

NORTH OF THE RIVER MUNICIPAL WATER DISTRICT

PROPOSAL FOR FUNDING PROPOSITION 13 2003 URBAN WATER USE EFFICIENCY GRANT

MULTI-FAMILY METER INSTALLATION AND CONSERVATION PROJECT



December 3, 2003



North of the River Municipal Water District

4000 Rio Del Norte Street • Bakersfield, CA 93308 • Office (661) 393-5411 • FAX (661) 399-8911

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

December 1, 2002

Attention: Marsha Prillwitz

Project: Meter Installation and Conservation Project

Dear Marsha:

North of the River Municipal Water District is committed to launching a new, innovative multi-family metering and water conservation program and requests Proposition 13 Urban Water Use Efficiency Grant funding.

The water conservation programs currently underway in the District show a positive response from managers of metered multi-family apartments, who are eager to participate, and encourage water conservation among their tenants. However, the un-metered apartment owners have a low response to the conservation program. These managers have little incentive to participate because they pay a flat rate. Seventy-seven percent of North of the River Municipal Water District's (NORMWD) accounts are un-metered

Metering is essential to initiate effective water conservation in the District.

The proposed project consists of the following:

- Installing 137 meters at 103 multi-family, and 19 commercial locations;
- Collecting one year of water use data from the accounts prior to changing billing to commodity rates;
- Converting the customers to a metered rate billing;
- Implementing 5 innovative conservation measures funded by NORMWD;
- Collecting one year of post-metering data;
- Analyzing the water savings of the project;
- Preparing a report to DWR and the California Urban Water Conservation Council.

The total amount requested in our application is \$153,340 for the meter installation. In addition, NORMWD will provide funding for the 5 additional conservation measures to compliment the metering project. The total in kind contribution from NORMWD will be \$44,575, or 23% of the total project cost. The projected water savings will be 80 acre-feet/year. The benefit/cost ratio of the project is 1.05, which is somewhat misleading because of the low cost of the District's water supply. The true value of the project is reflected in the attractive \$199/acre-foot cost of water saved.

This project has many positive benefits that can improve conservation metering efforts throughout the Central Valley. This project is unique in that it will gather critically needed multi-family savings data. This data can be shared with the CUWCC and other California cities to demonstrate how multi-family and commercial metering and can be effective at reducing water demands.

Thank you for your consideration of our proposal.

Sincerely,

William R. Miller, General Manager

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Application Part A — Project Description, Organizational, Financial and Legal Information

A-1 Urban Water Conservation Grant Application Cover Sheet

1. Applicant (Organization or affiliation): North of the River Municipal Water District
2. Project Title: Multi-Family Metering and Conservation Program
3. Person authorized to sign and submit proposal:
- | | |
|------------------------|---|
| Name, Title | <u>William. R. Miller, General Manager</u> |
| Mailing address | <u>4000 Rio Del Norte St.,
Bakersfield, CA 93308</u> |
| Telephone | <u>(661) 393-5411</u> |
| Fax | <u>(661) 399-8911</u> |
| E-mail | <u>spock@NORMWD.org</u> |
4. Contact person (if different):
- | | |
|------------------------|---|
| Name, Title | <u>Tom Holson, Water Conservation Coordinator</u> |
| Mailing address | <u>4000 Rio Del Norte St.,
Bakersfield, CA 93308</u> |
| Telephone | <u>(661) 393-5411</u> |
| Fax | <u>(661) 399-8911</u> |
| E-mail | <u>tholson@NORMWD.org</u> |
5. Funds requested (dollar amount): \$153,340
6. Applicant funds pledged (local cost share) (dollar amount): \$ 44,575
7. Total project costs (dollar amount): \$197,915
8. Estimated net water savings (acre-feet/year): 79.93
- Estimated total amount of water to be saved (acre-feet):
- Over 30 years 2217.87
- Benefit/cost ratio of project for applicant: 1.05
- Estimated \$/acre-feet of water to be saved: \$199
9. Project life (month/year to month/year): 02/2003–02/2032
10. State Assembly District where the project is to be conducted: 32
11. State Senate District where the project is to be conducted: 18
12. Congressional District(s) where the project is to be conducted: 21

13. County where the project is to be conducted: Kern

14. Do the actions in this application involve physical changes in land use, or potential future changes in land use?

(a) Yes _____

Or

(b) No (b) No change

A-2 Application Signature Page

By signing below, the official declares the following:

The truthfulness of all representations in the application;

The individual signing the form is authorized to submit the application on behalf of the applicant;

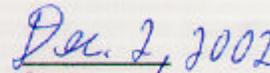
The individual signing the form read and understood the conflict of interest and confidentiality section and waives any and all rights to privacy and confidentiality of the application on behalf of the applicant; and

The applicant will comply with all terms and conditions identified in this Application Package if selected for funding.

Signature



William R. Miller, Manager



Date

A-3 Application Checklist

Complete this checklist to confirm all sections of this application package have been completed.

