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Project Information Form

Applying for:

Urban Agricultural

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

- (a) implementation of Urban Best Management Practice, # _____
- (b) implementation of Agricultural Efficient Water Management Practice, # _____
- (c) implementation of other projects to meet California Bay-Delta Program objectives, Targeted Benefit # if applicable _____
- (d) Specify other: _____

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

- (e) research and development, feasibility studies, pilot, or demonstration projects
- (f) training, education or public information programs with statewide application
- (g) technical assistance
- (h) other

3. Principal applicant (Organization or affiliation):

California State University, Fresno Foundation

4. Project Title:

Pilot Water Meter Flow Testing and Certification

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

Name, title Thomas McClanahan
Associate Vice President

Mailing address CSUF - Foundation
4910 N. Chestnut Ave
Fresno, CA 93726

Telephone (559) 278-0840

Fax (559) 278-0992

6. Contact person (if different):

Name, title. David Zoldoske

Mailing address. 5370 N. Chestnut Ave MS OF 18
Fresno, CA 93740

Telephone (559) 278-2066

Fax. (559) 278-6033

E-mail

Davidzo@csufresno.edu

7. Funds requested (dollar amount):

\$965,008

(from Table C-1, column III, row p)

8. Applicant funds pledged (dollar amount):

\$569,030

(from Table C-1, column II, row p)

9. Total project costs (dollar amount):

\$395,978

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

10. Is your project locally cost effective?

Locally cost effective means that the benefits to an entity (whether in dollar terms or qualitatively) of implementing a program exceed the costs of that program within the boundaries of that entity.

(a) yes

(b) no

(If yes, project is not eligible)

11. Explain why this project is not locally cost effective:

12. Estimated Bay-Delta annual net water savings (reduced irrecoverable losses only, in acre-feet):

(from Table C-5a (row E)

13. Cost/AF of water saved to Bay-Delta:

(from Table C-7 (row L)

14. Cost/AF of water saved with Applicant Contribution:

(from Table C-7 (row N)

1/1/06 – 12/31/08

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

Mike Villines - 29th

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

Charles Poochigian - 14th

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

18. Congressional district(s) where the project is to be conducted:
Devin Nunes - 21st George Radanovich is the 19th and Jim Costa is the 20th

19. County where the project is to be conducted:

Fresno

20. Location of project (longitude and latitude)

Latitude 36° 46' N
Longitude 119° 43' W

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

0

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

0

23. 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 _____

24. Is applicant a disadvantaged community?
If 'yes' include annual median household income.

- (a) yes, _____ median household income
- (b) no

(Provide supporting documentation.)

Signature Page

By signing below, the official declares the following:

The truthfulness of all representations in the proposal;

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

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

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

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

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

Signature

Name and title

Date

Project Summary

The proposed project will provide for the calibration of water meters used by growers and water districts that are responsible for managing water supplies in California. This service along with a targeted educational program will raise public awareness on the value and uses of water meters. Each of these efforts offer the potential for significant water savings. Outreach efforts will provide comprehensive water management education, training and technical assistance for industry and agriculture in California.

The pilot water meter calibration facility will be located on the campus of California State University, Fresno, housed in the Center for Irrigation Technology's (CIT) new 13,000 square foot laboratory (under construction). CIT provides water management education and training to the students at California State University, Fresno as well as to industry and agriculture. The laboratory will test, calibrate and certify the flow rates of water meters according to the California Department of Food and Agriculture's (CDFA) Division of Measurement Standards Service Agency.

Outreach efforts, including education and technical assistance, will be delivered through the hydraulic testing facility at Fresno State or via two Mobile Education Centers (MEC's). The MEC's consist of 28-foot trailers equipped with state-of-the-art pumping, flow metering and back-flow prevention devices and are fully self-contained. These trailers make it possible to bring the educational programs directly to the client (grower or water district) any where in California.

Statement of Work

Relevance and Importance

There is a saying about water that "you must measure it, before you can manage it". This supports an established need to increase the use of water meters at the farm level, as well as provide facilities to periodically calibrate the equipment. The demand for water meter calibration will be increasing with legislation in place that will require metering of all water deliveries by the year 2020. This proposed project will provide water meter calibration and certification for meters from 3 inches through 16 inches in size or to a maximum flow rate of 15,000 gpm.

A service agency performing volumetric calibration and certification would be ideally located on the Fresno State campus in the central San Joaquin Valley. The proximity would be near a significant concentration of agricultural water users in California

The United States Bureau of Reclamation (USBR) has supported the initial planning and engineering of the facility through a grant provided in 2003 to the Center for Irrigation Technology. The USBR recognized the need for regional water meter testing, calibration and education facilities (see attached letter). Education, training and technical assistance

is also a necessary component of a successful program to raise awareness and increase the use of water meters as a management tool.

