



## ENGINEERING COMMITTEE

### AGENDA

Committee Meeting:  
Tuesday, July 7, 2020  
2:00 PM (Board Room)

Calaveras County Water District  
120 Toma Court / P.O. Box 846  
San Andreas, California 95249

**Based on guidance from the California Governor's Office, social distancing measures are imposed, Board chamber's capacity will be limited to 8 persons during public meetings.**

**Social distancing and  
cloth facemasks are required.**

**The following alternatives are available to members of the public to watch these meetings and provide comments to the Board before and during the meeting:**

[Join meeting](#)

Phone Number: 1-408-418-9388

Meeting number (access code): 126 114 8235

Meeting password: 2YrdcheTm82 (29732438 from phones and video systems)

In compliance with the Americans with Disabilities Act, if you need special assistance to participate in this meeting, please contact the Administration Office at (209) 754-3028. Notification in advance of the meeting will enable CCWD to make reasonable arrangements to ensure accessibility for this meeting. Any documents that are made available to the Committee before or at the meeting, not privileged or otherwise protected from disclosure, and related to agenda items, will be made available at CCWD for public review.

### ORDER OF BUSINESS

#### CALL TO ORDER / PLEDGE OF ALLEGIANCE

##### 1. PUBLIC COMMENT

At this time, members of the public may address the Committee on any non-agendized items. The public is encouraged to work through staff to place items on the agenda for consideration by the Committee. Comments are limited to three (3) minutes per person.

##### 2. APPROVAL OF MINUTES

- Date of Prior Minutes of May 5, 2020

3. **NEW BUSINESS**

None

4. **OLD BUSINESS**

4a Presentation/Discussion Update Regarding the Jenny Lind Elementary School Connection and Regionalization with the La Contenta Wastewater System (Charles Palmer, District Engineer)

4b Alternatives and Recommendations for Implementing Automatic Meter Reading (AMR) and Advanced Metering Infrastructure (AMI)(Damon Wyckoff, Director of Operations and Charles Palmer, District Engineer)

5. **FUTURE AGENDA ITEMS**

6. **NEXT COMMITTEE MEETING**

Tuesday, September 1, 2020 at 2:00 p.m.

7. **ADJOURNMENT**

\*No Paperwork included in package

CCWD ENGINEERING COMMITTEE  
CALAVERAS COUNTY WATER DISTRICT  
May 5, 2020

The Engineering Committee of CALAVERAS COUNTY WATER DISTRICT met at the CCWD Offices in San Andreas, California, at approximately 2:10 p.m.

**Based on guidance from the California Governor's Office and Department of Public Health, in order to minimize the potential spread of the COVID-19 virus, the Calaveras County Water District convened its public Committee Meeting via teleconference.**

The following Directors/Committee Members were present:

Jeff Davidson  
Russ Thomas

Also present:

Michael Minkler	General Manager
Charles Palmer	District Engineer
Damon Wyckoff	Director of Operations
Rebecca Hitchcock	Executive Assistant/Clerk to the Board
Kevin Williams	Civil Engineer
Bob Godwin	Senior Engineer
Joel Metzger	Manager of External Affairs
Members of the public	

1. PUBLIC COMMENT:  
There was no public comment.

2. APPROVAL OF MINUTES:

The March 3, 2020 Minutes were approved as presented by a motion from Director Thomas, and seconded by Director Davidson.

3. NEW BUSINESS:

3a Review of Proposed District Actions to Facilitate Continued Wastewater Effluent Disposal on Closed Golf Courses (Damon Wyckoff, Director of Operations)

Mr. Wyckoff presented the steps the District would have to take to continue effluent disposal if one of the golf courses went out of business. He explained the costs associated with the District stepping in to dispose of the treated effluent. There was

significant discussion between the Committee and staff regarding the unlikely event that the District has to step in and dispose of treated effluent.

Public Comment: There was no public comment

3b Presentation / Discussion Update Regarding District's New Operations Maintenance Facility Bid Results and Options Moving Forward (Kevin Williams, Civil Engineer)

Mr. Williams discussed the bids received for the District's new operations maintenance facility. He explained that the bids came in significantly over the Engineers estimate. Staff contacted the lowest bidder, Roland Construction to value engineer the project to reduce cost and potentially proceed with an amended contract. Mr. Williams reviewed the identified items in the project that could be modified or eliminated to reduce costs. The Committee discussed the various cost saving measures with Mr. Williams. Mr. Minkler, General Manager advised the Committee that staff is working on getting the project cost down but the staff needs guidance from the Board regarding the appetite for the project due to financial uncertainty from COVID-19. Direction was given to rework the project to reduce cost and scope and bring back to the Board at a later date.

