

**2004 Water Use Efficiency Proposal
Proposal Information**

Applying for:

Urban

Agricultural

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

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

- (a) implementation of Urban Best Management Practice, # BMP 5 and Proposed BMP 15
- (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: _____

(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):

Irrigation Training and Research Center

Integration & Enhancement of WBMConserve

4. Project Title:

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

Name, title

Jill Keezer

Mailing address

Sponsored Programs Director
Cal Poly State University
Foundation
Building #38, Room 103
San Luis Obispo, CA 93407

Telephone

(805) 756-1123

Fax.

(805) 7565588

E-mail

jkeezzer@calpoly.edu

6. Contact person (if different):

Name, title.

Mailing address.

Telephone

Fax.

E-mail

7. Grant funds requested (dollar amount):

\$363,812

(from Table C-1, column VI)

\$ 300,000

8. Applicant in-kind contributions (dollar amount):

9. Total project costs (dollar amount):

\$ 663,812

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

10. Percent of State share requested (%)

55 %

(from Table C-1)

11. Percent of local share as match (%)

45%

(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.

(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.)

(a) yes

(b) no

Project has state-wide application

13. Is your project required by regulation, law or contract?

If no, your project is eligible.

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.

(a) yes

(b) no

14. Duration of project (month/year to month/year):

3 years

15. State Assembly District where the project is to be conducted: **Project applies state-wide**

16. State Senate District where the project is to be conducted: **Project applies state-wide**

17. Congressional district(s) where the project is to be conducted: **Project applies state-wide**

18. County where the project is to be conducted: **Project applies state-wide**

19. Location of project (longitude and latitude)

20. How many service connections in your service area (urban)? **Project applies state-wide**

21. How many acre-feet of water per year does your agency serve? **Dose not apply**

22. 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 _____

23. 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
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.

_____	<u>Jill Keezer, Sponsored Programs Director</u>	_____
Signature	Name and title	Date

Section One: Relevance and Importance

Goals

1. Increase the water savings accomplished by urban water users by increasing the number of urban water agencies that are in compliance with the California Urban Water Conservation Council's (CUWCC) Best Management Practice (BMP) 5: Large Landscape Conservation Programs and Incentives, and proposed BMP 15: Residential Landscape Conservation Programs. A cost-effective method of generating ETo-based water budgets and reports that meet CUWCC requirements will make it practical for more water suppliers to implement BMP 5 and BMP 15 programs in the future.
2. Enhance the integration and expand the capabilities of **WBMConserve** (for more details, see "Innovation" section) to fully support the goals and objectives of the CUWCC's BMP 5 and proposed BMP 15. **WBMConserve** consists of two existing Web-based programs which were recently combined to create a single web application. The two programs are Santa Clara Valley Water District's (SCVWD) Web-based Irrigation Technical Assistance Program (WEB-ITAP) and Water Budget Manager (WBM) developed by Irrigation Training and Research Center (ITRC). Both programs were originally funded by CALFED.
3. Facilitate the dissemination of site-specific water management information to all interested users in California through **WBMConserve** as a Web-based program. Potential users include urban water suppliers (wholesale and retail) and their water conservation staff, property owners (including home owners), property managers, landscape contractors, irrigation system operators, and other Green Industry professionals.
4. Provide water agencies and other **WBMConserve** water users with automatic and immediate feedback concerning current site-specific water use and computed ETo budgets.
5. Provide email notification with a Web link to access detailed information about saving water based on the user's specific site water budget and water use. Providing timely feedback is essential for the proper operation and management landscape irrigation systems.
6. Create **WBMConserve** that will use the Internet to:
 - Develop site-specific ET-based water budgets and irrigation schedules
 - Track water budget vs. actual water use
 - Generate Water Use Reports
 - Update Water Use Reports each time new water meter data is entered
 - Accept and process user-entered data (irrigated area and water meter readings, irrigation system performance)
 - Link to CIMIS weather data and produce automatic updates
 - Link to troubleshooting and technical assistance
 - Link to other irrigation and water conservation resources
7. Compile irrigation water budgets and corresponding water use data locally and statewide. Compile data by location (zip code), water supplier, site size, or type of irrigation system.

Objectives

1. Significantly enhance the capabilities of the recently combined Water Budget Manager (WBM) and WEB-ITAP web applications now called **WBMConserve** in order to:
 - a. Maintain the privacy and security of the property owner's water use data and records by:
 - i. Giving the property owner control of the access to specific site water use data.
 - ii. Allowing the property owner to give other users such as property managers, landscape contractor, or irrigation consultants permission to access site data.
 - b. Use the power of the Internet to accept user-entered data.
 - c. Create a process to upload bulk water meter data from retailer billing databases.
 - d. Provide links to CIMIS weather data and other useful sites for up-to-date tracking, and implement an "Expert System" to provide troubleshooting and technical support.
 - e. Track water use vs. ETo-based water budgets entered by user(s), not by water meter data.
 - f. With property owner permission, allow multiple users to track real-time site(s) water use and water budgets as well as edit or add information to the site's records.
 - g. Generate automatic email to property owner and others with property owner permission notification of water budget and water use update.
 - h. Enhance support in the following areas:
 - i. Troubleshooting (especially useful if a site is over-budget)
 - ii. Area Measurement/Calculation
 - iii. Site Surveys/Inspections
 - i. Implement zip code-based comparative data for coordinators and end- or program users (e.g., Inspection, Distribution Uniformity, and Water Application Amounts).
 - j. Create a chat room as support from WBMConserve's other users. Several different forums are possible: general, specific groups such retailer water conservation staff, property managers, landscape contractor, irrigation consultants, etc.
2. Automate the generation of ETo-based water budgets for water retailers where water use records and irrigated landscape areas are available. Two Bay-Area wholesale water suppliers (SCVWD and Sonoma County Water Agency) are acting as liaisons with their retailers. Four or more water retailers within the service area of these wholesalers will participate in the pilot project, as well as two additional water retailers located outside of this service area.
3. Create a program structure that will allow water users, property managers and others to enter all the required data to take advantage of WBMConserve's water tracking email notification features. For a number of retailers, the database structure, billing procedures, or company policy prevent the use of their site-specific water use data. We will attempt to enlist 10 or more property or Green Industry professionals and 10 homeowners to participate in this pilot project.
4. Develop a strategy and procedure for estimating ETo-based water budgets for residential and CII mixed-use water meters.
5. Collect and evaluate water use data to provide an updated estimate of water savings potential from implementing ETo water-based budgets and identify water users in need of technical support.

6. Using the information obtained in the “pilot” application of WBMConserve, develop guidelines to assist homeowners, Green Industry professionals and other water agencies to use Web applications as a statewide program.

Importance

1. Reducing landscape water use reduces the demand on Bay-Delta water during minimum flows, which tends to occur during the summer and fall seasons. Landscape water use is particularly important to the Bay-Delta because two-thirds of California’s population gets some portion of their water supply by way of the Bay Delta¹. As much as 75% of landscape water use occurs during these two seasons.
2. WBMConserve directly supports the goals, objectives and the implementations of CUWCC BMP 5 and the proposed BMP 15 by generating ETo-based water budgets, water use tracking and providing feedback on water use performance.
3. The implementation of BMP 5 and the proposed BMP 15 can reduce the use of irrigation water on California’s irrigated landscapes.
4. The CALFED Record of Decision (ROD) includes CUWCC BMP #5 – Large Landscape Conservation Programs and Incentives. Fully implemented, BMP 5 could permanently reduce total urban water use by as much as 3%¹. The CUWCC states that water saving from implementing ETo water budgets is in the order of 15% for BMP 5 and 10% for BMP 15. California’s water retailers and wholesalers are rushing to implement large landscape water budgets and surveys (a component of BMP 5). Training and educational materials will increase the understanding of the principles and methodology to implement BMP 5.
5. An analysis of current work being done by the Irrigation Training and Research Center (ITRC) of Cal Poly State University, San Luis Obispo indicates the level of water use in excess of ETo-based water budgets is 26% of the total irrigation water applied. The data used in this analysis contained the irrigation water use from 715 dedicated irrigation water meters, for a single year (2004).
6. Many of California's urban water suppliers are struggling to implement BMP 5’s large landscape water budgets and surveys. The factors limiting participation and compliance with the reporting requirements of BMP 5 range from program cost, lack of staff and lack of understanding of the principles of ETo-based water budgets, and complexity of program implementation. The entire process requires significant staff time, not only to generate ETo-based budgets, but also to provide technical assistance to help water users meet their budgets. There is in many cases very little motivation for water users to participate. In addition, there are urban water wholesalers unable to obtain specific water user data from their retailers because of water user privacy issues.
7. If approved, the proposed BMP 15: Residential Landscape will significantly increase the workload on urban water conservation programs simply due to the number of residential water users. Using the Web, homeowners can review their site-specific water budgets and water use records, reducing the demand for one-on-one staff time.

¹ Water Issues, Water Education Foundation, <http://www.water-ed.org/california.asp#waterissues>.

8. WBMConserve generates ETo-based water budgets by site, which can provide real-time feedback to the managers and operators of irrigation systems. This immediate feedback is an essential part of good landscape irrigation water management. Water budgets supplied to the water user at the end of the irrigation season is of very little value to the user and has no effect on reducing the current demand for water. In this case the only hope is that the information in year-end water budgets will be applied to the following year's irrigation water management. The effectiveness of the water budget is significantly enhanced as the elapsed time between the actual water use and receiving feedback from water budget decreases.

Section Two: Technical/Scientific Merit, Feasibility

Program Development

Development will complete the integration and enhance the capabilities of **WBMConserve**. It will focus on simplifying the process of generating ETo-based water budgets and providing the water user timely feedback on their water use. The work described in this proposal is not a “project” as defined by CEQA.

Figure 1 shows a proposed 3-year schedule, divided into five “Tasks”:

1. Initial Development
2. Testing and Evaluation
3. Modification, Testing & Evaluation
4. Outreach and Technical Support
5. Monitoring and Assessment

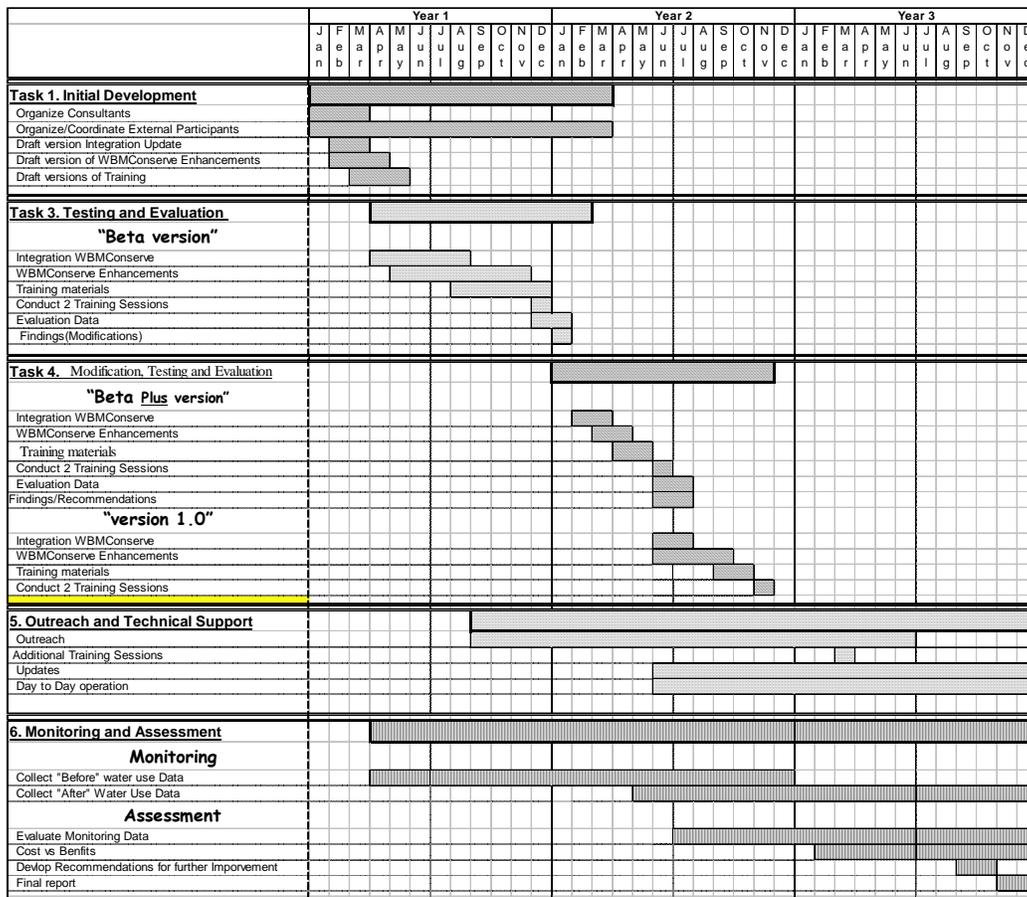


Figure 1. Proposed timeline

Task 1. Initial Development

This task includes computer/web programming consultant selection, and the organization and coordination of work with project partners and cooperators.