The potential market for flow meters on agricultural pumps is substantial. The demographics of agricultural pumping plants in the Pacific Gas and Electric (PG&E) and Southern California Edison (SCE) service areas as reported in “Field Determination of Agricultural Pump Plant Electric Motor Efficiencies (Solomon & Zoldoske, Sept. 1994, pages 5-15) indicate 111,033 pumps in the region, each a potential site for meters. Pumping plant open accounts as reported by PG&E were 89,961 and SCE were 21,072. An estimate based on pump test flow data collected by Fresno State suggests the water meter calibration facility would be able to potentially service meters, if used, on approximately 94 percent or 104,371 of these pumps (based on flow rates up to 15,000 gpm).

The proposal is designed to meet the CALFED Bay-Delta goals of reduced water demand through “real water” conservation. Water savings will occur by reducing over-irrigation (total applied water) of agricultural crops.

Technical/Scientific Merit, Feasibility

The Center for Irrigation Technology possesses the facility, equipment and expertise to provide a comprehensive testing and educational program. It is well documented that agriculture uses approximately 80 percent of the developed water supplies in California. Water cannot be efficiently managed without knowing “how much” is being delivered. Calibrated meters are a proven method of measurement.

A strong educational outreach program to promote the benefits of water meters and a facility to provide testing and calibration services will increase the number of water meters used in agriculture. This will have tremendous benefits on water supplies statewide. While estimates of potential water savings vary widely, it is clear that even a small percentage increase in the efficiency of agricultural water management would yield a significant volume of water savings. An additional benefit is the energy savings involved in pumping less water.

The Center for Irrigation Technology has the history, expertise, and reputation to successfully work within the agricultural community to deliver this proposed program. The use of water meters has been shown to be an effective conservation tool in landscape irrigation. There is no doubt that the wide spread adoption of calibrated water meters will be as effective in agriculture in saving water.

Monitoring and Assessment

Water meter testing and certification will be recorded and reported as required by the Division of Measurement Standards. A log of the number of water meters tested and

calibration accuracy will be maintained. Additional information such as any failure mode due to lack of maintenance or operation will be identified. This information will be used to enhance the education message back to the growers and to focus on key aspects of water meter installation, operation, and maintenance. The dynamic link between the ongoing calibration in the laboratory and the education efforts in the field will ensure the message is precise and accurate.

Statewide educational events will be coordinated with ongoing activities as well as targeted audiences. In FY03-04, CIT delivered approximately 100 training programs and related educational opportunities. The audience included water districts, grower, and agricultural commissioners statewide.

A quarterly summary of the program activities will be provided to the Department of Water Resources as a means to evaluate project success.

Qualifications of the Applicants and Cooperators

CIT currently manages statewide programs addressing energy use and water quality in irrigation systems and pumping plants. Additionally, CIT possesses over 20 years of experience in operating a hydraulics laboratory directed at testing irrigation equipment. This proposal seeks to build on this expertise and to provide for a focused program on water management through accurate metering.

The staff at Fresno State is well qualified to successfully implement this proposal. Staff directly involved will be the director of CIT, David Zoldoske, mechanical engineer, Bob Hall, agricultural engineer, Ed Norum, education specialist, Bill Green, and program manager, Theresa Sebasto.

Outreach, Community Involvement, and Acceptance

The existing hydraulics laboratory at Fresno State has been in operation since 1983. It is well-established and recognized within the state, nationally, as well as internationally. Completion of the new 12,000 sq. ft. testing/education facility is expected in the summer of 2005. This state-of-the-art facility will provide high flow water volumes (15,000 gpm) which are well suited to the size of irrigation systems common in California.

The Mobile Education Centers (MEC) have been widely requested by agricultural interests across the state since they were completed about two years ago. They have been used to deliver a variety of educational messages on agricultural pumping efficiency and energy use. This proposal seeks to enhance the message to include the necessity for using water meters as a management tool. Additionally, we will promote the need for proper maintenance and periodic calibration of the meters.

CIT has developed a comprehensive manual and energy slide rule to promote energy efficiency. More information about this existing program can be viewed at www.pumpefficiency.org.

Innovation

The new testing and certification facility under construction will be multi-purpose including certifying flow rates up to 15,000 gpm (See Figure 1). Additionally, the laboratory area is available for training workshops on the use of water meters, calibration, and maintenance. We are not aware of any independent facility currently providing this type of service in California. The new facility is scheduled to begin operation in August 2005. The new laboratory is designed for pump/motor certification. However, it will be easily modified to meet the water calibration function as outlined in this proposal.



