

AGENDA ITEM NO. 9:15 AM A
COUNCIL MEETING 1/14/2010

APPROVED BY

DEPARTMENT DIRECTOR

CITY MANAGER

January 14, 2010

FROM: RENE A. RAMIREZ, Director
Department of Public Utilities 

BY: ROBERT N. ANDERSEN P.E., Assistant Director
Department of Public Utilities 

SUBJECT: ADOPT RESOLUTION AWARDING A REQUIREMENTS CONTRACT IN THE AMOUNT OF \$22,247,679.89 TO BADGER METER, INC. FOR THE FIXED NETWORK AUTOMATED METER READING (AMR) AND WATER METERING SYSTEM AND FINDING AWARD TO BE IN THE BEST INTERESTS OF THE CITY

RECOMMENDATION

Staff recommends that the City Council adopt the attached resolution awarding a requirements contract in the amount of \$22,247,679.89 to Badger Meter, Inc. for the Fixed Network AMR and Metering System, finding the award to be in the best interests of the City, subject to the issuance of bonds by the City for the financing of the Project and appropriation of such bond proceeds for the Project.

EXECUTIVE SUMMARY

This project will purchase the required water meters and AMR system to be installed by City on all single family residential water customers of the City of Fresno. The passage of Assembly Bill 514 in 2003, as amended by Assembly Bill 2572 (adding section 526 to the California Water Code), requires that all suppliers of water from the federal Central Valley Project (CVP) install water meters on or before January 1, 2013 and bill for water usage at a metered rate by March 1, 2013, or according to the terms of a CVP water contract. Under the terms of the City's CVP contract renewal with the United States Bureau of Reclamation, the City must begin charging a metered rate to all users with existing water meters, starting March 1, 2010, and all services must be metered by January 1, 2013. The Water Division has approximately 111,000 residential water services that will require water meters in order to be in compliance with AB 514.

To meet the deadline, the City currently has two contractors installing meter boxes throughout the City. Of the 111,000 residents, 65,000 are missing water meter boxes. To date, the two contractors have installed 19,200 meter boxes and are on schedule to complete before 2013.

On December 10, 2009, Council approved the financing on the Water Bonds for this project and others, but bonds will not close until early February, 2010. Staff will enter into the contract with Badger Meter Inc. after the close of the sale of water bonds.

REPORT TO THE CITY COUNCIL

Award a Contract in the Amount of \$22,247,679.89 to Badger Meter Inc.

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BACKGROUND

The passage of Assembly Bill 514 in 2003, as amended by Assembly Bill 2572 (adding section 526 to the California Water Code), requires that all suppliers of water from the federal Central Valley Project (CVP) install water meters on or before January 1, 2013 and bill for water usage at a metered rate by March 1, 2013, or according to the terms of a CVP water contract. Under the terms of the City's CVP contract renewal with the United States Bureau of Reclamation, the City must begin charging a metered rate to all users with existing water meters, starting March 1, 2010, and all services must be metered by January 1, 2013. The Water Division has approximately 111,000 residential water services that will require water meters in order to be in compliance with AB 514.

In December 2006, the City retained the services of HDR Engineering, Inc. to prepare an update to the City's 1990 Residential Meter Program/System Evaluation as well as a comprehensive Water Metered Rate Study. The completed Residential Meter Implementation Plan (Implementation Plan) enabled the City to make the necessary decisions as to the type of meters and meter reading system to be utilized.

On June 24, 2008, Council adopted a Negative Declaration for an Environmental Assessment, dated April 28, 2008, State Clearing House No. 2008051008 for the Residential Meter Implementation Plan and adopted HDR Engineering's Implementation Plan and recommended to move forward with a City-wide residential AMR system.

In accordance with the adopted Implementation Plan, staff proceeded to evaluate both the mobile and fixed AMR technologies that are available. The Phase 1 Prequalification was advertised in the Fresno Business Journal and on January 2, 2009, staff sent out the specifications to 10 Builder Exchanges, distributed to 21 prospective bidders and posted on the City's website. On January 22, 2009, the Prequalification documents were due to the Purchasing Division and the City received seven (7) responses for each reading technology type.