Part A: Project Description, Organizational, Financial and Legal Information

- A-1 Urban Water Conservation Grant Application Cover Sheet
- A-2 Application Signature Page
- A-3 Application Checklist
- A-4 Description of project
- A-5 Maps
- A-6 Statement of work, schedule
- A-7 Monitoring and evaluation
- A-8 Qualification of applicant and cooperators
- A-9 Innovation
- A-10 Agency authority
- A-11 Operation and maintenance (O&M)

Part B: Engineering and Hydrologic Feasibility (construction projects only)

- B-1 Certification statement
- B-2 Project reports and previous studies
- B-3 Preliminary project plans and specifications
- B-4 Construction inspection plan

Part C: Plan for Environmental Documentation and Permitting

- C-1 CEQA/NEPA
- C-2 Permits, easements, licenses, acquisitions, and certifications
- C-3 Local land use plans
- C-4 State and local statutes and regulations

Part D: Need for Project and Community Involvement

- D-1 Need for project
- D-2 Community involvement, support, opposition

Part E: Water Use Efficiency Improvements and Other Benefits

- E-1 Water use efficiency improvements
- E-2 Other project benefits

Part F: Economic Justification, Benefits to Costs Analysis

- F-1 Net water savings
- F-2 Project budget and budget justification
- F-3 Economic efficiency
- Benefit/Cost Analysis Tables 1; 2; 3; 4a, 4b, 4c, 4d; and 5

A-4 Description of Project

North of the River MWD (NORMWD) is a small water district just north of Bakersfield that serves approximately 5,500 people. About 74 percent of the 1,917 connections are unmetered. Their long-term goal is to convert to a completely metered service area. NORMWD wholesales water to Oildale Mutual Water Company, an unincorporated area of about 35,000 people. NORMWD receives treated surface water from Kern County Water Agency (KCWA) plus a local well.

North of the River Municipal Water District (NORMWD) is committed to launching a new innovative multifamily metering and water conservation program. The goal and expected outcome of this project is to reduce water demand per capita by 80 Acre-feet (AF); this water would benefit CALFED as it reduces the demand on the State Water Project.

The proposed new project for NORMWD is innovative as many metering programs focus on single-family residences instead of multi-family units. The lack of multi-family projects has created a large untapped potential to save water in California. This project would serve to gather data to be shared with the Urban Water Conservation Council and other nearby cities to demonstrate and provide additional empirical data on just how a multi-family and commercial metering and water conservation program can be effective at reducing water demands.

Based on a literature study and calling other local agencies it was found that the best plan was a diversified water conservation program. Based on this research, NORMWD proposes a “six-element approach” to obtain the desired water conservation goals. The six elements are the following:

NORMWD Conservation Program

<u>Element</u>	<u>Project Element Description</u>	<u>Year</u>	<u>Water Saved</u>
1	BMP 4 - Metering-Multi-Family and Commercial	2003	80 AF/YR
2	BMP 1 - Residential Water Audits-Multi-Family	2005	
3	BMP 2 - Residential Plumbing Retrofit-Multi-Family	2005	
4	BMP 7 - Public Education-Multi-Family	2005	
5	Evapotranspiration Controllers-Multi-Family	2005	
6	Leak Detection-Multi-Family	2005	
Total	All Elements	2003-06	

The first element of this program is to install 137 meters to commercial and multi-family accounts (BMP 4). Engineering estimates and results of other studies prepared for agencies with similar characteristics (Fresno, Clovis) indicate that NORMWD will generate 24% water savings per meter installed (Reference provided in section F-1). After the meters have been installed, five other elements would begin in 2005.

Through the help of the Proposition 13 Urban Water Conservation Grant, NORMWD proposes to achieve all of the above programs for a total grant contribution of \$153,340 that would generate a savings of 80 AF/YR, which would yield a cost benefit ratio of 1.05. More importantly this project would produce water savings at the very low price of \$199/AF.

A-5 Maps

Boyle Engineering has developed a set of maps that identify the location of the project site and the location of meter installations. Please see maps in Appendix A.

A-6 Statement of Work, Schedule

The project plan includes a work schedule with tasks, deliverable items, start and end dates, and projected costs for each task, along with a quarterly expenditure projection. Start and completion dates of each task are identified as are which tasks are considered to be inseparable if only a portion of the project would be funded. This plan forms the basis of the required quarterly and annual project fiscal and programmatic reports. Tasks listed in the work schedule match those in the budget.

Enough information is provided to demonstrate the technical adequacy of the approach, show the project objectives and our readiness to proceed, including methods, procedures, equipment, and facilities.

Project Plan

Element 1

BMP 4 Install Residential Meters

NORMWD historically has not metered its customers. NORMWD does meter all new service connections, in compliance with state law. Approximately 77% of NORMWD's accounts are not metered, making it difficult to track water usage and conservation efforts. Recognizing that improved water use efficiency is a critical issue to the state of California, NORMWD would like to implement a meter installation program, beginning with its 122 unmetered commercial and multi-family customers, representing 137 meters. Studies conducted in similar areas, including the City of Fresno and the City of Clovis, show projected water savings of 24% per meter, see Section F-1.

