Cover Memo

File #: CONS 16-154, **Version:** 1

DATE: April 5, 2016

TO: Mayor and City Council

FROM: Director of Utilities & Environmental Services

SUBJECT
Advanced Metering Infrastructure: Authorization for the City Manager to Execute a Contract for the Purchase and Installation of an AMI System

RECOMMENDATION
That the City Council adopts the attached resolutions:

1) Authorizing the City Manager to execute a contract with Aclara for the purchase and installation of an Advanced Metering Infrastructure (AMI) system in an amount not to exceed $3,113,000, and;

2) Authorizing the City Manager to execute a contract with Delta Engineering for the purchase of project materials, including water meters, meter transmission units (MTUs), and meter box lids in an amount not to exceed $9,500,000, and;

3) Modifying the $10M transfer for this project from the Water Operating Fund to occur in FY 2016 ($8M) and F Y2017 ($2M).

BACKGROUND

The City receives all of its water supply from the San Francisco Public Utilities Commission (SFPUC) and distributes the water to residential, commercial, industrial, and governmental customers. Customers are billed for actual water use as measured by water meters, which are manually read on a bimonthly basis. For context, the City has approximately 34,000 customer endpoints (water meters).

Even with safety procedures in place, City meter readers have been prone to injury due to the repetitive nature of the work. Bimonthly meter reading also provides customers with limited and outdated consumption information, which can be inefficient in terms of conservation efforts because customers are unaware of their consumption throughout the bill period; and leaks can go undetected for too long.

In recent years, the use of a technology known as AMI has become more widespread in the water utility industry. AMI enables two-way communication over a fixed network between the utility system and metering endpoints (customers). This allows meters to be read, monitored, and managed from a remote, central location rather than relying on the physical read of a meter in the field by an employee.

AMI Feasibility Study Results

Funding was included in the Ten-Year Capital Improvement Program (CIP) to study the feasibility of implementing AMI in Hayward. In August 2013, a request for proposals was issued to firms with experience and knowledge in the AMI field to provide consulting services to inform City staff about AMI features and functions, pricing, and to incorporate small-scale pilot programs to test AMI technologies. The City Council authorized an agreement with TritonAMI (Triton) in October 2013.

The major objective in studying AMI feasibility was to consider the basic issues that are critical to implementation of an AMI system. Triton aided City staff in developing a deeper understanding of AMI technology and its application in Hayward by outlining the features of AMI systems and assisting with establishing AMI functional priorities (such as meter brand compatibility, battery life, and tamper notification for example). Triton also prepared planning level cost estimates for equipment and labor based on the City's functional priorities.
Given the significant investment of resources, staff determined that it would be in the City's best interest to pilot-test three different AMI systems and to obtain equipment pricing for City-wide implementation of various systems. The intention was to have the success of the pilot program aide in the selection process to procure an AMI vendor for the City-wide AMI program.

Pilot Study

On May 19, 2014, a request for proposal (RFP) was issued to eight AMI vendors to procure small scale AMI pilot programs. The RFP also requested fixed long-term equipment pricing for AMI components for City-wide implementation, assuming all meters would be replaced, which is conservative, given that some newer meters may be able to be retrofitted to accommodate the new AMI system. Seven proposals were received from six vendors on June 16 (One vendor submitted two proposals, utilizing different types of water meters).

On July 15, 2014, based on staff's recommendation, the Council authorized the City to enter into agreements with three vendors to pilot test the AMI systems, one of which was Aclara. In the months following, the pilot systems were installed in three locations in the City, all of which had been carefully selected to present challenging topographical conditions. Staff identified thirty services in each location. All vendors were assigned ten services within each of the three pilot areas. In this way, staff was able to evaluate each AMI system under identical conditions. Water meters at the pilot locations continued to be read manually for billing purposes, so there was no impact to customers.