On February 2, 2009, the Prequalification Committee which consisted of City employees from various Departments met and short listed the seven prospective bidders down to four. The reasons for removal from the process was either the vendor did not manufacture the specified positive displacement meter or could not read the City's existing Metron meters (non-residential meter type); one of the requirements for prequalification.

Four companies were invited to participate in a field demonstration project to see how their meter and AMR technology would work in the environment posed within the community. These companies were Badger Meter, Inc., Ferguson Waterworks, Itron Inc. and Neptune Technology Group, Inc. Each company was to demonstrate their technology- both mobile and fixed- within twenty locations supplied by the City. To keep the demonstration as fair as possible, the site areas for the four companies were randomly chosen. During the period between March 2 and March 27, 2009, these four companies installed their equipment and were put through environmental testing by City personnel. This testing consisted of filling the meter boxes with water, sand and topping the meter box with steel plating to try and adversely hinder the water meter's signal transmission. Each vendor was also required to make a three hour presentation to the Prequalification Committee regarding the capabilities of their proposed technology solutions and for the Prequalification Committee to gather more information for evaluation purposes.

Three of the companies qualified as a result of their performance in the field demonstration project and were asked to submit a price proposal. These companies were Badger Meter, Inc., Ferguson Waterworks and Neptune Technology Group, Inc.

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On October 12, 2009, staff issued an Addendum to the prequalification project for submission of final pricing.

Three (3) bid proposals were received and two were opened in a public bid opening on November 12, 2009. One Bid was not accepted due to the lack of a Bidder's Bond. Bid proposal prices ranged from \$17,383,812.40 to \$29,584,707.37.

TWENTY YEAR LIFE CYCLE COST EVALUATION

After the Bids were opened, HDR Engineering evaluated the initial capital costs and long term operating costs of the lowest bidder for both technologies: mobile and fixed reporting. Within the analysis, costs were modeled with the following four scenarios:

- 20-year operations and maintenance (O&M), debt, and replacement costs for bi-monthly readings
- 20-year debt costs with 30-years of O&M and replacement costs for bi-monthly readings
- 20-year O&M, debt, and replacement costs for monthly readings
- 20-year debt costs with 30-years of O&M and replacement costs for monthly readings

During the Budget review on June 6th and 9th, 2009, staff brought up the fact of the City moving towards monthly utility billing rather than the current bi-monthly billing due to a change from "billing forward" to "billing in arrears." Finance Department staff is currently reviewing final candidates for outsourcing bill printing and anticipates it will be bringing the contract for award and change to monthly billing before Council in the near future.

By using the above scenarios, HDR determined that in three out of four, the fixed metering option would be less expensive overall for the City. Their results breakdown as follows:

Cost Analysis Results

	Mobile	Fixed
20-year O&M, debt, and replacement costs for bi-monthly readings	\$27,927,193	\$29,297,443
20-year debt costs with 30-years of O&M and replacement costs for bi-monthly readings	33,472,217	32,624,346
20-year O&M, debt, and replacement costs for monthly readings	29,500,662	29,297,443
20-year debt costs with 30-years of O&M and replacement costs for monthly readings	35,977,713	32,624,346

Other factors to consider in the choice of technologies is that the fixed system allows almost real time readings of water consumptions to alleviate billing dispute calls, allows staff to more effectively monitor water usage for conservation purposes, finding potential water leaks on customer property and also locating non-working meters in a more timely fashion. All of these factors could mean cost savings for the City of Fresno and it's customers.

Taking the above information into account, staff is requesting that Council find that the Fixed System be in the best interests of the City. Staff is requesting that the requirements contract be awarded to Badger Meter, Inc.

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Award a Contract in the Amount of \$22,247,679.89 to Badger Meter Inc.

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as the lowest responsive and responsible bidder in the amount of \$22,247,679.89 for the Fixed Network AMR and Metering System (an estimated amount of \$22,014,554.89 for the initial term and a total of \$233,125.00 for any future maintenance fees).

The award of the meter Project is subject to the sale of the Water Bonds. The bonds are scheduled to be sold and monies available after February 3, 2010. After that date, staff will execute the Contract with Badger Meter, Inc.