Element 2

BMP 1 Water Survey Programs for Multifamily Residential Customers

NORMWD would offer an indoor and outdoor water survey to all recently metered multifamily residential customers.

Specific activities for each indoor survey would include:

- Check for leaks including toilets, faucets, and meter check
- Check flow rates for showerheads and faucets, and offer to replace or recommend replacement with low flow models as appropriate
- Check toilet flow rates and offer to install or recommend installation of displacement replace leaking toilet flapper, as necessary

The outdoor survey would consist of the following:

- Check irrigation system and timers
- Review or develop customer irrigation schedule in minutes of watering time per week for spring, summer and fall.

- Measure currently landscaped area
- Measure total irrigable area

Customer will be provided with survey evaluation results and water savings recommendations and given an information packet. NORMWD will track surveys offered, surveys completed, survey results, and survey costs. Audits would reduce indoor use about 5 percent and outdoor use about 15 percent (Reference provided in Section F-1). Audits have about a five-year life and so must be repeated every five years to maintain savings.

Element 3

BMP 2 Residential Plumbing Retrofit

NORMWD would develop a targeting and marketing strategy for recently metered multifamily buildings. They would provide high quality low-flow showerheads, toilet displacement devices (as needed), toilet flappers (as needed), and faucet aerators as practical to buildings requiring them. NORMWD would track the number of devices distributed, and program costs. Showerheads are projected to save about 21 percent of shower water use.

Element 4

BMP 7 Public Information Programs

NORMWD would extend their on-going public education program to recently metered multifamily customers. Programs could include poster contests, T-shirt design contests, presentations and tours with hands-on demonstrations; radio and television time, printed educational material such as bill inserts, providing information on the customer's bills showing use in gallons per day for the last billing period compared to the same period the year before, and coordinating with neighborhood groups, public interest groups, and the media.

The following steps would be used to extend the public information programs to new customers:

- Develop a clean and persuasive statement of purpose.
- Choose an appropriate theme.
- Identify communication paths, resource materials, and volunteers.
- Design and implement specific campaigns.
- Ensure effective coordination and follow-through.

Education programs such as these would reduce water use about 3 percent.

Element 5

ET Controller for Multifamily

NORMWD would purchase and give state-of-the-art Evapotranspiration (ET) irrigation controllers to Multifamily customers having more than 6 dwelling units per account. This would bring about one-half of the newly metered accounts under ET control. Approximately 15 ET Controllers would be required. ET controllers have been shown to reduce irrigation requirements in Irvine California about 20 percent.

Element 6
Multifamily Building Leak Detection

NORMWD will use it's own forces and equipment to detect leaks on newly metered multifamily accounts. This sensitive listening equipment can detect leaks on either the customer or utility side of the meter. NORMWD would use this equipment to detect any leaks in the area and isolate them to NORMWD's system, the service connection, exterior piping, or internal building plumbing (in so far as possible). They would then inform the building owner of any detected leaks. The owner would then be motivated to fix the leaks to reduce the water bill.

Methods, Procedures, Equipment and Facilities

If the project should be accepted NORMWD would immediately issue Request for Proposal (RFP) to hire a qualified contractor to perform the actual meter installations. NORMWD has commissioned its engineering contractor, Boyle Engineering, to prepare a cost estimate for the meter installations and to develop product specifications for the meters to be installed. The assessment made by Boyle Engineering study determined that the majority of the service lines will also need to be replaced when the meters are installed, due to their advanced age and deteriorating condition. Furthermore, many of the water lines are in alleys, and many service lines would be long. Therefore, Boyle Engineering estimated that the cost to install a ¾" or 1" meter will average \$1000. The cost to install a 2" or 6" meter will average \$1800. This includes construction and contract administration costs. Contingency costs are figured at \$100 per meter installation.

NORMWD proposes installing the types and quantities of meters as shown in the table below:

Type of Account	Number of Accounts	Meter Type	Number of Meters
Multi-Family	103	¾" or 1" meters	115
		2" meter	2
		6" meter	1
Commercial	19	¾" or 1" meters	19
Total Meters			137

The selected contractor will provide NORMWD with documentation of each meter installed. To verify installation, and to ensure that the meter is operating correctly, NORMWD staff will inspect each meter. Once inspected, NORMWD will update its billing system with the meter number, and after one year to collect baseline data, will begin billing the metered connections with a commodity rate instead of at a flat rate.

After completion of collecting one year of pre-meter data, NORMWD will notify its customers that meters have been installed, and will use the meter installation as an opportunity to provide educational material to its customers regarding water usage and conservation opportunities. Customer feedback and concerns will be tracked, and used by NORMWD as part of its evaluation of a future expansion of the program to single family unmetered accounts.

At the same time NORMWD will initiate elements 2-6 described above to enhance water savings by these accounts.