Figure 1: New testing and certification facility

CIT's Mobile Education Center's (MEC's) were conceived and built in the past two years as a tool to take the educational message to the grower. Two 28-ft trailers were purchased to house the water supply, pumps, and motors to demonstrate dynamically pumping plant energy efficiency.

The MEC's have been used to provide more than fifty seminars throughout California. Figure 2 below shows one complete MEC unit and Figure 3 shows some of the equipment featured (flow meters, pumps, valves and variable frequency drive etc.) inside the trailer. The electronics are capable of controlling the pump speed to maintain constant system pressure, or flow rate.



Figure 2: MEC unit



Figure 3: Inside the MEC

Benefits

Awareness and benefits of using water meters will be substantially enhanced by a programmatic education program. The fact that a relatively small percentage of all agricultural irrigation systems use water meters as a water management tool is a strong indication of the general lack of awareness of their benefit. Couple this with the lack of an easily accessible testing and certification facility for verification of accuracy clearly supports the development of a program as proposed.

The benefits of funding the proposed program include:

- 1) Improved awareness by growers of the benefits of owning and using a water meter to manage agricultural irrigation events,
- 2) increased number of agricultural irrigation systems installing water meters,
- 3) improved water management in applied water to agricultural fields, resulting in significant water savings, and
- 4) improved accuracy of water meters used to manage agricultural water supplies due to periodic testing, calibration, and repair.

The funding request will be used in part for staffing to operate the water calibration laboratory, which will help off-set the direct cost of meter calibration and encourage participation by growers/operators. Additionally, funds will help sponsor approximately 40 to 50 educational events throughout California during the proposed three-year project. The events will promote the use of meters for improved water management.

Table C1 – Project Budget

Category (I)	Project Costs \$ (II)	Contingency % (ex. 5 or 10) (III)	Project Cost + Contingency \$ (IV)	Applicant Share \$ (V)	State Share Grant \$ (VI)
Administration ¹					
Salaries, wages	\$13,125	0	\$13,125	\$13,125	\$0
Fringe benefits	\$5,905	0	\$5,905	\$5,905	\$0
Supplies	\$750	0	\$750	\$0	\$750
Equipment	\$2,500	0	\$2,500	\$0	\$2,500
Consulting services	\$0	0	\$0	\$0	\$0
Travel	\$3,000	0	\$3,000	\$0	\$3,000
Other	\$0	0	\$0	\$0	\$0
Total Administration Costs	\$25,280		\$25,280	\$19,030	\$6,250
Planning/Design/Engineering	\$75,050	0	\$75,050	\$50,000	\$25,050
Equipment Purchases/Rentals/Rebates/Vouchers	\$250,000	0	\$250,000	\$250,000	\$0
Materials/Installation/Implementation	\$340,000	0	\$340,000	\$50,000	\$290,000
Implementation Verification	\$0	0	\$0	\$0	\$0
Project Legal/License Fees	\$3,000	0	\$3,000	\$0	\$3,000
Structures		0	\$0	\$0	\$0
Land Purchase/Easement	\$0	0	\$0	\$0	\$0
Environmental Compliance/Mitigation/Enhancement	\$0	0	\$0	\$0	\$0
Construction	\$0	0	\$0	\$0	\$0
Other (Specify) Value of MEC's and Admin and Foundation Indirect Cost	\$261,678	0	\$261,678	\$200,000	\$61,678
Monitoring and Assessment	\$5,000	0	\$5,000	\$0	\$5,000
Report Preparation	\$5,000	0	\$5,000	\$0	\$5,000
TOTAL	\$965,008		\$965,008	\$569,030	\$395,978
Cost Share -Percentage				59	41

References

Solomon, K. and Zoldoske D. (1994). Field Determination of Agricultural Pumping Plant Electric Motor Efficiencies.

Topp., G.C (1993). Soil Water Content. Chapter 51 in Martin R. Carter, Soil Sampling and Methods of Analysis. Lewis Publication Boca Raton, Fl.