This staff determination was posted on the City's website on December 8, 2009.

The project will be completed before the end of December 2012 with maintenance service at no additional charge through the balance of the initial term ending December 31, 2013. The contract may be extended by City for up to 5 additional one-year periods for annual maintenance at the pricing contained in the bid proposal.

FISCAL IMPACT

See attached.

Attachments:

Fiscal Impact Report

Bid evaluation

Resolution

HDR Technical Memorandum

FISCAL IMPACT STATEMENT

PROGRAM: WC00070

<u>RECOMMENDATION</u>	<u>TOTAL OR CURRENT</u>	<u>ANNUALIZED COST</u>
Direct Cost	<u>\$22,247,679.89</u>	_____
Indirect Cost	<u>\$ -0-</u>	_____
TOTAL COST	<u>\$22,247,679.89</u>	_____
Additional Revenue or Savings Generated	<u>-0-</u>	_____
Net City Cost	<u>\$22,247,679.89</u>	_____
Amount Budgeted (If none budgeted, identify source)	<u>\$89,000,000.00</u>	_____

LISTING OF BIDDERS

FOR:

SUPPLY WATER METERS AND WATER METER REPORTING SYSTEM
PHASE 2: PRICE PROPOSALS FROM QUALIFIED SYSTEM VENDORS

Bid File No. 2862
Bid Opening: November 12, 2009

PROPOSERS (In alphabetical order)	TOTAL PROPOSAL AMOUNT	
1. Badger Meter, Inc. 4545 W Brown Deer Rd Milwaukee WI 53223	Alternative Bid Proposal One (Mobile System) Alternative Bid Proposal Two (Fixed System)	\$17,383,812.40 \$22,247,679.89
2. Neptune Technology Group, Inc. 1600 Alabama Highway 229 Tallasse AL 36078	Alternative Bid Proposal One (Mobile System) Alternative Bid Proposal Two (Fixed System)	\$18,673,685.00 \$29,584,707.37

Each bidder has agreed to allow the City ninety (90) days from date bids were opened to accept or reject their bid proposal.

BACKGROUND OF PROJECT (To be completed by Evaluating Department/
Division. Explain need for project/equipment):

This project is for the purchase of Automatic Meter Reading Systems and the corresponding meter to be installed at approximately 111,000 residences within the City water service area.

Staff is recommending the approval of the fixed system over the mobile system for its versatility in direct real time reading, the ease for collecting information to assist with conservation of water and the savings on the personnel and equipment necessary to drive by each meter every month to read on a mobile system. Staff has made a study of the cost difference based on a twenty (20) year life cycle to show the savings on the purchase of a fixed system over a mobile system.

The Purchasing Division reviewed both bid proposals and Badger Meter has indicated that their general liability aggregate does not apply per project, but as an alternative higher total limits will be provided. Purchasing has determined this statement to be non-responsive to the City's specification requiring "\$2,000,000 general aggregate applying separately to the work performed under the Contract," but during the staff evaluation and through review with Risk Management it was determined that this is not a material change as "higher total limits" will provide the same coverage. does not affect price or provide Badger with an unfair advantage. The bid specifications provide that "The City reserves the right to waive any informality or minor irregularity that does not have a monetary consideration and when it is in the best interest of the public and of the City to do so." Therefore, the Purchasing Manager recommends that the failure to provide the coverage in the form of a general liability aggregate be waived as a minor irregularity in accordance with provisions in the bid specifications and that Badger Meter be awarded a contract as the lowest responsive and responsible bidder.

LISTING OF BIDDERS

FOR:

SUPPLY WATER METERS AND WATER METER REPORTING SYSTEM
PHASE 2: PRICE PROPOSALS FROM QUALIFIED SYSTEM VENDORS

Bid File No. 2862
Bid Opening: November 12, 2009

DEPARTMENT CONCLUSIONS AND RECOMMENDATION:

Award a contract in the amount of \$ 22,247,679.89 to Badger Meter, Inc.
in accordance with the Selection Committee recommendation.