A complete analysis of the pilot performance and vendor evaluation can be found in the staff report presented to the Council on July 21, 2015. In summary, staff found that the vendor that best met the City's objectives was Aclara. On July 21, 2015, staff requested Council authorization to negotiate with Aclara and to prepare a procurement contract term sheet for Council consideration. Staff also committed to preparing installation specifications and refining the estimated installation cost, to be presented together with the term sheet for Council consideration and approval.

DISCUSSION

Description and Benefits of AMI System

An AMI system refers to the measurement and data collection system consisting of meters at the customer site, communication networks between the customer and the utility, and data reception and management systems that make information available to the utility and to the customer. A number of vendors provide AMI technology and each system's design varies slightly.

In general, AMI systems are considered "fixed-based," which means the system is permanently installed to capture meter readings. The fixed-based system consists of the infrastructure needed to gather consumption data, including data collector units and in some cases, repeaters, which collect meter data transmissions and push the data to a central computer server. Meter consumption data is fed from a "transmitting unit" on the meter. The data collectors then transmit meter reads to utility system computers.

AMI systems allow meters to be read much more frequently, such as by day or hour, for example. The data can be used for many purposes in addition to billing, including consumption reporting, leak detection, tamper alerts, as well as to populate a customer web portal, which allows customers to see detailed water usage information and better understand and manage their water use. These portals, which can be accessed on a computer or smart phone, are becoming an increasingly popular tool to help customers monitor their consumption; and also allow the utility to communicate directly and in a timely manner with their customers. Analyzing data by frequent time intervals could also enable the City to look at consumption profile data for education and awareness related to conservation.

As meters begin to wear, they tend to under-read the amount of water actually consumed. This means that some customers may not be paying for their actual consumption. To the extent that water rates are increased to make up for that lost revenue, the remaining customers bear the burden. The City's current meter stock is, on average, over forty years old, and is in need of replacement independent of how the meters are read. With AMI, a more detailed consumption history can be established for each account, allowing staff to more readily detect any unintentional errors and correct them before bills are issued. The AMI installation process would also provide the opportunity to assess the current meter stock throughout the service area and allow the City to establish a comprehensive meter inventory. AMI data would provide the City the opportunity to consider transitioning to monthly utility billing, as well as redeploy staff resources towards preventative maintenance activities or customer service.

Contract Term Sheet

As outlined in the July 21, 2015 staff report mentioned above, staff has negotiated a draft contract with Aclara and presents the terms below for Council consideration.
Scope of Work. Aclara will provide project management, AMI infrastructure project materials and equipment (i.e. data collectors units (DCUs)), AMI software, and installation labor to accomplish meter replacement and conversion to AMI City-wide. Delta Engineering will provide project materials, including meters, meter transmission units (MTUs), handheld field programmers, as well as meter box lids. The requested contract amounts for Aclara is $3,113,000 and for Delta Engineering is $9,500,000.

Final Project Acceptance. Final acceptance of the project is achieved when the following criteria have been met for all endpoints (with some exceptions for site specific radio frequency communication issues, such

as a car being parked over the meter box):

a. A minimum of 98.5% of transmissions are received over a thirty-day period.
b. A minimum 99% accuracy standard is achieved.

Payment. Ten percent of the per MTU installation fee shall be retained and not invoiced until satisfaction of final acceptance as described above. For project materials procured through Delta Engineering, a similar ten percent retention shall be released to the vendor upon each route completion, which requires the same accuracy and receptions standards addressed as part of final acceptance.

Installation & Product Warranties. Aclara will warrant the installation workmanship for one year from the accepted MTU installation date. The Aclara MTU has a basic ten-year warranty, and an extended ten-year warranty (for a total of twenty years), where the replacement cost is prorated based on the age of the MTU. The DCUs have a one year basic warrantee. The Badger meters, procured through Delta Engineering, have a one year basic warrantee.

Data Collector Units (DCUs). Aclara has proposed thirty-one data collector units, which will be placed throughout the service area on City-owned infrastructure such as water reservoirs, rooftops of buildings, and some light poles. Aclara is responsible for providing the DCU equipment, and installation. The City will also enter into a separate annual contract for maintenance of the DCUs.