“Draft version”

1. Complete the Integration of WBMConserve

- a. Update screen, appearance
- b. Update Navigation
- 2. WBMConserve Enhancements
 - a. Entry of site data owner and other users
 - b. “Troubleshooting” modules for water user exceeding water budget.
 - c. Irrigation News & NewEntry (possible use of Web Board)
 - d. Process for evaluating mixed meter, CII and residential.
 - e. Increase Available Reports
 - Site Reports Summary: site name, description, contacts, budget performance, punch list, and recommendations.
 - Detailed Report: adds inventory, water use, target budget, site survey, field tests, diary
 - Contractor Punch List: action items, project plans and results
 - Thumbnail Report: small charts for all sites keyed to an owner, property manager, landscape contractor or utility surveyor with highlights for significantly over and under budget
 - Retailer Summary Report: summarize data about sites located within a service district, highlight water budget performance and flag sites for technical assistance and/or incentives.
- 3. Training
 - a. Water Supplier (Specific to water retailer database and computer system)
 - How to get started
 - Day to day operation
 - b. Other Users (Specific to property owner, managers, Green Industry professionals)
 - How to get started
 - Day to day operation
 - c. All Users
 - Web based help
 - PowerPoint presentation
 - Training manual

Deliverables

- 1. Draft version integration update
 - Screen update, appearance
 - Update navigation
- 2. Draft version of WBMConserve enhancements
 - Irrigation News & New Entry
 - Reports (site reports, summary, detailed, contractor punch list, thumbnail, retailer summary)
- 3. Draft versions of Training
 - Web based Help
 - Power point Presentation
 - Training manual

Task 2. Testing & Evaluatio.

Using review comments from the pilot project participants, “Deliverables” listed in Task 1 will be modified to develop a “Beta” version for testing and evaluation.

Deliverables – “Beta” version

1. Integration WBMConserve
2. WBMConserve Enhancements
3. Training materials
4. Conduct two Training Sessions
 - Water Suppliers
 - Other WBMConserve users
5. Evaluation Data
 - Workshop attendees
 - Pilot project cooperators
6. Evaluation Findings

Task 3. Modification, Testing, Evaluation

Using findings from Task 2 evaluations and modification of the “Deliverables” in Task 2, develop a “Beta Plus” version. The review from a second set of training sessions will be used to fine-tune the work in progress. This round of evaluation and modification will result in “Version 1.0” of **WBMConserve**. ITRC staff and the project manager will be integral participants in the review and evaluation to ensure that any changes are properly integrated into the program.

Deliverables – “Beta Plus” version

1. Integration WBMConserve
2. WBMConserve Enhancements
3. Training materials
4. Conduct two additional training sessions
5. Evaluation Data
6. Findings (Modifications)

Version 1.0

1. Integration WBMConserve
2. WBMConserve Enhancements
3. Two Training Sessions
 - Water Suppliers
 - Other WBMConserve users

Task 4. Outreach and Technical Support

Once version 1.0 of **WBMConserve** has been completed attempts will be made to recruit additional water supplies and Green Industry professionals to participate.

Deliverables - Version 1.0

1. Summary of activities to enlist additional participants
2. Additional training sessions
3. Report on ongoing technical support activities

Task 5. Monitoring and Assessment

Monitoring. A “Before and After” comparison of water use will be made with participating organizations and/or individual Green Industry professionals. Water use will be expressed as a percentage of CIMIS ETo values with excesses and reductions in water use in acre-feet. This approach accounts for changes in the need for irrigation created by weather, temperature, humidity, sunlight, wind and rainfall. If scheduling permits, two years of water use after program implementation will be collected and evaluated. The objective would be to

get the participation of four or more water retailers, ten or more Green Industry professionals, and ten or more homeowners to participate.

Assessment. The effectiveness of **WBMConserve** will be evaluated based on: participant evaluations, reduced water use, and costs (development, presentation, user participation).

Deliverables

1. A final report will include:

- Results from both “Monitoring and Assessments” activities
- Summary of participant evaluations
- Guidelines for program implementation
- Recommendations if any for future improvements

Qualifications of the Applicants and Cooperators

Resumes for all of the following personnel are included in Appendix 2.

◆ *Project Management*

Professor Robert Walker

Irrigation Training and Research Center, Project Manger
Cal Poly State University, San Luis Obispo, CA

- Curriculum development
- Training Development
- Conducting Workshops
- Previous Project Management

Landscape Irrigation Auditor -1983 (Funding DWR)

Landscape Water Manager - 1993 (Funding Metropolitan Water District, DWR)

Project Design Jan 2001 (funding Bureau of Reclamation)

Water Budget Manager 2001 (CALFED)

Water Budget Manager Enhancement 2004 (Bureau of Reclamation)

◆ *External Cooperators*

Gary Kah

AquaMetrics LLC, Manager (formerly Agtech Associates)
Redwood City, CA

- Using multi-spectral imaging to provide irrigated area data for BMP5.
- Managing Landscape Water Audits for over 1,500 acres
- Helping develop the Landscape Water Management Program
- Computer Programming
- Large Scale Program Management
- Landscape Irrigation Auditor Training

◆ *Partnerships*

This Bay-Area partnership consisting of Santa Clara Valley Water District and Sonoma County Water Agency will participate in three ways:

1. Advise, review and comment on the project design, and provide direction for the work in progress.
2. Act as liaison between selected their participating water retailer and the “pilot project” component of this project.
3. Provide in-kind support for on going technical assistance.

Hossein Ashktorab

Santa Clara Valley Water District
San Jose CA

Manager, Water Use Efficiency Unit

- Providing technical direction
- Coordinating activities
- Managing the implementation of all 14 BMPs required
- Managing the adopted Water Conservation Plan
- Administration of the water conservation and water recycling programs
- Responsible for implementation of CALFED grants for the District
- Developing and managing water conservation programs

Lynn Hulme

Sonoma County Water Agency
Santa Rosa, California

Water Conservation Coordinator, Environmental Resources and Public Affairs
Division

- Coordinating, planning, organizing, directing and evaluating conservation programs
- Directing activities related to demand-side water conservation, water reclamation, conservation planning
- Coordinating the effective use of personnel
- Providing technical staff assistance
- Coordinating budget and program management activities
- Implementing one-of-a-kind water conservation programs
- Residential water audits, large turf audits, commercial water audit

Agency Support

The following agencies have expressed support and/or an interest in participating in the pilot project or using WBMConserve once it is completed. Letters of support are included in the Appendix.

Santa Clara Valley Water District San Jose, California	Sonoma County Water Agency Santa Rosa California
California Urban Water Conservation Council Sacramento California	City of Santa Rosa Santa Rosa, California
San Juan Water District Granite Bay California	California Water Service Company San Jose California
City of Sunnyvale	San Jose Water Company

Sunnyvale, California	San Jose California
City of Gilroy Gilroy, California	City of San Jose, Environmental Service Dept. San Jose California
City of Morgan Hill Morgan Hill California	City of Milpitas Milpitas California
City of San Jose San Jose California	

Dissemination

The dissemination of information regarding the use of **WBMConserve**, water use reduction results and the costs for this pilot program may include the following:

- Use of **WBMConserve** by the Irrigation Training and Research Center (ITRC) as an updated version of their “Auditing and Budgeting” software/program. ITRC will conduct four typical workshops per year with an average of 25 attendees per workshop.
- An email sent to all previous participants of ITRC’s Designer/Manager School of Irrigation with instructions on how to access the newly developed **WBMConserve** with contact information and a schedule of workshops.
- An email sent to water users in the databases of Green Industry organizations such as:
 - California Urban Water Conservation Council
 - Department of Water Resources
 - Water Retailers
 - Golf Course Superintendents
 - Irrigation Association
 - California Landscape Contractors Association
- Internet links on the following websites, which are accessed by hundreds of irrigation professionals on a daily basis:
 - Irrigation Training and Research Center
 - Current Water Budget Manager
 - WEB-ITAP
 - Irrigation Association
 - DWR (CIMIS)
 - Santa Clara Water District
 - Sonoma County Water Agency
 - Other water retailers and water retailer organizations
- Press releases forwarded to organizations such as:
 - Selected newspapers
 - Department of Water Resources
 - Water Retailers
 - Irrigation Association
 - California Landscape Contractors Association

Innovation

Past Work

The Irrigation Training and Research Center (ITRC) of California Polytechnic State University, San Luis Obispo (Cal Poly) conducted an investigation, funded by the Bureau of Reclamation, to define the need to update the existing Landscape Water Management (LWM) program. To define the need for an update of LWM, ITRC conducted an industry survey, made presentations to Green Industry professional groups, interviewed selected industry representatives and finally reviewed other existing programs.

Findings from this report include the following:

1. There is significant support for the LWM program.
2. The program should be expanded to include homeowners.
3. The LWM can be made more useful if it can:
 - Track water use and recalculate irrigation schedules to reduce water use
 - Track water use over multiple sites
 - Permit multi-user access to data
 - Support special needs of central control systems and ETo-based controller
 - Address BMP 5 requirements for water utilities
4. LWM training needs to be more accessible with local workshops and updated sessions, plus expanded technical support.
5. The Web-based program should be utilized to facilitate user access and technical support.

A design for the upgrade of LWM was developed as part of this work done for the US Bureau of Reclamation (USBR). The upgrade of LWM was named Water Budget Manager (WBM). The design that resulted from this investigation continues to guide efforts to produce a complete tool to support the water management and water conservation efforts of water suppliers, water users and Green Industry professionals.

Two projects previously funded by CALFED in 2001 now form the foundation for the work currently in progress and the enhancements included in this proposal:

1. Web-based Irrigation Technical Assistance Program (**WEB-ITAP**) developed by the Santa Clara Valley Water District – included water budgeting and more.
2. Water Budget Manager (**WBM**) developed by ITRC – included only “basic irrigation scheduling” component of current work.

Work in Progress

The ITRC, with funding from the USBR Mid-Pacific Region, is currently enhancing the computational capabilities of WBM so that it will have the same functionality of the now-outdated LWM software. The Santa Clara Valley Water District (SCVWD) is funding work to combine or “stitch together” both WEB-ITAP and the enhanced WBM. The combined WBM and WEB-ITAP has been named **WBMConserve**. The results of this work by SCVWD will be a single Web application that provides water budgeting, landscape irrigation audits and irrigation scheduling. It is anticipated that the first version of **WBMConserve** will be completed by June 2005 and made available statewide to any interested user.

