WaterSMART:
Water and Energy Efficiency Grants for FY 2014

FOA No. R14AS00001

COLUSA COUNTY WD SCADA INSTALLATION and MEDIUM VOLTAGE PUMP CONTROLS EFFICIENCY UPGRADE PROGRAM

COLUSA COUNTY WATER DISTRICT

P.O. Box 337, Arbuckle, California, 95912

Shelly Murphy, General Manager

January 15, 2014

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Executive Summary

Date: January 20, 2014

Applicant Name: Colusa County Water District, Shelly Murphy, GM

City, County, State: Arbuckle, Colusa County, California

Project Name: *Colusa County WD SCADA Installation and Medium Voltage Pump Controls Efficiency Upgrade Program*

Part 1- Upgrade District pumping plants and office with SCADA Automation

Part 2- Pumping plant 2B and 2C Install/retrofit/upgrade Medium Voltage panels

2014 Funding Request Summary

FUNDING SOURCE	FUNDING AMOUNT
Non-Federal Subtotal:	$903,075
Reclamation Funding:	$483,000
(series II grant program)	
TOTAL PROJECT FUNDING:	$ 1,386,075

Project Summary

Colusa County WD SCADA Automation Program and 2B and 2C Medium Voltage and Motor Control Center Equipment Upgrade

The primary purpose of this project is to install a District wide SCADA Automation program and upgrade the Medium Voltage Motor Control Centers (pumping plants 2B and 2C) at the Colusa County Water District. Currently the district does not have any SCADA system upgrades. There is currently a vintage (1960s) wireless alarm system that tells ditch tenders there is some type of problem at the pumping plants. To understand the alarm the ditch tenders must go the site to determine the actual problem. The new SCADA system will provide central control from the district office and remote viewing of alarm and problems accessing SCADA information through 4G tablet, laptops or even smart phones. The new SCADA system and control will provide state-of-the-art control algorithms for selecting the most efficient combination of pumps to use

for any given require flow rate. The existing MV (Medium Voltage) MCC (Motor Control Center) at pumping plant 2B and 2C are proposed to be upgraded. This project will consist of replacing the complete medium voltage motor starter, sync and operator control components on the fourteen (14) pumps at the 2B and 2C pumping plants. The new motor starters will be soft-starts that will prolong life of motors, pumps, hydraulic system components and reduce energy usage. This new upgrade of the 2B and 2C MCC will also be designed to support SCADA interface which would not be possible with the existing MV MCC. With the use of Soft Starts on the MV MCC in rush current will be reduced at startup. And, with the new pump selection controls, pump starts will be reduced. This will result in substantial energy savings at the MV MCC plants. It is estimated savings could be as high as 25%. The remaining pumping plants (regular voltage plants) in the district would not be retrofitted with soft-starts but would have, as a result of the SCADA implementation, new pump selection algorithm implemented for selecting the most efficient pump combination for the desired flow rate. This could result in another 5% to 10% energy savings for these pumping plants. The new SCADA system would allow the pumping plants to maintain a much narrower operational band at the downstream reservoirs and standpipes resulting in a much tighter level control. The tighter level would equate to higher flow control and as a result provide from 5% to 10% water saving to more accurate and consistent flow rates (goal III.B.1 SCADA components that allow for remote monitoring of irrigation delivery system conditions). The SCADA system would also help free up labor now used to remotely determine cause of alarms and manage pumping plants. This extra labor could be uses to better manage other parts of district water deliveries. This will result in significant energy savings (goal III.B.4 Retrofit to increased energy efficiency and quantifiable reductions). Installation of SCADA at the pumping plants will likewise significantly improve water delivery management and result in water savings. (CONTRIBUTES TO GOALS Sec III.B.1 and .4)

Estimated time required for this project is 24 months from contracting date, (which allows one operating season to install and de-bug and a second water season to gather data. The total project completion will be within the two years allotted for the grant agreement.

This facility is a Bureau of Reclamation facility, the Northern California Area Office has been notified and has responded that it is within the responsibilities of the District under their contract with Reclamation to maintain and make modifications as needed.

Background Data

History and District information.

The Colusa County Water District (CCWD) is located in Arbuckle, Colusa County, (Northern) California. Water is delivered to the CCWD pumping plants on the Tehama-Colusa Canal, through long-term contracts with the Mid Pacific Region of the Bureau of Reclamation through the Tehama-Colusa Canal Authority. CCWD also has a transfer agreement with Westside Water District for transferred water to supplement shortages in Reclamations allocations.

CCWD was formed in May 1954 and has 29,204 irrigated acres (overall size 45,670 ac.). In recent years water allocations have been approximately 54,000 ac. ft.. The major crops grown are: Almonds, Vine seeds, Wheat, Grapes, Alfalfa, and Tomatoes. Irrigation methods are 70% sprinkler and drip systems with 25% Border and Furrow and 5% of other methods.

Annual entitlement under each right and/or contract

	AF	*Source*	*Contract #*	*Availability period(s)*
Reclamation Urban AF/Y	As needed	USBR		As needed
Reclamation Agriculture	68,164	USBR	14-06-200-304-A-LTR1	Year round – Sep15-Jun15 limited by pumping limits
Other AF/Y	(24,000) 12,000	Westside WD	Transfer agreement –	Any year – reduced to BOR allocation in shortage

The water supply facilities:

Water is diverted from the T-C Canal at eight locations. Five of the diversions are by pump and three are by gravity. Water from each diversion enters a pipeline distribution system.

The eight separate pipeline lateral system which comprise the irrigation distribution system of the District are numbered from north to south: 6BP, 5BP, 4G, 3BP, 2BP, 2BG, 7AP, 8G. Pumped systems are designated by the letter P. and the gravity systems designated by the letter G. The pumped systems are served by canal side pumping plants and water is delivered into the gravity systems through gates on the canal side turnouts. System 6A, 6B, 3B, 3BA, share a common turnout structure and flow meters, although the systems are operated independently. All systems include buried pipelines, farm outlets (also referred to as farm turnouts), and appurtenant facilities. The major portion of the surface water service area is located uphill from and generally west of the Tehama-Colusa Canal. Pumped systems 6B, 7A, 3B, 2B serve lands on the downhill side of the Canal *Incoming flow locations and measurement methods*

Location Name	*Physical Location*	*Type of Measurement Device*	*Accuracy*
6BP	R.3 W.14 (SW corner)	Venturi and Doppler Meter	< 5%
5BP	R.2 W.19 (SE corner)	Venturi and Doppler Meter	< 5%
Turnout 4 (4G)	R.2 W 20 (center)	Venturi and Doppler Meter	< 5%
3BP	R.2 W.33 (SW corner)	Venturi and Doppler Meter	< 5%
2BP	T.13N.R 2W 14 (SE corner)	Venturi and Doppler Meter	< 5%
2BG	T.13N.R 2W 14 (SE corner)	Venturi and Doppler Meter	< 5%
7AP	T.13N.R 2W 25	Venturi and Doppler Meter	< 5%
Turnout 8	T.13N.R1W 31	Venturi and Doppler Meter	< 5%

Storage facilities (tanks, reservoirs, regulating reservoirs)

Na	*Type*	*Capacity (AF)*	*Distribution or Spill*
6A	Regulating Tank	1.11	Distribution
6B	Regulating Tank	1.48	Distribution
5B	Regulating Tank	.92	Distribution
3BA	Regulating Tank	.92	Distribution
3BC	Regulating reservoir		Distribution
3CG	Regulating reservoir		Distribution
3D	Regulating Tank	.59	Distribution
2B	Regulating reservoir		Distribution
7B	Regulating reservoir		Distribution
7B	Regulating Tank	.77	Distribution

There is no seepage water loss in the District's water distribution because the entire system is piped. All turnouts are metered using Micrometer propeller meters.

Water delivery statistics

Number of delivery points (turnouts and connections) *650*

Number of delivery points serving more than one farm *10*

Number of measured delivery points (meters and measurement devices) *650*

Percentage of delivered water that was measured at a delivery point *100%*

Miles of AC pipeline *105 miles*

Water use is primarily Agricultural, however, a small amount is used for M&I.

This district electricity is served by the Western Area Power Administration (WAPA).

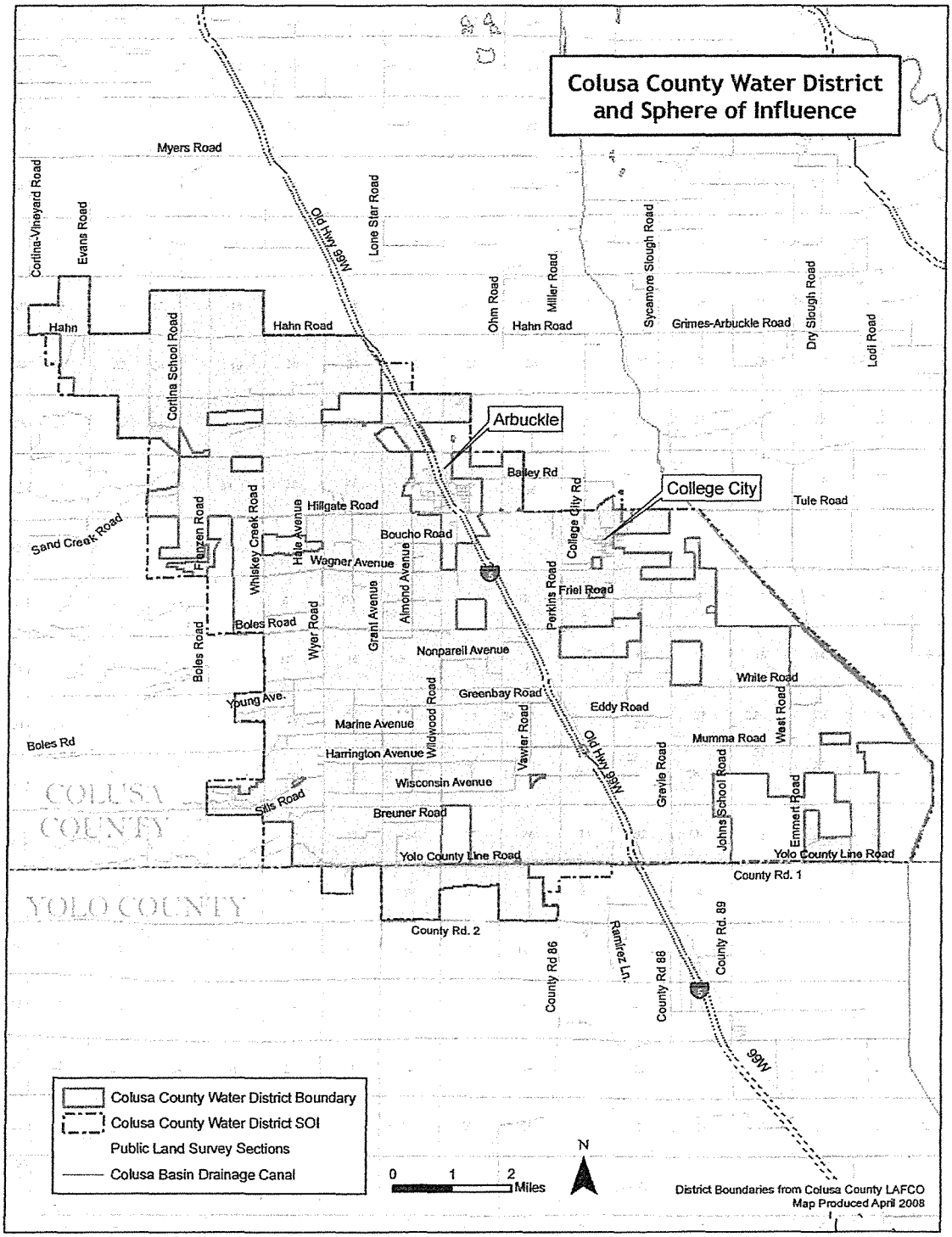
This Project:

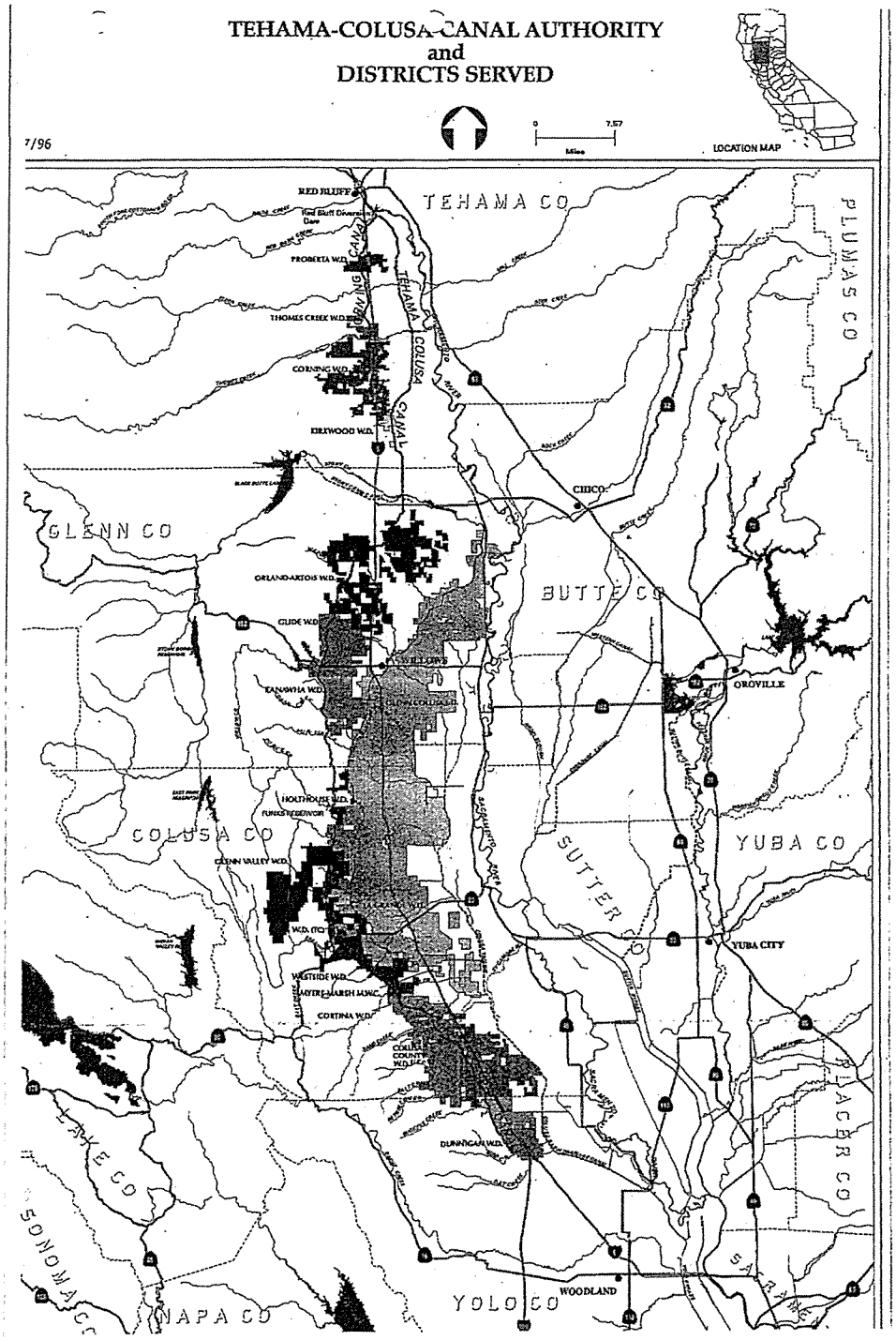
The District would like to improve water management to maximize conserved water by implementing SCADA automation, and maximize energy efficiency by retrofitting water management facilities in conjunction with the SCADA automation program.

This project retrofits for SCADA integration the 2B and 2C pumping plants. These plants differ from the other pumping plants because they are "Medium Voltage" or 480 volts AC.. The other pumping plants are 240 volt plants and are much more common.

The primary purpose of this project is to install a District wide SCADA Automation program at the Colusa County Water District. Currently the district does not have any SCADA system upgrades. There is currently a vintage wireless alarm system that tells ditch tenders there is some type of problem at the pumping plants. To understand the alarm the ditch tenders must go the site to determine the actual problem. The new SCADA system will provide central control from the district office and remote viewing of alarm and problems via tablets accessing SCADA information through 4G tablet, laptops or even smart phones. The new SCADA system and control will provide state-of-the-art control algorithms for selecting the most efficient combination of pumps to use for any given require flow rate. The existing MV (Medium Voltage) MCC (Motor Control Center) at pumping plant 2B and 2C are proposed to be upgraded. This project will consist of replacing the complete medium voltage motor starter, sync and operator control components on the fourteen (14) pumps at the 2B and 2C pumping plants. The new motor starters will be soft-starts that will prolong life of motors, pumps, hydraulic system components and reduce energy usage. This new replacement of the 2B and 2C MCC will also be designed to support SCADA interface which would not be possible with the existing MV MCC. With the use of Soft Starts on the MV MCC in rush current will be reduced at startup. And with the new pump selection controls, pump starts will be reduced. This will result in substantial energy savings at the MV MCC plants. It is estimated savings could be as high as 25%. The remaining pumping plants (regular voltage plants) in the district would not be retrofitted with soft-starts but would have, as a result of the SCADA implementation, new pump selection algorithm implemented for selecting the most efficient pump combination for the desired flow rate.

This SCADA installation project complies with the water conservation planning elements of the Bureau of Reclamation, and the State and County Water Plans.


Colusa County Water District and Sphere of Influence
Myers Road
Cortina-Vineyard Road
Evans Road
Old Hwy 99W
Lone Star Road
Ohm Road
Miller Road
Sycamore Slough Road
Dry Slough Road
Lodi Road
Hahn
Hahn Road
Cortina School Road
Grimes-Arbuckle Road
Arbuckle
College City
Bailey Rd
Tule Road
College City Rd
Sand Creek Road
Fleuren Road
Whiskey Creek Road
Hale Avenue
Hillgate Road
Boucho Road
Wagner Avenue
Almond Avenue
Perkins Road
Friel Road
Boles Road
Wyer Road
Grant Avenue
Nonpareil Avenue
White Road
Young Ave.
Greenbay Road
Eddy Road
Wildwood Road
Vawter Road
West Road
Marine Avenue
Mumma Road
Boles Rd
Harrington Avenue
Grevle Road
Johns School Road
Emmert Road
Wisconsin Avenue
Stills Road
Breuner Road
COLUSA COUNTY
Yolo County Line Road
County Rd. 1
YOLO COUNTY
County Rd. 2
Ramirez Ln.
County Rd 86
County Rd 88
County Rd. 89
99W
Colusa County Water District Boundary
Colusa County Water District SOI
Public Land Survey Sections
Colusa Basin Drainage Canal
0 1 2 Miles
N
District Boundaries from Colusa County LAFCO
Map Produced April 2008


TEHAMA-COLUSA CANAL AUTHORITY
and
DISTRICTS SERVED
7/96
LOCATION MAP
TEHAMA CO
PLUMAS CO
GLENN CO
BUTTE CO
COLUSA CO
SUTTER CO
YUBA CO
PLACER CO
LAKE CO
SONOMA CO
NAPA CO
YOLO CO
SACRAMENTO CO
RED BLUFF
PROBERTA W.D.
THOMES CREEK W.D.
CORNING W.D.
KIRKWOOD W.D.
CHICO
ORLAND-ARTOIS W.D.
GLIDE W.D.
KANAWHA W.D.
HOLTHOUSE W.D.
GLENN VALLEY W.D.
WESTSIDE W.D.
CORTINA W.D.
DUNNIGAN W.D.
OROVILLE
YUBA CITY
WOODLAND
TEHAMA COLUSA CANAL
GLENN COLUSA CANAL

TECHNICAL PROJECT DESCRIPTION

SCADA Project Description

The new SCADA system and control will provide state-of-the-art control algorithms for selecting the most efficient combination of pumps to use for any given require flow rate. The existing MV (Medium Voltage) MCC (Motor Control Center) at pumping plant 2B and 2C are proposed to be upgraded. This project will consist of replacing the complete medium voltage motor starter, sync and operator control components on the fourteen (14) pumps at the 2B and 2C pumping plants. The new motor starters will be soft-starts that will prolong life of motors, pumps, hydraulic system components and reduce energy usage. This new replacement of the 2B and 2C MCC will also be designed to support SCADA interface which would not be possible with the existing MV MCC. With the use of Soft Starts on the MV MCC in rush current will be reduced at startup. And with the new pump selection controls, pump starts will be reduced. This will result in substantial energy savings at the MV MCC plants. It is estimated savings could be as high as 25%. The remaining pumping plants (regular voltage plants) in the district would not be retrofitted with soft-starts but would have, as a result of the SCADA implementation, new pump selection algorithm implemented for selecting the most efficient pump combination for the desired flow rate. This could result in another 5% to 10% energy savings for these pumping plants. The new SCADA system would allow the pumping plants to maintain a much narrower operational band at the downstream reservoirs and standpipes

Technical description for MV MCC's Pumping Station 2B and 2C upgrade.

Engineers have recommended to the District Manager and Board to Retrofit the existing Motor Control Centers at pumping plants 2B and 2C prior to installing the SCADA systems equipment. Retrofits will be performed by certified and licensed electricians.

This project will consist of replacing the complete medium voltage motor starter, sync and operator control components on the fourteen (14) pumps at the 2B and 2C pumping plants (See cost sheets for individual components). The new retrofitted motor starters will be soft-starts that will prolong the life of motors, pumps, hydraulic system and components. The existing enclosure and internal bussing will be reused.

The new installation will be engineered with SCADA control interface. "Optional" motor and control leads to each pump from the new MCC will also be replaced considering their age and possible future failures. The breakers, both main and at individual pumps, will be tested and replaced as needed. The MCC enclosure will be painted outside for future weather protection.

(see Below for cost sheets and parts breakdown.)

Technical Description and SCADA Specifications

Integrator (Innovative Controls) *will provide a Turn Key system, which will give Colusa County total control over all Pumping Stations, and the ability to monitor all stations whether it be Flow, Level, or Pressure. SCADA system will provide visual aspects of the district, while maintaining precision control over key aspects of the system.*

Pumping Stations- *All pumping stations will be equipped with Programming Logic Controllers (PLC) which contains the program the pumping station will abide by when running. All PLC's will communicate through TransNET 900 radio's from Lookout, giving the user total control over the pumping stations from the computer in the District's Office, IPAD, or Home Computer. Utilizing a nested radio system all pumping stations will relay information from station to station and from station to District Office, which will allow the pumping stations to control based off of level, flow, or pressure while still having the ability to control all stations from the District Office at the same time. Set point, Alarm, Trending, and Control screens will be developed for the user interface part of the system.*

Flow Sites- *Any flow site(s) using a Sontek Flow Meter will be coupled with a TransNET 900 radio relaying Flow, Accumulation (Acft), and Battery (Voltage) back to the office. Flow and Battery Voltage will be graphed to a trend chart where user can view the real time data or scroll back as far as 1 year. Accumulation can be reset based on user's discretion. Alarms will be setup to notify user(s) through alarm bands in Lookout or through a Dialer which can dial out employee(s) if process exceeds limits which are set by user. Generating a .CSV file of Flow(s) and Accumulation(s) are within reason, and can be done with a small amount of programming in Lookout.*

Radio- *MDS TransNET 900 radios will be used in the Colusa County Water District. These 900Mhz Non Liscensed radio's utilize a Frequency Hopping Spread Spectrumn pattern and are linked by a Network Address which helps with radio interference among other radios which might be in the area.*

Lookout- *National Instruments Lookout will be the HMI software used by Innovative Controls. Multiple screens will be set up by Innovative Controls for user to control and monitor any process pertaining to the site chosen by user.*

This quote provides for a turn-key SCADA system for Colusa County Water District. The system will provide operator control from a central Human Machine Interface (HMI) computer at the district office to the pumping plants on laterals. Each lateral will be automated to maintain levels or pressures as required. The SCADA system will serve the following sites:

- District Office HMI
- 2-System
- 3-System
- 5-System
- 6-System
- 7-System

The HMI computer in the district office will provide the following operator controls:

- Hand-Off-Auto (HOA) selection for each pump
- On and Off control when in Hand
- Field HOA Indication
- Operational screens for each pumping plant
- Trending for Pressures, Levels, Flows and Pump Run times
- Engineering Screens to provide transducer Scaling and Alarm set points
- Separate alarm dialer for voice notification directly to Cell.
- Internet connection for connection of field Tablets to SCADA computer for remote control of system.
- Security password protection
- Overview screen of entire system to provide important operational data at-a-glance.
- Documentation

Dialer- *Any Alarms provided by Lookout will have the ability to generate a call out to any employee on the Dialer's call out list. This list will be provided by the District prior to setting up the Dialer. All call outs will be acknowledged via a special code by which the user will provide.*

Computer will be installed in District office along with a 24"x24"x8" Enclosure containing the Dialer and Master Radio. Once Master Site is fully installed a radio survey will take place, data collected will tell us how high we need to install antenna poles at certain sites. All IPAD's will be configured to talk with computer, dialer will be programmed to interface with computer, and radio's will be configured to talk with each other from Lookout Software.