Reject all bids. Reason:

Remarks:

Department Head Approval



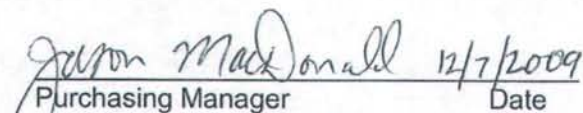
Title Assistant Director of DPU

Date 12/3/09

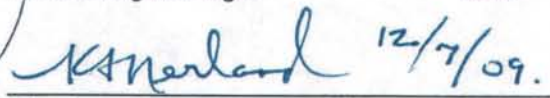
- Approve Dept. Recommendation Approve GSD/Purchasing Recommendation
 Disapprove Disapprove
 See Attachment

GENERAL SERVICES DEPARTMENT

CITY MANAGER


Purchasing Manager Date 12/7/2009


City Manager or Designee Date 12/8/09


Director Date 12/7/09

RESOLUTION NO. _____

A RESOLUTION OF THE COUNCIL OF THE CITY OF FRESNO, CALIFORNIA, SELECTING ALTERNATIVE BID PROPOSAL TWO – FIXED NETWORK AMR AND METERING SYSTEM, AND AWARDING REQUIREMENTS CONTRACT TO BADGER METER, INC. IN THE AMOUNT OF \$22,247,679.89.

WHEREAS, the City is required to meter its residential water service by January 1, 2013 to comply with Assembly Bill 514, as amended by Assembly Bill 2572; and

WHEREAS, as part of the implementation of metering such service, City initiated the procurement of an automated water meter reporting system (“Project”); and

WHEREAS, following a pre-qualification phase (“Pre-qualification to Supply a Fixed or Mobile Automated Water Meter Reporting System and Supply Water Meters RFP No. 2862), the City solicited bid proposals from the pre-qualified system vendors (“Supply Water Meters and Water Meter Reporting System Phase 2: Price Proposals from Qualified System Vendors Bid File No. 2862); and

WHEREAS, Bid File No. 2862 included two alternative bid forms (i.e., Alternative Bid Proposal One for a Mobile Read AMR and Metering System and Alternative Bid Proposal Two for a Fixed Network AMR and Metering System); and

WHEREAS, each of the pre-qualified system vendors submitted bid proposals for each of the two alternatives; and

WHEREAS, Badger Meter, Inc. submitted the lowest bid for each of the two alternatives; and

WHEREAS, the bid specifications require commercial general liability insurance with a “\$2,000,000 general aggregate applying separately to the work performed under the Contract,” and the Purchasing Manager has determined that Badger Meter, Inc.’s statement in their bid proposal that their general liability aggregate does not apply per project, but as an alternative higher total limits will be provided, is non-responsive to the specification; and

WHEREAS, after review with Risk Management, the Purchasing Manager determined that this is not a material change as “higher total limits” will provide the same coverage and does not affect price or provide Badger Meter, Inc. with an unfair advantage; and

WHEREAS, the bid specifications provide that “[T]he City reserves the right to waive any informality or minor irregularity that does not have a monetary consideration and when it is in the best interest of the public and of the City to do so;” and

WHEREAS, the Purchasing Manager recommends that the failure to provide the commercial general liability insurance coverage in the form of a general liability aggregate be waived as a minor irregularity in accordance with provisions in the bid specifications and that Badger Meter, Inc. be awarded a contract as the lowest responsive and responsible bidder; and

WHEREAS, in accordance with Fresno Municipal Code section 4-103(d)(3), the bid specifications specify the "Council Findings Method" to be used to determine the lowest bid as between the two alternative bid forms; and

WHEREAS, under the "Council Findings Method," the "lowest bid" shall be the price of the alternative bid form selected by the Council after consideration of the amount of the bids received and the combination of the products to be delivered when the Council finds an award to the responsive and responsible bidder either to be in the best interests of the City or obtains for the public the best economic result, and the purchase is authorized by resolution of the Council containing a declaration of the facts constituting the finding; and

WHEREAS, the City of Fresno is planning to begin monthly billing in the near future; and

WHEREAS, when evaluating the twenty year life cycle costs of both the mobile and fixed system technologies with the use of monthly billing, the fixed technology (Alternative Bid Proposal Two) is less costly for the City of Fresno; and

WHEREAS, the fixed system technology (Alternative Bid Proposal Two) has additional advantages over the mobile system including the capability to (i) monitor water usage on an approximately real-time basis, (ii) identify service theft, (iii) identify non-working meters between monthly reads, and (iv) increase water conservation efforts.