Task List and Schedule

The task list and schedule for this project is shown below in Table A-1. The schedule is also shown on the Task Timeline on the following page. All of the grant funds requested should be expended by the end of the second quarter of 2004 (June 30). Funding for all other tasks will be provided by NORMWD. The analysis and final report would be produced in August 2006. As the Gantt Chart shows the schedule is to design the project, and install meters in 2004, but no billing in 2004. Read meters, collect and evaluate current baseline water use for one year (2005), with no bills sent. Billing for metered water use and implementing other elements will begin in 2006. Follow-up surveys to assess participation in various programs will be done in 2006. A report on water savings will be prepared in 2006.

A quarterly expenditure plan follows the overall list of tasks.

Table A-1 - Expenditure Plan

Task	Is this task inseparable if only a portion of the project was funded??	Projected Cost Amount	Funding Source	Schedule Start – Completion Date	Deliverable
Award of Grant Funding	Yes			May 2003	
Contract Executed	Yes			October 2003	
Phase 1:					
Element 1, Install Meters					
Planning, design & engineering	Yes	\$3,450	NORMWD	October-November 2003	Final Plans and Specs
Project Legal Fees/License Fees	Yes	\$1,150	NORMWD	October-November 2003	
NORMWD RFP Process and Selection of Contractor	Yes	\$1,152	NORMWD	December to January 2004	
Notification letter and customer education (123 x \$1)	Yes	\$141	NORMWD	December to January 2004	
Meter installations See cost breakdown in Section F Table 1	Yes	\$153,340	Requested Grant Funding	February to April 2004	
Installation inspections by NORMWD staff 71 x 0.5hr x 28	Yes	\$2,014	NORMWD	February to April 2004	Record of Installations
Phase 2:					
Element 2-6					
Element 2 – Residential Audits	No	\$14,684	NORMWD	May 2005 to May 2006	Audits Completed
Element 3 – Residential Retrofit	No	\$1,407	NORMWD	May 2005 to May 2006	Retrofits Completed
Element 4 – Pub. Education	No	\$7,296	NORMWD	May 2005 to May 2006	
Element 5 –ET Controllers	No	\$3,935	NORMWD	May 2005 to May 2006	ET Controllers Installed
Element 6 – Leak Detection	No	\$5,146	NORMWD	May 2005 to May 2006	Leaks Found
Water Savings Analysis	No	\$2,100	NORMWD	May 2005 to Jul 2006	Report on Water Saved
Final project report	No	\$2,100	NORMWD	August 2006	
Total Project		\$197,915			

* These services will continue to be offered to customers after the data gathering period.

Insert Gantt chart from Boyle (Task Timeline)

	2003				2004				2005				2006			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
- Element 1, Install Meters	\$				\$				\$				\$			
Planning, Design & Engineering				3,450												
Contractor Selection Process				1,150	1,152											
Notification Letter and Customer Education						141										
Meter Installation						153,340										
Installation Inspections by Staff						2,014										
I- Element 2-6 & Misc																
Residential Audits (E-2)											7,342	7,342				
Residential Retrofit (E-3)											704	703				
Public Education (E-4)											3,648	3,648				
ET Controllers (E-5)											2,000	1,935				
Leak Detector (E-6)											2,500	2,646				
Project Legal Fees/License Fees																
Water Savings Analysis											500	500	500	600		
Final Project Report																2,100
TOTAL	-	-	-	4,600	1,152	155,495	-	-	-	-	16,694	16,774	500	600	2,100	-

A-7 Monitoring and Evaluation

Monitoring and assessment will take place on several levels as follows:

1. Quantification of the number of meters installed on a monthly and quarterly basis, as well as for the program overall.
2. Quantification of the other programs run (Elements 2-6).
3. Quantification of the water savings based on the installation of meters, billing with commodity rates, and participation in Elements 2-6. The District will use a base year of post meter installation but pre-billing data, to establish the level of unmetered consumption prior to impact of all elements.
4. The District will analyze the change in annual total consumption for unmetered accounts following the meter installations, in order to determine the associated reduction in consumption or water savings. The District will weather-normalize the data in conducting its evaluation. Based on the response to elements 2-6 the District will, in so far as possible, separate out the water savings from metering and all other programmatic conservation programs targeted at the newly metered customers. The District would be amenable to delaying the start of elements 2-6 for one year so as to collect one year of post metering data and then one year of post metering plus programmatic conservation data. This would simplify the process of separating the water savings just due to metering from water savings due to other programs.
5. Evaluation of customer feedback. The District will track and monitor customer feedback resulting from the meter installations. This important feedback will be used to evaluate strategies for potentially expanding the meter installation program to single family unmetered accounts.
6. The District will prepare a report based upon its findings. DWR will have an opportunity to review the draft report and comment on the methodology for analyzing water savings and other aspects of the report.
7. A copy of the final report will be made available to DWR, CALFED and to the California Urban Water Conservation Council for distribution.