Project Performance Schedule
Contracting:

After the Grant Agreement is in place (Sept 2014), the District will meet with the low bid Contractor (Innovative Controls) and establish a contract for the described work. A funding request will be made to purchase the parts, materials and supplies for the 2B and 2C MVMCC retrofit work.

Installation Phase I:

It is anticipated that the MVMCC retrofit will require several months to perform as there are soft start controllers to order, panels to be made, and wiring assembly to occur prior to in-field application of the project. While awaiting the pre-installation parts. Power will be removed from the 2B and 2C pump stations (for absolute safety) and a team will be removing the equipment to be retrofit. While awaiting the MCC equipment ordered and being fabricated, the 2B and 2C SCADA equipment will be ordered to be available for installation after the MVMCC equipment is installed and initially tested. This schedule will be PHASE I. to be completed prior to March 1 and the beginning of water season. (2B and 2C will be complete and operational)

The second part of Phase I will be to install the Master Computer, Radios, Telemetry, programs and programming in the office. This should occur immediately after field work is completed (March -April 2015) on 2B and 2C. (or sooner). (Master Computer operational, Radio and Program communicating with 2B & 2C,)

Installation Phase II

Installation Phase II will begin in the summer by ordering the necessary SCADA parts, manufacturing panels, ordering radio's, assembling parts, and generally preparing to install the systems at the other pumping plants. Installations will begin around the end of the water year or October 1st. Specifically, when the District manager gives the "go-ahead".

Installation Phase III

Phase III will provide the Debugging, Training, and provide documentation.. The beginning of the water year is also when the District will pay special attention to gathering the pre-season data for project reporting of outcomes and benefits.

MV and MCC retrofit parts breakout

Item	Description	Cost	Qty	Total
A	RTFT-XXXX	$55,428.00	3	$166,284.00
	Design 1A: Motor 350HP/2400VAC/900RPM/69.5A Exciter:125VDC/24.2A			
	LV Front Door Panel: - ANSI 61 Gray Panel - Customer Mount -OL Reset - Keypad (MVSS&MX2 Sinc)l - DC Amp meter - DC Volt meter - E Stop - Field fault light (Amber) - On Light (Red) - Off light (Green) - 3 position H-O-A - 3 position SS-Off-ALT			
	LV Control Box Panel: -White -MX3 Primary motor control and protection package MX2SEP Package -Relays and controls -Terminals -120VDC BIST test switch and plug			
	MV Backpanel: -SMMVRMX12-350-2400-C -2400V Isolation contactor -Resistor divider card -Motor lead landing pad -Current Transformers -SEP transformer fusing			
	Additional Items: -Resistor divider card harness -CT harness -Field Discharge resistor -SEP Supply transformer -Misc. Power cables			

Item	Description	Cost	Qty	Total
B	RTFT-XXXX	$50,283.60	2	$100,567.20
	Design 1B: Motor 100HP/2400VAC/1800RPM/20.5A Exciter:125VDC/5.98A			
	LV Front Door Panel: - ANSI 61 Gray Panel - Customer Mount -OL Reset - Keypad (MVSS&MX2 Sinc)l - DC Amp meter - DC Volt meter - E Stop - Field fault light (Amber) - On Light (Red) - Off light (Green) - 3 position H-O-A - 3 position SS-Off-ALT			
	LV Control Box Panel: -White -MX3 Primary motor control and protection package MX2SEP Package -Relays and controls -Terminals -120VDC BIST test switch and plug			
	MV Backpanel: -SMMVRMX12-350-2400-C -2400V Isolation contactor -Resistor divider card -Motor lead landing pad -Current Transformers -SEP transformer fusing			
	Additional Items: -Resistor divider card harness -CT harness -Field Discharge resistor -SEP Supply transformer -Misc. Power cables			

Item	Description	Cost	Qty	Total
C	RTFT-XXXX	$52,518.00	1	$52,518.00
	Design 1C: Motor 200HP/2400VAC/1200RPM/20.5A Exciter:125VDC/16.3A			
	LV Front Door Panel: - ANSI 61 Gray Panel - Customer Mount -OL Reset - Keypad (MVSS&MX2 Sinc)l - DC Amp meter - DC Volt meter - E Stop - Field fault light (Amber) - On Light (Red) - Off light (Green) - 3 position H-O-A - 3 position SS-Off-ALT			
	LV Control Box Panel: -White -MX3 Primary motor control and protection package MX2SEP Package -Relays and controls -Terminals -120VDC BIST test switch and plug			
	MV Backpanel: -SMMVRMX12-350-2400-C -2400V Isolation contactor -Resistor divider card -Motor lead landing pad -Current Transformers -SEP transformer fusing			
	Additional Items: -Resistor divider card harness -CT harness -Field Discharge resistor -SEP Supply transformer -Misc. Power cables			

Item	Description	Cost	Qty	Total
D	RTFT-XXXX	$55,428.00	2	$110,856.00
	Design 1D: (Tesco) Motor 350HP/2400VAC/900RPM/69.5A Exciter:125VDC/24.2A			
	LV Front Door Panel: - ANSI 61 Gray Panel - Customer Mount -OL Reset - Keypad (MVSS&MX2 Sinc)l - DC Amp meter - DC Volt meter - E Stop - Field fault light (Amber) - On Light (Red) - Off light (Green) - 3 position H-O-A - 3 position SS-Off-ALT			
	LV Control Box Panel: -White -MX3 Primary motor control and protection package MX2SEP Package -Relays and controls -Terminals -120VDC BIST test switch and plug			
	MV Backpanel: -SMMVRMX12-350-2400-C -2400V Isolation contactor -Resistor divider card -Motor lead landing pad -Current Transformers -SEP transformer fusing			
	Additional Items: -Resistor divider card harness -CT harness -Field Discharge resistor -SEP Supply transformer -Misc. Power cables			

Item	Description	Cost	Qty	Total
E	RTFT-XXXX	$54,216.00	3	$162,648.00
	Design 1E: Motor 250HP/2400VAC/900RPM/50.2A Exciter:125VDC/22.2A			
	LV Front Door Panel: - ANSI 61 Gray Panel - Customer Mount -OL Reset - Keypad (MVSS&MX2 Sinc)l - DC Amp meter - DC Volt meter - E Stop - Field fault light (Amber) - On Light (Red) - Off light (Green) - 3 position H-O-A - 3 position SS-Off-ALT			
	LV Control Box Panel: -White -MX3 Primary motor control and protection package MX2SEP Package -Relays and controls -Terminals -120VDC BIST test switch and plug			
	MV Backpanel: -SMMVRMX12-350-2400-C -2400V Isolation contactor -Resistor divider card -Motor lead landing pad -Current Transformers -SEP transformer fusing			
	Additional Items: -Resistor divider card harness -CT harness -Field Discharge resistor -SEP Supply transformer -Misc. Power cables			

Item	Description	Cost	Qty	Total
F	RTFT-XXXX	$50,628.00	1	$50,628.00
	Design 1F: Motor 125HP/2400VAC/1200RPM/25.1A Exciter:125VDC/11.7A			
	LV Front Door Panel: - ANSI 61 Gray Panel - Customer Mount -OL Reset - Keypad (MVSS&MX2 Sinc)l - DC Amp meter - DC Volt meter - E Stop - Field fault light (Amber) - On Light (Red) - Off light (Green) - 3 position H-O-A - 3 position SS-Off-ALT			
	LV Control Box Panel: -White -MX3 Primary motor control and protection package MX2SEP Package -Relays and controls -Terminals -120VDC BIST test switch and plug			
	MV Backpanel: -SMMVRMX12-350-2400-C -2400V Isolation contactor -Resistor divider card -Motor lead landing pad -Current Transformers -SEP transformer fusing			
	Additional Items: -Resistor divider card harness -CT harness -Field Discharge resistor -SEP Supply transformer -Misc. Power cables			

Item	Description	Cost	Qty	Total
G	RTFT-XXXX	$49,224.00	2	$98,448.00
	Design 1G: Motor 75HP/2400VAC/1800RPM/15.4A Exciter:125VDC/6.14A			
	LV Front Door Panel: - ANSI 61 Gray Panel - Customer Mount -OL Reset - Keypad (MVSS&MX2 Sinc)l - DC Amp meter - DC Volt meter - E Stop - Field fault light (Amber) - On Light (Red) - Off light (Green) - 3 position H-O-A - 3 position SS-Off-ALT			
	LV Control Box Panel: -White -MX3 Primary motor control and protection package MX2SEP Package -Relays and controls -Terminals -120VDC BIST test switch and plug			
	MV Backpanel: -SMMVRMX12-350-2400-C -2400V Isolation contactor -Resistor divider card -Motor lead landing pad -Current Transformers -SEP transformer fusing			
	Additional Items: -Resistor divider card harness -CT harness -Field Discharge resistor -SEP Supply transformer -Misc. Power cables			

Item	Description	Cost	Qty	Total
H	26A1	$4,800.00	1	$4,800.00
	- Approval Drawings			

Item	Description	Cost	Qty	Total
I	25A1	$4,200.00	1	$4,200.00
	- O&M Manual			
	-Electronic Copy			

Item	Description	Cost	Qty	Total
J	Benshaw Field Engineering Services - Two Days on site -Review Installation -Training -Travel and Lodging Included	$7,500.00	1	$7,500.00

Item	Description	Cost	Qty	Total
K	Project management	$5,000.00	1	$5,000.00
L	On site field installation	$5,175.00	14	$72,450.00

Item	Description	Cost	Qty	Total
M	MCC Commercial Painting 2B	$5,175.00	1	$5,175.00
N	MCC Commercial Painting 2C	$3,000.00	1	$3,000.00
	- White			

Item	Description	Cost	Qty	Total
O	Motor and control lead replacement -Wire and installation	$3,500.00	14	$49,000.00

Total Project Cost 2B/2C **$893,074.20**

Colusa County Water District Pumping Plant listing

Facility	Pmping Plant	Motor - Horsepower	Total HP
2 System			
Canal side	2B	2 - 350 hp	2000
	GE 2400 V.	3 - 300 hp	

	8 pumps	1 - 200 hp 2 - 100hp	
Relift	2C GE 2400 V. 6 pumps	3 - 250 hp 1 - 125 hp 2 - 75 hp	1025
Relift	2D GE 480 V 5 pumps	2 - 125 hp 1 - 75 hp 2 - 40 hp	365
2B Gravity	-	-	-
3 System			
Canal side	3BA GE 460 V 4 pumps	1 - 75 hp 1 - 40 hp 2 - 20 hp	155
	3A Tank	300,000 gal	
Relift	3BC GE 460 V 5 pumps	2 - 350 hp 1 - 200 hp 2 - 100 hp	1100

Relift	3CD GE 460 V 5 pumps	2 - 200 hp 1 - 150 hp 2 - 50 hp	650
Relift	3CG GE 460 V 4 pumps	2 - 100 hp 2 - 50 hp	300
Relift	3D GE 460 V 5 pumps 3D Tank	2 - 150 hp 1 - 100 hp 2 - 40 hp 190,000 gal	480
Relift	3G GE 460 V 3 pumps	1 - 75 hp 2 - 40 hp	155
4 System Gravity	-	-	-

Facility	Pumping Plant	Motor - Horsepower	Total HP

5 System			
Canal side	5B	1 - 200 hp	420
	GE 460 V	1 - 100 hp	
	4 pumps	2 - 60 hp	
Relift	5 Tank	250,000 gal	
6 System			
Canal side	6BA	2 -200 hp	500
	GE 460 V	1 - 50 hp	
	5 pumps	2 - 25 hp	
	6A Tank	362,000 gal	
Relift	6B	1 - 150 hp	300
	GE 460 V	2 - 75 hp	
	3 pumps		
	6B Tank	300,000 gal	
7 System			
Canal side	7A	2 -400 hp	1250
	VS 480 V	1 - 200 hp	

	5 pumps	2 - 125 hp	
Relift	7B	1 - 200 hp	350
	VS 480 V	1 - 100 hp	
	4 pumps	2 - 50 hp	
	7B Tank	-	
8 System Gravity	-	-	-

EVALUATION CRITERIA

*Up to **28 points** may be awarded for a proposal that will conserve water and improve efficiency. Points will be allocated to give consideration to projects that are expected to result in significant water savings.*

Subcriterion No. A.1—Water Conservation

Colusa County WD is proposing that through this program it has both quantifiable and non-quantifiable water savings.