NOW, THEREFORE, BE IT RESOLVED by the Council of the City of Fresno as follows:

1. After consideration of the above, the Report to the City Council, dated January 14, 2009 (including the referenced Bid Evaluation), Badger Meter, Inc.'s failure to provide commercial general liability insurance with a "\$2,000,000 general aggregate applying separately to the work performed under the Contract," is waived as a minor irregularity in accordance with provisions in the bid specifications and Badger Meter, Inc. is the lowest responsive and responsible bidder under both Alternative Bid Proposal One and Alternative Bid Proposal Two.

2. Based upon the facts enumerated above and after consideration of the Report to the City Council, dated January 14, 2009 (including the referenced HDR Technical Memorandum, dated December 8, 2009, for the Fixed and Mobile Cost Comparison), the Council finds an award to Badger Meter, Inc. of Alternative Bid Proposal Two for a Fixed Network AMR and Metering System to be in the best interests of the City.

3. Badger Meter, Inc. is awarded the requirements contract for the Fixed Network AMR and Metering System (Alternative Bid Proposal Two) to Badger Meter, Inc. in the amount of \$22,247,679.89 (an estimated amount of \$22,014,554.89 for the initial term and a total of \$233,125.00 for any future maintenance fees), subject to the issuance of bonds by the City for the financing of the Project and appropriation of such bond proceeds for the Project.

* * * * *

STATE OF CALIFORNIA)
COUNTY OF FRESNO) ss.
CITY OF FRESNO)

I, REBECCA E. KLISCH, City Clerk of the City of Fresno, certify that the foregoing resolution was adopted by the Council of the City of Fresno, California at a regular meeting held on the _____ day of _____, 2010.

AYES :
NOES :
ABSENT :
ABSTAIN :

Mayor Approval: _____, 2010

Mayor Approval/No Return: _____, 2010

Mayor Veto: _____, 2010

Council Override Vote: _____, 2010

REBECCA E. KLISCH
City Clerk

BY: _____
Deputy

APPROVED AS TO FORM:
CITY ATTORNEY'S OFFICE

BY: *Nancy A. Algier* *1/5/10*
Nancy A. Algier Date
Senior Deputy

To: Robert Anderson, Mark Hughson Date: December 8, 2009
From: Dina O'Reilly, Tom Gould Project: AMR Procurement
cc: Tom Jakubowski, Ken Molli Job No.: 91809
Subject: Badger Fixed and Mobile Cost Comparison

Introduction

The City of Fresno (City) retained HDR Engineering, Inc. (HDR) to develop a meter implementation plan¹ and to assist with the meter procurement process. The meter implementation plan reviewed both fixed network and mobile systems and concluded that the City should obtain bids for both systems. The meter implementation plan contained a cost analysis of the various alternative automated meter reading (AMR) systems. Since the development of the meter implementation plan, the City has received bids from qualified vendors for the fixed network and mobile AMR systems. More specifically, the City has requested HDR to provide a cost analysis comparing the long-term cost of operation between the fixed network and mobile AMR bids provided by Badger Meter, Inc. (BMI) to assist it in its decision making.

The objective in providing this cost comparison for the BMI bids is to determine the most cost-effective bid between the two technologies. There is a trade-off between the initial capital costs of these two systems and their long-term operating costs. In providing this cost analysis, HDR utilized the same economic model used in the meter implantation plan. This model was updated to reflect the current bids (costs) and conditions. It is important to note that this cost analysis is only one aspect (input) in the evaluation and procurement process associated with these AMR systems.

Provided below is a more detailed discussion of HDR's review and conclusions regarding the BMI fixed network and mobile bids.

BMI Capital Costs

The capital costs included in the economic model were obtained from BMI's proposal documents and are summarized in the table below.