A-8 Qualifications of the Applicant and Cooperators

1. Resumes are attached for the proposed NORMWD project manager(s)
 - a. Bill Miller, General Manager, will be the District's overall project manager
 - b. Ben Horn, Boyle Engineering, will be the Design Engineer
 - c. Tom Holson, Water Conservation Coordinator, will conduct the conservation elements
 - d. Ron Goldman, Operations Supervisor, will inspect construction and handle permits
2. External Cooperators - NORMWD will select the best-qualified contractor to install the meters, based upon a competitive bid process.

Please see Appendix B for above resumes and qualifications.

A-9 Innovation

One of the major reasons that all water accounts in California are not metered today is money. Metering is expensive and water costs in areas where meters are not installed, such as Fresno, Sacramento and the NORMWD is historically low, compared to the rest of the state. It is a rare opportunity to find a metering project that is locally cost-effective. The reason NORMWD's project is locally cost effective, in spite of a low water cost, is threefold:

1. Only 137 meters are needed to meter 498 dwelling units and 19 commercial buildings
2. NORMWD is willing to contribute in-kind services and money to fund 5 other conservation programs to increase water savings from the project
3. NORMWD wholesales water to Oildale Mutual Water Company and charges a higher price than it's cost of water from Kern County Water Agency, increasing the value of the saved water

Because of this rare opportunity for a cost effective metering project, NORMWD is willing to defer billing the newly metered accounts to allow collection of data to establish water savings from metering. There is a genuine lack of statistically valid data on water saved by metering in California. We were unable to locate any California data that applied just to multifamily buildings. Most of the California data is empirical, comparing one metered city to a like unmetered city. Nevertheless we found enough data from other cities in the US to enable a reliable, yet conservative, estimate of water savings to be made. The documentation for these calculations is presented in section E-1.

NORMWD proposes an investigative study as a part of this project to document the water saved.

- Phase 1 – Install meters in year one, after receipt of the grant
- Phase 2 – Collect one year of baseline water use data prior to initiating water billing based on commodity rates.
- Phase 3 – Initiate Elements 2-6 (see section A-6) and collect post metering data for one year
- Phase 4 – Analyze water savings and prepare a report to be shared with DWR, CALFED and the California Urban Water Conservation Council.

This project represents a unique opportunity to collect data that will help justify metering in other cities in California. Metering multifamily buildings is a good place to start an overall metering program and this project will help other cities justify the actions being taken by NORMWD. Once a community meters it's multifamily buildings and can show water savings the difficult challenge of metering single-family residences will be made easier. NORMWD believes the importance of its project transcends its borders and is important to ensuring that California's water supply is used more efficiently in the future.

A-10 Agency Authority

This application addresses the following five questions listed in the application package:

1. *Does the applicant (official signing A-2, Application Signature Page) have the legal authority to submit an application and to enter into a funding contract with the State? Provide documentation such as an agency board resolution or other evidence of authority.*

The North of the River Municipal Water District Board of Directors, on November 22, 2002, approved a resolution authorizing the Manager to submit an application and enter into a funding contract with the State of California. A copy of that resolution is in Appendix C.

2. *What is the legal authority under which the applicant was formed and is authorized to operate?*

NORMWD was formed and operates under the legal authority established by the State of California Government Code 71000 ET. SEQ.

3. *Is the applicant required to hold an election before entering into a funding contract with the State?*

No, NORMWD is not required to hold an election before entering in a contract with the state.

4. *Will the funding agreement between the applicant and the State be subject to review and/or approval by other government agencies? If yes, identify all such agencies (e.g. Local Area Formation Commission, local governments, U.S. Forest Service, California Coastal Commission, California Department of Health Services, etc.).*

No, the funding agreement will not be subject to review or approval by a government agency.

5. *Is there any pending litigation that may impact the financial condition of the applicant, the operation of the water facilities, or its ability to complete the proposed project? If none is pending, so state.*

No, NORMWD does not have any pending litigations.

A-11 Operations and Maintenance

A summary of impact on the operation and maintenance (O&M) costs is as follows:

- The O&M cost of an unmetered connection in the District is \$164.95.
- The O&M cost of a metered connection, including meter reading is \$176.09.
- The difference in operating and maintaining a metered connection is \$11.14.
- Operating and maintaining the additional 137 meters will cost \$1526.18.

The \$1,526 represents an increase of .8% in the District's total retail O&M budget of \$174,137. The increased cost of \$1,526 will come from the District's General Fund.

Appendix D shows how the above incremental operation costs are calculated.

Application Part B—Engineering and Hydrologic Feasibility

B-1 Certification Statement

A California registered civil engineer working on this project has signed a certification statement regarding project feasibility, see next page.

BOYLE

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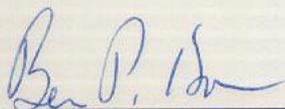
November 25, 2002
BK-N02-001-02

STATE OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES
OFFICE OF WATER USE EFFICIENCY
P.O. Box 942836
Sacramento, CA 94236-0001

North of the River Municipal Water District Proposition 13 Grant Proposal and Application Engineering Certification Statement

I, Ben Horn, a California registered civil engineer, have reviewed the information presented in support of this application. Based on this information, and any other knowledge I have regarding the proposed project, I find that it can be designed, constructed, and operated to accomplish the purpose for which it is planned and a sufficient water supply is available for the project. The information I have reviewed to document this statement is included in the proposal/application submittal.

