



Steven L. Beshear
Governor

Leonard K. Peters
Secretary
Energy and Environment Cabinet

Commonwealth of Kentucky
Public Service Commission
211 Sower Blvd.
P.O. Box 615
Frankfort, Kentucky 40602-0615
Telephone: (502) 564-3940
Fax: (502) 564-3460
psc.ky.gov

David L. Armstrong
Chairman

James W. Gardner
Vice Chairman

Charles R. Borders
Commissioner

September 22, 2011

Mr. Johnny Dowdy
Ms. Kristi McAdoo
Graves County Water District
P. O. Box 329
Mayfield, KY 42066

Sam Boyd Neely, Jr., Esq.
Post Office Box 708
Mayfield, Kentucky 42066

Re: Case No. 2011-00233
Graves County Water District

Ms. McAdoo and Gentlemen:

The enclosed documents, which represent Graves County Water District's Response to an inquiry from Commission Staff, have been filed in the record of the above-referenced case.

Sincerely,

A handwritten signature in black ink, appearing to read "Jeff Derouen".

Jeff Derouen
Executive Director

Enclosures

1. Cover Message
2. PSC Staff Questions
3. Graves County WD's Response
4. Exhibit A
5. Exhibit B
6. Exhibit C
7. Exhibit D
8. Exhibit E

ATT3739893.txt

Mr. Wuetcher,

The answers to the document titled "Questions for Graves County Water District" are above in the document titled "PSC Response" a hard copy of the above documents is being placed in the mail. If you need anything else please contact us and we appreciate your assistance in expediting this process.

Thank You

Brent Shultz
Mayfield Electric & Water Systems
301 East Broadway Mayfield, KY 42066
Office: 270.247.4661
Mobile: 270.705.8661

Bshultz@mewsbb.net

QUESTIONS FOR GRAVES COUNTY WATER DISTRICT

1. State the reasons why Graves County Water District (“Graves District”) wishes to replace its existing meters with advanced metering infrastructure (“AMI”) equipment.

2. In its application, Graves District states that documents related to bidding on the AMI equipment can be found at Exhibit D. The application submitted to the Commission lacks an Exhibit D.

a. Provide the bid specifications for the AMI equipment.

b. Provide the bid tabulation sheet for the AMI equipment.

c. If Graves District did not select the lowest bidder, state the reasons why the lowest bidder was not selected.

3. Provide all reports, studies, analyses, or reviews regarding the purchase of AMI equipment that Graves District prepared, performed, commissioned, or used in the reaching its decision to purchase such equipment.

4. If Graves District did not perform a cost-benefit analysis study of the proposed purchase of AMI equipment, explain why not.

5. List and describe each automated meter reading and AMI system that Graves District considered.

6. Describe how Graves District determined that the proposed installation of AMI equipment will result in annual savings of \$50,000. Show all calculations and state all assumptions made to reach this amount.

7. Refer to Graves District's Application, Memorandum dated September 28, 2010.

- a. State the number of persons who will install the AMI equipment.
- b. Describe the relationship of these persons to Graves District (e.g., permanent employees, temporary contract employees).
- c. List and describe all costs included in the estimate of \$18 per hour cost for labor.
- d. State whether the installers will be employees of Mayfield Electric and Water System.

8. Refer to Graves District's Application, Memorandum dated September 28, 2010. The use of two trucks for 2,600 hours at a cost of \$15 per hour is listed as a component of the AMI equipment installation cost. State whether Graves District intends to purchase the trucks in question. If Graves District will not be purchasing the trucks, explain why renting the trucks is more economical than their actual purchase.

9. Refer to Graves District's Application, Memorandum dated September 28, 2010. Graves District's cost estimate includes the construction of four "Buildings w/Electrical ht & air." Describe these buildings and their purpose.

10. a. State how frequently Graves District intends to inspect and test the proposed AMI equipment.
- b. State how frequently Grave District currently inspects and tests its current metering equipment.
- c. Describe the cost savings, if any, related to inspection and testing that will result from the proposed installation of AMI equipment.