Integration WBMConserve - The current efforts to combine WBM and WEB-ITAP into a single application named **WBMConserve** are not seamless, because the screen layouts and webpage navigation used in WBM and WEB-ITAP are different. However, the capabilities of **WBMConserve** include all of the functionality of both WBM and WEB-ITAP. The integration or combining of WEB_ITAP and WBM will be facilitated by creating new screen designs and navigation strategy for **WBMConserve**.

WBMConserve Enhancements-The proposed enhancements will result in a cost-effective method of generating ETo-based water budgets and reports that meet CUWCC requirements. A simple, easy to use tool for developing ETo-based water budgets will make it practical for water retailers to meet the objectives and goals of both BMP 5 and the proposed BMP 15. The most significant enhancements to WBMConserve include:

- Large selection of the types of report available to meet the needs of a wide range of users.
- Allowing the water user to enter their own site data simplifies the process by eliminating the need for **WBMConserve** to have access to water retailer customer water use data.
- Track water use by property owner site(s) (not by water meters)
- Ability to estimate water budgets and water use tracking (both CII and residential water meters)
- The Web-based “troubleshooting” module will provide some assistance to water users exceeding their budget, without requiring the assistance of water conservation staff.

Access through the Web

Web access will make specific site data available at any time and anywhere there is an Internet connection. This immediate feedback is very valuable to the operator/manager of irrigation systems. Users can make corrections in the system during the current irrigation season. The effectiveness of the water budget is significantly diminished as the elapsed time between the actual water use and receiving the feedback from water budget increases.

Benefits

There are at least two ways to look at the program benefits:

1. *Qualitatively*: How does the proposed work improve the process and results of water conservation?
2. *Quantitatively*: What are the actual water savings potential?

A brief description of Qualitative benefits is included in the required “Table C-5”. An expanded description of the Qualitative and the potential Quantifiable benefits are described below. Table 1 Qualitative Description of Benefits

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

QUALITATIVE DESCRIPTION - REQUIRED OF ALL APPLICANTS¹				Quantified Benefits²
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 Direct³, Indirect⁴ or Both	Quantified Benefits
Bay-Delta: Reducing landscape irrigation water use reduces the demand on Bay-Delta water during minimum flows, which tends to occur during the summer and fall. See the discussion below.	No data	The technical assistance project will cover a period of three year, but once in place WBMConserve could continue to serve as a conservation tool for ten or more years	Direct: can reduce the demand for water during the peak use period. Indirect benefit:: Reduce the demand for water that passes the Delta	No Data See the discussion below
Local: This does not really apply. The project as proposed has the potential for a state wide application	No data		Not Applicable	Not data

¹The qualitative benefits should be provided in a narrative description. Use additional sheets to describe the benefits.

²The project benefits that can be quantified (i.e. volume of water saved or mass of constituents reduced) should be provided.

³Direct benefits are project outcomes that contribute to a CALFED objective within the Bay-Delta system during the life of the project.

⁴Indirect benefits are project outcomes that help to reduce dependency on the Bay-Delta system. Indirect benefits may be realized over time.

Qualitative Benefits-WBMConserve provides water conservation/water management tools that are accessible by any interested user via the Internet. As a Web application, WBMConserve will fully support BMP 5 and the proposed BMP 15. Using WBMConserve will make it easier and cost-effective to implement BMP 5 and BMP 15. Making a tool easier to use means it is more likely that more water retailers will implement programs that will meet the BMP requirements. Implementing more BMP 5 programs means a reduction in the water used, which results in both environmental and energy conservation benefits.

Reducing landscape irrigation water use reduces the demand on Bay-Delta water during minimum flows, which tends to occur during the summer and fall. Landscape irrigation water use is particularly important to the Bay-Delta because two-thirds of California's population gets some portion of their water supply by way of the Bay Delta². As much as 75% of landscape water use occurs during the summer and fall.

Nearly all urban water must be pumped at some point along its path to end users. The amount of pumping or energy used will vary significantly between water suppliers, across the state and even within a supplier's service area. Reducing irrigated landscape water use will reduce the amount of energy needed to pump the irrigation water.

The qualitative benefits of using a web-based approach of providing a water conservation/water management tool include:

1. Direct access to current Water Management Data, providing the end user with:
 - Real-time weather
 - Plant water requirements by month
 - Irrigation performance guidelines
 - All current resource data, without the requirement of one-on-one support
2. Immediate software updates via the server software
3. Immediate performance updates available to all users
 - Reduced costs to implement updates
 - Allows for smaller updates as needed, instead of occasionally in large projects
4. Utilization of site data by multiple end-users, including property managers, landscape contractors, and HOA board members
 - Provides management with the tools to delegate and monitor tasks
 - Provides summary data for all involved, with password-protected levels of access
 - Provides specific site data on a real-time basis as required
5. On-line Technical Support, including training and resource materials
 - Self-paced training available at the users' desired level of detail
 - Anytime-anywhere training available
 - Access to a broad range of resource materials for state universities and community colleges

² Water Issues, Water Education Foundation, <http://www.water-ed.org/california.asp#waterissues>.

6. Calculation and viewing of statistical data
 - Real-time documentation of site specific data
 - Analysis of performance, past accomplishments and future opportunities
7. As an on-line system, provides the ability to send e-mail reminders of water budget performance
 - Encourages BMP 5 compliance
 - Improves program impact by keeping it visible to all levels of end-user
 - Transmission of key project action items to encourage schedule compliance
8. Summary reporting
 - Ability to view, analyze and compare data from all of a customer's sites
 - Summarizes data to document BMP5 program compliance
 - Provides summary reports for water utilities to analyze customer water use

It not possible to predict how many water suppliers and other Green Industry professionals will actually use the water conservation/water management tools that will be available with the completion of the proposed enhancement of **WBMConserve**. However, the potential for reducing the demand for landscape irrigation water is enormous. The actual reductions in water use will depend on the number of retailers and property owners who choose to use **WBMConserve**.

How much landscape water can actually be saved? There is a large range of estimates of potential water savings from water conservation efforts. Data from three Bay-area water retailers indicates a great deal of over-irrigation. One year of data from three water retailers and total of 715 irrigated sites with dedicated irrigation meters was evaluated. A total of 3960 ac-ft was applied at the 715 sites. The excess water applied was 1050 ac-ft (26% of the applied water) for the same period of time. The excess water applied was computed for each billing period as the difference between the computed ETo based water budget and the water applied. The average retail value of the water was \$1.80 per 100 ft³, or \$784 per ac-ft. This means the retail value of the excess water applied was \$823,000. It is not realistic to assume that all of the excess can be captured as water savings, but much of it could be reduced. The reduction in irrigation water depends on the commitment of the retailers and their water users. The tools that **WBMConserve** will provide can make it significantly easier to increase the water savings by increasing the number of urban water agencies that are in compliance with BMP 5 and proposed BMP 15.

In other estimates, Metropolitan Water District of Southern California³ estimates that their landscape water conservation programs will save from 1.8 % of the total urban water demand in 2010 to 2% in the year 2020. A 1991 evaluation of irrigation auditing for the North Marin Water District⁴ (NMWD) concluded that irrigation system auditing and scheduling could save 3% of the water delivered by NMWD. According to Department of Water Resources⁵ estimates, urban landscape water saved for the years 2010 and 2020 could reach 114,000 ac-ft and 127,000 ac-ft per year, respectively. ITRC approximates that the likely potential savings of urban landscape water statewide is 1%.

³ University of California, Riverside Turfgrass Research Program, UCRTRAC Newsletter, August 1999.

⁴ Evaluation of Energy and Water Savings for North Marin Water District, NEOS Corporation, Contract #DE-AC6586WA00497, Dec 1991

⁵ California Water Plan Executive Summary, Bulletin 160-93, California Department of Water Resources, Table ES-6, pg 5, October 1994.

The value of these water savings depends on the value of an acre-foot of water. The value of water (without energy costs) can be as low as \$10 per acre-foot or as much as \$100 per acre-foot or more, depending on the location within California. Therefore, even at the minimum of \$10 per ac-ft, the value of the potential savings ranges from \$1,140,000/yr in the year 2010 to \$1,270,000/yr in the year 2020.

Budget Justification

In-Kind Contributions - Each of the cooperating water suppliers will contribute staff time (wages and benefits), computer usage, communication, office supplies and other miscellaneous cost. The hourly rate necessary to cover these expenses is estimated to be \$75/hour. The project participants will contribute approximately 2 man-days per month per agency for each of the three years of this project. There are presently a total of seven water suppliers that indicated their willingness to participate in the pilot project. A total of approximately 4,000 man-hours will be contributed by the participating agencies, with an estimated value of \$300,000. It is likely that the hours of support contributed by the cooperating water agencies will exceed the estimated value of 2 man-days per agency per month. This will result in a total in-kind contribution significantly larger than the estimated \$300,000.

Salaries and Wages - The salary rates are based on the California State University and Cal Poly Foundation established salary rates paid during the 2004-2005 academic year (July 1 – June 30). Faculties in the California State University system teach a full twelve units each of three academic quarters per nine-month academic year. The salary and wage rates for all employees include an annual projected 4.5% salary increase. The rates shown are for budgetary purposes; the actual rates in effect at the time the work is performed will be charged to the project. The administrative/clerical staff provides important direct support on project work such as, but not limited to, assistance with technical report preparation, editorial review, and distribution.

Faculty and Staff Benefits - Faculty and staff fringe benefits include a benefit package consisting of FICA, State Unemployment Insurance (SUI), Worker's Compensation, non-industrial leave, medical, dental, and life insurance benefits, and retirement benefits (PERS). Rates vary with the number of dependents and type of coverage. An historic average of 34% - 57% is used for budgetary purposes and is determined by the work the employees are doing and the environment in which they do their work. Benefits for faculty summer salary and adjusted base salary include FICA, SUI and Workers Compensation and are calculated at 13.2% - 13.7%. Only actual rates in effect for each individual at the time the work is performed will be charged to the sponsor.

Student Benefits - Student/Intermittent benefits include FICA (when applicable), SUI, and Worker's Compensation. An historical average of 2.2% - 19.3% is used for budgetary purposes and is determined by the work the employees are doing and the environment in which they do their work. Only actual rates in effect for each individual at the time the work is performed will be charged to the sponsor.

Indirect Costs - Cal Poly State University uses for all projects the Federal negotiated indirect rate of 35% of modified total direct costs which do not include equipment, tuition or that part of subcontracts over \$25,000.

Operating Expenses -

Supplies (Printing, photocopying, report publication, miscellaneous supplies)

Materials and supplies in support of this project include general office supplies, training supplies and site visit supplies and materials. These include printer paper, printer cartridges, planning board, binders, transparencies, posterboard, white board markers, presentation/display boards and paper, sheet protectors, folders, graph papers, tape measures, notepads and notebooks, labels, plotting paper, ink and heads, network switches, film developing costs, rental of items such as LCD projector and digital camera. The rate charged for photocopies is based on historical data of cost recovery. The current rate approved by the Cal Poly Foundation and charged to projects is \$0.05 times the total number of pages copied.

Communications:

Communications expenses include the costs of phone, fax, and postage. These costs are based on historical estimates. Only actual expenses will be charged to the project.

Computer Usage:

The Cal Poly Irrigation Training and Research Center (ITRC) charges computer usage time to projects when ITRC computers are used for project work. The rates charged are based on historical data of cost recovery. The current rate approved by the Cal Poly Foundation and charged to projects is \$1.50 per hour, times the total number of hours charged to project work.