For projects with quantifiable and sustained water savings, please respond to Subcriterion No. 1(a)—Quantifiable Water Savings described in this subsection. If the project does not result in quantifiable water savings but will improve water management, please respond to Subcriterion No. 1(b)—Improved Water Management described in this subsection. If the project has separate components that will result in both quantifiable water savings and improved water management,

an applicant may respond to both Subcriteria Nos. A.1(a) and (b). However, an applicant is limited to 20 points total under both Subcriteria No. A.1(a) and (b).

Subcriterion No. A.1(a) Quantifiable Water Savings

*Up to **20 points** may be allocated based on the quantifiable water savings expected as a result of the project.*

Describe the amount of water saved

For projects that conserve water, please state the estimated amount of water expected to be conserved (in acre-feet per year) as a direct result of this project. Please provide sufficient detail supporting how the estimate was determined, including all supporting calculations. Please be sure to consider the questions associated with your project type (listed below) when determining the estimated water savings, along with the necessary support needed for a full review of your proposal

Currently the District estimates that there is approximately 2160 Ac. Ft. per year of water that can be conserved through improved pump controls and SCADA automation management. This can be verified through an analysis of the laterals measurements to growers farms that are on sprinkler and low pressure systems as compared to totalized diversions from the canal. The hypothesis is that there has been no specific program for monitoring of the pressures/tank/reservoirs allowing pump cycling (or maybe even spillage)high to low pressures without detection. Low pressures when recognized by growers in the field, encourage either early next irrigations or duplicate irrigations to provide the water the crops need. The estimate is based on 4% of the district's 54000 ac. Ft. of usage. Additionally, when there is an outage or shutdown or alarm, the district is subject to sometimes significant delays while the field men travel to find the problems. the SCADA systems would allow for rapid reset of pumps when there are outages the cause shut-downs. (again, another reason the growers would "reset" their irrigations effectively double-irrigating.

Estimate is based on the following

Automation systems life expectancy is 25 years

The District Annually pumps ~54,000 Ac Ft. X 4% (estimated savings) = 2160 Ac Ft. (estimated management conservation potential).

In addition, all applicants should be sure to address the following:

What is the applicant's average annual acre-feet of water supply?

54,000 Ac Ft.

Where is that water currently going

The water is currently seeping into the ground for crop irrigations.

Where will the conserved water go?

Conserved water will be retained in the Colusa Co. WD system and utilized to meet crop production water needs.

Please address the following questions according to the type of project you propose for funding.

(1) **Canal Lining/Piping**: Canal lining/piping projects can provide water savings when irrigation delivery systems experience significant losses due to canal seepage.

Colusa Co. Water District is completely piped (105 miles of AC pipe).

(2) **Municipal Metering:** Municipal metering projects can provide water savings when individual user meters are installed where none exist to allow for unit pricing and when new meters are installed within a distribution system to assist with leakage reduction. Applicants proposing municipal metering projects should address the following:

Corning WD has only 5 municipal client turnouts, with usage of little significance.

(3) Irrigation Flow Measurement: Irrigation flow measurement improvements can provide water savings when improved measurement accuracy results in reduced spills and over-deliveries to irrigators. Applicants proposing municipal metering projects should address the following:

All turnouts in Colusa Co. WD are on flow and totalizing propeller meters

(4) **SCADA and Automation**: SCADA and automation components can provide water savings when irrigation delivery system operational efficiency is improved to reduce spills, over-deliveries, and seepage. Applicants proposing municipal metering projects should address the following:

(a) How have average annual water savings estimates been determined? Please provide all relevant calculations, assumptions, and supporting data.

The Colusa Co. Water District is measured for water at diversions on the Tehama-Colusa Canal and at each growers turnout. This district is a closed piped water system. Water is ordered 24 hours in advance, but the land owners can turn their water on and off as suits their crop management style.

Growers are billed based on the propeller flow and totalizing records that are metered at their turnouts.

Based on that lateral's, grower water use records and canal diversion records the manager can determined the estimated quantity of conserved water.

(b) Have current operational losses been determined? If water savings are based on a reduction of spills, please provide support for the amount of water currently being lost to spills.

Operation losses are very low due to the closed pipe system. Only operation losses determined were from a broken pipeline caused by water hammer (that could have set off a low tank alarm, if SCADA were operational.) Uncertain of the amount of water lost.

No other operational losses have been identified.

(c) Will annual farm delivery volumes be reduced by more efficient and timely deliveries? If so, how has this reduction been estimated?

Yes, The district management believes it would on the effected laterals.

Growers in Colusa Co. Water District are very strong proponents of conservation. Partly because they are limited to a bare minimum supply of water and pay dearly ($150-$300/AF) for any additional water above their allocation (based on a % of the districts allocation off the Sacramento River (already on deficit irrigation programs.) Improved and reliable water pressure will allow them to not need the extra "bump" of water that has been experienced when water pressures cycle down and water doesn't reach the ends of their irrigation lines. As a result of these understandings, the District has assumed a conservative position that 4% could be saved, and are willing to invest in that possibility.

(d) Will canal seepage be reduced through improved system management? If so, what is the estimated amount and how was it calculated?

The District is 100% piped, no canal seepage occurs.

(e) How will actual water savings be verified upon completion of the project?

Savings will be verified by analysis of water balance records. Specifically, water diverted compared to water delivered. (water balance)

(5) **Groundwater Recharge**: Groundwater recharge can provide savings when surface water storage evaporation is reduced and/or surface runoff is intercepted for recharge. Applicants proposing groundwater recharge projects should address the following:

No Groundwater recharge opportunities exist in or around Corning WD.

(6) **Landscape Irrigation Measures**: Landscape irrigation measures can provide water savings by reducing outdoor water usage. These measures include turf removal, Smart irrigation controllers (e.g., weather or soil-moisture based) and high-efficiency nozzles (e.g., sprinkler heads).

Colusa Co WD has no significant landscape customers. All are agricultural crop growers.

(7) **High-Efficiency Indoor Appliances and Fixtures:** Installing high- efficiency indoor appliance and fixtures can provide water savings for municipal water entities where there is significant potential for replacing existing non-efficient indoor appliances and fixtures. Applicants proposing high-efficiency indoor appliance and fixtures projects should address the following:

Colusa Water District has no urban customers.

Subcriterion No. A.1(b) Improved Water Management

*Up to **5 points** may be awarded if the proposal will improve water management through measurement, automation, advanced water measurement systems, or through implementation of a renewable energy project, or through other approaches where water savings are not quantifiable.*

Describe the amount of water better managed. For projects that improve water management but which may not result in measurable water savings, **state the amount of water expected to be better managed, in acre-feet per year and as a percentage of the average annual water supply.** (The average annual water supply is the amount actually diverted, pumped, or released from storage, on average, each year. This does not refer to the applicant's total water right or potential water supply.) Please use the following formula:

Estimated Amount of Water Better Managed

Average Annual Water Supply

54000 = 100%

54000

As a result of this program, the Districts entire water delivery 54,000 Ac Ft. will be better managed. Reliable and regular water pressures, better pump control and greater energy efficiency. The programmable motor controls will extend the life expectancy of much of the equipment that are subjected to significant pounding from pumps turning off and on in rapid cycling. Greater management through SCADA control of the entire district. New programming allows password protected 4G electronic tablet control of data information and can be accessed over the internet so any water issues can be identified from any location that has internet access. Thus saving driving time and allowing staff time to be more efficiently used.

Subcriterion No. A.3—Reasonableness of Costs

*Up to **4 additional points** may be awarded based on the reasonableness of the cost for the benefits gained.*

Please include information related to the total project cost, annual acre-feet conserved (or better anaged), and the expected life of the improvement. Use the following calculation: Total Project Cost
(Acre-Feet Conserved, or Better Managed x Improvement Life)

$$\frac{1386075}{2160*25} = 25.67$$

Based on estimated water conserved through better management of 2160 ac. Ft. times anticipated life of 25 years, the water savings (and, not considering the energy savings) would cost $25.67 per acre foot. (less than the district is paying for water.) However, when water is purchased through the water markets, water sells for $75/Ac. Ft. to $300.00 per Ac FT. . Representing a much larger benefit.

This doesn't consider the pumping electricity being saved.

Industry accepted life-expectancy for SCADA Systems are 25 years.

Failure to include this required calculation will result in no score for this section.

Subcriterion No. B.2—Increasing Energy Efficiency in Water Management

If the project is not implementing a renewable energy component, as described in Subcriterion No. B.1 above, up to ***4 points*** *may be awarded for projects that address energy demands by retrofitting equipment to increase energy efficiency and/or through water conservation improvements that result in reduced pumping or diversions.*

Describe any energy efficiencies that are expected to result from implementation of the water conservation or water management project (e.g., reduced pumping).

- Please provide sufficient detail supporting the calculation of any energy savings expected to result from water conservation improvements. If quantifiable energy savings are expected to result from water conservation improvements, please provide sufficient details and supporting calculations. If quantifying energy savings, please state the estimated amount in kilowatt hours per year.

Through this grant, the 14 pumps from pumping stations 2B and 2C will be provided soft-starts motor controls for lower energy startup management. Also, through the new SCADA automation controls, a superior pump management algorithm will be established for the pump control program. This will provide the most energy efficient use of the pumping combinations to provide tank level management. Prior to the SCADA controls, the pump stations had a older pump priority system for maintaining tank levels and line pressures. Previous management of this pumping station was to set the pumps based on water orders and respond to grower water calls when the pressure dropped or discovery of issues on the rounds. Manual operations of the pump system has historically been in-efficient due to distance from the office and lack of communications. Significant energy savings are anticipated, this was proven when a neighboring districts pumping station (similarly constructed and operated) was automated resulting in approximately 100,000 kilowatt hours (at one plant) saved the first year. Energy savings at these sites are quantifiable by comparing the 2013 energy usage to the first full season with the new equipment in-place. KW usage per acre-foot can be calculated.

WAPA power is provided and their staff have been effective in providing energy use information upon request.

- Please describe the current pumping requirements and the types of pumps (e.g. size) currently being used. How would the proposed project impact the current pumping requirements?

District Pumps are listed in the Technical Description Section. Impact expected on pumping requirements would be to improve lateral water pressure management through custom SCADA level control algorithms.

With the use of programmable Soft Starts on the MV MCC on the 14 pumps at plants 2B and 2C, in-rush current will be reduced at startup and with the new pump selection control, pump starts will be reduced resulting is substantial energy savings at the MV MCC plants. It is estimated this could be as high as 20% to 25%.

The remaining pumping plants in the district would not be retrofitted with soft-starts but would have the new pump selection algorithm implemented for selecting the most efficient pump combination for the desired flow rate. This could result in another 5% to 10% energy savings for these pumping plants.

The new SCADA system would allow the pumping plant to maintain a much narrower operational band at the downstream reservoirs and stand resulting in a much tighter level control. The tighter level would equate to higher flow control and as a result provide from 5% to 10% water saving to more accurate flow rates.

The project will not change the horsepower requirements for pumping water at the laterals. The impact would be to utilize the SCADA pump sequencing algorithm to match distribution flow requirements and minimize the cycling of the pumps off and on, etc. The efficiency value is gained each time the motor starts because it requires a peak energy boost to power-up. This would smooth out the power usage, eliminate much of the peak power requirements and save energy. .

Pumping stations currently are staged by older programming that predates the SCADA logic. At the time of these designs Reclamation provided WAPA energy that was cheap and abundant, and control systems were not sophisticated. As a result, frequent cycling have been considered part of the cost of getting peak water pressures. While any overflow water of these stations spill returns to the delivery canal and is not lost, the power to pump it and wear on equipment, is lost.

- Please indicate whether your energy savings estimate originates from the point of diversion, or whether the estimate is based upon an alternate site of origin.

Energy Savings estimates are based on originating at the points of diversions

- Does the calculation include the energy required to treat the water?