11. State the age and time in service for Graves District's current meters.
12. State whether the proposed installation of AMI equipment will require an adjustment of Graves District's rates. If yes, describe how the installation will require a rate adjustment and state when Graves District expects to apply for a rate adjustment.
13. State whether, upon completion of the proposed installation of AMI equipment, Graves District will continue to read any meters manually. If yes, describe the criteria that Graves District will use to determine which meters will be read manually.
14. State whether, as a result of the proposed installation of AMI equipment, Graves District intends to modify of any of the policies listed below. If yes, describe the expected modifications. If no, explain why not.
 - a. Graves District's existing policy of rereading a customer's meters and checking for leaks when a deviation of 20 percent or more exists between the present monthly reading and the customer's average usage.
 - b. Graves District's existing procedures or policies regarding the investigation of customer usage when a customer complains of high usage.
 - c. Graves District's current leak adjustment procedures and policies.
15. Describe the reliability record of Graves District's current meters.
16. State the expected failure rate of and the reliability record of the proposed AMI equipment.
17. Describe how each of the AMI units will be powered. If battery power will be used, state the expected battery life and describe the protocols or procedures that Graves District will use to monitor the operation of the unit.

18. Identify the major risks associated with reliability of the proposed AMI equipment and the corresponding safeguards or contingency plans that Graves District will use to address these risks.

19. Describe how Graves District intends to use the proposed AMI equipment to support non-revenue water studies.

ANSWERS FOR THE GRAVES COUNTY WATER DISTRICT QUESTIONS

1. There are multiple benefits of replacing the existing meters with an AMI system. The aging infrastructure of the system and the potential water loss through the meter are justification as well as the costs associated with the monthly reading and the environmental impact of driving to each meter. The increased customer service by the real time alarms for leaks and the daily consumption report will also be valuable. All costs of the project and justification came as a result of the study performed for MEWS (Mayfield Electric and Water Systems). We operate, manage, treat and sell water to the GCWD (Graves County Water District) and the HWD (Hickory Water District). This includes reading and replacing the meters.
2. Please see Exhibits A, B, C, D, & E
3. Please See Exhibit D.
4. Please see Exhibit E.
5. GCWD chose the Sensus Flexware system that is currently in operation for MEWS. This is the best option because of the proven technology and success that Mayfield has had with the product. Choosing Flexware is also the most cost effective decision for the GCWD. MEWS has existing infrastructure in place to collect and process reads. This is a benefit to the GCWD because MEWS can collect the data, generate bills, retain backups in the event of an emergency, have onsite generation and a existing 300' guy tower in place with a fiber backhaul to our main office. MEWS currently has meter technicians trained on the Flexware System who can maintain and operate it to its highest potential. The meter technicians have the ability to program meters and diagnose problems if they occur in the system. They can comprehend reports generated by the system, such as backflow, stale meters, high consumption, leak detection, tampering, cut wires, etc.
6. Please see Exhibit E.

7.

a) The number of persons completing the meter change out will be approximately four.

b) The persons will be contracted employees of MEWS.

c) The rate was based on information obtained from the temp agency that has provided MEWS with contract labor in the past.

d) No the installers are not currently employees, however if it is in the GCWD best interest long term employees of MEWS can be considered to install the equipment.

8. The GCWD does not own any trucks currently and the short time frame of the job makes the purchase unjustifiable, considering the long-term commitment and cost of maintaining the equipment when it is no longer needed.

9. The buildings will be used to house and protect the TGBs (Tower Gateway Base station) which are the devices that are constantly collecting, receiving and transmitting meter data. The number of TGBs or collection points were determined by the propagation study that was completed by Black and Veatch Engineering firm. The sites were chosen based on the utilizing existing water towers in locations that could capture all reads and transmit the data back to the RNI (Regional Network Interface) without spending funds on unneeded infrastructure and excessive redundancy.

10.

a) There will be multiple employees of the MEWS staff monitoring the system daily. The system provides valuable information that must be managed and maintained to receive the full benefit for the GCWD and its customers. If the system or its meters are not functioning correctly it will be noticed immediately.

b) MEWS reads residential meters monthly currently and master meters daily.

c) There are cost savings to both the GCWD and its customers. Savings will be experienced through not requiring another trip to the meter costing time and mileage. Also by quick notification of leaks we can cut water loss and save a customer from experiencing a large leak that could carry on for weeks undetected.

11. MEWS is unsure about the age of many of the meters because MEWS has only operated the systems for a few years. MEWS have found and are continually finding stopped and non-registering meters.

12. The first phase of the meter change out should require no rate increase. Phase 1 will include approximately half of the total meters owned by GCWD this does not include HWD. HWD is currently in the process of merging with the GCWD. When this process is complete HWD will become part of the project. Phase II will require a rate adjustment, however at this time it has not been decided.