BMI Capital Costs

Component	Mobile	Fixed
Transmitter & Meters with Absolute Encoders	\$16,229,150.00	\$19,784,350.00
AMR System Reading Equipment	204,157.85	621,466.09
Annual Maintenance Fees for Five One-Year Option Periods (2014-2018)	174,525.00	233,125.00
Replacement Prices for AMR System Components	552,209.55	449,299.55
Ancillary Operational Support, Materials & Supplies	223,770.00	1,159,439.25
TOTAL	\$17,383,812.40	\$22,247,679.89

¹ City of Fresno, Residential Metering Program and System Evaluation, Jan. 2008, HDR Engineering, Inc.

As can be seen from the table, the initial capital costs for the mobile system are lower than the fixed network system. Within the cost analysis it is assumed that these capital costs are financed via long-term debt and paid over a 20-year period.

While the initial capital costs for the mobile system are lower, what has not been taken into account is the other operating costs which will be incurred by the City, over the long-term. In addition to the capital costs of these two AMR systems, other operating costs need to be factored into the cost analysis, which will have an impact on the overall cost of the systems. These other operating costs are discussed in more detail below.

Other Operating Costs

In order to better understand the relative financial/cost merits of the mobile technology versus the fixed network solution, an evaluation must include not only the upfront capital costs, but also the long-term operating costs, along with any replacement costs of components once they have reached the end of their useful life.

Updated Assumptions - As stated previously, the economic model from the meter implementation plan was updated with BMI's capital costs (bids) for the two alternatives. Other key assumptions needed to be updated as the Meter Implementation Plan was completed in January 2008. The assumptions were updated to reflect current market and trends in the economy. For example, the debt service rate was changed from 5.5% to 5% to reflect the rate in which the City anticipates issuing bonds. The discount rate was revised to 5% to correspond to the borrowing rate. Other changes included increasing benefits at 8% and final reads for the system at an average of 17%. These changes reflect HDR's best estimate of the current conditions/assumptions needed within the model.

Model Overview

In conducting the cost comparisons, the model took into consideration the capital costs outlined by BMI along with the O&M costs and the replacement costs for the system over the long-term and then brought those values back to a net present value in order to give a true cost of the operating and capital costs for each system. The net present value analysis is the cost of meter reading operations and capital investment presented, over the life of the investment, in current dollars.

The model also provided HDR and the City the opportunity to consider the cost impacts of key variable (e.g. bi-monthly vs. monthly meter reading). As will be seen, this sensitivity was utilized to compare both monthly and bi-monthly reads to show the impacts to the overall costs to the systems. These variables will be discussed in the following section.