No water treatment is required.

- Will the project result in reduced vehicle miles driven, in turn reducing carbon emissions? Please provide supporting details and calculations.

Yes, Anticipate a reduction in miles, by reducing the number of visits to the two project sites. Currently the field man visits each of these sites approximately 3 times per day on average, every day during the irrigation season (April 1- Sep 30). Each of these visits will require a minimum of 45 miles/ round trip. Calculating 180 day season, using 3 trips per day at 35 miles per trip. The field man travels 24300 miles per season checking these pumping stations. Anticipating that the visits can be reduced down to one visit per day or less on average in succeeding years. Using the average of one visit to the pumping stations, 16200 miles per year of reduce carbon emissions would be achieved.

Yes, based on calculations of 3 trips to each station per day, at 45 miles/trip (round trip) times 180 day water season, savings would be 16,200 miles.

(45 mi. X 1 trips X 180 days = 8100 miles)

V.A.3 Evaluation Criterion C: Benefits to Endangered Species (12 points)

No effects on endangered species are anticipated either positive or negative.

The only benefit may be the indirect benefit of power use reductions saving energy requiring less power generation and benefits derived from that savings. Also, possible benefits of less water required from the Sacramento River, leaving water in the river for Salmon habitat.

*Up to **12 points** may be awarded for projects that will benefit federally-recognized candidate species or up to **12 points** may be awarded for projects expected to accelerate the recovery of threatened or endangered species, or addressing designated critical habitat.*

V.A.4 Evaluation Criterion D: Water Marketing (12 points)

Anticipate benefits are the need to purchase less water from the available water market leaving that water for others to acquire.

*Up to **12 points** may be awarded for projects that propose water marketing elements, with maximum points for projects that establish a new water market.*

Briefly describe any water marketing elements included in the proposed project. Include the following elements:

(1) Estimated amount of water to be marketed

The Colusa County WD is expecting to be a water buyer due to the drought induced allocation reductions.

(2) A detailed description of the mechanism through which water will be marketed (e.g., individual sale, contribution to an existing market, the creation of a new water market, or construction of a recharge facility)

Any water made available for marketing through conservation efforts would be offered through the existing cooperative market established in association with the Tehama-Colusa Canal Authority.

(3) Number of users, types of water use, etc. in the water market

The seventeen irrigation Districts of the Tehama Colusa Canal, have an agreement to market available water when their allocation exceeds their water requirement in any given year. After the past 3 years of Drought and minimal water allocations it is unlikely that water will be available through this association. (2013 was the driest year on record in Northern California)

(4) A description of any legal issues pertaining to water marketing

(e.g., restrictions under Reclamation law or contracts, individual project authorities, or State water laws)

Uncertain of any legal restrictions outside of the existing State and Federal guidelines.

(5) Estimated duration of the water market

On-going throughout the water year

V.A.5 Evaluation Criterion E: Other Contributions to Water Supply Sustainability (14 points)

*Up to **14 points** may be awarded for projects expected to contribute to a more sustainable water supply. This criterion is intended to provide an opportunity for the applicant to explain how the project relates to a **WaterSMART Basin Study**, how the project could expedite future **on-farm improvements**, and/or how the project will provide **other benefits to water supply sustainability** within the basin. An applicant may receive the maximum 14 points under this criterion based on discussion of one or more of the numbered sections below.*

*(1) Points may be awarded for projects that address an adaptation strategy identified in a completed **WaterSMART Basin Study**.*

No WaterSMART Basin Studies have been identified in the Northern Sacramento Valley.

Proposals that provide a detailed description of how a project is addressing an adaptation strategy specifically identified in a Basin Study (i.e., a strategy to mitigate the impacts of water shortages resulting from climate change, drought, increased demands, or other causes) may receive maximum points under this criterion. Applicants should provide as much detail as possible about the relationship of the proposed project to the adaptation strategy identified in the Basin Study, including, but not limited to, the following:

(a) Identify the specific WaterSMART Basin Study where this adaptation strategy was developed. Describe in detail the adaptation strategy that will be implemented through this WaterSMART Grant project, and how the proposed WaterSMART Grant project would help implement the adaptation strategy.

Currently we are not aware of a "WaterSMART Basin Study in the Northern Central Valley of California.

Colusa Co. wd is actively participating in the CVPIA water conservation program. Utilizing a current Water Management Plan, The District is fully measured and collects water use data at each turnout and participates with the Tehama Colusa Canal Authority in its water measurement program monitoring water into the District, and water taken at each turnout. (measured with propeller meters). The District encourages it's farmers to implement water conservation activities like low flow irrigation systems, drip tape, and deficit irrigation practices. The project identified in this grant proposal is a result of Cal Poly Water Engineering reviews from the early days of the water conservation programs around 1996.

While this district is limited in its resources, it has made every effort to stay on the front edge of water conservation.

(b) Describe how the adaptation strategy and proposed WaterSMART Grant project will address the imbalance between water supply and demand identified by the Basin Study.

The district is striving to eliminate any areas of the district design that are not water and energy efficient. By reducing spills, conserving energy, and providing consistent and reliable water pressure to the growers, it provides the opportunity for maximized conservation and improved water efficiency.

(c) Identify the applicant's level of involvement in the Basin Study (e.g., cost-share partner, participating stakeholder, etc.).

The district is awaiting information on the development of a Basin Study in Northern California.

(d) Describe whether the project will result in further collaboration among Basin Study partners.

Water Users on the Tehama-Colusa Canal and across the valley are very concerned about the future of the impacts on water resources and how water will be made available in the future. This project will assist the Colusa Co. Water District in completing its SCADA program and provide an example of the latest programmable soft-start controls for pumps. It will be discussed at the Tehama Colusa Canal Authority board meetings spreading the word on available programs.

(2) *Points may be awarded for projects that describe in detail how they will directly expedite future* ***on-farm irrigation improvements****, including future on-farm improvements that may be eligible for NRCS funding. Please address the following:*

(a) Include a detailed listing of the fields and acreage that may be improved in the future.

The District notifies each of its growers whenever an NRCS program is available. The notifications usually go out with the monthly newsletter and water usage reports, including contact information.

The majority of the District growers are currently utilizing low volume irrigation techniques. The "hold-outs" are not inclined to newer irrigation methods. However, with the improved pressure regulation on these systems there may be some interest developed on these laterals.

(b) Describe in detail the on-farm improvements that can be made as a result of this project. Include discussion of any planned or ongoing efforts by farmers/ranchers that receive water from the applicant.

On farm improvements mostly on permanent crops would primarily be installations of low pressure irrigation sprinklers, microjet systems, or drip line or tape. This would reduce the wetted zones and maximize the system efficiency.

(c) Provide a detailed explanation of how the proposed WaterSMART Grant project would help to expedite such on-farm efficiency improvements.

Many growers understand for a high efficiency irrigation system to function properly, it is necessary to provide reliable and consistent water pressure. The current lateral pumping stations when upgraded will become more reliable and consistent in their water deliveries.

(d) Fully describe the on-farm water conservation or water use efficiency benefits that would result from the enabled on-farm component of this project. Estimate the potential on-farm water savings that could result in acre-feet per year. Include support or backup documentation for any calculations or assumptions.

Providing consistent and dependable pressure allows the farmer to take irrigation to a very refined quantity delivered. Maximizing conservation of the water resource. However, when the water pressure fluctuates and is unreliable, hi-tech micro drippers or micro sprinklers loose pressure to the ends of the lines, causing the plants near ends of the irrigation lines to stress.

The benefits of conversion are greatest when converting from flood, or furrow irrigation methods. However, benefits can be had even when converting from large sprinklers to micro-sprinkler systems. The plant must be provided the amount of water that it requires for healthy growth. The benefits usually come in reduced surface evaporation losses when watering just the root zone of the plant and not all the surrounding soils. Depending on crop and field size, savings can be minor to significant. A very rough estimate of potential savings could be in the neighborhood of 3-5% of applied water.

(e) Projects that include significant on-farm irrigation improvements should demonstrate the eligibility, commitment, and number or percentage of shareholders who plan to participate in any available NRCS funding programs. Applicants should provide letters of intent from farmers/ranchers in the affected project areas.

The District actively encourages growers to participate in any available agricultural assistance programs available.

(f) Describe the extent to which this project complements an existing or newly awarded AWEP project.

The District is 2/3rds irrigated with pressure irrigation systems. Due to the reduced allocations from drought conditions most growers have converted to systems that save as much water as is financially feasible. However, this project will provide encouragement to growers to make conservation investments of improved water efficiency.

(3) *Points may be awarded for projects that include* ***other benefits*** *to water supply sustainability.*

Projects that do not address a need/adaptation strategy identified in a Basin Study or do not help expedite future on-farm irrigation improvements, may receive maximum points under this criterion by thoroughly explaining additional project benefits. Please provide sufficient explanation of the additional expected project benefits and their significance. Additional project benefits may include, but are not limited to, the following:

(a) Will the project make water available to address a specific concern? For example:

(i) Will the project address water supply shortages due to climate variability and/or heightened competition for finite water supplies (e.g., population growth or drought)? Is the river, aquifer or other source of supply over-allocated?

Yes, the Area is in a 3 year drought. The past year provided the lowest rainfall in recorded history for Northern California. As a result of the CVPIA, water availability in the Sacramento River was under-calculated and resulted in an over-allocation to the environmental purposes. This has exaggerated the effects of the drought. All water that can be captured from system losses will assist in addressing the shortages the District is experiencing.

(ii) Will the project market water to other users? If so, what is the significance of this (e.g., does this help stretch water supplies in a water-short basin)?

No, the district is under-allocated for its water needs, it is highly unlikely that Colusa Co. WD will be in a position to market water in the future.

(iii) Will the project make additional water available for Indian tribes?

No, no tribal agencies are within, or adjacent to the district boundaries.

(iv) Will the project help to address an issue that could potentially result in an interruption to the water supply if unresolved? (e.g., will the project benefit an endangered species by maintaining an adequate water supply)? Are there endangered species within the basin or other factors that may lead to heightened competition for available water supplies among multiple water uses?

No, it is unlikely that the District water supply would be interrupted as a result of not accomplishing this project. This project deals primarily with lateral in-efficiency and pump controls. However, part of the intent of this project is to refurbish and upgrade the Medium Voltage MCC's.

(v) Will the project generally make more water available in the water basin where the proposed work is located?

No.

(b) Does the project promote and encourage collaboration among parties?

(i) Is there widespread support for the project?

Within the District and Reclamation there is solid support for this project. It is not a project that has been announced to a widespread audience.

(ii) What is the significance of the collaboration/support?

Unknown

(iii) Will the project help to prevent a water-related crisis or conflict?

Basin wide, probably not, but it is expected to provide some relief to the district.

(iv) Is there frequently tension or litigation over water in the basin?

Yes, Reclamation, due to drought conditions, continues to reduce allocations causing significant stress between agricultural water users and the environmental community.

(v) Is the possibility of future water conservation improvements by other water users enhanced by completion of this project?

Yes, It is the history of this area that as one district finds success in improvements the neighboring districts will make efforts to duplicate those successes in their district.

(c) Will the project increase awareness of water and/or energy conservation and efficiency efforts?

Yes, The District managers get together regularly (at least monthly) and discuss programs, conditions and opportunities. The success of this program will encourage others to implement similar programs.

(i) Will the project serve as an example of water and/or energy conservation and efficiency within a community?

Yes, the Colusa County community is very close (typical of a small community)

(ii) Will the project increase the capability of future water conservation or energy efficiency efforts for use by others?

Yes, however it is uncertain to the degree.

(iii) Does the project integrate water and energy components?

Yes, This project does integrate the conservation of water and significant energy savings

- ***Conservation on-farm through reliable and consistent supply, eliminating duplicate irrigations.***
- ***Energy savings by eliminating Hi/low tank cycles***
- ***Energy savings from reduced peak start-up requirements***
- ***SCADA assisted water management conservation efficiencies***

V.A.6 Evaluation Criterion F: Implementation and Results (10 points)

Points may be awarded for proposals with planning efforts that provide support for the proposed project.

Does the project have a Water Conservation Plan, System Optimization Review (SOR), and/or district or geographic area drought contingency plans in place? Does the project relate/have a nexus to an adaptation strategy developed as part of a WaterSMART Basin Study)? Please self-certify, or

provide copies of these plans where appropriate, to verify that such a plan is in place.