Boyle Engineering Corporation



Ben P. Horn, PE
Managing Engineer



Enclosures: As noted.

B-2 Project Reports and Previous Studies

All relevant information has been included in this application.

B-3 Preliminary Project Plans and Specifications

The preliminary plans attached meet the minimum requirement 30 percent design. A copy of preliminary project specifications, including citations of all standards used and all applicable health and safety specifications such as OSHA standards and applicable building codes (such as Uniform Building Codes), is contained in Appendix E.

B-4 Construction Inspection Plan

The District's Operation Supervisor will handle construction inspection for the project. He is familiar with all installation locations and will meet with contractor(s) to explain the installation requirements at each site before work begins, monitor work progress, and inspect the completed installation. He will obtain the nineteen Kern County encroachment permits needed for ally-way installations, and oversee the completion of all permit requirements. He will see that all meters are operationally acceptable. The inspection timeline is included in Section A-6.

Application Part C—Plan for Completion of Environmental Documentation and Permitting Requirements

C-1 California Environmental Quality Act and National Environmental Policy Act

This project is not subject to the Requirements of CEQA or NEPA. The project is exempt because the service lines that will be replaced will serve the same existing development. The replacement lines and new meters will have substantially the same purpose and capacity as the replaced water service lines. The metering will have a positive environmental effect by reducing water consumption and waste. A copy of a Negative Declaration will be filed, prior to the commencement of the project, with both the County of Kern and the State Office of Planning and Research. A copy of the document to be filed is in Appendix F.

C-2 Permits, Easements, Licenses, Acquisitions, and Certifications

Nineteen of the meter installation locations are located in alleyways belonging to the County of Kern, and will require routine Encroachment Permits. These nineteen permits will be obtained prior to the installations. The remaining locations are in easements and no permits are required.

C-3 Local Land Use Plans

The proposed meter installations involved in this project are located entirely within existing developments and are not in conflict with any local land use plans.

C-4 Applicable Legal Requirements

This project has been approved by a resolution of the North of the River Municipal Water District Board of Directors, dated November 22, 2002. There are no other laws, statutes, regulations, or ordinances required to proceed with the project.

Application Part D- Need for Project and Community Involvement

D-1 Need for the Project

Seventy-seven percent of North of the River Municipal Water District's accounts are un-metered. This makes it difficult to conduct meaningful water conservation programs. Recent studies have shown that metering the entire district is not cost-effective, however, there is evidence showing that metering the presently un-metered multi-family and commercial units, along with commodity rates and an active water conservation programs, can result in significant water savings for the District and the community at large, and is cost-effective.

The water conservation programs currently underway in the District (residential water audits, large landscape water audits and public education), shows a positive response from managers of metered multi-family apartments. These managers are eager to participate, and encourage water conservation among their tenants. There is a low response from un-metered apartment owners who have little incentive to participate because they pay a flat rate. Due to the large percentage of un-metered accounts, the proposed meter installation and conservation project can make a significant impact in the District's effort to save water. The District has found that without meters, little water conservation takes place.

The proposed project consists of the following:

- Installing 137 meters at 103 multi-family, and 19 commercial locations;
- Collecting one year of water use data from the accounts prior to changing billing to commodity rates;
- Converting the customers to a metered rate billing;
- Implementing 5 innovative conservation measures funded by NORMWD (Elements 2-6)
- Collecting one year of post-metering data;
- Analyzing the water savings of the project;
- Preparing a report to DWR and the California Urban Water Conservation Council.

This project is in keeping with the Urban Water Management Plan, developed by the District in December 2000, which shows projected water use increasing by about 8% per year, and calls for active use of conservation programs.

The benefits to DWR and the State of California include:

- Conserve State Project Water
- Divert less water from the Delta
- Gather water savings data useful to DWR and the California Urban Water Conservation Council (CUWCC) for estimating the benefit of metering like properties elsewhere in the state
- Better water management

D-2 Outreach, Community Involvement, Support, Opposition

North of the River Municipal Water District currently has the only water conservation program in the Bakersfield area, which is based upon the CUWCC's Best Management Practices (BMPs). Acceptance by the general community has been slow, due primarily to the low cost of water and unmetered connections, however customers are aware that the cost of water will be going up. Interaction with customers participating in the District's Residential Water Surveys indicates their awareness that conserving water is important, and seem quite willing to so.

Upon notification that our project is approved, the District will begin an education program to inform all customers of the expected meter installations, of the study that will follow, and the probable impact upon them. It is believed that, in general, they will appreciate our conservation concerns and with a few exceptions go along with the project. There could be some apartment owners with special concerns but there is every reason to believe that with proper education they will support the project.

At this time, our wholesale customer, Oildale Mutual Water Company has expressed no interest in our BMP programs, but as other agencies in the area begin participating, it is possible that, within the timeframe of this project, they be prompted to show support for our project and become involved in conservation programs of their own. NORMWD will continue to offer our Conservation Coordinator services to them.

