maintenance.

Ms. Pressgrove and Mr. Boles are long-term employees of Cathedral City. They have cooperated on numerous pubic works projects.

2. H2O Strategies

Resumes of Executive Officers of H2O Strategies are included on the following pages.

3. Other Water Conservation Projects

H2O Strategies is involved in a previous successful DWR water use efficiency grant. In 2003 the City of Placentia received funds from the California Department of Water Resources through the 2003 Urban Water Conservation Program. The City of Placentia utilized H2O Strategies to install the MCS 1000 Irrigation Control System at Tri-City Park. The project has been a complete success and in the first forty-eight days of operation saved the City of Placentia 6,789 ccf of water and $9,088 in water costs.

H2O Strategies is also involved in large water efficiency grant in the State of New Mexico. In December 2004, the company in partnership with New Mexico Tech was awarded $500,000 from Governor Richardson's Water Innovation Fund to install the MCS 1000 Irrigation Control System in both agricultural and non-agricultural environments. Out of 111 proposals only 25 projects were selected for funding. The grant application went through a rigorous vetting process headed by Cabinet Secretary of Finance and Administration, James Jimenez.

Insert H2O Resumes

Insert H2O Resumes

Outreach, Community Involvement, and Acceptance
(Section A Projects: 5 Points)

1. Local/Regional Water Agencies

Staff and consultants representing Cathedral City are coordinating this project with staff from the Coachella Valley Water District and the Desert Water Agency. The water agencies are supportive of the project and expressed interest in being involved in the implementation, monitoring and testing phases of the project. Already the water agencies have provided copies of their long-term water management plans in order to align goals and objectives. In addition, they provided copies of City water bills from 2001 – 2004 for the specific irrigation meters involved in the project. These were used to document water usage and costs, and to establish the baseline for the project. Cathedral City will continue to involve the two water agencies in the project as it progresses.

2. Local Community

Cathedral City has a strong environmental conservation program with established community outreach components. For other conservation projects, the Environmental Conservation Manager has provided media outreach, community events, publications, temporary and permanent signage and more to involve and educate the community of the City's conservation projects and results.

A local community awareness program is included in this project proposal. The water conservation and management project will be incorporated into the overall marketing and publicity efforts of the City' environmental conservation program. In addition, the following three activities are planned.

- ☑ Install a permanent sign in the parks promoting the water conservation project and the support of the California Department of Water Resources. Photos of two other project signs are included on the following pages.

- ☑ Place news stories in the local media publicizing the project

- ☑ Include project in yearly direct mailings to the Panorama neighborhood. Flyer for landscape program is included on the following pages.

Other opportunities to promote the water conservation project and water conservation in general will be used as they become available.

INSERT PHOTO #1

INSERT PHOTO #2

INSERT FLYER PAGE 1

INSERT FLYER PAGE 2

Innovation
(Section A projects: 10 points)

MCS 1000 Technology

The project proposed in this application is very innovative while being practical and proven. Historically, no system on the market has effectively been able to create a moisture sensor that provides significant water saving, durability and ease of use.

H2O Strategies has successfully combined the historical idea of soil moisture sensing with new materials and technologies. In addition, H2O Strategies has engineered a streamlined unit that in now placed directly at the root level and will automatically turn off the water at a pre-determined setting.

The MCS 1000 Patented Moisture Sensor and Irrigation Control Technology works on the principle of electrical resistance. The MCS 1000 is an electrical conductivity probe that measures capacitance. Capacitance measures the electronic conductivity of a substance utilizing two different types of metals as a capacitor in the soil. The MCS 1000 measures soil moisture by how well a current of electricity passes between two dissembler metals separated by a dielectric, a material that does not readily conduct electricity.

When an irrigation timer or controller activates the 24 VAC to the irrigation solenoid, the MCS 1000 Encapsulated Circuitry ("EC") intercepts the current, converts it to DC and redirects it to the probe. Depending on the amount of "resistance" the current encounters as it travels along the probe, a signal will be sent back to the "EC" which will, in turn, send a signal to the value solenoid either initiating or preventing irrigation as necessary.

Each MCS 1000 unit contains a Moisture Sensitivity Setting. This permits each unit to be separately adjusted to provide more or less irrigation as required by each irrigation zone. Each unit can also be separately turned off to permit purposeful flooding of the landscape to flush salts and chemicals from the soil or for other reasons.

Finally, as an added benefit, merging the patented moisture sensing technology with the existing irrigation systems technology will create data for use state-wide. This will include soil moisture information based systems for landscape irrigation within the state and Moisture Sensor Probe data available to create enhanced water management efficiencies.