Software. Aclara will provide the City with their proprietary AMI software, necessitating a license agreement. Based on the City's direction, Aclara will also host the software, meaning the physical servers where the data is stored will reside in an off-site Aclara owned and managed facility.

System Acceptance Testing. Prior to mass installation, Aclara will perform system acceptance testing at 100 end points, chosen by the City, to ensure functionality of the system (i.e. data is flowing correctly from the meter and MTU to the billing system). Only upon City approval of this testing can mass installation occur.

Warehousing. Aclara will also procure a secure space to store meters, MTUs, and all equipment required for Aclara to execute the project.

Waste Materials, Recycling, Trash. Aclara is responsible for proper disposal of legacy product and waste materials.

Billing Integration. Aclara will provide technical support needed to ensure successful billing integration. The City will also utilize the professional services of Triton AMI, with whom the City has an existing contract for consulting services for deployment of the project, to also assist in this area. Aclara has successfully integrated with the same billing software the City currently uses in other locations across the country.

Installation Specifications and Cost

Initially, installation services were going to be procured through a separate bid process upon execution of a contract with an AMI vendor. In exploring this option, staff reviewed with other agency staff who had recently converted to AMI with a "turn-key" AMI system, where both the AMI system and installation services are procured under a single contract. The concern with this approach was that while a particular

AMI system may be preferred (Aclara, in the case of Hayward), with this approach, the City would have no purview over the installation contractor selected by the bundled proposal.

Upon discussing these concerns with Aclara, it was determined that Aclara prefers to prime the contract, including installation, because it essentially eliminates "finger pointing" when it comes down to system performance. This is also preferable to the City in that there is a single point of contact and single vendor responsible for the performance of the system. Aclara committed to cooperatively developing installation specifications with staff input, and reviewing the bids carefully with staff to ensure a comfort level with the selection of the installation contractor. They delivered on this commitment, and staff is satisfied with both the specifications and installation contractor selection.

Staff had estimated installation of a City- wide AMI system to cost approximately $2M. The actual proposed installation cost is $2.84M, which includes a ten percent additional services budget beyond the authorized baseline services. The difference in cost is predominately associated with the assumption that the City had a direct contract with an installer. The remaining costs included in the Aclara contract are associated with the procurement of DCUs, installation of DCUs, project management, software license agreement, and hosting fee.

ECONOMIC IMPACT

The potential economic benefits of AMI to customers include greater control over water consumption, given increased interval data and a future customer portal and smartphone application, including prompt water leak notification. Most customers will also benefit from having more accurate meters because customers will more equitably share their proportional cost of water. And, the system should aid in the community achieving greater water conservation results over time.

FISCAL IMPACT

This project will be entirely funded by the Water Enterprise and therefore has no impact on the General Fund. The estimated project costs are as follows:

Purchase and Installation of AMI System (Aclara)	$ 3,113,000
Purchase of Project Materials (Delta Engineering)	$ 9,500,000
Professional Services (Triton AMI)	$ 110,000
Project Administration - City Staff	$ 200,000
Customer Web Portal Development	$ 100,000
Total:	$ 13,023,000

The Adopted FY 2016 Capital Improvement Program (CIP) includes $16.1M, over three years, in the Water Replacement Fund for implementation of an AMI system (just over $3M more than the estimated project costs) as shown below:

FY2016	$ 6,100,000
FY2017	$ 5,000,000
FY2018	$ 5,000,000
Total:	$16,100,000

The current budget includes $10M in offsetting transfers from the Water Operating Fund in the next two

years, as shown below, to cover the cost of the project:

FY2017	$ 5,000,000
FY2018	$ 5,000,000
Total:	$ 10,000,000

The budget was structured in the CIP to allow for a phased contract award over a three-year period. At the time the budget was established, installation costs were estimated, and had yet to be refined. Staff believed that there would be benefits in awarding installation contracts in phases as the project progressed.