Model Results

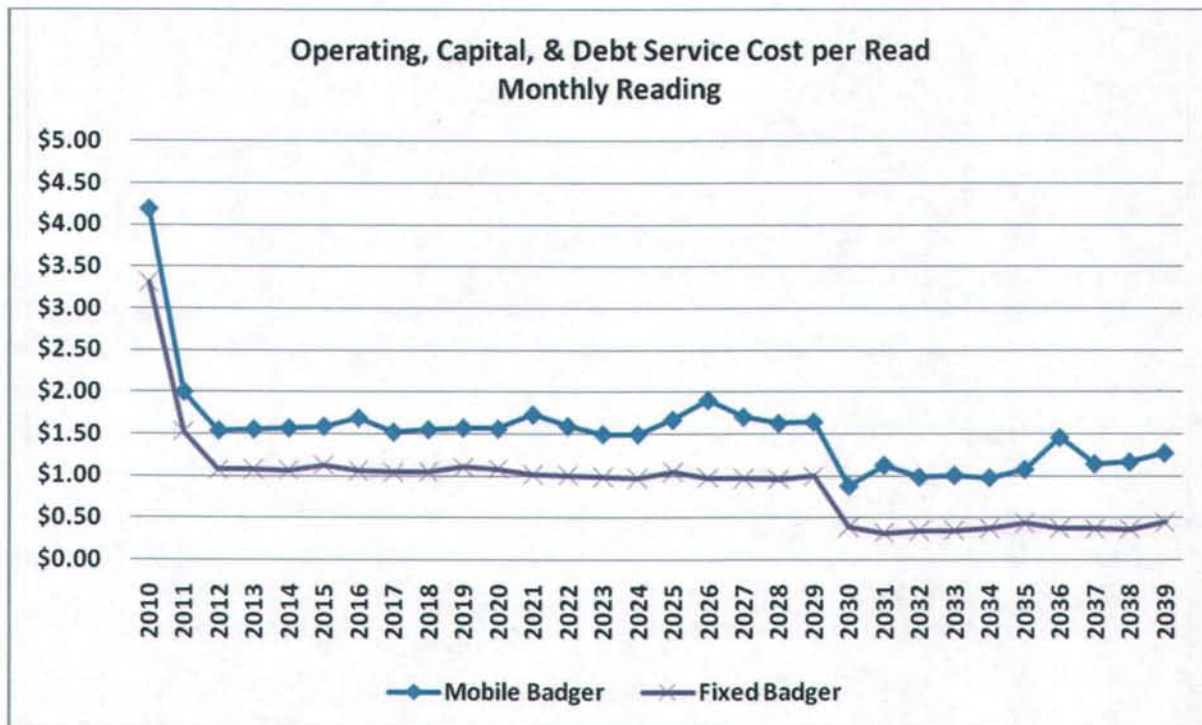
Four scenarios were evaluated to give the City an understanding of the long-term financial costs of both AMR solutions.

- 20-year O&M, debt, and replacement costs for bi-monthly readings
- 20-year debt costs with 30-years of O&M and replacement costs for bi-monthly readings
- 20-year O&M, debt, and replacement costs for monthly readings
- 20-year debt costs with 30-years of O&M and replacement costs for monthly readings

Cost Analysis Results

	Mobile	Fixed
20-year O&M, debt, and replacement costs for bi-monthly readings	\$27,927,193	\$29,297,443
20-year debt costs with 30-years of O&M and replacement costs for bi-monthly readings	33,472,217	32,624,346
20-year O&M, debt, and replacement costs for monthly readings	29,500,662	29,297,443
20-year debt costs with 30-years of O&M and replacement costs for monthly readings	35,977,713	32,624,346

In viewing the above table, it appears the fixed network technology is the lowest cost solution in three of the four scenarios reviewed. Mobile technology is only cost effective when the technology is not highly utilized to its full benefit (i.e. bi-monthly readings) and viewed over the shortest time period (20-years of O&M). In all other cases, and in particular when the fixed network technology is being taken advantage of (i.e. monthly readings), it appears that the fixed network solution will be the most cost-effective. The figure below shows the operating, capital and debt service cost per read for monthly reading over the 30-year period.



20-Year Debt, 30-Year O&M and Replacement Cost per Read

The cost per read for the fixed network is significantly lower than the mobile for monthly reads. The cost per read in 2029 for mobile is \$1.64 while the fixed network is \$0.99. The drop in year

2030 is when the debt service is paid off for the AMR system initial investment. For monthly reads, the cost per read for mobile is \$1.27 in 2039 while the fixed network is \$0.96 per read.

Other Considerations

The above analysis has considered only the bid and routine and final reading operating costs associated with these two technologies. There clearly are other items or benefits the City should consider when choosing an AMR technology. These considerations or benefits may include improved customer service, lower operating costs, improved water resource management and environmental benefits. Some of these have been quantified in the cost model, such as the operating costs. Others are more qualitative and have not been included in the model. The following discussion provides an overview of some of the more important qualitative items the City should consider when making its final selection.