Applicants Cost Share and Description

The City of Cathedral City will contribute sixty (60) percent of the cost of the project. The City is requesting forty (40) percent of the project costs from the Department of Water Resources 2004 Water Use Efficiency Proposal.

As with all Southern California projects, the benefits to the Bay-Delta system are indirect. The proposed project will reduce dependency on the Bay Delta System by improving the quantity and reliability of the local water supply. The saving will be direct water usage savings.

The City of Cathedral City is proposing to provide all administrative costs as well as legal/license fees for the project. The City is asking for grant participation at 50% each for of the following categories: equipment, equipment installation, monitoring and assessment and report writing.

The project is expected to save thirty-five (35) percent of the annual irrigation water usage at the three project parks. The annual total water usage for the past forty-six months has been approximately 140 acre-feet. The water saving will equal forty-nine (49) acre feet of water per year.

Project Costs and Benefits Tables

Table C- 1: Project Implementation Costs (Budget)

Table C- 2: Annual Operations and Maintenance Costs

Table C- 3: Total Annual Project Costs

Table C-4: Capital Recovery Factor

Table C- 5: Project Annual Physical Benefits (Quantitative and Qualitative Description of Benefits)

Table C- 6: Project Annual Local Monetary Benefits

Table C- 7: Project Local Monetary Benefits and Project Costs

Table C- 8: Applicant's Cost Share and Description

H2O Strategies
Incorporated

CATHEDRAL CITY, CA

Project Plans and Specifications

Project Overview

H2O Strategies has been asked to assist Cathedral City ("CC") in its water management and conservation efforts through the installation of its **MCS 1000 Irrigation Control System** in the following three public parks:

1. Panorama Park.
2. Century Park.
3. 2nd Street Park.

Each property is a public use facility and contains play and picnic areas. The terrain of each park is slightly undulating with no severe sloping. Overall quality of the landscape is good with some inconsistent turf quality and brown spotting. The landscape consists primarily of turf with some trees.

Project Specifications

The following table summarizes all specifications for the three subject parks (all figures est.).

Category	Panorama Park 1/	Century Park Park 2/	2ND Street Park 3/	Total
Size of Park (acres)	**2.2**	**8.7**	**5.4**	**16.3**
Number of MCS 1000 Units	**46**	**45**	**30**	**121**
Annual Water Usage	**32,412ccf**	**20,617ccf**	**7,644ccf**	**60,673ccf**
Avg. Annual Water Cost:	**$21,396.00**	**$13,607.00**	**$5,352.00**	**$42,468.00**
Current Cost of Water	**$0.66ccf**	**$0.66ccf**	**$0.70ccf**	**n/a**
No. Mos. In Baseline	**30**	**26**	**26**	**n/a**
Project Budget	**$24,021.00**	**$23,400.00**	**$15,579.00**	**$63,000.00**
@35% Annual Savings	**11,344ccf**	**7,216ccf**	**2,675ccf**	**21,235ccf**
@35% Annual Savings	**$7,489.00**	**$4,762.00**	**$1,873.00**	**$14,124.00**
ROI @ 100% of Cost	**39 mos.**	**59 mos.**	**99 mos.**	**65 mos.**
ROI @ 50% of Cost	**19 mos.**	**29 mos.**	**49 mos.**	**33 mos.**

Explanatory Notes

1. Water Rate obtained from Coachella Valley Water District **account nos. 405092.356.0.0, 405092.356.1.0 and 405092.356.2.0).**

2. **Water Rate Obtained from Coachella Valley Water District account no. 405151.034.1.1.**
3. **Water Rate Obtained from Desert Water Agency account no. 4533.6162.0.**
4. **Baseline excludes those months where little if any water was used. A total of 46 consecutive months was analyzed for each park.**

Project Budget

The combined budget for the three subject parks is as follows:

1. 121 MCS 1000 Units @ $325.00 / unit	$ 39,325.00
2. Labor & Installation Charges	$ 18,800.00
3. Monitoring & Evaluation (12 months)	$ 6,000.00
Total	**$ 63,000.00**

The individual budgets are as follows:

1. Panorama Park:	$ 24,021.00
2. Century Park:	$ 23,400.00
3. 2ND Street Park:	$ 15,579.00
Total	**$ 63,000.00**

The Site Inspection

H2O Strategies will conduct a complete On-Site Inspection of the subject property and IS. The Inspection will include a physical inspection of the IS including: wiring, timers / controllers, valves and sprinkler heads. The purpose of this inspection is to determine the current operating condition of the IS and to make recommendations for any needed repairs or system upgrades.