DAVID F. ZOLDOSKE
The Center for Irrigation Technology
Fresno, CA 93740-8021
559/278-2066

AREAS OF EXPERTISE:

- **Program Leadership • Educational Development • Analytic Studies • Grant/Contract Management**

EDUCATION:

Edd, Education University of La Verne, La Verne, CA (Leadership)
MS, Agriculture, California State University, Fresno, Fresno, CA (Economics)
BS, Agricultural Business California State University, Fresno, Fresno, CA

PROFESSIONAL EXPERIENCE: (*Note: Current job responsibilities include parts of three positions.*)

- 1994- Present: **Director (70%)**, Center for Irrigation Technology (CIT), California State University, Fresno. Requires administrating all aspects of the management of the Center including: planning and budgeting (currently at 21 million dollars); promotion and public relations with community and industry; liaison with advisory board; provide educational opportunities to the public, development of contracts and grants for applied research, hiring and supervision of staff; and training and publications efforts.
- 2000 - Present: **Associate Director (20%)**, California Water Institute, California State University, Fresno. Given the charge by the Provost and funded from Proposition 13 to develop the Water Institute. Activities include developing partnerships with three sister CSU campuses, working with campus president to secure funding from CSU Chancellor's office, obtain building space, hire and supervise staff, allocate and fund campus research projects, and create an industry advisory board.
- 2002 – Present: **Interim Director (10%)**, International Center for Water Technology, California State University, Fresno. Working directly with approximately 40 water technology companies in the San Joaquin Valley to secure funding for a proposed 50 million dollar technology center to be located on campus. Responsibilities include establishing an interim industry board, project leadership, providing liaison between the community and the University, and fund raising.
- 1996: **Lecturer**, Department of Agriculture, College of the Sequoias, Visalia, CA.
- 1993: **Lecturer**, Department of Plant Science and Mechanized Agriculture, College of Agricultural Sciences and Technology, California State University, Fresno, Fresno, CA.
- 1988 – Present: **Almond Grower**, owner and operator of farming operation. Activities include orchard development, cultural practices, and general business requirements for a successful farming enterprise.
- 1990 – 1993: **Assistant Director**, Center for Irrigation Technology (CIT), California State University, Fresno. Specific duties include developing educational programs for the irrigation industry, promotion of Center activities, developing grant and contract proposals, supervision of staff and students positions, supporting the director's duties as required, and performing special projects as assigned.

- 1986 – 1990: **Hydraulic Lab Manager**, Center for Irrigation Technology (CIT), California State University, Fresno. Responsible for the operations of the internationally recognized research laboratory, including program development, liaison with private sector clientele, educational efforts, and supervision of staff and students positions.
- 1983 – 1985: **Research Technician**, Center for Irrigation Technology (CIT), California State University, Fresno. Worked primarily in laboratory and field research to advance new water use efficient technologies. Assisted faculty and graduate students in conducting applied research.
- 1981 – 1982: **Research Assistant**, Department of Agricultural Economics, California State University, Fresno. Conducted research funded by US Agency for International Development.

HONORS AND RECOGNITION:

- Recognized nationally as one of 18 Environmental Stewards and Innovators in the Golf Industry by the Golfweek's Superintendent NEWS, October 26th, 2001.
- Honorary Life Membership in the American Society of Irrigation Consultants, May 2001.
- National Water and Energy Conservation Award presented to CIT by the Irrigation Association, 1998.
- Roy Williams Memorial Award presented to CIT for service to the industry by the American Society of Irrigation Consultants, 1996.
- Edwin J. Hunter Industry Achievement Award for service to the industry presented to CIT by Hunter Industries, 1994.

EDWARD M. NORUM (CV)
IRRIGATION ENGINEERING CONSULTANT

AREAS OF SPECIALIZATION:

- Irrigation Project Design, Installation, Operation and Evaluation, Project Contracting
- Irrigation Product Design, Testing, Evaluation and Marketing

SUMMARY OF POSITIONS HELD:

Principal, E.M. Norum and Associates, Fresno, California (July, 1992 to present)
Chief Engineer, National Irrigation Commission, Kingston, Jamaica (April, 1989 to July, 1992)
Chief Engineer, Agro-21 Corporation, Kingston, Jamaica (January, 1986 to April, 1989)
Executive Director, Center for Irrigation Technology, California State University, Fresno, California (March, 1982 to January, 1986)
Manager, Technical Service and Training, Lockwood Corporation, Gering, Nebraska (1979-1982)
Senior Applications and Chief Irrigation Engineer, Lockwood Corporation, Gering, Nebraska (1974-1979)
Sales Manager, Pollution Control Equipment, McDowell Manufacturing Company, DuBois, Pennsylvania (1972-1974)
Manager, Construction Division and Field Engineer, Kohala Sugar Company, Hawaii, Hawaii (1962-1972)
Project Engineer, Hawaiian Sugar Planters Association, Honolulu, Hawaii (1953-1962)

DEGREES:

Master of Science Degree, Agricultural Engineering, University of Minnesota, 1958
Bachelor of Science Degree, Agricultural Engineering, University of Minnesota, 1953