Provide the following information regarding project planning:

(1) Identify any district-wide, or system-wide, planning that provides support for the proposed project. This could include a Water Conservation Plan, SOR, Basin Study, or other planning efforts done to determine the priority of this project in relation to other potential projects.

The District has an approved Water Management/Conservation Plan submitted and approved through Reclamations CVPIA Water Conservation Program in Sacramento. In that plan reflects the conservation actions required and proposed by the District. SCADA automation and water management practices, Water Measurement at turnouts, piped water delivery system, minimizing spills, reduced tail-water flows, on-farm water use efficiency, water use data management and reporting, and revising the Water Management Plans every 5 years are all commitments of the water conservation program.

(self certifying, plan copies are available at the District office or in Reclamation's Sacramento water conservation office.)

(2) Identify and describe any engineering or design work performed specifically in support of the proposed project.

This SCADA project was first conceived back in the late 1990's. Cal Poly staff provided a review before SOR's were called SOR's. In that review, they recommended SCADA automation throughout the district. Not being a small district, complete implementation (even with a cost share assistance) was more than the Board believed there was funding for. The current board has seen the results of SCADA in other Districts and is now inclined to implement the SCADA program if financial assistance can be made available.

Four engineering companies with appropriate qualifications have been contacted to provide proposals for the implementation of the MVMCC retrofit and SCADA installation.

a. The first company provided a projected cost for the MVMCC of around $2 million dollars for the MV MCC. But didn't offer SCADA integration.

b. The Second offered a bid of $1.2 million for the MVMCC, also didn't offer SCADA integration.

c. Innovative Controls provided a bid of $893,075. And also a bid for the SCADA integration work of $448,000. This was determined to be low bid.

d. The fourth company sent out a representative to see the project, no bid, and he was not heard from again (wouldn't return calls)

(3) Describe how the project conforms to and meets the goals of any applicable planning efforts, and identify any aspect of the project that implements a feature of an existing water plan(s).

The District has stated that its goals are to implement water and energy conservation programs that will provide real water and energy savings. (CVPIA Water Conservation Plan)

"Evaluate and improve efficiencies of district pumps
The District will investigate, with electrical contractors and telemetry contractors, opportunities to convert the pumps to operate off transducers and replace electrical panels with a PUC and converting the pumps to soft-start which improves pump efficiencies and lengthens the life expectancy of the pumps."

Subcriterion No. F.2—Readiness to Proceed

Points may be awarded based upon the extent to which the proposed project is capable of proceeding upon entering into a financial assistance agreement.

Describe the implementation plan of the proposed project. Please include an estimated project schedule that shows the stages and duration of the proposed work, including major tasks, milestones, and dates. ***(Please note, under no circumstances may an applicant begin any ground-disturbing activities—including grading, clearing, and other preliminary activities—on a project before environmental compliance is complete and Reclamation explicitly authorizes work to proceed).***

Please explain any permits that will be required, along with the process for obtaining such permits.

The Northern California Area Office has been provided with a form MP620 for approval of modification to a Federal Facility. The process is for the AO Engineer to review the proposal and provide written approval. Request has been filed, awaiting response.

No other Permits are required.

Implementation Plan Narrative.

It is the Contractors intent to initiate the Sub-contract with the Integration Company in September when the Grant Agreement is finalized. September, October and November will preparation time for ordering equipment, manufacturing necessary paneling, assembly and preparation for installation of the MVMCC panels and Soft-Start's.

After 2B and 2C are complete and the soft-starts are installed (complete with SCADA and programming), The Integrator will turn the focus to the master (Office) SCADA and subsequently the other pumping plants. Ordering parts, manufacturing panels and assembly in preparation to install.

By the time 2B and 2C are complete it may be too close to water season to initiate taking down any of the other pumping plants for the SCADA installations. Depending on time available we have projected the SCADA install for the Spring of 2016, with debug in the spring and data gathering through the 2016 water year. Finalizing the project that fall with reports and close-out.

Estimated Project Schedule — Colusa County WD Project

TASK #	SCHEDULE DATE	Description
estimated grant/agreement date Sept 1, 2014		Need Grant Officer approval for any advanced expenditures on project
1	1-Sep 2014	Provide Design Plans and Performance Schedule
2	1-Sep 2014	Review design plans
3	5-Sep 2014	Establish Contract
4	9/5 - 11/15/2014	Equipment Procurement MVMCC
5	10/1/14 -2/1/2015	Manufacture frame structures and Pre-assemble (pre-wire) Soft start equipment (2B/2C)
6	1/1/2015	Install MVMCC panels and motor control equipment
7	3/1/2015	Install Master Computer, radio and programs
8	4/1/2015-8/1/2015	Manufacture frame structures and Pre-assemble (and pre-wire) SCADA equipment
9	10/1/2015	Install SCADA equipment
10	3/1/2016	Program, debug, Troubleshoot.
11	3/30-9/31/16	Gather Performance Data
12	9/31-12/15/16 report	

Subcriterion No. F.3—Performance Measures (See also Section VIII: Other Information *"Performance Measures")*

Points may be awarded based on the description and development of performance measures to quantify actual project benefits upon completion of the project

Provide a brief summary describing the performance measure that will be used to quantify actual benefits upon completion of the project (e.g., water saved, marketed, or better managed, or energy saved). For more information calculating performance measure, see Section VIII.A.1 "FY2014 WaterSMART Water and Energy Efficiency Grants: Performance Measures."

The Colusa Co. Water District staff will perform the following analysis' at the end of the project cycle. The analysis' will include the following studies.

VIII.A.1 Performance Measure No. A: Projects with Quantifiable Water Savings

Performance Measure No. A.3—SCADA

Colusa Co. Water District proposes to identify water savings using pre-installation data on all laterals (and the composite data for the district) for water year 2013 and comparing that data to post installation year 2016 to identify any savings that may have been made available. This analysis will be supplemented by analyzing water measured at the turnouts on each of those lateral. Also, there is measurement data available at the canal turnout (to each lateral) to assist in the comparative analysis.

Performance Measure No. A.4—Automation

This proposal includes a system automaton project aimed at identifying management efficiencies through the installation and implementation of SCADA. Analysis will be made of operational benefits and (staff) savings from the upgraded equipment and telemetry.

Report will include anecdotal issues, concerns and benefits recognized by staff and customers. An analysis of changes both in energy usage, water conservation or unanticipated changes, and efficiencies gained will be reported. This will be accompanied by any benefits identified in the water and energy reports.

Pre-project estimations of baseline data:

The District has established baseline data by measuring totalized water diversions by lateral from the Canal. Likewise for comparison and analysis the District will collect grower turnout totals to compare with canal diversions and historic diversions and lateral turnout data. To account for temporal variations, a minimum of a one-year history of pre-project measurements is desirable for future comparison to post-project water usage. This district has recorded measurements that will allow an average of pre-project history for comparative purposes.

Post-project methods for quantifying benefits of spillage reduction projects

- *Using rated devices, measure post-project totalized flows. Gather enough data to account for seasonal and temporal variations. Using baseline and post project data, calculate savings using the following calculation:*
- *Track post-project changes in the amount of water diverted and compare to pre-project diversion data.*
- *Compare estimated historical spills from district/project boundaries to any post project spills.*
- *Report specific volume changes to spill, diversions, or deliveries due to system automation.*

VIII.A.2 Performance Measure No. B: Projects with Quantifiable Energy Savings

Energy efficiency projects are intended to increase the use of renewable energy and increase overall energy efficiency in the management and delivery of water.

Performance Measure No. B.2—Increasing Energy Efficiency in Water Management

Explain the methodology for calculating the quantity of energy savings resulting from the water management improvements or water conservation improvements

Compare pre-project electrical usage to post project electrical usage. Considering any other changes, the difference should reflect the improvement.

The SCADA's pump algorithm should maintain a steady water level in the tanks. This will minimize the pumping, reducing the amount of electricity used. Power reductions anticipated are expected to be in the tens of thousands of kilowatt hours annually.

Colusa Co. WD uses Western Area Power Administration (WAPA) power. While the district doesn't pay directly to WAPA for the electricity, it is calculated in the water rates charged by Reclamation. Savings on electricity should translate into lower water rates. WAPA has been very cooperative about providing power usage data as requested.

V.A.7 Evaluation Criterion G: Additional Non-Federal Funding (4 points)

*Up to **4 points** may be awarded to proposals that provide non-Federal funding in excess of 50 percent of the project costs. State the percentage of non- Federal funding provided*

Colusa Co. Water District is providing 65% of the funding.

Non-Federal Funding	**$903,075= 65%**
Total Project Cost	**$1,386,075**

V.A.8 Evaluation Criterion H: Connection to Reclamation Project Activities (4 points)

*Up to **4 points** may be awarded if the proposed project is in a basin with connections to Reclamation project activities. No points will be awarded for proposals without connection to a Reclamation project or Reclamation activity.*

(1) How is the proposed project connected to Reclamation project activities?

Colusa Co. WD is a Contractor to Reclamation in the Northern California Area Office of the Mid Pacific Region.

(2) Does the applicant receive Reclamation project water?

YES, From the Sacramento River (CVP)

(3) Is the project on Reclamation project lands or involving Reclamation facilities?

YES, It is one of the Tehama-Colusa Canal Contractors on the Tehama-Colusa Canal.

(4) Is the project in the same basin as a Reclamation project or activity?

YES, The Central Valley Project

(5) Will the proposed work contribute water to a basin where a Reclamation project is located?

Yes, the Northern Sacramento Basin

Colusa Co. WD Section VIII: Other Information

VIII.A FY2014 WaterSMART Water and Energy Efficiency Grants: Performance Measures

All WaterSMART Grant applicants are required to propose a method (or

"performance measure") of quantifying the actual benefits of their project once it is completed. Actual benefits are defined as water actually conserved, marketed, or better managed, as a direct result of the project. A provision will be included in all assistance agreements with WaterSMART Grant recipients describing the performance measure and requiring the recipient to quantify the actual project benefits in their final report to Reclamation upon completion of the project.

Quantifying project benefits is an important means to determine the relative effectiveness of various water management efforts, as well as the overall effectiveness of WaterSMART Grants.

The following information is intended to provide applicants with examples of some acceptable performance measures that may be used to estimate pre-project benefits and to verify post-project benefits upon completion. Reclamation understands that, in some cases, baseline information may not be available, and that methods other than those suggested below may need to be employed. If an alternative performance measure is suggested, the applicant must provide information supporting the effectiveness of the proposed measure as applied to the proposed project.

VIII.A.1 Performance Measure No. A: Projects with Quantifiable Water Savings

Performance Measure No. A.3—SCADA

For projects that install or expand a SCADA and/or GIS system, the applicant should consider the following:

Colusa Co. WD has available water measurement records of all turnouts on all laterals for all prior years. Also related diversion data can be acquired from the Canal Authority for each lateral diversion from the Tehama Colusa Canal for past water years.

For energy use comparisons, records of power usage by month/year/lateral is available through WAPA power.

Colusa County Water District proposes to identify water and energy savings using pre-installation data on all Laterals (and the composite average data for the district) for water year

2013 and comparing that data to post installation year 2016 to identify savings that was made available. This analysis will be supplemented by analyzing waters measured at the turnouts on each of those lateral. Also, there is measurement data available at the canal turnout to assist in the analysis.

The following will also be considered:

How SCADA implementation will differ from pre-project operations in terms of how improved data availability was incorporated into daily operational decisions.

The opportunities for improved operational efficiencies that were realized through implementation of the SCADA system (e.g. improved delivery equity, improved response to unanticipated events, reduced spillage, and enhanced productivity of human resources),

Pre-project estimations of baseline data:

- *Collect data on diversions and deliveries to water users, making estimates if necessary.*
- *Document employee pre-project time spent on pipeline monitoring and water control.*

Post-project methods for quantifying benefits of SCADA system projects:

1. *Track and record the diversions to water users and compare to pre-project diversions. This would show results of improved management if yearly fluctuations in weather are accounted for.*
2. *Report delivery improvements (e.g. changes in supply, duration or frequency that are available to end users because of SCADA.*
3. *Document other benefits such as less mileage by operators on dusty roads (which saves time and influences air quality) and less damage to canal banks.*

Performance Measure No. A.4—Automation

This proposal includes a system automaton project aimed at *preventing* spillage from reservoirs.