Installation

There are approximately 121 automated irrigation valves at the three parks combined. H2O Strategies will provide four (4) installation technicians and one (1) on-site Project Supervisor. In addition, two (2) inspection technicians will conduct the preliminary site inspection and the final system check.

The project (including site evaluation, installation, training of LV grounds personnel and final system check) will be completed within 10 business days.

The Site Inspection will also include updating and/or creating system maps to accurately reflect the location of all valves and irrigation zones and MCS 1000 Moisture Sensor Probe placement points for each park.

The MCS 1000 Irrigation Control System

The MCS 1000 Irrigation Control System (MCS 1000) incorporates a patented technology to regulate water usage in automated irrigation systems and is designed to (1) prevent or reduce over-watering of subject landscapes; (2) increase the efficiency of automated irrigation systems; and (3) conserve both water and power.

Each MCS 1000 unit consists of:

(1) One Moisture Sensor Probe: 6" x ¼"
(2) UL Approved Underground Cable
(3) One Encapsulated Electronics Box ("EEB"): 2" x 2 ½" x 1"
(4) Waterproof Wire Nuts / Petroleum Capsules

Once installed, the MCS 1000 controls the amount of watering time as pre-set by the irrigation system timer or controller. Using the existing 24 VAC which powers the irrigation system, the MCS 1000 interrupts the signal sent by the timer/controller whenever the Probe "senses" there is sufficient moisture in the soil to promote proper growth. The MCS 1000 is adjustable to any soil classification or texture and can be easily disabled to permit periodic heavy irrigation to promote new growth, to leach the soil of impurities or for other purposes.

The Technology

H2O Strategies' patented Moisture Control Sensor works on the principle of electrical resistance. The MCS 1000 is an electrical conductivity probe that measures capacitance. Capacitance measures the electronic conductivity of a substance utilizing two different types of metals as a capacitor in the soil. The MCS 1000 measures soil moisture by how well a current of electricity passes between two dissimilar metals separated by a dielectric (a material that does not readily conduct electricity).

Monitoring & Evaluation

To monitor properly the operation of the MCS 1000 Units and to insure that proper water savings are realized, H2O Strategies will conduct a complete on-site inspection of the MCS 1000 Units on a monthly basis for the 12 month period following installation.

Applicant: Cathedral City

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

Table C-6 Project Annual Local Monetary Benefits

ANNUAL LOCAL BENEFITS	ANNUAL QUANTITY	UNIT OF MEASUREMENT	ANNUAL MONETARY BENEFITS
(a) Avoided Water Supply Costs (Current or Future Source)	49 af	$291.00 per af	$14,259
(b) Avoided Energy Costs	0		$0
(c) Avoided Waste Water Treatment Costs	0		$0
(d) Avoided Labor Costs	0		$0
(e) Other (describe)	0		$0
(f) Total [(a) + (b) + (c) + (d) + (e)]			$14,259

Table C-7 Project Local Monetary Benefits and Project Costs

(a) Total Annual Monetary Benefits [(Table C-6, row (f)]		$14,259
(b) Total Annual Project Costs (Table C-3, column III)		$15,414

Table C-8 Applicant's Cost Share and Description

Applicant's cost share %: (from Table C-1, row o, column V)	**60**
Describe how the cost share (based on relative balance between Bay-Delta and Local Benefits) is derived. (See Section A-7 for description.)	
Provide Description in a narrative form.	

Applicant: Cathedral City

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[1]								
	Salaries, wages	$4,000	5	$4,200	$4,200	$0	10	0.1359	$571
	Fringe benefits	$0	0	$0	$0	$0	0	0.0000	$0
	Supplies	$1,000	5	$1,050	$1,050	$0	10	0.1359	$143
	Equipment	$0	0	$0	$0	$0	0	0.0000	$0
	Consulting services	$5,000	5	$5,250	$5,250	$0	10	0.1359	$713
	Travel	$0	0	$0	$0	$0	0	0.0000	$0
	Other	$1,000	5	$1,050	$1,050	$0	10	0.1359	$143
(a)	Total Administration Costs	$11,000		$11,550	$11,550	$0			$1,570
(b)	Planning/Design/Engineering	$0	0	$0	$0	$0	0	0.0000	$0
(c)	Equipment Purchases/Rentals/Rebates/Vouchers	$40,000	5	$42,000	$21,000	$21,000	10	0.1359	$5,708
(d)	Materials/Installation/Implementation	$20,000	5	$21,000	$10,500	$10,500	10	0.1359	$2,854
(e)	Implementation Verification	$0	0	$0	$0	$0	0	0.0000	$0
(f)	Project Legal/License Fees	$5,000	5	$5,250	$5,250	$0	10	0.1359	$713
(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 (Specify)	$0	0	$0	$0	$0	0	0.0000	$0
(l)	Monitoring and Assessment	$6,000	5	$6,300	$3,150	$3,150	10	0.1359	$856
(m)	Report Preparation	$5,000	5	$5,250	$3,000	$2,250	10	0.1359	$713
(n)	**TOTAL**	$87,000		$91,350	$54,450	$36,900			$12,414
(o)	Cost Share -Percentage				60	40			

1- excludes administration O&M.