Domestic Travel:

Travel expense in includes lodging, meals and vehicle mileage. Based on previous trips to the Bay area the lodging was estimated at \$105 per day. The current rates approved by the Cal Poly Foundation for meals are \$45 per day and vehicle use is \$0.36/mile.

Computer Programming Subcontract:

Estimates of the computer programming contract cost are based man-hours required for programming and an hourly charge rate of 110 per hour. The hourly charge is based on a review of proposals for computer programming work for a current project.

Project Budget

The project costs are summarized in Table 2 by task and year. The project costs with in-kind contributions are shown in Table 3 (Table C-1) as required by the request for proposal.

Table 1. Project costs summarized by task and year.

	Jan-Dec 05	Jan-Dec 06	Jan-Dec 06	Total
<u>1. Initial Development</u>	\$22,992	\$1,620		\$24,612
<u>2. Evaluation and Testing</u>	\$59,279	\$6,165		65443.56152
<u>3. Initial Modification</u>		\$79,966		\$79,966
<u>4. Final Evaluation and Modification</u>	\$559	\$20,152	\$29,959	\$50,670
<u>5. Monitoring and Assessment</u>	\$5,942	\$20,714	\$39,920	\$66,577
Total Operating Expenses	\$88,772	\$128,618	\$69,879	\$287,270
Total Indirect	\$27,510	\$30,022	\$19,010	\$76,542
Total Project Costs	\$116,282	\$158,640	\$88,889	\$363,812

Table 2 (Table C-1) Project Cost and In-kind Contributions

Table C-1: Project Costs (Budget) in Dollars								
Category	Project Costs	Contingency % (ex. 5 or 10)	Project Cost + Contingency	Applicant Share	State Share Grant	Life of investme nt (years)	Capital Recovery Factor	Annualiz ed Costs
(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)	(VIII)	(IX)
	\$		\$	\$	\$			\$
Administration ¹								
Salaries, wages	\$35,016	0	\$35,016	\$0	\$35,016			
Fringe benefits	\$4,702	0	\$4,702	\$0	\$4,702			
Supplies	\$8,833	0	\$8,833	\$0	\$8,833			
Equipment	\$3,200	0	\$3,200	\$0	\$3,200			
Consulting services	\$185,784	0	\$185,784	\$0	\$185,784			
Travel	\$13,304	0	\$13,304	\$0	\$13,304			
Other (Indirect)	\$66,056	0	\$66,056	\$0	\$66,056			
(a) Total Administration Costs	\$316,895		\$316,895	\$0	\$316,895			
(b) Planning/Design/Engineering	Basic planning and project DESIGN were completed in Jan 2001, work was funded by the Bureau of Reclamation							
Equipment								
(c) Purchases/Rentals/Rebates/Vouchers	\$0	0	\$0	\$0	\$0			
(d) Materials/Installation/Implementation	\$0	0	\$0	\$0	\$0			
(e) Implementation Verification	\$0	0	\$0	\$0	\$0			
(f) Project Legal/License Fees	\$0	0	\$0	\$0	\$0			
(g) Structures	\$0	0	\$0	\$0	\$0			
(h) Land Purchase/Easement	\$0	0	\$0	\$0	\$0			
Environmental								
(i) Compliance/Mitigation/Enhancement	\$0	0	\$0	\$0	\$0			
(j) Construction	\$0	0	\$0	\$0	\$0			
(k) In-Kind Contributions	\$300,000	0	\$300,000	\$300,000	\$0			
(l) Monitoring and Assessment	\$36,491	0	\$36,491	\$0	\$36,491			
(m) Report Preparation	\$10,426	0	\$10,426	\$0	\$10,426			
(n) TOTAL	\$663,812		\$663,812	\$300,000	\$363,812			
(o) Cost Share -Percentage				45%	55%			

APPENDIX 1
LETTER OF SUPPORT

January 7, 2005

Ms. Debra Gonzalez
Office of Water Use Efficiency
Department of Water Resources
901 P Street
Sacramento, CA 95814

RE: Support Letter for Integration and Enhancement of *WBMConserve*

Dear Ms. Gonzalez:

The California Urban Water Conservation Council wishes to indicate its support for Proposition 50 Funding for the above-mentioned project. The purposes of the project proposal are the following:

1. Increase the water savings accomplished by urban water users by increasing the number of urban water agencies that are in compliance with the California Urban Water Conservation Council's Best Management Practice (BMP) 5: *Large Landscape Conservation Programs and Incentives*, and proposed BMP 15: *Residential Landscape Conservation Programs*. A cost-effective method of generating ETo-based water budgets and reports that meet the Council's requirements will make it practical for more water suppliers to implement BMP 5 and BMP 15 programs in the future.
2. Expand the capabilities of *WBMConserve* to fully support the goals and objectives of BMP 5 and proposed BMP 15. *WBMConserve* consists of two existing Web-based programs which were combined to create a single web application. The two programs are Santa Clara Valley Water District's (SCVWD) Web-based Irrigation Technical Assistance Program (WEB-ITAP) and Water Budget Manager (WBM) developed by Irrigation Training and Research Center (ITRC). Both programs were originally funded by a CALFED grant application.
3. Disseminate site-specific water management information to all interested users in California through *WBMConserve* as a Web-based program. Potential users include urban water suppliers (wholesale and retail) and their water conservation staff, property owners (including home owners), property managers, landscape contractors, irrigation system operators, and other Green Industry professionals.
4. Provide water agencies and other *WBMConserve* water users with automatic and immediate feedback concerning current site-specific water use and computed ETo budgets.
5. Provide email notification with a Web link to access detailed information about saving water based on the user's specific site water budget and water use. Providing timely feedback is essential for the proper operation and management landscape irrigation systems.
6. Modify *WBMConserve* to enable Internet tools to:
 - Develop site-specific ET-based water budgets and irrigation schedules;
 - Track water budget vs. actual water use;



455 Capitol Mall
Suite 703
Sacramento
California 95814

PHONE
916/552-5885
FAX
916/552-5877

www.cuwcc.org

- Generate Water Use Reports;
- Update Water Use Reports each time new water meter data is entered;
- Accept and process user-entered data (irrigated area and water meter readings, irrigation system performance);
- Link to CIMIS weather data and produce automatic updates;
- Link to troubleshooting and technical assistance;
- Link to other irrigation and water conservation resources;
- Compile irrigation water budgets and corresponding water use data locally and statewide; and
- Compile data by location (zip code), water supplier, site size, or type of irrigation system.

This project will fill a needed gap in the promotion of efficient irrigation system management. The Council strongly urges that this project be funded. The Council is even willing to offer its internet web site as a host for this important project.

Sincerely yours,



Mary Ann Dickinson
Executive Director



COMMUNITY SERVICES DEPARTMENT

City of Gilroy

7351 Rosanna Street
Gilroy, California
95020-6197

Telephone (408) 846-0460
Operations (408) 846-0444
Facsimile (408) 846-0445

ROBERT J. CONNELLY
DIRECTOR

January 3, 2005

California Department of Water Resources
Office of Water Use Efficiency
P.O. Box 942836
Sacramento, CA 94236-0001

Re: Proposition 50 Water Use Efficiency Grant Proposal: "WBM Conserve"

To Whom It May Concern:

The Santa Clara Valley Water District, California Polytechnic State University at San Luis Obispo's Irrigation Training and Research Center, and Sonoma County Water Agency, are in the process of applying for a Proposition 50 Water Use Efficiency grant to help fund an irrigation efficiency program called "WBM (Water Budget Manager) Conserve." Our agency is sending this letter to express our full support for this proposed program.

One of the goals of the Proposition 50 grant program is to benefit the Bay-Delta System through water supply reliability and water quality projects. The proposed WBM Conserve program is designed to help achieve this goal and will help our service area by conserving water. WBM Conserve will integrate and expand the capabilities of the recently combined WEB-ITAP (irrigation training assistance program), which generates water budgets, and Water Budget Manager (WBM), which evaluates irrigations system performance and generates irrigation schedules. WBM Conserve will assist water agencies meet the requirements of BMP 5 and the proposed BMP 15.

We encourage the California Department of Water Resources to consider funding for this grant proposal.

Sincerely,

Lisa Jensen
Environmental Programs Coordinator



CALIFORNIA WATER SERVICE COMPANY
1720 NORTH FIRST STREET • SAN JOSE, CA 95112-4598 • (408) 367-8200

December 28, 2004

California Department of Water Resources
Office of Water Use Efficiency
P.O. Box 942836
Sacramento, CA 94236-0001

Re: Proposition 50 Water Use Efficiency Grant Proposal: "WBM Conserve"

To Whom It May Concern:

The Santa Clara Valley Water District, California Polytechnic State University at San Luis Obispo's Irrigation Training and Research Center, and Sonoma County Water Agency, are in the process of applying for a Proposition 50 Water Use Efficiency grant to help fund an irrigation efficiency program called "WBM (Water Budget Manager) Conserve." Our agency is sending this letter to express our full support for this proposed program.

One of the goals of the Proposition 50 grant program is to benefit the Bay-Delta System through water supply reliability and water quality projects. The proposed WBM Conserve program is designed to help achieve this goal and will help our service area by conserving water. WBM Conserve will integrate and expand the capabilities of the recently combined WEB-ITAP (irrigation training assistance program), which generates water budgets, and Water Budget Manager (WBM), which evaluates irrigations system performance and generates irrigation schedules. WBM Conserve will assist water agencies meet the requirements of BMP 5 and the proposed BMP 15.

We encourage the California Department of Water Resources to consider funding for this grant proposal.

Sincerely,

A handwritten signature in black ink, appearing to read "Paul Ekstrom".

Paul Ekstrom
Vice President, Corporate Secretary
California Water Service Company

DISTRICT OFFICES: ANTELOPE VALLEY • BAKERSFIELD • BAYSHORE • BEAR GULCH • CHICO • DIXON • EAST LOS ANGELES • KERN RIVER VALLEY • KING CITY • LIVERMORE • LOS ALTOS • MARYSVILLE • OROVILLE • RANCHO DOMINGUEZ • REDWOOD VALLEY • SALINAS • SELMA • STOCKTON • VISALIA • WESTLAKE • WILLOWS



CALIFORNIA WATER SERVICE COMPANY
1720 NORTH FIRST STREET • SAN JOSE, CA 95112-4598 • (408) 367-8200

December 28, 2004

California Department of Water Resources
Office of Water Use Efficiency
P.O. Box 942836
Sacramento, CA 94236-0001

Re: Proposition 50 Water Use Efficiency Grant Proposal: "WBM Conserve"

To Whom It May Concern:

The Santa Clara Valley Water District, California Polytechnic State University at San Luis Obispo's Irrigation Training and Research Center, and Sonoma County Water Agency, are in the process of applying for a Proposition 50 Water Use Efficiency grant to help fund an irrigation efficiency program called "WBM (Water Budget Manager) Conserve." Our agency is sending this letter to express our full support for this proposed program.

One of the goals of the Proposition 50 grant program is to benefit the Bay-Delta System through water supply reliability and water quality projects. The proposed WBM Conserve program is designed to help achieve this goal and will help our service area by conserving water. WBM Conserve will integrate and expand the capabilities of the recently combined WEB-ITAP (irrigation training assistance program), which generates water budgets, and Water Budget Manager (WBM), which evaluates irrigations system performance and generates irrigation schedules. WBM Conserve will assist water agencies meet the requirements of BMP 5 and the proposed BMP 15.

We encourage the California Department of Water Resources to consider funding for this grant proposal.