Billing Disputes - Billing questions and disputes are a part of the utility customer service and billing process. For example, there will be an adjustment period as the customers get used to receiving bills based on consumption. Even if some customers receive a lower bill than their current flat rate, there may be questions regarding the technology and its accuracy. Other utilities have seen an increase in customer service calls after the implementation of AMR. During the adjustment period, it should be noted that for mobile technology, the dispute will need to be resolved by re-visiting the meter, while for the fixed network, the City's Customer Service staff will have immediate access to the information without making a trip to the customer's meter. **Advantage: Fixed Network**

Water Usage Monitoring - Utilities which have deployed a fixed network system have found they can be more pro-active in monitoring water usage. Utilities are able to identify customers who might have leaks or using an excessive amount of water as opposed to utilities whose only view of the water usage is a monthly read, which shows the usage 30 or more days in the past. Utilities with fixed networks have the capability (technology) to be able to monitor customer accounts and inform the customer of a possible leak and suggest repairs earlier. Such monitoring is also available with the mobile system, but only with additional visits to the customer. **Advantage: Fixed Network**

Non-Working Meters - Should a meter begin to fail and the utility is on a mobile bi-monthly reading schedule, it could take up to two billing cycles or four months to notice a non-working meter read. Unless the customer is on vacation or otherwise absent from the premises, a fixed network would have the capability (technology) to notice the non-working meter within a few days. **Advantage: Fixed Network**

Monthly Reading and Billing - As the costs and rates for water and wastewater increase, more frequent billing reduces the size of the bill, reduces collection efforts, and reduces potential for bad debt write-offs. If the City moved to monthly reads, it would need to double the staff for the mobile system, while the staff for the fixed network would remain the same. As the figure above shows, there is a significant difference in the cost per read should the City move to monthly billing. With the selection of either mobile or fixed network, the City should take advantage of the technology and benefits of monthly billing. **Advantage: Fixed Network, due to lower cost per read**

Theft of Service - It is more difficult to identify the theft of water with a mobile system due to the length of time between readings, while with a fixed network, the City would have the capability

to know almost immediately of the attempt to steal water or tamper with the meter. **Advantage: Fixed Network**

Water Conservation - The City, and much of California, is currently experiencing a drought. The best way to monitor water usage is to know how much water is being used in a timely manner. Even if the City should move to a monthly reading schedule, a mobile system will only provide 12 reads annually, providing consumption information up to 30 days after the customer has used it. A fixed network system will provide the City the ability to pro-actively monitor water usage on a daily or hourly basis. Should the City experience an extended drought period and need to more actively monitor water usage, a mobile system will be more costly for the City. For example, at \$45,000 per meter reader and \$8,500 to equip the vehicle to read, at 22 meter readers, it would cost the City \$1 million per year to capture one read per day while the fixed network would already be capable of reading daily. Finally, being able to better manage the water usage will also help the City meet the California Urban Water Conservation Council (CUWCC) best management practices (BMP). **Advantage: Fixed Network**

Water Restriction Monitoring and Enforcement - As part of the City's Urban Water Management Plan (West Yost, 2008), the City has a water shortage contingency plan which includes the restriction of usage should the City experience a drought. In order for any water restrictions to be effective, they need to be monitored and enforced. With a fixed network system, the City would be able to monitor the usage of water without having to hire additional staff to observe, monitor, and investigate water restriction violations. The fixed network can be equipped to identify potential infractions and send out notifications without the need for additional staff. **Advantage: Fixed Network**

Environmental – The mobile system requires a number of vehicles to collect the readings. The fixed network system does not require vehicles for reading purposes. The reduced use of vehicles for meter reading has not only provides a cost saving, but also an environmental benefit. **Advantage: Fixed Network**

Recommendations

The cost analysis conducted as a part of this bid procurement process has determined that on a cost-basis, it appears the fixed network AMR system is more cost-effective over the long run, when compared to a mobile (drive-by) system. An important assumption within that analysis is that the City will take advantage of this technology, and eventually move from bi-monthly billing to a monthly billing. The fixed network system provides the power, capability and technology for the City to provide vast improvements in the area of customer service and billing. The fixed network system also appears to provide significant benefits over the mobile system, which were not quantified within this cost analysis, but will certainly provide the potential for both cost savings and improved service.

As a result of the findings based on BMI's bid proposal and the updated operating costs from the Meter Implementation Plan, **from strictly a cost perspective, HDR would recommend the City approve and purchase the GALAXY fixed network reading system from BMI.** The cost analysis shows that over the long term, the fixed network will provide more flexibility to the City and will offer the best long-term value to the City and its customers.