Public Comment: There was no public comment

3c Presentation/Discussion of Calaveras County Water District's FY 2020-21 5-Year Capital Improvement Project (CIP) Program (Charles Palmer, District Engineer)

Mr. Palmer provided the draft CIP Program list to the Committee. He discussed the various projects for water and wastewater, taking questions from the Committee. The updated 5-Year CIP program will be incorporated into the FY 2020-21 annual budget for adoption prior to July 1, 2020. R&R funds will be utilized to pay for some of the projects budgeted for the upcoming fiscal year, but District staff are working to identify sources of financing for the larger projects. Mr. Minkler discussed the financing shortfall and explained how the District is planning for it.

Public Comment: There was no public comment

4. OLD BUSINESS:

There was nothing to report.

5. FUTURE AGENDA ITEMS:

- Reeds Turnpike exposed water mainline

- District's Operations Maintenance Facility planning
- Discussion on the COVID-19 response and return to work plan

6. NEXT MEETING

Tentatively Scheduled: July 7, 2020 at 2:00 p.m.

7. ADJOURNMENT

There being no further business, the meeting adjourned at approximately 3:37 p.m.

Respectfully submitted,

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Rebecca Hitchcock  
Executive Assistant/Clerk to the Board

# Agenda Item

DATE: July 7, 2020

TO: Calaveras County Water District, Engineering Committee  
Michael Minkler, General Manager

FROM: Charles Palmer, District Engineer

SUBJECT: Presentation/Discussion Regarding Jenny Lind Elementary School  
Connection and Regionalization with the La Contenta Wastewater System

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## **SUMMARY:**

Hugh Logan representing the Calaveras Unified School District (CUSD) and Jack Scroggs with KASL, the project engineer, will provide an update regarding CUSD's construction grant through the State Water Resources Control Board (SWRCB) Clean Water State Revolving Fund (CWSRF). This grant will be used to connect the Jenny Lind Elementary School to the La Contenta sewer system. CCWD and CUSD entered into a Memorandum of Understanding (Board Res. 2018-72) authorizing the sewer connection. CUSD is responsible for construction of the project including a new lift station and force main along Berkesey Ln. and connecting to our sewer system near Vista Del Lago Dr. CUSD will pay applicable capacity fees and bi-monthly rates. Upon completion of the project, CCWD will take ownership, operate and maintain the lift station and force main.

## **FINANCIAL CONSIDERATIONS:**

None at this time.

# Agenda Item

DATE: July 7, 2020

TO: CCWD Engineering Committee

FROM: Michael Minkler, General Manager  
Damon Wyckoff, Director of Operations  
Charles Palmer, District Engineer  
Rebecca Callen, Director of Administrative Services

SUBJECT: Alternatives and Recommendations for Implementing Automatic Meter Reading (AMR) and Advanced Metering Infrastructure (AMI)

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## SUMMARY

The Calaveras County Water District provides water service to over 13,100 water customers in six independent systems including the Ebbetts Pass, Jenny Lind, Copper Cove, West Point, Wallace, and Sheep Ranch. The District's customers are primarily single family residential with some commercial and wholesale customers. The District proposes to furnish and install radio read meters, often referred to as automatic meter reading (AMR) and advanced metering infrastructure (AMI), for all its customers throughout the County. The proposed new AMR/AMI systems will replace old, conventional manual-read meters and the District expects to gain multiple benefits from this program.

The project will include only revenue meters of 5/8", 3/4" and 1" sizes. The new meters will be either nutating disc meters (same as our existing meters) with attachable radio read registers or ultrasonic, solid state radio read meters with integrated registers. The meter pit antennas will be mounted in new meter box covers. Also, the project scope will include purchasing new handheld data collectors and software for drive-by reads.

The District has obtained several propagation studies identifying potential locations for placement of fixed network data collectors, which have a small footprint and could be located on existing radio towers or water tanks on District property. A fixed network, known as AMI, is a method of collecting radio meter reads using fixed, remote data collectors (instead of drive-by reads). This type of data collection is better suited to areas with open topography where radio signals can transmit over longer distances with minimal interference. For this project, the District is looking at fixed networks in the Copper Cove, Jenny Lind, and West Point systems. A fixed network in the Ebbetts Pass system poses more challenges due to the topography and tree cover, but it could be done at additional cost. The deployment of an AMI network would allow the District to collect water meter data automatically over radio frequency and almost entirely eliminate the necessity of doing drive-by readings.