Managers of two large multi-family metered units in the District, currently participating in our conservation programs, were not aware that there were un-metered apartments in their customer base, and offered letters of support for equal service and billing treatment for all customers. Their letters also express support and appreciation for the District's water conservation programs. Copies of their letters are available in Appendix G.

Application Part E—Water Use Efficiency Improvements and Other Benefits

E-1 Water Use Efficiency Improvements

The proposed project will contribute to CALFED objectives of increasing statewide water use efficiency. The saved water will be used to supply NORMWD's wholesale customer, Oildale Mutual Water Company thereby reducing District's need to purchase water from KCWA that originates with the State Water Project. We estimate that this project will result in 80 acre-feet of conservation yield per year, 95% of which (76 acre-feet/year) will result in reduced exports from the Delta. See section F-1 for the documentation on these savings. The project also addresses Urban Best Management Practice BMP 4 – Metering with Commodity Rates for all New Connections and Retrofit of Existing Connections. The in-kind contributions to this project also address BMPs 1, 2, and 7. NORMWD has been a signatory to the Urban MOU since November 2001. The project is also consistent with the District's Urban Water Management Plan, adopted in December 2000.

Finally, in addition to reducing local demand, and demand on water from the State Water Project, the project will also provide NORMWD with data and customer feedback. This is critical for the District to be able to assess the impact of a future meter installation program for its single-family customers, as funds may become available.

E-2 Other Project Benefits

The proposed project will reduce the draw on the State Water Project. Most of the water savings and reduced need for water will occur during the summer, when stream flows and Delta inflows are low. This can directly benefit the Delta.

The project will reduce energy use. Less water will need to be treated by Kern Water Agency and then pumped to the District and pumped on to Oildale. Customers who respond to metering and the retrofit programs offered by the District will save significant amounts of energy. The value of this energy is quantified in Section F. The energy savings will result in less gas and electricity needed to serve this area, helping the State's current energy crisis.

NORMWD sees this project as an important first step in metering its entire District. Following this action it is believed that the District's wholesale customer, Oildale Mutual Water Company, who serves a much larger area, will also be motivated to install water meters. While there can be no guarantee that this project will lead to further water savings in the geographic area, it is an important first step in tackling a challenging situation.

Application Part F – Economic Justification: Benefits to Costs

F-1 Net Water Savings

The water savings were estimated using an end use model called the Least Cost Planning Decision Support System (DSS). The DSS model, developed by Bill Maddaus and Russell Beatty, calculates water savings at the end use level and is described in Reference 1 (Beatty, 2001). Separate estimates were made for each of the six elements of the program and then the elements were combined and reevaluated together to eliminate the possibility of double counting. For example, the water saved by metering is figured first, and then other reductions such as use of ET Controllers or showerhead retrofit estimated. The savings estimates and references for each element are presented below. Most of the references are described in the CUWCC's publication "BMP Costs and Savings Study". This publication and others were used to compile the unit water savings and references shown in the table F-1 below. As a point of reference unmetered multifamily units in the NORMWD area are estimated to use 185 gal/day/dwelling unit of which 54 percent is for outdoor uses. This publication is available from the CUWCC. Shown in the table are the end use savings used in the DSS model. When the entire program is put together and overlapping measures accounted for the overall savings for all accounts is estimated to be 37 percent. Upon inspection of cited references it is apparent that we have selected conservative values for our water savings analysis.

The DSS model can be provided upon request.

Table F-1 Basis of Water Savings Estimates

Element No.	Element Name	Internal Water Savings	External Water Savings	Equivalent Overall Use, Measures 1-5 Acting Alone	Reference and Water Savings Estimate
1	Metering with Commodity Rates	10%	40%	24%	Speedwell (1994) – 36% Multifamily Buildings in New York Bishop and Weber (1995) - 28% residential in Denver Leblanc (1997) – 20% single family in Vancouver, B.C.
2	Residential Water Audits	5%	15%	10%	Whitcomb (1994) – 6 to 24 %, average 16% Bamezai (1994) – 32 gal/day targeted at high water use homes Chestnutt (1995)– 21 gal/day for untargeted audits
3	Residential Plumbing Retrofit	21% Shower Use Only	0	2%	Chestnutt (1995)– 5.2 gal/day/showerhead Mayer (1999) – 21% on shower use
4	Public Information	3%	3%	3%	Maddaus (1987) – 2-5%
5	ET Irrigation Controllers	0	20%	11%	IRWD (2001) – 24% external use
6	Multifamily Building Leak Detection	25% of leakage	25% of leakage	5%	Estimated
1-6	All Elements Working Together			37%	Computed by DSS Model

Shown in Table F-2 is data compiled on water saved by metering by the City of Fresno. NORMWD's water use is the highest of those surveyed, 16 percent higher than the averaged unmetered city. NORMWD is from 36 to 64 percent higher than the metered cities surveyed and is 55 percent above the average metered city and 44 percent above the state average. Based on this comparison the value of 24 percent used in the water savings analysis (as listed in project description Section A-4) for metering alone appears very conservative. Even the overall savings for all six elements of the program, 37 percent, is below the comparison of NORMWD to all metered cities, the average of all metered cities, and is below the average of the difference between the unmetered and metered cities. In other words these water savings are certainly achievable.