For projects that automate a system, consider the following:

The selected automation equipment and provider to Colusa Co. WD has proven to be very reliable. Many systems at neighboring districts are continuing to function at peak efficiency

with few problems. Maintenance agreements with the integrators are recommended as major programming is highly technical and not well suited for most water operators. However, proper programming provides simple district operation changes with touch screen simplicity.

Challenges come most frequently from the computer operating systems providers (Microsoft). By changing their operating systems, frequently, it is challenging to keep the HMI programs compatible. It is common that computer systems that run 24/7/365 require replacement at approximately 5 year intervals. This may require updates for operating software and some additional installation and programming. It is the experience of neighboring districts that the automation of any lateral improves significantly the districts operations and results in greater customer satisfaction due to consistent water pressures and deliveries.

For this project custom SCADA Automation algorithms will be engineered for each of the Lateral pumping stations. This will more efficiently match pump deliveries to water demand. Also a benefit of the SCADA telemetry is that staff can review history, and adjust pump status, tank level, pressure levels, and history from literally anywhere. This is available because programming can now be viewed through password protected internet connections to the master computer. Providing alarms, status screens, adjustable settings and off/on controls for the whole District. This information will be available (password protected) to any of the staff that need access to the information and can be available on a laptop, tablet, or smart phone.

Pre-project estimations of baseline data:

Establish baseline data by measuring/tracking any spillage. To account for temporal variations, a minimum of a one-year history of pre-project measurements is desirable for future comparison to post-project water usage. Spillage volumes can vary substantially between wet and dry years; therefore, some multiyear estimates of spillage may be necessary. This district has recorded measurements that will allow an average of pre-project history for comparative purposes.

Post-project methods for quantifying benefits of spillage reduction projects

- *Using rated devices, measure post-project flows. Gather enough data to account for seasonal and temporal variations. Using baseline and post project data, calculate savings using the following calculation:*
- *Track post-project changes in the amount of water diverted and compare to pre-project diversion data.*

- ***Compare estimated historical spills from district/project boundaries to post project spills.***
- ***Report specific volume changes to spill, diversions, or deliveries due to system automation.***

VIII.A.2 Performance Measure No. B: Projects with Quantifiable Energy Savings

Energy efficiency projects are intended to increase the use of renewable energy and increase overall energy efficiency in the management and delivery of water.

Performance Measure No. B.2—Increasing Energy Efficiency in Water Management

Explain the methodology for calculating the quantity of energy savings resulting from the water management improvements or water conservation improvements

Compare WAPA provided information regarding pre-project electrical usage at each lateral to post project electrical usage at each lateral. Compare Canal diversion flow data to lateral turnout records for water quantities pumped and energy and water conserved calculations. Considering any other changes, the difference should reflect the improvement.

Explain anticipated cost savings

The programmable MV MCC Soft start motor controls should cut the peak power requirement for each of the pump start-ups. The SCADA Algorithm controlled pumps should match the pump size and capability to the needed flow as calculated from the tank pressure sensor, and maintain a steady water level in the tanks. This will minimize the number of pump start cycles reducing the amount of electricity used. Power savings anticipated are expected to be in the tens of thousands of kilowatt hours annually.

Colusa County WD is provided Western Area Power Administration (WAPA) power. While the district doesn't pay directly to WAPA for the electricity, it is calculated in the water rates charged by Reclamation. Savings on electricity should translate into lower water rates.

Environmental and Cultural Review:

There appears to be no significant impact as a result of this project.

1. The amount of **$25,000.00** has been established in the budget for Environmental and Cultural review costs.

2. No significant environmental or cultural issues are apparent.

3. **No activities are to include any soil disturbance, plant disturbance, flora or fauna disturbance.**

(all activities are confined to within electrical panels, with the exception of radio antennae's which will be mounted on the exterior of the electrical cabinets. (Antennae are typically a 15-25', 2", metal pipe with an 18-24" Yagi direction or 36" Omni direction antennae attached. These will be bolt mounted to the metal cabinets of the existing electronics.)

4. All work will be confined to within the electrical panels of the pumping stations, and the Desk-top computer area of the District Office.

5. These locations are currently actively worked and visited by District staff. All access is on established paved roads or existing county or canal dirt roads.

6. No issues are anticipated relating to air quality (however, the installation of the SCADA equipment should reduce the staff driving and to a small degree improve the air quality by reducing the by-products of vehicular traffic.)

7. The majority of Farms and the District delivery system are piped and on pressure systems, and as a result there is no affected tail water, from either the farms or District. So, there should be no negative impact as a result of the conserved energy and water.

There are no anticipated impacts from this project beyond making additional water available for productive purposes, reducing energy consumption, reducing wear on surge pressure sensitive equipment and improving water pressure consistency to improve management of irrigation timing and applications within the district.

Cultural Concerns: (NHPA)

Within this project parameters there are no modifications on Historic Properties, and no properties or structures will be disturbed as a result of this project.

1. Facilities for Colusa County Water District were constructed in 1962. (52 years ago)

2. No structural disturbance is anticipated for the District office or the pump stations.

3. No soil will be moved or disturbed on this project.

4. No exterior finishes to any of the control cabinets, tanks, or reservoirs, will be disturbed (as a result of this agreement, pumping plant cabinets at 2B and 2C may be painted to prevent rust. Prior to any painting, Reclamation approval will be acquired.)

5. There are no "at risk" cultural resources apparent around any of the work sites.

(On request, District staff will meet with Reclamation staff to review the work site's and assist with the Section 106 process.)

ESA Concerns:

1. No Listed, Threatened or Endangered species have been identified on or around the work sites.

2. No habitat of any kind will be disturbed on this project.

3. The project work areas are confined to areas frequented (daily to weekly) by Reclamation and District staff in the maintenance of operational water delivery equipment. No significant impacts are anticipated.

Required Permits or Approvals

Applicants must state in the application whether any permits or approvals are required and explain the plan for obtaining such permits or approvals.

Colusa Co. WD has applied through the Northern California Area Office of the Bureau of Reclamation for an MP620 review and Approval to modify Federal Facilities. The forms have been filed, awaiting response.

(will provide requested approvals when notified of selection for funding)

No other permits or approvals are Required.

Applicants proposing renewable energy components to Federal facilities should note that some power projects may require FERC permitting or a Reclamation Lease of Power Privilege. To complete a renewable energy project within the time frame required of this FOA, it is recommended that an applicant has commenced the necessary permitting process prior to applying. To discuss questions related to projects that propose renewable energy development, please contact Mr. Josh German at 303-445-2839 or jgerman@usbr.gov.

Note that improvements to Federal facilities that are implemented through any project awarded funding through this FOA must comply with additional requirements. The Federal government will continue to hold title to the Federal facility and any improvement that is integral to the existing operations of that facility. Please see Section III.H.1. Reclamation may also require additional reviews and approvals prior to award to ensure that any necessary easements, land use authorizations, or special permits can be approved consistent with the requirements of 43 Code of Federal Regulations (CFR) §429, and that the development will not impact or impair project operations or efficiency.

SEE BOARD RESOLUTION (ATTACHED)

Project Budget

Funding Plan

The funding plan must include all project costs, as follows:

(1) How you will make your contribution to the cost share requirement, such as monetary and/or in-kind contributions and source funds contributed by the applicant (e.g., reserve account, tax revenue, and/or assessments).

Colusa Co. WD will provide the cost share ($903,075.00) as proposed from the District Reserve Account Fund.

Monetary cost share = $893,075.00
In-Kind (staff time) = $10,000 ***($5000 for Project Oversight, $5000.00 for data analysis and Reporting)***

(2) Describe any in-kind costs incurred before the anticipated project start date that you seek to include as project costs. Include:

No in-kind expenses projected in this budget have been expended at the time of this proposal.

(a) What project expenses have been incurred ***NONE***

(b) How they benefitted the project

(c) The amount of the expense

(d) The date of cost incurrence

(3)
Provide the identity and amount of funding to be provided by funding partners, as well as the required letters of commitment.

No Funding Partners are proposed for this effort.

(4) Describe any funding requested or received from other Federal partners. Note: other sources of Federal funding may not be counted towards your 50 percent cost share unless otherwise allowed by statute.

The only financial assistance requested is the WaterSMART Grant funding.

(5)
Describe any pending funding requests that have not yet been approved, and explain how the project will be affected if such funding is denied.

No other funding proposals have been submitted. Absent this funding assistance, the proposal will be shelved until funding assistance can be acquired. The area is in a 3 year drought and water allocations and revenues have been cut significantly. Since a major portion of the District revenue comes from water sales this project would not be feasible without financial assistance.

Table 1. – Summary of non-Federal and Federal funding sources

Funding sources	Funding amount
Non-Federal entities	
1. Colusa County Water District	$903,075.00
2.	
3.	
Non-Federal subtotal:	$903075.00
Other Federal entities	
1.	
2.	
3.	
Other Federal subtotal:	
Requested Reclamation funding:	$483,000.00
Total Project Funding:	$1,386,075.00

For applicants submitting a proposal under Funding Group II, please include the following chart (table 2) to summarize your Federal funding request by year.

Table 2. – Funding Group II funding request

Funding Group II request			
	Year 1 (FY2014)	**Year 2 (FY 2015)**	**Year 3 (FY2016)**
Funding requested	**0**	**$483,000**	**0**

Table 3. – Funding sources

Funding sources	Percent of total project cost	Total cost by source
Recipient funding	65.2	$ $903,075
Reclamation funding	34.8	$ $483,000
Other Federal funding		$ -0
Totals	**100**	**$ $1,386,075.00**

Table 4. – Budget proposal

Budget item description	Computation		Quantity type (hours/day)	Total Cost
	$/Unit	Quantity		
Salaries and Wages				
Employee 1 S. Murphy	38.07/hr	152	Hrs	$5806.66
Employee 2 Field staff 1	39.68/hr	142	Hrs	$5664.96
Employee 3 Office staff1	18.53/hr	158	Hrs	$2935.36
Fringe Benefits	$5593.02			$5593.02
Full Time Employees				
Part Time Employees				
Travel				
Trip 1				
Equipment				
Item A				
Item B				
Supplies/Materials				
Item A				
Item B				
Contractual/Construction				
Contractor A MVMCC	893,075			$893,075.00
SCADA	448,000			$448,000.00
Other				
Reporting	**10,000.00**			(in above salaries)
Environmental	**25,000.00**			$25,000.00
Total Direct Costs				
Indirect costs _0_ %				
Total Project Costs				$1,386,075.00

Budget Narrative

Submission of a budget narrative is mandatory. An award will not be made to any applicant who fails to fully disclose this information. The budget narrative provides a discussion of, or explanation for, items included in the budget proposal. Include the value of in-kind contributions of goods and services and sources of funds provided to complete the project. The types of information to describe in the narrative include, but are not limited, to those listed in the following subsections.

Salaries and Wages

Indicate program manager and other key personnel by name and title. Other personnel may be indicated by title alone. For all positions, indicate salaries and wages, estimated hours or percent of time, and rate of compensation proposed. The labor rates should identify the direct labor rate separate from the fringe rate or fringe cost for each category. All labor estimates, including any proposed subcontractors, shall be allocated to specific tasks as outlined in the recipient's technical project description. Labor rates and proposed hours shall be displayed for each task.
Clearly identify any proposed salary increases and the effective date.
Generally, salaries of administrative and/or clerical personnel will be included as a portion of the stated indirect costs. If these salaries can be adequately documented as direct costs, they should be included in this section; however, a justification should be included in the budget narrative.

General Manager: Shelly Murphy
Salary/yr : $79,179 w/ (benefits $29,912) or 38.07/hr w/ 14.38 benefits = 52.45 /hr
Time to project: 152 hrs
Project funding allocation: $5806.66 plus benefits 2193.34 = 8,000.00
Duration of project = 24 months

The manager will provide data management, report writing and flow monitoring. This position would require additional specific training on SCADA. This position would be responsible for all environmental and regulatory compliance reporting requirements.

Field Supervisor: Denny Dawley
Salary: $82,530 w/ (benefits $34,018) or $39.68/hr w/ 16.35 benefits = $56.03/hr
(benefits $34,018
Time to project: 142 hrs
Project funding allocation: ($5664.96 / salary plus benefits of 2335.04 = 8,000.00
Duration of project = 24 months

The Field Supervisor will serve as the project's program manager and would supervise the MV MCC and SCADA installations. This position oversees the implementation of any district projects and will be utilized to manage the structural components of the proposed

project the field supervisor has extensive knowledge of the District's water delivery and pumping system. This position would require additional specific training on SCADA

Administrative Support: Martha Sachs

Salary: $ ($38,550) (benefits $13,982 or $18.53/hr w/ 6.72/hr benefits)=$25.26/hr
Time to project: 158 hrs
Project funding allocation: $2935.36 plus benefits $1064.65 = $4,000.00
Duration of project = 24 months

This person will provide administrative support to the Field Supervisor and General Manager during the duration of this project.