Sincerely,

A handwritten signature in black ink, appearing to read "Paul Ekstrom".

Paul Ekstrom
Vice President, Corporate Secretary
California Water Service Company

DISTRICT OFFICES: ANTELOPE VALLEY • BAKERSFIELD • BAYSHORE • BEAR GULCH • CHICO • DIXON • EAST LOS ANGELES • KERN RIVER VALLEY • KING CITY • LIVERMORE • LOS ALTOS • MARYSVILLE • ORVILLE • RANCHO DOMINGUEZ • REDWOOD VALLEY • SALINAS • SELMA • STOCKTON • VISALIA • WESTLAKE • WILLOWS



PUBLIC WORKS DEPARTMENT
100 EDES COURT
MORGAN HILL, CA 95037-5301
ENGINEERING: 408-776-7337
MAINTENANCE: 408-776-7333
FAX: 408-779-6282
WWW.MORGAN-HILL.CA.GOV

January 4, 2005

California Department of Water Resources
Office of Water Use Efficiency
P.O. Box 942836
Sacramento, CA 94236-0001

Re: Proposition 50 Water Use Efficiency Grant Proposal: "WBM Conserve"

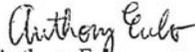
To Whom It May Concern:

The Santa Clara Valley Water District, California Polytechnic State University at San Luis Obispo's Irrigation Training and Research Center, and Sonoma County Water Agency, are in the process of applying for a Proposition 50 Water Use Efficiency grant to help fund an irrigation efficiency program called "WBM (Water Budget Manager) Conserve." Our agency is sending this letter to express our full support for this proposed program.

One of the goals of the Proposition 50 grant program is to benefit the Bay-Delta System through water supply reliability and water quality projects. The proposed WBM Conserve program is designed to help achieve this goal and will help our service area by conserving water. WBM Conserve will integrate and expand the capabilities of the recently combined WEB-ITAP (irrigation training assistance program), which generates water budgets, and Water Budget Manager (WBM), which evaluates irrigations system performance and generates irrigation schedules. WBM Conserve will assist water agencies meet the requirements of BMP 5 and the proposed BMP 15.

We encourage the California Department of Water Resources to consider funding for this grant proposal.

Sincerely,


Anthony Eulo
Program Administrator



January 3, 2005

California Department of Water Resources
Office of Water Use Efficiency
P.O. Box 942836
Sacramento, CA 94236-0001

Re: Proposition 50 Water Use Efficiency Grant Proposal: "WBM Conserve"

To Whom It May Concern:

Santa Clara Valley Water District, California Polytechnic State University at San Luis Obispo's Irrigation Training and Research Center, and Sonoma County Water Agency are in the process of applying for a Proposition 50 Water Use Efficiency grant to help fund an irrigation-efficiency program called "WBM (Water Budget Manager) Conserve." Our agency is sending this letter to express our full support for this proposed program.

One of the goals of the Proposition 50 grant program is to benefit the Bay-Delta System through water supply reliability and water quality projects. The proposed WBM Conserve program is designed to help achieve this goal and will help our service area by conserving water. WBM Conserve will integrate and expand the capabilities of the recently combined WEB-ITAP (irrigation training assistance program), which generates water budgets, and Water Budget Manager (WBM), which evaluates irrigations system performance and generates irrigation schedules. WBM Conserve will assist water agencies meet the requirements of BMP 5 and the proposed BMP 15.

We encourage the California Department of Water Resources to consider funding for this grant proposal.

Sincerely,

Sincerely,

A handwritten signature in black ink, appearing to read "Val Conzet", written over a horizontal line.

Val Conzet
Public Works Supervisor

cc: File

ADDRESS ALL MAIL TO: P.O. BOX 3707 SUNNYVALE, CALIFORNIA 94088-3707
For deaf access, call TDD/TTY (408) 730-7501



Environmental Services Department
MUNICIPAL WATER SYSTEM DIVISION

January 3, 2005

California Department of Water Resources
Office of Water Use Efficiency
P.O. Box 942836
Sacramento, CA 94236-0001

Re: Proposition 50 Water Use Efficiency Grant Proposal: "WBM Conserve"

To Whom It May Concern:

The Santa Clara Valley Water District, California Polytechnic State University at San Luis Obispo's Irrigation Training and Research Center, and Sonoma County Water Agency, are in the process of applying for a Proposition 50 Water Use Efficiency grant to help fund an irrigation efficiency program called "WBM (Water Budget Manager) Conserve." Our agency is sending this letter to express our full support for this proposed program.

One of the goals of the Proposition 50 grant program is to benefit the Bay-Delta System through water supply reliability and water quality projects. The proposed WBM Conserve program is designed to help achieve this goal and will help our service area by conserving water. WBM Conserve will integrate and expand the capabilities of the recently combined WEB-ITAP (irrigation training assistance program), which generates water budgets, and Water Budget Manager (WBM), which evaluates irrigations system performance and generates irrigation schedules. WBM Conserve will assist water agencies meet the requirements of BMP 5 and the proposed BMP 15.

We encourage the California Department of Water Resources to consider funding for this grant proposal.

Sincerely,

Mansour M. Nasser, P. E.
Water Utility Manager
Municipal Water System Division

MMN:eb
le39



5750 ALMADEN EXPWY
 SAN JOSE, CA 95118-3686
 TELEPHONE (408) 265-2600
 FACIMILE (408) 266-0271
 www.valleywater.org
 AN EQUAL OPPORTUNITY EMPLOYER

Mr. Robert Walker
 Irrigation Training and Research Center
 California Polytechnic State University
 San Luis Obispo, CA 93405

Re: California Department of Water Resources Prop 50 Grant Application "WBM Conserve"

Dear Mr. Walker,

The Santa Clara Valley Water District is in support of the Irrigation Training and Research Center (ITRC), as lead agency in the grant proposal being submitted to the California Department of Water Resources under the Proposition 50 Water Use Efficiency grant proposal solicitation on January 11, 2005.

Water Budget Manager (WBM) Conserve will integrate and expand the capabilities of the recently combined WEB-ITAP (irrigation training assistance program), which generates water budgets, and Water Budget Manager, which evaluates irrigations system performance and generates irrigation schedules.

For water agencies that have irrigated landscape areas and water use data for dedicated water meters the goal would be to automate the process of generating water use reports each billing period. The automation would include immediate notification of excess water use via email with Web links to the water user's specific site reports with suggestions of corrective action. WBM Conserve will assist water agencies meet the requirements of BMP 5 and the proposed BMP 15.

After completion of the pilot program, it is envisioned that this program would be available as a state-wide web application to increase the number of water agencies that are in compliance with the California Urban Water Conservation Council's (CUWCC) Best Management Practice (BMP) 5 and (proposed) BMP 15 by producing ETo based water budgets and meeting the CUWCC reporting requirements.

As a partner in this project, we are sending this letter to confirm our commitment to participating in this program. We look forward to being a partner with ITRC and other community organizations in this innovative water use efficiency grant program.

Sincerely,

Hossein Ashktorab
 Hossein Ashktorab, Ph.D.
 Manager, Water Use Efficiency Unit

The mission of the Santa Clara Valley Water District is a healthy, safe and enhanced quality of living in Santa Clara County through watershed stewardship and comprehensive management of water resources in a practical, cost-effective and environmentally sensitive manner.



FILE:WC/40-0-20

January 4, 2005

Mr. Robert Walker
Irrigation Training and Research Center
Cal Poly
San Luis Obispo, CA 93405

**RE: CALIFORNIA DEPARTMENT OF WATER RESOURCES PROP 50 GRANT
APPLICATION "PILOT WEB-BASED BMP 5 PROGRAM"**

Dear Bob Walker:

I am writing to express support for designating the Irrigation Training and Research Center (ITRC), as lead agency in the grant proposal being submitted to the California Department of Water Resources under the Proposition 50 Water Use Efficiency grant proposal solicitation on January 11, 2005. I understand that Sonoma County Water Agency, as external cooperator as defined by the Department of Water Resources, will be an indirect recipient of these funds if the grant is awarded to the ITRC. Sonoma County Water Agency intends to participate in three ways:

1. Advise, review and comment on the project design, and provide direction for the work in progress.
2. Act as liaison between selected their participating water retailer and the "pilot project" component of this project.
3. Provide in-kind support for on going technical assistance.

My staff looks forward to working with you on this pilot program, and will work to support the grant application and encourage state funding for this project.

This letter confirms our intent to participate in this program and provide the necessary in-kind support as called for in the grant application. We look forward to being a partner with ITRC and other community organizations in this innovative water use efficiency grant program.

Sincerely,

Randy D. Poole
General Manager

c Lynn Hulme, Water Conservation Coordinator

rs3/ucl/rw/wrconsv/hulme/letter of commitment BMP 5 TDA EDIT

P.O. Box 11628 - Santa Rosa, CA 95406 - 2150 W. College Avenue - Santa Rosa, CA 95401 - (707) 526-5370 - Fax (707) 544-6123



**San Jose
Water
Company**

374 West Santa Clara St.
San Jose, CA 95196-0001
Phone 408 279-7800
Fax 408 279-7934

January 4, 2005

California Department of Water Resources
Office of Water Use Efficiency
P.O. Box 942836
Sacramento, CA 94236-0001

Re: Proposition 50 Water Use Efficiency Grant Proposal: "WBM Conserve"

To Whom It May Concern:

The Santa Clara Valley Water District, California Polytechnic State University at San Luis Obispo's Irrigation Training and Research Center, and Sonoma County Water Agency, are in the process of applying for a Proposition 50 Water Use Efficiency grant to help fund an irrigation efficiency program called "WBM (Water Budget Manager) Conserve." Our agency is sending this letter to express our full support for this proposed program.

One of the goals of the Proposition 50 grant program is to benefit the Bay-Delta System through water supply reliability and water quality projects. The proposed WBM Conserve program is designed to help achieve this goal and will help our service area by conserving water. WBM Conserve will integrate and expand the capabilities of the recently combined WEB-ITAP (irrigation training assistance program), which generates water budgets, and Water Budget Manager (WBM), which evaluates irrigations system performance and generates irrigation schedules. WBM Conserve will assist water agencies meet the requirements of BMP 5 and the proposed BMP 15.

We encourage the California Department of Water Resources to consider funding for this grant proposal.

Sincerely,
SAN JOSE WATER COMPANY

A handwritten signature in cursive script, appearing to read 'Melania Corbin'.

Melania Corbin
Water Conservation Supervisor



Environmental Services Department
DIRECTOR'S OFFICE

January 7, 2005

California Department of Water Resources
Office of Water Use Efficiency
P.O. Box 942836
Sacramento, CA 94236-0001

Re: Proposition 50 Water Use Efficiency Grant Proposal: "WBM Conserve"

To Whom It May Concern:

The Santa Clara Valley Water District, California Polytechnic State University at San Luis Obispo's Irrigation Training and Research Center, and Sonoma County Water Agency, are in the process of applying for a Proposition 50 Water Use Efficiency grant to help fund an irrigation efficiency program called "WBM (Water Budget Manager) Conserve." Our agency is sending this letter to express our full support for this proposed program.

One of the goals of the Proposition 50 grant program is to benefit the Bay-Delta System through water supply reliability and water quality projects. The proposed WBM Conserve program is designed to help achieve this goal and will help our service area by conserving water. WBM Conserve will integrate and expand the capabilities of the recently combined WEB-ITAP (irrigation training assistance program), which generates water budgets, and Water Budget Manager (WBM), which evaluates irrigations system performance and generates irrigation schedules. WBM Conserve will assist water agencies meet the requirements of BMP 5 and the proposed BMP 15.

We encourage the California Department of Water Resources to consider funding for this grant proposal.