Table F-2 – Comparison of Water Use in Metered and Unmetered Cities

City	Year 2000 Total Per Capita Water Use	Metered (M) or Flat Rate (FR)	Comparison to NORMWD Per Capita Water Use
North of the River MWD	379	77% FR	-
Bakersfield	352	FR	-7%
Tarpey area of Clovis	338	FR	-11%
Fresno	332	FR	-12%
Sacramento	300	FR	-21%
Modesto	272	FR	-28%
Visalia	270	FR	-29%
Average Unmetered	320	FR	-16%
Clovis	241	M	-36%
Anaheim	198	M	-48%
Los Angeles	156	M	-59%
San Jose	150	M	-60%
San Diego	150	M	-60%
Santa Ana	138	M	-64%
Average Metered	172	M	-55%
State Average	211	Mostly M	-44%

Based on information provided by Doug Kirk, City of Fresno, November 2002. Telephone (559) 498-1409

References

1. Beatty, R., Chapman, S., Maddaus, W. "Benefit-Cost Analysis with an End Use Model", Proceedings Water Sources Conference and Exposition, American Water Works Association, Las Vegas, Nv. January 27-30, 2002
2. Speedwell, Inc. "the impact of Metered Billing for Water and Sewer on Multifamily Housing in New York", prepared for the New York City of Environmental Protection, September 1994.
3. Bishop, W.J., and J.A. Weber "The Impacts of Metering: A Case Study at Denver Water", prepared for 20th Congress International Water Association, Durban South Africa, 1995.
4. LeBlanc, L., et al :Is Residential Metering Cost-Beneficial in Water Rich Greater Vancouver?" Conference Proceedings of the AWWA, Pacific Northwest Section, 1997.
5. Whitcomb, J.B., "Residential Water Audit Evaluation", prepared for Contra Costa Water District, August 1994.
6. Bamezai, A., and T.W. Chestnutt, "Residential Audit Program: Evaluation of Program Outcomes and Water Savings", a report for the Metropolitan Water District of Southern California, December 1994.
7. Chestnutt, T.W., C.N. McSpadden, and D. M. Pekelney, "What is the Reliable Yield for Residential Home Survey Programs?" Proceedings AWWA Annual Conference, Anaheim, CA, June 1995.
8. Chestnutt, T.W., C.N. McSpadden, and A. Bamezai, "Ultra Low Flush Toilet Programs: Evaluation of Program Outcomes and Water Savings", a report for the Metropolitan Water District of Southern California, July 1995.
9. Mayer, P. et al, "Residential End Uses of Water", Report to the American Water Works Research Foundation, 1999.
10. Maddaus, W. "Water Conservation" handbook for American Water Works Association, 1987.
11. Irvine Ranch Water District (IRWD), Residential Weather-based Irrigation Scheduling: Evidence from the Irvine "ET Controller" Study", June 2001.

F-2 Project Budget and Budget Justification

The total budget for this project is \$197,915. Table 1 shows the cost for each of the following elements.

- a) Land Purchase/Easement
- b) Planning/Design/Engineering
- c) Materials/Installation
- d) Structures
- e) Equipment Purchases/Rentals
- f) Environmental Mitigation/Enhancement
- g) Construction Administration/Overhead
- h) Legal & License Fees
- i) Other
- j) Contingency Costs up to 15 percent of budget
- k) TOTAL

The annual costs for administration, operations, maintenance and other costs are entered into Table 2. These include the incremental cost of metering an additional 122 customers.

F-3 Economic Efficiency

The water conserved by this project will be sold to the Oildale Mutual Water Company. The value of the conserved water is measured by the expected price for which it is sold, thus generating revenue.

- **Period of analysis.** The economic evaluation based on 30 years.
- **Inflation and escalation.** Assumed zero future inflation and escalation of costs.
- **Discount rate.** 6 percent discount rate.
- **Dollar value base year.** All benefits and costs are expressed in current year dollars.
- **Multiple-funded projects.** The economic analysis is conducted for the entire project, regardless of funding sources. All project costs (capital and O&M) are included in the economic analysis, although the applicant requested grant funds for only part of the project.

Project costs All elements included in the project budget.

Water Supply Vendibility (Table 4c). The anticipated revenue is water sales from sales to Oildale, an existing and NORMWD's only wholesale customer.

The other benefit not explicitly considered in the application's spreadsheets are the benefits to the NORMWD's newly metered customers. Some of the water saved will be reduced energy to heat water. Although other energy savings in the service area for pumping are included in the cost of water, the customer energy savings are a benefit that should be considered. Table 5 shows the customer energy savings and the impact on the project benefit-cost ratio, which is a significant improvement.