Staff is now requesting that the Council approve transfers from the Water Operating Fund, as follows, in order to allow all contracts to be awarded at this time:

FY2016	$ 8,000,000
FY2017	$ 2,000,000
Total:	$ 10,000,000

As discussed previously, the benefits of having Aclara act as the prime contractor for both the purchase of the AMI system and the installation allows a single vendor to be responsible for quality control of the project, and also reduces installation mobilization costs that would be incurred as a result of multiple contract awards. In order to award the contracts, however, requires modification of the currently approved transfers from the Water Operating Fund so that sufficient funds are available in the current Fiscal Year.

SUSTAINABILITY FEATURES

Energy: Electricity/natural gas/other fossil fuels.

Leaks in the water distribution system or at customer sites represent not only lost water, but in some cases wasted energy to distribute it. With the increased consumption information provided by AMI systems, the City can be proactive when it comes to leak detection. The DCU's for this project will also be solar powered, reducing the need for electricity.

Water: Efficiency and conservation.

The more frequent water consumption data made available as result of this project will provide detailed information to help measure the overall effectiveness of targeted conservation initiatives. This information can be used to inform customers about potential leaks or overly high consumption. Analyzing data by frequent time intervals could also enable the City to look at consumption profile data for education and awareness related to conservation. Customers will also be able to be notified of unusual increased or continuous water usage, which could be the result of a leak, because it will be easier to pinpoint the timing of the increased water usage with more frequent reads. Remote notification of leaks allows for the ability to alert customers to an issue before substantial water waste or excessive charges occur.

Air: Air emissions of pollutants.

Eliminating the requirement for manual meter reading also reduces the number of vehicle miles traveled by City staff, which is in support of the Climate Action Plan goals of reducing greenhouse gas emissions.

Solid Waste: Waste reduction and diversion.

This project will generate construction waste. However, given that most water meters are made of brass, much of the waste can be recycled. The concrete meter box lids that are being replaced with polymer lids as part of the project will also be recycled.

Purchasing: Consistent with the City's Environmentally Preferred Purchasing Policy.

The City's current meter stock is, on average, over forty years old, and is in need of replacement independent of how the meters are read. The new water meters are expected to last for at least the life of the AMI system (twenty years), and are considered a long-term investment. This is in compliance with the subject purchasing policy, as it states that the maximization of life cycle economics is a factor to consider when determining that a product or service has environmentally preferable attributes. The meters are also mostly made of brass, which is a recyclable material. Other vendors offer a plastic/composite body meter that was specifically not chosen for this project.

PUBLIC CONTACT

If the Council approves this project, staff will develop a plan to inform customers prior to and during the project start up. Staff acknowledges that it will be necessary to fully engage the public to ensure that customers are informed about AMI, the vastly improved communication tools, and the benefits in managing their water use and that this will require a robust and on-going communication plan. As is the protocol whenever a meter is changed, customers will be notified that their water meter is being replaced and why. If the contact is made in person and if no one is home at the time, a door hanger will be left with information and a telephone number to call with questions well ahead of the actual installation. Meters will continue to be read manually for a short period to assure billing accuracy and seamless integration.

NEXT STEPS

The estimated schedule for this project is summarized as follows:

Award Purchase and Installation Contracts:	April 5, 2016
Begin AMI Infrastructure Construction:	May 2016
Begin Meter Conversion:	June 2016
Construction Completed:	December 2018

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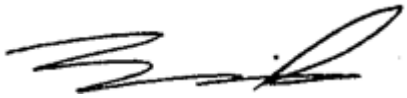
Recommended by: Alex Ameri, Director of Utilities & Environmental Services

Approved by:



Fran David, City Manager

Attachments:

Attachment I	Resolution - Aclara
Attachment II	Resolution - Delta
Attachment III	Resolution - Water Operating Fund Transfer