Sincerely,

Linden Skjeie
Manager
Water Efficiency Program
City of San Jose
Environmental Services Department
777 N. First Street, Suite 300
San Jose, CA 95112





CITY OF MILPITAS

455 EAST CALAVERAS BOULEVARD, MILPITAS, CALIFORNIA 95035-5479
GENERAL INFORMATION: 408-586-3000, TDD: 586-3013, www.ci.milpitas.ca.go

December 29, 2004

California Department of Water Resources
Office of Water Use Efficiency
P.O. Box 942836
Sacramento, CA 94236-0001

Re: Proposition 50 Water Use Efficiency Grant Proposal: "WBM Conserve"

To Whom It May Concern:

The Santa Clara Valley Water District, California Polytechnic State University at San Luis Obispo's Irrigation Training and Research Center, and Sonoma County Water Agency, are in the process of applying for a Proposition 50 Water Use Efficiency grant to help fund an irrigation efficiency program called "WBM (Water Budget Manager) Conserve." The City of Milpitas is sending this letter to express our full support for this proposed program.

One of the goals of the Proposition 50 grant program is to benefit the Bay-Delta System through water supply reliability and water quality projects. The proposed WBM Conserve program is designed to help achieve this goal and will help our service area by conserving water. WBM Conserve will integrate and expand the capabilities of the recently combined WEB-ITAP (irrigation training assistance program), which generates water budgets, and Water Budget Manager (WBM), which evaluates irrigations system performance and generates irrigation schedules. WBM Conserve will assist water agencies meet the requirements of BMP 5 and the proposed BMP 15.

We encourage the California Department of Water Resources to consider funding for this grant proposal.

Sincerely,

A handwritten signature in black ink, appearing to read "Darryl Wong".

Darryl Wong
Utility Engineer

December 23, 2004

Robert Walker
Irrigation Training and Research Center
Cal Poly
1 Grand Avenue
Cal Poly State University
San Luis Obispo, CA 93407



UTILITIES DEPARTMENT
Water Conservation Division
69 Stony Circle
Santa Rosa, CA 95401
707-543-3985
Fax: 707-543-3937

RE: California Department of Water Resources Proposition 50 Grant Application "Pilot Web-Based BMP 5 Program"

Dear Mr. Walker,

The City of Santa Rosa is in support of the Irrigation Training and Research Center (ITRC), as lead agency in the grant proposal being submitted to the California Department of Water Resources (DWR) under the Proposition 50 Water Use Efficiency grant proposal solicitation on January 11, 2005. We understand that we are an external cooperator as defined by DWR since our agency will be an indirect recipient of these funds if the grant is awarded to the ITRC.

We further understand that this regional Pilot Web-Based BMP 5 Program will help retail water agencies comply with the California Urban Water Conservation Council's (CUWCC) Best Management Practice (BMP) 5 and the proposed BMP 15. This program will be an Internet or web-based program designed to assist water agencies, Commercial, Industrial and Institutional (CII) water customers, property managers, and site landscape management companies with managing their outdoor water use.

The Pilot Web-Based BMP 5 Program will integrate and expand the capabilities of the recently combined WEB-ITAP (irrigation training assistance program), which generates water budgets, and Water Budget Manager (WBM), which evaluates irrigation system performance and generates irrigation schedules.

For water agencies that have irrigated landscape measurements and water use data for dedicated water meters, the goal would be to automate the process of generating water use reports each billing period. The automation would include immediate notification of excess water use via email with Web links to the water user's specific site reports and suggestions of corrective action.

For Owners, Property Managers, and Landscape Managers, the Pilot Web-Based BMP 5 Program will be a valuable water management and communication tool between property owners, managers and landscapers. The program will be available by entering a password and

the water user and their representatives (landscape contractor or property manager) would be able to enter additional water meter readings to determine if the site is being watered correctly.

After completion of the pilot program, it is envisioned that this program would be available as a state-wide web application to increase the number of water agencies that are in compliance with the CUWCC's BMP 5 and proposed BMP 15 by producing ET_o based water budgets and meeting the CUWCC reporting requirements.

We look forward to working with you on this pilot program, and will do everything we can to encourage DWR to select this as a project to be funded. Without the funding award of this grant application, we will not have the opportunity to aggressively administer this program.

This letter confirms our commitment to participate in this program and provide the necessary in-kind funds as called for in the grant application. We look forward to being a partner with ITRC and other community organizations in this innovative water use efficiency grant program.

Sincerely,

A handwritten signature in cursive script that reads "Jennifer Durkin".

JENNIFER DURKIN
Water Conservation Program Coordinator
City of Santa Rosa

Cc: Lynn Hulme, Sonoma County Water Agency



San Juan Water District

P.O. Box 2157 • Granite Bay, California 95746 • 916.791.0115
9935 Auburn Folsom Road • Granite Bay, California 95746
Fax: 916.791.7361 • www.sjwd.org

Directors
Davis Peterson, President
Edward J. "Ted" Costa, Vice President
Dorothy Kilgore
Kenneth H. Miller
Pamela Tobin
▲
General Manager
Shauna Larence

January 10, 2005

Mr. Robert Walker
Irrigation Training and Research Center
Cal Poly State University
1 Grand Avenue
San Luis Obispo, CA 93407

Re: California Department of Water Resources Prop 50 Grant Application "Pilot Web-Based BMP 5 Program"

Dear Robert Walker,

The San Juan Water District supports the Cal Poly Irrigation Training and Research Center (ITRC) as the lead agency in the grant proposal being submitted to the California Department of Water Resources (DWR) under the Proposition 50 Water Use Efficiency grant. If the grant is awarded to the ITRC, we understand that our agency will be an indirect recipient of the funds.

We understand that this regional Pilot Web-Based BMP 5 Program is a program designed to assist water agencies, CII water customers, property managers, and site landscape management companies in managing outdoor water use. It will help retail water agencies comply with BMP 5 and the proposed BMP 15. The pilot program will integrate and expand the capabilities of the recently combined WEB-ITAP (Irrigation training assistance program) and Water Budget Manager to generate water budgets, evaluation of irrigations system performance, and irrigation schedules.

The goal for water agencies that have irrigated landscape areas and water use data for dedicated water meters would be to automate the process of generating water use reports for each billing cycle. Automation would include immediate notification of excess water use via email including Web links to the water user's specific site reports and the offering of suggestions of corrective action.

The pilot program would be accessible by password to owners, property managers, and landscape managers. The pilot program will be a valuable water management and communication tool for the landscape contractor or property manager as they could enter additional water meter readings mid-cycle to determine if the site is being watered correctly.

Mr. Robert Walker
January 10, 2005
Page 2

After completion of the pilot program, it is envisioned that this program would be available to California Urban Water Conservation Council members as a statewide Web application to increase compliance with BMP 5 and the proposed BMP 15 by producing ETo based water budgets and meeting CUWCC reporting requirements.

San Juan Water District looks forward to participating in this pilot program and providing the necessary in-kind funds as called for in the grant application, as well as partnering with ITRC and other community organizations in this innovative water use efficiency grant program. Without the funding award of this grant application, we will not have the opportunity to aggressively administer this program.

Sincerely,



Barbara Leatham
Conservation Tech II

APPENDIX 2
PERSONNEL RESUMES

ROBERT E. WALKER, P.E.

EXPERIENCE

1984 – June 2004

- Project Director, Irrigation Training and Research Center, Cal Poly, San Luis Obispo, CA
See project descriptions below

1983 – June 2004

- Professor, Dept. of BioResources and Agricultural Engineering Dept.

1979 - 1983

- Hydraulic Engineer - Bureau of Reclamation, Engineering Research Center, Denver, Colorado

1978 - 1979

- Senior Consulting Engineer, J. W. Patterson & Associates Inc. 6825 E. Tennessee Ave., Denver, Co.

1976 – 1978

- Graduate School, Utah State University, Logan, Utah

1975 - 1976

- General Manager - Foxley & Co., Ordway, Co.

1972 – 1975

- Agricultural Engineer - Foxley & Co., Ordway, Co

1968 - 1972

- Work Unit Engineer - U.S. Dept. of Agriculture, Soil Conservation Service (Redlands, Riverside, Bakersfield, and Calif.)

EDUCATION

1978 Utah State University, Logan, Utah.

- M.S. Agricultural and Irrigation Engineering

1968 California Polytechnic State University, San Luis Obispo, Calif.

- B.S. Agricultural Engineering

PUBLICATIONS

Walker, R.E., Gary Kah, William Smille. (1992). "Improving Irrigation Performance A Guide of Procedure and Equipment." ITRC, Cal Poly State University, San Luis Obispo, CA., Published by Los Angeles Department of Water and Power

Walker, R.E., William Smille. (1994). "Landscape Irrigation Design." ITRC, Cal Poly State University, San Luis Obispo, CA.

Walker, R.E., Kah, G., and Lehmkuhl, M. (1994). "Landscape Irrigation Auditor Handbooks." ITRC, Cal Poly State University, San Luis Obispo, CA.

Walker, Robert , Richard Cavaletto (1998). "Evaluation of Small Area Measurement." ITRC, Cal Poly State University, San Luis Obispo, CA.

PROJECTS

1985 Project Director-Landscape Irrigation Auditor, Develop a method of evaluating landscape irrigation system performance, computing appropriate irrigation schedules. Evaluation of system data was completed by computer software. Training consisted of a two-day workshop was developed to teach process of data collection process and computer based analysis. Funded by California Dept. of Water Resources

1991 Project Director –“Landscape Irrigation System Trouble Shooting, Repair and Auditing” for the California Conservation Corp, Developed a five day (8 hours a day) training for a crew of 20 CCC crew members. Subject covered included: irrigation system basics (function of system components), site inspection, system repairs, system evaluation, and plant water use and water management skills. The workshop consisted of approximately 40% class work and 60% field work. Objective of the fieldwork was to provide a visual and hands-on experience. Funded by the Calif. Dept of Water Resources.

1992 Project Director - "Improving Irrigation Performance A Guide of Procedure and Equipment." Developed a resource handbook and workshop to help site managers qualitatively evaluate their irrigation system and take actions to improve the system performance. Funded by LA Dept. of Water and Power.

1993 Project Director -Landscape Water Management Program, Major revision and upgrade of the “Landscape Water Auditor “ process originally developed in 1985. software was significantly expanded to develop irrigation schedules using the capabilities of the irrigation controller on the specific site. The Landscape water management program was expanded to support the concepts of Water Budgeting as described in the “Model Efficient Landscape Ordinance” which resulted from AB235. Funded by Metropolitan Water District of Southern Calif funded the project.

1994 Project Director – Protector Del Agua (Bi-lingua Training) Designed, developed and tested a series of 6 workshops for parks and landscape maintenance worker. Objective was to make the workshops available locally and to minimize the amount of time required away from the work place. The titles of the workshops included : Landscape Irrigation Fundamentals, Basic Repairs and Adjustment, Trouble Shooting, Controller Basics, Advanced Controller Programming, Irrigation Scheduling. A reference handbook was also developed to provide a means of quick review for the workshop attendees. Funded by Metropolitan Water District of Southern Calif funded the project.