District staff have evaluated the need for the project as well as multiple options for project implementation. As discussed below, the District received multiple bids from contractors who would supply the equipment and install all meters within a two-year construction period. Alternatively, the District could purchase the meters and install them with in-house labor or temporary hires, however, these options would result in delayed implementation, present operational and logistical challenges, and would likely be more expensive than the lowest contractor bid.

In addition to evaluating multiple options for project implementation, staff considered whether to finance the project or pay as we go out of capital reserves. The District has secured a low-interest loan from USDA that could cover the full cost of the project. Since the District's capital improvement needs far exceed our ability to self-finance projects, and because of the favorable terms of the USDA loan, staff's recommendation is to finance the project with the USDA loan and repay the loan within 15 years.

## **ANALYSIS**

### **Project Rationale**

Upon full deployment of the radio read meters, the District anticipates improvements in several operational and regulatory compliance efficiencies, as well as, direct financial benefits to District revenues. For the former, the AMI/AMR project will improve the District's ability to track and benchmark water conservation measures mandated by the State of California under the 2018 "Making Water Conservation a California Way of Life" legislation (SB606/AB1668). As retail water suppliers will be expected to develop efficiency standards and water use objectives under this legislation this AMR/AMI technology will be an essential tool in collecting water user data, assessing system water losses, validating annual water audits, correlating consumption and production data, and planning future water loss mitigation projects. Reporting of these metrics to the State Water Resources Control Board (SWRCB) is expected to be due after they adopt long-term water use and loss standards prior to June 30, 2022. The District's current lack of timely, reliable data constrains the District's ability to report accurate data and could lead to unnecessarily aggressive use constraints or infrastructure updates to meet SWRCB standards. The new and more accurate data obtained from the AMI/AMR system will be a critical component to the District's effort to comply with the conservation mandates and reporting requirements, and helps the District identify key user and infrastructure needs.

The District expects to gain direct financial benefits such as recovering lost revenue caused by under-registering and broken meters, reducing staff time spent repairing or replacing meters, and by using drive-by and fixed network data collectors versus manual reads. The District currently employs two full-time meter readers to manually read all 13,100+ water meters. Once this project is complete, they will be able to complete meter reads in a fraction of the time freeing them up to provide much needed assistance to the distribution, collections, and construction crews. The District could also switch to monthly



billing cycles, which is currently impossible, and customers would have better information regarding their water use.

The project is critical for future regulatory compliance and will provide multiple financial and operational benefits. The increased revenue and potential cost savings are difficult to quantify, but they will be substantial.

### **Meter Replacement Work Effort**

In considering options, it is important to understand the field work and highlight conditions associated with meter replacements, as follows:

Best Case Scenario – Quick meter replacement taking only a matter of minutes presumes very favorable conditions:

- Isolation valves exist and are easy to access and operate without any difficulty.
- Existing meter is fully exposed and easy to access within the box
- New meters are exactly same size and length as existing meters being replaced
- Customer is not home or has no issue with a brief shutdown of water supply.

Worst Case Scenarios – More often than not the circumstances generally encountered do not align with the best-case scenario, requiring additional effort that could take several hours for a single meter:

- Meters are covered in dirt that must be dug out for replacement
- No isolation valve on the meter thereby requiring the service lateral to be crimped (creating a weak spot in the lateral) or an isolation valve installed prior to replacement.
- New meter is too tall and box must be reset to accommodate a greater height.
- Service lateral or customer's service line cracks or breaks during replacement of the meter.

The actual conditions are often somewhere in between the best- and worst-case scenarios. Staff currently assumes a meter replacement will take 30 minutes on average.

### **Options for Implementation**

While the Board members previously expressed support for an AMR/AMI project, the project is costly and it was suggested that options be considered in how to best implement the project most efficiently and cost-effectively. The District contemplated different installation options and their cost and schedule implications in determining the best solution. One option is to award the project to the low bidder who will independently purchase and install the radio read meters and fixed network equipment. Other options include purchasing the meters and equipment directly from a vendor and having either existing field staff install the meters or hire temporary staff to install them.

#### **Option One: Private Contractor**

The project as proposed would be awarded to one Contractor who will then bear the responsibility of fully implementing the project and installing all 13,100+ AMR meters and the AMI fixed network systems. The project includes purchase of the radio read meters and AMI equipment and installation, startup and testing of the systems. The project will be completed within 2-years (with 50% of the project required to be complete in the first 12-months). Within the shortest possible timeframe, it achieves key objectives (reduced water loss and increased revenues associated with better meter accuracy). This option does not create significant additional work load for District Staff and allows Staff (both field and management) to focus on regular work tasks and overall work effort efficiencies are not compromised. Also, timely completion of the project allows the meter readers more time to attend to other tasks such as better on-going maintenance of our meter population (currently there is a backlog of broken and non-registering meters) and the ability to assist the Distribution and Construction Crews several days per month.