Fringe Benefits

Fringe Benefits at the District are standard for full time employees. They include retirement, health, dental and vision and life insurance, vacation benefits, sick leave, etc.. Temporary employees do not receive fringe benefits. The District does not have a Federally approved benefit agreement.

Travel

Travel has not been projected as a cost for this request.

Equipment

No significant Equipment is identified to be used in this grant.

Materials and Supplies

No separate Materials and Supplies identified

Contractual

Innovative Controls (licensed and certified electrical contractor and SCADA integrator), will provide the installation of MV MCC at pumping plant 2B and 2C, and SCADA at each of the pumping plants.

Colusa County SCADA system Quote

Date: 11/25/13

Scope:

This quote provides for a turn-key SCADA system for Colusa County Water District. The system will provide operator control from a central Human Machine Interface (HMI) computer at the district office to the pumping plants on laterals. Each lateral will be automated to maintain levels or pressures as required. The SCADA system will serve the following sites:

- District Office HMI
- 2-System
- 3-System
- 5-System
- 6-System
- 7-System

The HMI computer in the district office will provide the following operator controls:

- Hand-Off-Auto (HOA) selection for each pump
- On and Off control when in Hand
- Field HOA Indication
- Operational screens for each pumping plant
- Trending for Pressures, Levels, Flows and Pump Run times
- Engineering Screens to provide transducer Scaling and Alarm set points
- Separate alarm dialer for voice notification directly to Cell.
- Internet connection for connection of field Tablets to SCADA computer for remote control of system.
- Security password protection
- Overview screen of entire system to provide important operational data at-a-glance.

Cost Estimates:

Office Master HMI-----$35,500.00

2- System----------$72,000.00

3-System----------$154,000.00

5-System----------$43,500.00

6-System----------$74,800.00

7-System----------$68,200.00

SCADA System Total --------$448,000.00

COLUSA COUNTY WATER DISTRICT MV MCC UPGRADE
Quote

Item	Description	Cost	Qty	Total
A	RTFT-XXXX	**$55,428.00**	**3**	**$166,284.00**
	Design 1A: Motor 350HP/2400VAC/900RPM/69.5A Exciter:125VDC/24.2A			
	LV Front Door Panel: - ANSI 61 Gray Panel - Customer Mount -OL Reset - Keypad (MVSS&MX2 Sync)l - DC Amp meter - DC Volt meter - E Stop - Field fault light (Amber) - On Light (Red) - Off light (Green) - 3 position H-O-A - 3 position SS-Off-ALT			
	LV Control Box Panel: -White -MX3 Primary motor control and protection package MX2SEP Package -Relays and controls -Terminals -120VDC BIST test switch and plug			
	MV Backpanel: -SMMVRMX12-350-2400-C -2400V Isolation contactor -Resistor divider card -Motor lead landing pad -Current Transformers -SEP transformer fusing			
	Additional Items: -Resistor divider card harness -CT harness -Field Discharge resistor -SEP Supply transformer -Misc. Power cables			

Item	Description	Cost	Qty	Total
B	RTFT-XXXX	**$50,283.60**	**2**	**$100,567.20**
	Design 1B: Motor 100HP/2400VAC/1800RPM/20.5A Exciter:125VDC/5.98A			
	LV Front Door Panel: - ANSI 61 Gray Panel - Customer Mount -OL Reset - Keypad (MVSS&MX2 Sinc)I - DC Amp meter - DC Volt meter - E Stop - Field fault light (Amber) - On Light (Red) - Off light (Green) - 3 position H-O-A - 3 position SS-Off-ALT			
	LV Control Box Panel: -White -MX3 Primary motor control and protection package MX2SEP Package -Relays and controls -Terminals -120VDC BIST test switch and plug			
	MV Backpanel: -SMMVRMX12-350-2400-C -2400V Isolation contactor -Resistor divider card -Motor lead landing pad -Current Transformers -SEP transformer fusing			
	Additional Items: -Resistor divider card harness -CT harness -Field Discharge resistor -SEP Supply transformer -Misc. Power cables			

Item	Description	Cost	Qty	Total
C	RTFT-XXXX	**$52,518.00**	**1**	**$52,518.00**
	Design 1C: Motor 200HP/2400VAC/1200RPM/20.5A Exciter:125VDC/16.3A			
	LV Front Door Panel: - ANSI 61 Gray Panel - Customer Mount -OL Reset - Keypad (MVSS&MX2 Sinc)l - DC Amp meter - DC Volt meter - E Stop - Field fault light (Amber) - On Light (Red) - Off light (Green) - 3 position H-O-A - 3 position SS-Off-ALT			
	LV Control Box Panel: -White -MX3 Primary motor control and protection package MX2SEP Package -Relays and controls -Terminals -120VDC BIST test switch and plug			
	MV Backpanel: -SMMVRMX12-350-2400-C -2400V Isolation contactor -Resistor divider card -Motor lead landing pad -Current Transformers -SEP transformer fusing			
	Additional Items: -Resistor divider card harness -CT harness -Field Discharge resistor -SEP Supply transformer -Misc. Power cables			

Item	Description	Cost	Qty	Total
D	RTFT-XXXX	**$55,428.00**	**2**	**$110,856.00**
	Design 1D: (Tesco) Motor 350HP/2400VAC/900RPM/69.5A Exciter:125VDC/24.2A			
	LV Front Door Panel: - ANSI 61 Gray Panel - Customer Mount -OL Reset - Keypad (MVSS&MX2 Sinc)l - DC Amp meter - DC Volt meter - E Stop - Field fault light (Amber) - On Light (Red) - Off light (Green) - 3 position H-O-A - 3 position SS-Off-ALT			
	LV Control Box Panel: -White -MX3 Primary motor control and protection package MX2SEP Package -Relays and controls -Terminals -120VDC BIST test switch and plug			
	MV Backpanel: -SMMVRMX12-350-2400-C -2400V Isolation contactor -Resistor divider card -Motor lead landing pad -Current Transformers -SEP transformer fusing			
	Additional Items: -Resistor divider card harness -CT harness -Field Discharge resistor -SEP Supply transformer -Misc. Power cables			

Item	Description	Cost	Qty	Total
E	RTFT-XXXX	**$54,216.00**	**3**	**$162,648.00**
	Design 1E: Motor 250HP/2400VAC/900RPM/50.2A Exciter:125VDC/22.2A			
	LV Front Door Panel: - ANSI 61 Gray Panel - Customer Mount -OL Reset - Keypad (MVSS&MX2 Sinc)l - DC Amp meter - DC Volt meter - E Stop - Field fault light (Amber) - On Light (Red) - Off light (Green) - 3 position H-O-A - 3 position SS-Off-ALT			
	LV Control Box Panel: -White -MX3 Primary motor control and protection package MX2SEP Package -Relays and controls -Terminals -120VDC BIST test switch and plug			
	MV Backpanel: -SMMVRMX12-350-2400-C -2400V Isolation contactor -Resistor divider card -Motor lead landing pad -Current Transformers -SEP transformer fusing			
	Additional Items: -Resistor divider card harness -CT harness -Field Discharge resistor -SEP Supply transformer -Misc. Power cables			

Item	Description	Cost	Qty	Total
F	RTFT-XXXX	**$50,628.00**	**1**	**$50,628.00**
	Design 1F: Motor 125HP/2400VAC/1200RPM/25.1A Exciter:125VDC/11.7A			
	LV Front Door Panel: - ANSI 61 Gray Panel - Customer Mount -OL Reset - Keypad (MVSS&MX2 Sinc)l - DC Amp meter - DC Volt meter - E Stop - Field fault light (Amber) - On Light (Red) - Off light (Green) - 3 position H-O-A - 3 position SS-Off-ALT			
	LV Control Box Panel: -White -MX3 Primary motor control and protection package MX2SEP Package -Relays and controls -Terminals -120VDC BIST test switch and plug			
	MV Backpanel: -SMMVRMX12-350-2400-C -2400V Isolation contactor -Resistor divider card -Motor lead landing pad -Current Transformers -SEP transformer fusing			
	Additional Items: -Resistor divider card harness -CT harness -Field Discharge resistor -SEP Supply transformer -Misc. Power cables			

Item	Description	Cost	Qty	Total
G	RTFT-XXXX	**$49,224.00**	**2**	**$98,448.00**
	Design 1G: Motor 75HP/2400VAC/1800RPM/15.4A Exciter:125VDC/6.14A			
	LV Front Door Panel: - ANSI 61 Gray Panel - Customer Mount -OL Reset - Keypad (MVSS&MX2 Sinc)l - DC Amp meter - DC Volt meter - E Stop - Field fault light (Amber) - On Light (Red) - Off light (Green) - 3 position H-O-A - 3 position SS-Off-ALT			
	LV Control Box Panel: -White -MX3 Primary motor control and protection package MX2SEP Package -Relays and controls -Terminals -120VDC BIST test switch and plug			
	MV Backpanel: -SMMVRMX12-350-2400-C -2400V Isolation contactor -Resistor divider card -Motor lead landing pad -Current Transformers -SEP transformer fusing			
	Additional Items: -Resistor divider card harness -CT harness -Field Discharge resistor -SEP Supply transformer -Misc. Power cables			

Item	Description	Cost	Qty	Total
H	26A1	**$4,800.00**	**1**	**$4,800.00**
	- Approval Drawings			

Item	Description	Cost	Qty	Total
I	25A1	**$4,200.00**	**1**	**$4,200.00**
	- O&M Manual			
	-Electronic Copy			

Item	Description	Cost	Qty	Total
J	Benshaw Field Engineering Services - Two Days on site -Review Installation -Training -Travel and Lodging Included	**$7,500.00**	**1**	**$7,500.00**

Item	Description	Cost	Qty	Total
K	Project management	**$5,000.00**	**1**	**$5,000.00**
L	On site field installation	**$5,175.00**	**14**	**$72,450.00**

Item	Description	Cost	Qty	Total
M	MCC Commercial Painting 2B	**$5,175.00**	**1**	**$5,175.00**
N	MCC Commercial Painting 2C	**$3,000.00**	**1**	**$3,000.00**
	- White			

Item	Description	Cost	Qty	Total
O	Motor and control lead replacement -Wire and installation	**$3,500.00**	**14**	**$49,000.00**

2B and 2C
Total Cost **$893,075.00**

BOARD OF DIRECTORS
COLUSA COUNTY WATER DISTRICT

RESOLUTION 2014-01

APPROVING WATERSMART GRANT APPLICATION
AND AUTHORITY TO SIGN

AS A BASIS AND PREMISE for this Resolution, the Board of Directors of COLUSA COUNTY WATER DISTRICT finds and states as follows:

WHEREAS, The Colusa County Water District must maintain, provide for, and service the Water System,

WHEREAS, The District desires to conserve water and manage its water supply more efficiently and is in need of upgrading motor controls in the oldest system (2B/C) within the District in order to continue uninterrupted service to customers and install SCADA throughout the District

WHEREAS, The District desires to obtain grant funding from the Bureau of Reclamation through the WaterSMART: Water and Energy Efficiency Grant Program for FY 2014.

NOW, THEREFORE, BE IT RESOLVED that the Board of Directors, agrees and authorizes that:

1. The Grant application as prepared by Western Water Strategies, has been reviewed by the Board of Directors and supports the contents therein;

2. The Colusa County Water District is capable of providing the amount of funding specified in the funding plan; and

3. If selected for a WaterSMART: Water and Energy Efficiency grant, the District will work with the Bureau of Reclamation to meet established deadlines for entering into a cooperative agreement.

4. The General Manager, Shelly Murphy, is hereby authorized to sign the grant application on behalf of the Colusa County Water District and that such signature is acknowledgment of the acceptance by the Board complying with all terms and conditions of said application.

PASSED AND ADOPTED THIS 15th day of January, 2014, by the following vote:

AYES: D. Griffin, T. Charter, L. Rominger, H. Charter, K. Myers

NOES: None

ABSENT: None

Douglas A Griffin
Doug Griffin, President

ATTEST: Shelly Murphy
Shelly Murphy, Secretary