1998 Project Director "Evaluation of Small Area Measurement." Identified several methods of area measurement readily available to municipalities or water suppliers. These methods were evaluated for accuracy, can cost. Funded by themed Pacific Region, Bureau of Reclamation,

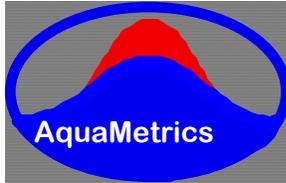
2001 Project Director Phase I – LWM upgrade, define the content of the entire upgrade of LWM. It will consist of a survey of the Green industry, program design and an estimated cost. Funded by themed Pacific Region, Bureau of Reclamation,

OTHER PROJECTS

Righetti Ranch Water Rights Arbitration
Bear Valley Springs Irrigation System/Water Quality Analysis
Review Irrigation System Plans and Specs, Riverside National Cemetery
Water Rights/Water Supply Expert Testimony
Evaluate Reservoir water Supply, Bear Valley Springs Golf Course
Flood Plain Analysis, Lambert Ranch, Cayuucus

OTHER QUALIFICATIONS AND CREDENTIALS

Member, American Society of Civil Engineers.
Professionally Registered Civil Eng., State of California,



Gary F. Kah
1114 Chesterton Avenue
Redwood City, CA 94061
(650) 366-8076

OBJECTIVE Resource Management Through Applied Technology

EXPERIENCE

1984-present

AQUAMETRICS LLC, Manager (*formerly Agtech Associates*)

Water Management Services - Developed a **Landscape Area Measurement System (LAMS)** using multi-spectral imaging to provide irrigated area data for BMP5 Irrigation Management Programs. Managed **Landscape Water Audits** for over 1,500 acres of golf course, commercial and public facilities, for clients such as the City of Sacramento, Santa Clara Valley Water District and the San Diego County Water Authority. Helped develop the **Landscape Water Management Program** for the California Office of Water Conservation, including the **Landscape Water Manager** software package and the training of over 1,000 **Auditors**.

Data Acquisition Equipment - Developed a modem-accessible **Soil Moisture Sensing System** to track irrigation needs. Developed a computerized **Automatic Pump Test System** to permit rapid and accurate pump curve and system curve data collection in the field; pressure test system used at San Francisco Water Department for transient pressure pulse testing. Developed a portable **Pump Test Kit** employing state of the art multimeter technology for use in testing Diesel and Electric irrigation pumps and a prototype **Tractor Test Kit** for measuring fuel and tractive efficiency in Pakistan (USAID).

1981-1984

PACIFIC GAS AND ELECTRIC COMPANY

Program Manager and Senior Energy Services Engineer

Profit Center Management - Responsible for \$2.0 million, 27 person Energy Management team serving 115,000 customer accounts; expanded budget and staff by 62% from 1981-84. Developed strategies and policies which raised labor productivity and improved profitability from close to zero to over 100% return on investment.

Marketing and Product Development - Performed detailed market analysis for agriculture, created individual service products and support systems for key target markets. Cited by management for "outstanding contributions."

Software Development - Designed and managed development of a fieldwork database system that produced a 20% increase in staff productivity.

1980-1981 **HONEYWELL, INCORPORATED**

Assistant Director, Washington Energy Office; Control Systems Group

Market Analysis - Conducted technology assessments and briefed Division Managers throughout the country for development of corporate plans and investment decisions. Devised an issues classification system that improved division staff awareness of federal regulatory developments. Cited by management for "exceptional performance in providing timely, solid, well-organized assessments and recommendations."

Sales Development - Assisted Honeywell's Technology Strategy Center in identifying and obtaining key research contracts.

1976-1980 **DHR, INCORPORATED**

Senior project engineer; Member, Corporate Planning Committee

Contract Management - Managed contracts totaling \$450,000 for clients including NASA, US-AID and the Department of Energy. Completed all contracts within budget; consistently authored winning proposals.

Policy Analysis - Directed studies including "Market Assessment of Photovoltaic Power Systems in World-wide Agriculture" and "Review of Load Management Technology Options." Provided technical support to members of the National Academy of Science's Committee on Nuclear and Alternative Energy Systems.

EDUCATION

1979 **CORNELL UNIVERSITY**

MS, Agricultural Engineering
Full Scholarship for Graduate Tuition and Stipend

1974 **CORNELL UNIVERSITY**

BS, Civil Engineering
New York State Regents Merit Scholarship

HONORS AND ACHIEVEMENTS

- Member, Board of Directors, California Irrigation Institute (1981-1984; 2000-2004).
- Member, Board of Directors and Treasurer, West Bay Opera (1983-1989; 1995-1998).
- Instructor for Landscape Water Management for four consecutive years at The Pacific Southwest Maintenance Management School (1989-1993).
- Recipient of Cash "Pay for Performance" Award (selected in first round) at PG&E (1983)
- Individually cited by PG&E Vice-President as having made "Outstanding Contributions . . . in 1982" in a department of over 500 people. (1983).
- Consistently rated as "Outstanding" in yearly performance reviews at PG&E (1982, 1983)
- Completed "Microcomputer Interfacing," an American Society of Agricultural Engineers Short Course (1982).
- Completed graduate study in "Qualitative Analysis for Business Decisions," Master of Business Administration Program, Golden Gate University, San Francisco (1982).
- Invited member of the California Interagency Task Force on Efficient Irrigation (1982).
- Member, Board of Directors and Chairman, Finance Committee, California Committee on the Relation of Energy to Agriculture (1981-1984).
- Member, American Society of Agricultural Engineers Technical Committees for "Electric Utilization Research" and "Engineering Standards" (1981-present).
- Rated "Exceptional" in performance review at Honeywell, Incorporated (1981).
- Elected President and Member of the Board of Directors, Mayflower Square Condominium Association (oversight responsibilities for capital expenditure budget of \$500K and annual budget of \$400K) (1980-1981).
- Awarded a Graduate Tuition and Stipend Scholarship for Master of Science program from the Department of Agricultural Engineering, Cornell University (1974-1976).
- Co-founder and Coordinator of the Cornell Alternative Energy Center (presently known as the Community Energy Network). Obtained University funding to demonstrate a variety of solar, wind and biomass technologies (1973-1975).
- Selected through audition to tour Eastern Europe with the Cornell University Men's Glee Club. Performed 11 concerts throughout Germany and Communist Europe under special State Department travel exemption (1971).
- New York State Regents Merit Scholarship for Undergraduate Tuition Assistance (1970-1974).

PROFESSIONAL SOCIETY MEMBERSHIPS

1981 to present - Member, Irrigation Association (IA)

1981 to present - Member, American Water Works Association (AWWA)

1976 to 1998 - Associate Member, American Society of Agricultural Engineers (ASAE)

PUBLICATIONS

- Kah, G.F. (2002): "Why I Decided to Own a Power Plant – On My Roof!"; Prepared for The California Irrigation Institute Annual Meeting, Sacramento, CA, January 2002
- Kah, G.F. (2001): "Landscape Water Budgets = Green + Blue"; Prepared for The California Irrigation Institute Annual Meeting, Fresno, CA, January 2001
- Kah, G.F. (2000): "Water Budgeting Makes \$en\$e" Prepared for The National Irrigation Symposium, Irrigation Association, Phoenix, AZ, November 2000
- Kah, G.F. (1998): "Landscape Area Measurement Supports Water Budgeting" Prepared for The International Irrigation Show, The Irrigation Association, San Diego, CA, November 1998
- Kah, G.F. (1997): "Landscape Area Measurement -- The Key to Urban Water Management" Prepared for Irrigation Business & Technology, The Irrigation Association, November 1997 (Expo Issue).
- Kah, G.F. (1997): "We "Audit" Do Better." Prepared for Irrigation Business & Technology, The Irrigation Association, June 1997, pp. 28-30.
- Kah, G.F. (1997): "Landscape Area Measurement System (LAMS) - The Key to Urban Water Management." Prepared for the Fall Meeting of ACWA, South Lake Tahoe, CA, May 1997
- Kah, G.F. (1996): "Landscape Audits Optimized with Automated Measurement of Landscape Areas." Prepared for Conserve '96. Orlando, Florida. January 1996
- Kah, G.F. , and W.C. Willig (1994): "Irrigation Management By The Numbers Part IV: Strategic Plan." Prepared for Golf Course Irrigation Magazine, October 1994
- Kah, G.F. , and W.C. Willig (1994): "Irrigation Management By The Numbers Part III: Landscape Water Management Audits." Prepared for Golf Course Irrigation Magazine, June 1994
- Kah, G.F. , and W.C. Willig (1994): "Irrigation Management By The Numbers Part II: Does Your Course Measure Up?." Prepared for Golf Course Irrigation Magazine, January/February 1994.
- Kah, G.F. , and W.C. Willig (1993): "Irrigation Management By The Numbers Part I: Put Your System to the Test." Prepared for Golf Course Irrigation Magazine, November 1993.
- Reinemann, D.J., M. Khalid, G.F. Kah and G.S. Saqib (1993): "Irrigation Pumpset Efficiency in Developing Countries: Field Measurements in Pakistan." Applied Engineering in Agriculture, Vol. 9 No. 1, pp. 141-145, January 1993.
- Kah, G.F. , and W.C. Willig (1992): "Estimating Irrigation Efficiency." Prepared for Landscape and Irrigation Magazine, November 1992.
- Kah, G.F. (1992): "Testing for Irrigation Uniformity." Prepared for Landscape and Irrigation Magazine, June 1992.
- R.E. Walker and G.F. Kah (1992): "Water Audits." Grounds Maintenance Magazine, pp. 74+, April 1992.
- Kah, G.F., R.E. Walker and D. Polhemus (1991): "Soil Polymers - Caveat Emptor." Water Efficient Landscaping Conference, Oakland, CA, February, 1992.
- Kah, G.F. (1991): "Golf Course Irrigation For the 90's." Golf Course Superintendents Association of America, Las Vegas, NV, February, 1991.
- Kah, G.F. (1990): "Efficient Landscape Water Management - A Step by Step Approach." CONSERV 90, Phoenix, AZ, August, 1990.
- Kah, G.F. (1990): "Golf Course Irrigation For the 90's." A Presentation for the American Society of Golf Course Architects, Spanish Bay, Carmel, CA, March, 1990.
- Kah, G.F. and M. Prillwitz (1989): "Managing Landscape Water Use." A paper presented at the Annual Meeting of the Irrigation Association. Anaheim, California. November 1989.
- Kah, G.F. and R.E. Walker (1989): "Landscape Water Management Handbook." Prepared for the Office of Water Conservation, Department of Water Resources, State of California. Version 4.1, January 1989.