Staff prepared contract bid documents for the AMR/AMI project and advertised and solicited bids beginning in late May 2020. A bid opening was conducted on June 30, 2020. A total of three bids were received with the lowest bidder being submitted by Mueller Systems in the amount of \$3,975,273.87. A bid summary is provided below.

Table 1. Bid Results for AMR/AMI Meter Project (June 30, 2020)

BIDDER	MUELLER	FERGUSON	TEICHERT
Purchase AMR Meters	\$2,392,456.66	\$2,748,753.73	\$5,425,405.22
Install AMR Meters	\$1,018,650.76	\$1,338,320.66	\$1,938,315.64
Purchase AMI Equipment	\$ 223,381.24	\$ 466,975.33	\$ 353,972.40
Install AMI Equipment	\$ 138,858.06	\$ 341,092.02	\$ 365,106.10
Software, Training, Mobile DCU's	\$ 201,927.16	\$ 92,324.03	\$ 137,883.64
TOTAL	\$3,975,273.87	\$4,987,465.77	\$8,220,683.00

### Option Two: Meters Installed by Existing Staff

One proposal is to have the District's Meter Readers (two employees) install meters daily as they work through their regular meter reading regimen. Staff has determined this approach is not efficient given the District's scheduling constraints for on-going bi-monthly meter reading.

The District's meter reading regimen is divided in two cycles:

#### Cycle 1 – Valley Springs, Copperopolis and West Point

- o 20 Routes in this cycle
- o 7,151 Meters in total
- o 3 weeks needed to read all meters
- o 1,440 hours per year

### Cycle 2 – Ebbetts Pass

- 22 Routes in this cycle
- 6,040 meters in total
- 3 weeks needed to read all meters
- 1,440 hours per year

The 4<sup>th</sup> week of each month is used to issues door tags for lock-offs, perform restoration (restores) of those lockoffs, re-reads, herbicide spraying, and complete any equipment maintenance and administrative tasks.

To remain on track, each employee averages 220 meter reads per day, or 1 meter read every 2 minutes over 6 hours plus 2 hours of drive time. When you contemplate the amount of meters that are required to be read each day vs. the variables associated with each meter installation (e.g. soil, accessibility, check appurtenances for leaks, reporting any issues, are there dogs, cars, yard art that make reading the meter problematic, customer interactions, weather, etc.), it becomes clear there is not much time, if any, remaining to install new meters. Furthermore, any additional time meter readers do have is quickly consumed by assisting with other work efforts in the field where additional staff are needed.

For existing staff to replace meters in-house, a conservative average for a meter replacement is 30 minutes each. This is the time frame field staff currently give to customers when replacing a customer's meter. Even if each meter reader could free up two hours per day for meter replacement, which is not currently realistic, with an average replacement time of 30 minutes, this equates to 8 meters replaced per day. At that rate, assuming 8 meters are replaced each day meter readers are on their routes (approximately 188 days per year), the replacement would take 8.8 years.

Staff did contemplate the fact that as more radio read meters are installed and with a gradual transition to drive-by reads, less time will be needed for manual reads. Over time this could free up more time for employees to replace meters, but only after a significant number of meters have been installed, the data collection software has been installed and integrated into the District's finance system, and the AMI infrastructure is in place in the service areas where that is needed. The IT integration and infrastructure installation would require coordination among the District's IT administrator, electricians, construction crew – all of whom already have significant backlogs of projects to complete – as well as the District's finance and customer service staff. It would be a significant undertaking for a workforce that is already stretched thin. Factoring in all of these considerations, it is likely the project would take at least seven years.

Were the District to use in-house staff (Meter Readers) to install the meters, labor costs for that 9-year effort would be \$286,393.80, and the cost to purchase the meters is \$4,085,000. Mobile data collectors and software are expected to cost \$73,000. The Customer Service Department's work associated with updating customer accounts and meter information is estimated to be \$14,000 over the course of the project. The AMI fixed network systems is estimated to cost \$197,000 to purchase equipment and

\$114,000 for installation, which this work effort is to be performed by the District's Construction Crew and Electricians. The grand total estimate for Option 2 is \$5.7 Million excluding administrative costs, legal costs, or contingencies.