Applicant: Cathedral City

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

Table C-2: Annual Operations and Maintenance Costs

Operations (1) (I)	Maintenance (II)	Other (III)	Total (IV) (I + II + II)
$1,500	$1,500	$0	$3,000

(1) Include annual O & M administration costs here.

Table C-3: Total Annual Project Costs

Annual Project Costs (1) (I)	Annual O&M Costs (2) (II)	Total Annual Project Costs (III) (I + II)
$12,414	$3,000	$15,414

(1) From Table C-1, row (n) column (IX)
(2) From Table C-2, column (IV)

Table C- 4: Capital Recovery Table (1)

Life of Project (in years)	Capital Recovery Factor
1	1.0600
2	0.5454
3	0.3741
4	0.2886
5	0.2374
6	0.2034
7	0.1791
8	0.1610
9	0.1470
10	0.1359
11	0.1268
12	0.1193
13	0.1130
14	0.1076
15	0.1030
16	0.0990
17	0.0954
18	0.0924
19	0.0896
20	0.0872
21	0.0850
22	0.0830
23	0.0813
24	0.0797
25	0.0782
26	0.0769
27	0.0757
28	0.0746
29	0.0736
30	0.0726
31	0.0718
32	0.0710
33	0.0703
34	0.0696
35	0.0690
36	0.0684
37	0.0679
38	0.0674
39	0.0669
40	0.0665
41	0.0661
42	0.0657
43	0.0653
44	0.0650
45	0.0647
46	0.0644
47	0.0641
48	0.0639
49	0.0637
50	0.0634

(1) Based on 6% discount rate.

Applicant: Cathedr

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

Table C-5 Project Annual Physical Benefits (Quantitative and Qualitative Description of Benefits)

	Qualitative Description - Required of all applicants[1]				**Quantitative Benefits - where data are available [2]**
	Description of physical benefits (in-stream flow and timing, water quantity and water quality) for:	Time pattern and Location of Benefit	Project Life: Duration of Benefits	State Why Project Bay Delta benefit is Direct[3] Indirect [4] or Both	Quantified Benefits (in-stream flow and timing, water quantity and water quality)
Bay Delta	Reduction in Water Usage	Coachella Valley	10 years	Indirect	NA
Local	Reduction in Water Usage	Coachella Valley	10 years	Direct	21,235 ccf per year

[1] The qualitative benefits should be provided in a narrative description. Use additional sheet.

[2] Direct benefits are project outcomes that contribute to a CALFED objective within the Bay-Delta system during the life of the project.

[3] Indirect benefits are project outcomes that help to reduce dependency on the Bay-Delta system. Indirect benefits may be realized over time.

[4] The project benefits that can be quantified (i.e. volume of water saved or mass of constituents reduced) should be provided.

Applicant: Cathedral City

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

Table C-6 Project Annual Local Monetary Benefits

ANNUAL LOCAL BENEFITS	ANNUAL QUANTITY	UNIT OF MEASUREMENT	ANNUAL MONETARY BENEFITS
(a) Avoided Water Supply Costs (Current or Future Source)	49 af	$291.00 per af	$14,259
(b) Avoided Energy Costs	0		$0
(c) Avoided Waste Water Treatment Costs	0		$0
(d) Avoided Labor Costs	0		$0
(e) Other (describe)	0		$0
(f) Total [(a) + (b) + (c) + (d) + (e)]			$14,259

Table C-7 Project Local Monetary Benefits and Project Costs

(a) Total Annual Monetary Benefits [(Table C-6, row (f)]		$14,259
(b) Total Annual Project Costs (Table C-3, column III)		$15,414

Table C-8 Applicant's Cost Share and Description

Applicant's cost share %: (from Table C-1, row o, column V)	**60**
Describe how the cost share (based on relative balance between Bay-Delta and Local Benefits) is derived. (See Section A-7 for description.)	
Provide Description in a narrative form.	