- Kah, G.F. and M. Prillwitz (1988): "Computer Applications for Turf Irrigation Management." A paper presented at the Annual Meeting of the American Water Works Association. Orlando, Florida. June 1988.
- Kah, G.F. (1988): "Fill 'er Up - But Don't Spill a Drop!."(Irrigation Management Techniques) Grounds Maintenance Magazine - Special Irrigation Issue, Volume 23, No. 4. April 1988. pp. 3-17.
- Kah, G.F. (1987): "Landscape Irrigation Management." Presented at the San Jose Xeriscape Meeting. San Jose, California. November 1987.
- Kah, G.F. (1987): "Pump Testing and Data Acquisition." Presented at the American Water Works Association California-Nevada Section Spring Meeting. Fresno, California. April 1987.
- Kah, G.F. (1986): "Pumps and Wells Seminar: Economic Efficiencies in Agricultural Water Wells and Pumps." Presented at the 1986 Energy Expo, Oakland, California. Sponsored by the Pacific Gas and Electric Company. April 1986.
- Kah, G.F. and D.F. Whitson (1985): "Analysis of Energy Investments." Presented at the American Water Works Association California-Nevada Section Fall Meeting. San Diego, California. October 1985.
- Kah, G.F. (1985): "If It Ain't Broke . . . Fix It Anyway! : The Timing of Pump Repair Decisions." Presented at the American Water Works Association California-Nevada Section Spring Meeting. Oakland, California. April 1985.
- Kah, G.F. and D.F. Whitson (1985): "Turfgrass Energy Management for Golf Courses." Prepared for the American Society of Agricultural Engineers Pacific Region Conference, Sacramento, California, January 1985.
- Kah, G.F. (1984): "Rate Decisions for Energy Cost Savings: A Comparative Analysis." Presented at the American Water Works Association California-Nevada Section Fall Meeting, Reno, Nevada, October 1984.
- Perrson, E.A. and G.F. Kah (1984): "Energy Conservation for Water Utilities: PG&E's Pumping System Analysis Program." Presented at the American Water Works Association California-Nevada Section Spring Meeting. Monterey, California. April 1984.
- Kah, G.F. (1983): "Agricultural Energy Management in California - A Utility's Perspective." ASAE Technical Paper presented at the Annual Meeting, Chicago, December 1983.
- Kah, G.F. (1983): "Evaluating On-Farm Irrigation Efficiency - PG&E's Irrigation System Survey." Technical Paper presented at the Agri-Turf Irrigation Conference, Denver, December 1983.
- Kah, G.F., Editor (1983): "Cost-Effectiveness of Energy Management Programs." A report of the Cost-Effectiveness Working Group. Energy Management Department, Pacific Gas and Electric Company. November 1983.
- Kah, G.F. (1983): "Energy Efficient Irrigation." Invited talk at the Annual Meeting of the Irrigation Association, Denver, December 1983.
- Kah, G.F. (1983): "Energy Management In Agriculture." Keynote address presented at the "Farm Energy Workshop." Renewable Energy Technology Symposium and Industrial Exhibit, Anaheim, California, August 1983.
- Kah, G.F., Editor (1983): "Irrigation System Survey Manual." Energy Management Department, Pacific Gas and Electric Company, May 1983.
- Kah, G.F., Editor (1982): "Pump Tester's Manual." Energy Conservation and Services Department, Pacific Gas and Electric Company, November 1982.
- Kah, G.F. and P. Moliterno (1982): "Agricultural Facility Audit Manual." Energy Conservation and Service Department, Pacific Gas and Electric Company, June 1982.
- Kah, G.F. (1982): "Marketing Plan for the Agriculture Conservation Service, PG&E." Energy Conservation and Service Department. Pacific Gas and Electric Company, January 1982.
- Kah, G.F. (1980): "The Critical Role of Agricultural Engineering in Commercializing Photovoltaic Power Systems." ASAE Technical Paper for the ASAE National Energy Symposium, Kansas City, MO, September 1980.

- Kah, G.F. (1978): "New Building Conservation Standards and Solar Energy Utilization: Trade-offs and Optimal Systems." Paper presented at the Solar Energy and conservation Symposium Workshop, December 11-13, 1978, Hanover Hotel, Miami Beach, Florida.
- Kah, G.F. (1977): "Alternative Energy Sources and Conservation Technologies: Optimal Systems." A paper presented at the Miami International Conference on Alternative Energy Sources, December 5-7, 1977. Proceedings published August 1978 by the Clean Energy Institute, Miami, Florida.
- Kah, G.F. (1977): Methane Digester Heat Loss Modeling: Results for a Plug Flow System for a 50 Cow Dairy. Report prepared for W. Jewell, Department of Agricultural Engineering, Cornell University, Ithaca, New York, under US Energy Research and Development Administration contract No. 123-8350-360, May 1977.
- Kah, G.F. (1975): "Bioconversion - Correcting Confusions in Energy Policy." The Cornell Engineer. Cornell University Department of Engineering. December 1975

CONTRACT ACTIVITIES 1976 - 1980

International Energy Policy Studies

- A Market Assessment of Photovoltaic Power Systems in Worldwide Agriculture - National Aeronautics and Space Administration *
- Caribbean Alternative Energy Project - US Agency for International Development *
- The Oil-Importing Developing Countries - The Impact of OPEC (Private Client) *
- A Study of the Food and Energy System of Senegal - Background Information Survey - Brookhaven National Laboratory
- World Energy Use and the Role of "Inexhaustible" Energy Sources in Less Developed Countries - Energy Research and Development Administration

Conventional Energy Technology Development and Assessment

- Load Management Technology Options - Department of Energy *
- The Federal Role in Dry Cooling Tower RD&D - Department of Energy *
- Assessment of "Clean Coal Energy-Source to Use Economics Model" - Brookhaven National Laboratory
- Review and Analysis of Energy Supply/Demand Projections - Oak Ridge National Laboratory
- Conservation Strategy Development - Department of Energy
- Analytical, Data Base and Technical Support to Staff and Members of the Committee on Nuclear and Alternative Energy Systems (CONAES) Department of Energy
- Development of US Energy Scenarios 1977-1980 - Solar Energy Research Institute

Renewable Technology Development and Policy Studies

- Methane Digester Heat Loss Modeling - Cornell University
- Developmental Analysis of the US Solar Heating and Cooling Industry: Implications for the Electric Utility Industry - Electric Power Research Institute
- Energy, Environment and Land Use - Review and Analysis of Legislation - Lawrence Livermore Laboratory
- Domestic Policy Review of Solar Energy - Staff Support, Department of Energy
- The Soft Energy Path: Implications for RD&D - Energy Research and Development Administration
- Solar Energy Policy Analysis - Department of Energy

* G. Kah served as Contract Manager for these Contracts

PERSONAL

Enjoy bicycling, golf and model airplanes; performed with the West Bay Opera in productions of Don Giovanni and Madama Butterfly.

HOSSEIN ASHKTORAB
Santa Clara Valley Water District
5750 Almaden Expressway
San Jose, CA 95118-3614
(408) 265-2600

EDUCATION:

Ph.D., University of California, Davis, 1989. Plant, Soil and Water Science.
Master of Science, California State University, Chico, 1981. Irrigation.
Bachelor of Science, University of Mazandaran, 1979. Agriculture Engineering.

PROFESSIONAL EXPERIENCE:

Unit Manager, Water Use Efficiency Unit, Santa Clara Valley Water District, Jan. 2001- Present

Responsible for managing the District's Water Use Efficiency Unit, providing technical direction, coordinating its activities with other District units, and external stakeholders including 11 water retailers. The water conservation program is a long-term commitment of the District, which provides the highest quality programs and educational opportunities to residents, businesses and agriculture in Santa Clara County.

Managing the implementation of all 14 BMPs required by the Memorandum of Understanding Regarding Urban Water Conservation in California (MOU). In addition, managing the adopted Water Conservation Plan (including an agriculture water conservation program) to comply with US Bureau of Reclamation mandate as required by the Central Valley Project Improvement Act (CVPIA).

Manage and participate in the development, implementation and administration of the water conservation and water recycling programs with more than \$9 million annual budget in Santa Clara County. Additionally, managed numerous grant funded programs, which, in FY 03/04 alone, totaled over \$2.8 million.

Develop partnership with local and regional cities, including various water conservation programs with City of San Jose, with more than \$3 million cost-sharing budget.

Participate and engage in the recycled water partnership such as the South Bay Water Recycling cost sharing agreement for the \$50 million in projects in the Santa Clara County.

Participate and coordinate with local, regional and statewide water conservation and recycling organizations. Member of CUWA water conservation committee and CUWCC steering committees.

Responsible for implementation of CALFED grants for the District Agricultural and Urban Water Use Efficiency programs. Developed proposals and received grant fund for two District's water recycling projects from Proposition-13 grant funding.

In partnership with the Santa Clara County Farm Bureau, UC Cooperation Extension, Department of Agriculture, Department of Water Resources, and Santa Clara County Natural Resource Conservation Service, developed and conducted nine Agricultural Irrigation and Nutrient Management seminars for the County growers and interested groups

Water Conservation Specialist, Water Conservation & Recycling Unit, Santa Clara Valley Water District, Jan. 1997 - Jan.2001

Developed and managed water conservation programs including programs for agricultural and large landscape water users.

Technical staff to District Landscape Water Advisory Committee, and District Agriculture Water Advisory Committee.

RESEARCH AND TEACHING EXPERIENCE:

Researcher/ Assistant professor, University of California, Davis. June 96 - Dec 1997.

Crop water requirement and water management

3-D Aerodynamic latent heat flux research studies

Field research study on irrigation systems and evaluations.

Assistant Professor, Dept. of Irrigation Eng., Shiraz University. Sept.93-June 96.

Lectured on urban water use and conservation

Lectured on crop water requirements and evapotranspiration.

Lectured on irrigation systems and design.

Directed related laboratories and field trips.

Associate Land Water Use Analyst, California Department of Water Resources, December 1986 to September 1993.

Technical coordinator for the Assembly Bill 325 Task Force Advisory Committee in 1991 and 1992 and facilitated the development of the State Landscape Water Conservation Model Ordinance. Assisted water agencies, cities and counties to develop and implement landscape water conservation guidelines and ordinances.

As a member of the State Water Conservation Advisory Committee, participated in the development of the Best Management Practices (BMPs) in water conservation.

Participated in the negotiation with the agricultural stakeholders and U.S. Bureau of Reclamation for the State Department of Water Resources Drought Water Bank. Developed a new method using nonlinear regression model to estimate crop water requirement values for major crops in the Delta's agricultural area which was the bases for the negotiation of the irrigation water use.

Supported agencies in the development of their water management plan, implementation and evaluation of various water conservation programs such as the ULF toilet replacement, toilet displacement devices, low flow shower heads and outdoor water audits.

Developed a new method using nonlinear regression model to estimate historical ETo values in the Delta's agricultural area.

Member of the 1989 and 1992 Xeriscape Conferences Steering Committee and chaired the Award Subcommittee meetings.

Research Assistant, University of California, Davis. September 1981 to May 1982 and April 83 - Dec.86

Field laboratory investigations related to the separation of soil evaporation and transpiration of tomato plants.

Studied the evaporation rate under different plant growth stages and soil moisture contents using highly sensitive Lysimeter.

Collected and interpreted weather station data at U.C. Davis field station. Worked extensively with instruments, soil moisture and particle size analysis.

Lynn Hulme

Sonoma County Water Agency PO Box 11628, Santa Rosa, California 95406

Phone: (707) 547-1909 Fax: (707) 524-1782

Education: Web Publishing Professional Series, 2000

Sonoma State University, California

Associate in Science in Landscape Management, 1986

College of Marin, Kentfield, California

Committees:

Current Council Member of CUWCC

Past Vice Chair AWWA, Cal/Nev Water Conservation Committee

Experience: Sonoma County Water Agency, October 1996 to Present

Water Conservation Coordinator, Santa Rosa, California

Under general direction, coordinate, plan, organize, direct and evaluate the activities of the water conservation programs at the Sonoma County Water Agency; direct activities related to demand-side water conservation, water reclamation, and conservation planning; coordinates the effective use of personnel within the assigned section; provides technical staff assistance; recommends and implements changes, policies and procedures; coordinates budget and program management activities; and performs related duties as required.

Lynn Hulme and Associates, 1990 to 1996

Water Conservation Consultant

The firm specialized in developing and implementing one-of-a-kind water conservation programs based on the needs of the water agency or city. Water conservation technical support and program development that we worked on included: Residential water audits, large turf audits, commercial water audit, ULF toilet programs, reclaimed water, water management and training.

Cal-Poly, Irrigation Training and Research Center, 1990-1992

Large Landscape Water Auditor Instructor

Marin Municipal Water District, 1981 to 1990

Water Conservation Worker, Corte Madera, California

Tasks included a wide variety of supervision; office and field work in residential, commercial and landscape water conservation and landscape management of various office buildings, and 200 tank and pump house sites.

Certifications:

- Certified Landscape Auditor (Irrigation Association) 1991
- Water Conservation Practitioner, Level 1 (CA-NV Section of the American Water Works Association)