PROFESSIONAL SOCIETIES: American Society of Agricultural Engineers, The Irrigation

Association, Member ISO TC-23/SC-18 Irrigation Standards Committee

PATENTS: No. 2,832-202, Irrigation Flume Outlet and No. 4,086,507, Irrigation Motor Cover,

and No. 4,944,327 Flow Control Valve

COUNTRIES OF WORK EXPERIENCE:

AFRICA:	Nigeria, South Africa, Swaziland, Zimbabwe
MIDDLE EAST:	Egypt, Iraq, Israel, Libya, Morocco, Saudi Arabia, Syria
EUROPE:	France, Sweden, United Kingdom, Yugoslavia
NORTH AMERICA:	Canada, United States

CENTRAL AMERICA: Guatemala, Honduras, Mexico
LATIN AMERICA: Venezuela
WEST INDIES: Jamaica

PUBLICATIONS: Thirty-two separate publications including technical papers, articles and chapters for books on a full range of irrigation-related subjects.

Theresa Sebasto

Key Qualifications

Theresa Sebasto has a broad-based background in marketing, public relations, government relations and project management. With almost 20 years of experience in the marketing arena she has used her project management and coordination skills in a variety of ways:

- Created and implemented campaign targeting grant funds for the California Ag Industry.
- Responsible for outreach to Central California business community to promote participation in “Flex Your Power” energy conservation campaign.
- Implemented corporate communications program that included press release submissions to local and industry media and corporate media kit; built relationships with local and industry media; created PR tracking and monitoring program for executive review.
- Spearheaded innovative branding and corporate identity program including budgeting, negotiating contracts, art direction, product selection and sales projections.
- Wrote newsletter feature articles, sales and promotional materials, ad copy, technical pieces and press releases.
- Implemented creation of corporate web site and product line web sites from site mapping to launch.
- Developed product brochures and collateral materials for innovative, industry-leading companies.
- Event planning including theme customer parties, educational courses, media events, open house and ribbon-cutting ceremonies; managed event budgets.
- Tradeshow booth design, layout and planning.
- Interfaced with a diverse variety of departments to successfully introduce new products and programs and maintain effective sales literature.
- Developed and managed nationwide educational programs focusing on product innovations and applications.
- Strategic marketing planning of results-oriented projects and programs.
- Planned and managed 6-figure marketing budgets.

Current Position: Program Specialist, California Water Institute
California State University, Fresno
2002-Present

Previous Positions: McGuire & Co./Flex Your Power Campaign Fresno, CA
Statewide Ag Campaign Lead/Business Campaign Coordinator

Netafim USA Fresno, CA
Marketing Coordinator

Winners on Wheels
Director of Marketing and Fund Development

Fresno, CA

CA
Sunrise Medical/Quickie Designs
Senior Marketing Coordinator

Fresno,

Education: BA, Home Economics
California State University Fresno
Consumer Science Emphasis; Business Minor with Marketing/Finance
Emphasis

Affiliations: Fresno County Farm Bureau, Board Member and Public Relations
Committee Chairman
California Women for Agriculture, Member

Bob L. Hall, P.E.
Mechanical Engineer
Center for Irrigation Technology
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E-mail: bhall@csufresno.edu

I am a California Registered Professional Engineer with extensive experience as a design and consulting engineer in manufacturing and processing facilities and specialize in machine design, heat transfer, structural analysis and project management. Since 2002, I have been the program manager of the Agricultural Peak Load Reduction Program at the Center for Irrigation Technology at California State University, Fresno. In addition to providing engineering services, I have also been an owner and manager of a welding and machine works business.

Education

Bachelor of Science, Mechanical Engineering, California State University, Fresno, CA

Professional History

2002 to Present:	Program Manager, Agricultural Peak Load Reduction Program, CIT, CSU, Fresno, CA
2001 to 2002:	Consulting Engineer, Strictly Custom Engineering, Fresno, CA
1999 to 2001:	Chief Design Engineer, Safety Storage, Inc., Hollister, CA
1991 to 1999:	Consulting Engineer, Strictly Custom Engineering, Fresno, CA
1990 to 1991:	Plant Engineer, ATAPCO, Fresno, CA
1986 to 1990:	Plant Engineer, Pacific Coast Packaging Corp., Kerman, CA
1985 to 1986:	Manufacturing Engineer, The Vendo Company, Fresno, CA
1985:	Project Engineer, Gerawan Enterprises, Inc., Sanger, CA
1975 to 1984:	Owner/Manager, Strictly Custom Welding and Machine Works, Clovis, CA
1971 to 1975:	Design/Project Engineer, Sequoia Manufacturing Company, Inc., Fresno, CA