### Option 3: Meters Installed by Temporary Staff

Another option is hiring temporary staff to complete the project. The District would look to hire two temporary employees possibly using the Meter Reader 1 Job Description. Hiring temporary staff to complete work objectives poses challenges for CCWD, as it could be construed that temporary employees take work away from regular union positions. The potential uncertainty and complications associated with this option may prove to be a significant burden to making this option viable.

If viable, to estimate the number of meters temporary staff would be able to replace, an average of 30 minutes per meter replacement was used. With this average timeframe in mind, and accounting for a 5.5-hour day (and subtracting sick days, vacations, drive time, bathroom breaks, administrative tasks, etc.), two temporary staff members should be able to replace 21 meters per day or approximately 5,208 meters per year. At this rate the project would be completed in approximately 2.5 years. Were the District to hire two temporary employees, labor and benefits for 2.5-years would be \$531,774. It is possible the schedule could be accelerated by freeing up time from the District's existing meter readers as the project is gradually implemented, however that would depend on other District staff's availability to install other necessary infrastructure and software and integrate the remote read data.

Other project costs for the AMR meters include an estimated \$4,085,000 to purchase the new meters, \$73,000 for mobile data collectors and software, and \$16,000 for Customer Service staff time to update customer accounts with new meter information for the duration of the project. The AMI fixed network systems will be installed by the District's Construction Crew and Electricians. The costs to purchase and install the AMI systems is \$197,000 and \$114,000, respectively. The estimated grand total for Option 3 is \$4.8 Million excluding administrative time, legal costs, or other contingencies.

### Options Comparison

Summarized below are the costs and timeframe for each of the three options. Bid results for a private contractor to complete the project and estimated costs to furnish and install the AMR/AMI systems using in-house or temporary staff.

Table 2. -

DESCRIPTION	OPTION 1 (Contractor)	OPTION 2 (In-House Staff)	OPTION 3 (Temp. Staff)
Purchase AMR Meters	\$2,392,457	\$4,085,000	\$4,085,000
Install AMR Meters	\$1,018,651	\$286,393.80	\$531,774
Purchase AMI Equipment	\$223,381	\$197,000	\$197,000

Install AMI Equipment	\$138,858	\$114,000	\$114,000
Software, Training & Mobile DCU's	\$201,927	\$73,000	\$73,000
Other Costs	-	\$14,000	\$16,000
<b>TOTAL CONSTRUCTION COST</b>	<b>\$3,975,274</b>	<b>\$ 4,769,393.80</b>	<b>\$5,016,774</b>
<b>Time to Completion</b>	<b>Max 2 years</b>	<b>8.8 years</b>	<b>2.5 years</b>

### Staff Recommendation

Option 1, awarding the contract to a private contractor to furnish and install the AMR/AMI project, is recommended by Staff as the most efficient, cost-effective, and timely option. It does not pull District staff time away from their regular duties to ensure project completion, nor does it potentially strain internal relationships by using temporary staff to complete union work. These efficiencies allow CCWD to proceed with working to meet other objectives while the vendor works to complete the project within the required time frame of less than two-years. This time-frame requirement is also the shortest of the available options. The sooner the better it will be to implement the AMR/AMI project. Currently, consumptive revenue represents nearly 17% of the total billed water rate revenue. Based on historical information from implemented AMI/AMR projects, it is anticipated that this project will increase consumptive revenues by at least 5%, or \$70,000 annually. Roughly 2% of the meters are currently reading nothing or drastically under-reading, while the remaining meters are under reading due to age. As such, we anticipate the industry estimate of 5% to be low compared to what we are likely to experience. This project will also free up staff time compared to manual meter reads. It also enables the District to start compiling and reporting accurate water loss data, which will ensure regulatory compliance and assist capital infrastructure planning efforts.

The District has been approved for financial assistance through USDA Rural Development, which as of August 2019 obligated \$6 million dollars for the project including a proposed \$5 million low-interest, 40-year loan and a \$1 million grant if the project cost exceeds \$5 million. Because the low bidder was \$3.975 million, grant funds will not likely become available but that does not diminish the favorable terms of the low interest loan. To potentially take advantage of grant funds, the District would have to significantly increase the scope of work by either: a) adding an AMI fixed network to the Ebbetts Pass service area, b) replacing all meter boxes with new boxes, and c) replacing old curb stops with new valves. This, however, would also require the District to take on an additional \$1 million in debt to reach the \$5 million loan amount.

Up to the point of awarding a construction contract and starting construction, the District has no obligation to accept a loan through USDA. Staff has maintained contact with USDA and is ready to move forward with a USDA loan to fund the project, pending Board approval.