13. No, the GCWD will not continue to read meters manually.

14. GCWD does not anticipate change in policy, except we will check daily for leaks in order to try to catch them earlier than after they have been read.

a) No, MEWS does not anticipate change in policy however we hope to eliminate the need for this over time through constant observation of the meter data. MEWS would like to be proactive in the correction of these problems.

b) No, MEWS does not anticipate a change in policy, however we will have more tools to aid on the investigation and we can show the customers when the consumed the water.

15. MEWS attempts to change the 10% per year since we have contract operated the GCWD, however in the aging system there are many meters beyond the 10% that need replacement.

16. MEWS has experienced less than 1% during the two years of operation and all equipment has been replaced under warranty.

17. A lithium ion battery will be utilized in the transmitter the batteries have a 20-year warranty with full replacement up to 10 years. The current state of the battery is displayed and monitored on the Flexware meter portal.

18. An item that could be considered a major risk would be a failure of one or more TGBs on the Flexware network. This would disable our ability to collect reads and meter data. This could be caused by a failure of the equipment or possibly a lightning strike. However MEWS has safeguarded against this with our "Flexnet protection Plan" that insures a prompt replacement of the TGB, also the 520X transmitter on each meter can store days of data until the system is up and running. MEWS has also protected our tower and infrastructure from a lightning strike by installing substantial grounding grid and properly grounding all equipment.

A second item of concern would be RF interference that disrupts data collection from another system or piece of equipment that is operated in the same spectrum as the Flexnet System. However, a deciding factor in choosing the Flexnet System was because it operates in a FCC licensed spectrum that is fully protected.

19. If ever requested MEWS will have access to and can make available 13 months of hourly consumption on all AMI water meters accompanied by other meter data and alarms.

CRIME STOPPERS
247-5000

Anthem 
INDIVIDUAL
Health Coverage For
Individuals & Families
Call
**Brown Insurance &
Financial**
1-270-247-0100
516 South 6th, Mayfield, KY

Janet Fowler is an
Independent Authorized Agent
in Kentucky For Anthem Blue
Cross And Blue Shield
Anthem Blue Cross and Blue Shield is the trade
name of Anthem Health Plans of Kentucky, Inc.,
an independent licensee of the Blue Cross and
Blue Shield Association. Registered marks Blue
Cross and Blue Shield Association.

The Kentucky Hospitals Association is scheduled to take up a possible recommendation that members begin using armbands to identify patient issues. The newspaper reported the inspector general for the Cabinet for Health and Family Services will meet with officials of the long-term care industry to discuss using the armbands in nursing homes.

Burial will follow at Owens Chapel Church Cemetery. Visitation will be from 5 to 8 p.m. today at the funeral home. Expressions of sympathy may take the form of a donation to Owens Chapel Methodist Church, c/o Martha Jones, 3615 County Line Rd., Melber, KY 42069.

VIRGINIA
FRANCES TAYLOR
August 9, 1937-
May 4, 1999
Ten years ago today,
God called you Home.
Not a day goes by that
we don't miss you with
all of our hearts.
**Love, Lanetta,
Denise, Randall,
Dan, spouses and
families**

Norma Loudon
Norma Loudon, 83, of Mayfield died Monday, May 4, 2009 at 12:20 a.m. at Murray Calloway County Hospital. Arrangements are incomplete at Brown Funeral Home in Mayfield.

Jeretta Hopkins
Jeretta Hopkins, 77, of Mayfield, formerly of Wingo died Sunday, May 3, 2009 at 4:25 p.m. at Jackson Purchase Medical Center. Arrangements are incomplete at Brown Funeral Home in Wingo.

INVITATION TO BID
ELECTRIC METERS WITH RADIO TRANSMITTERS

SEALED BIDS for the acquisition of Electric Meters with Radio Transmitters will be received by Mayfield Electric and Water Systems (MEWS) at their office at 301 East Broadway in Mayfield, Kentucky until 3:30 p.m. local time on the 19th day of May 2009. Bids will be opened at the ensuing MEWS Board meeting.
All BIDS shall be submitted in duplicate, sealed, and marked on the outside of the envelope - Water Meter BID May 19, 2009. MEWS reserves the right to reject any and all BIDS and to waive any informalities or technicalities therein. No bidder may withdraw a bid for a period of sixty days after the date set for the bid opening.
Specifications and bid documents may be examined at the MEWS office or may be obtained by contacting Marty Ivy, General Superintendent, Mayfield Electric and Water Systems, 301 East Broadway, P.O. Box 347, Mayfield, KY 42066, telephone (270) 247-4661.

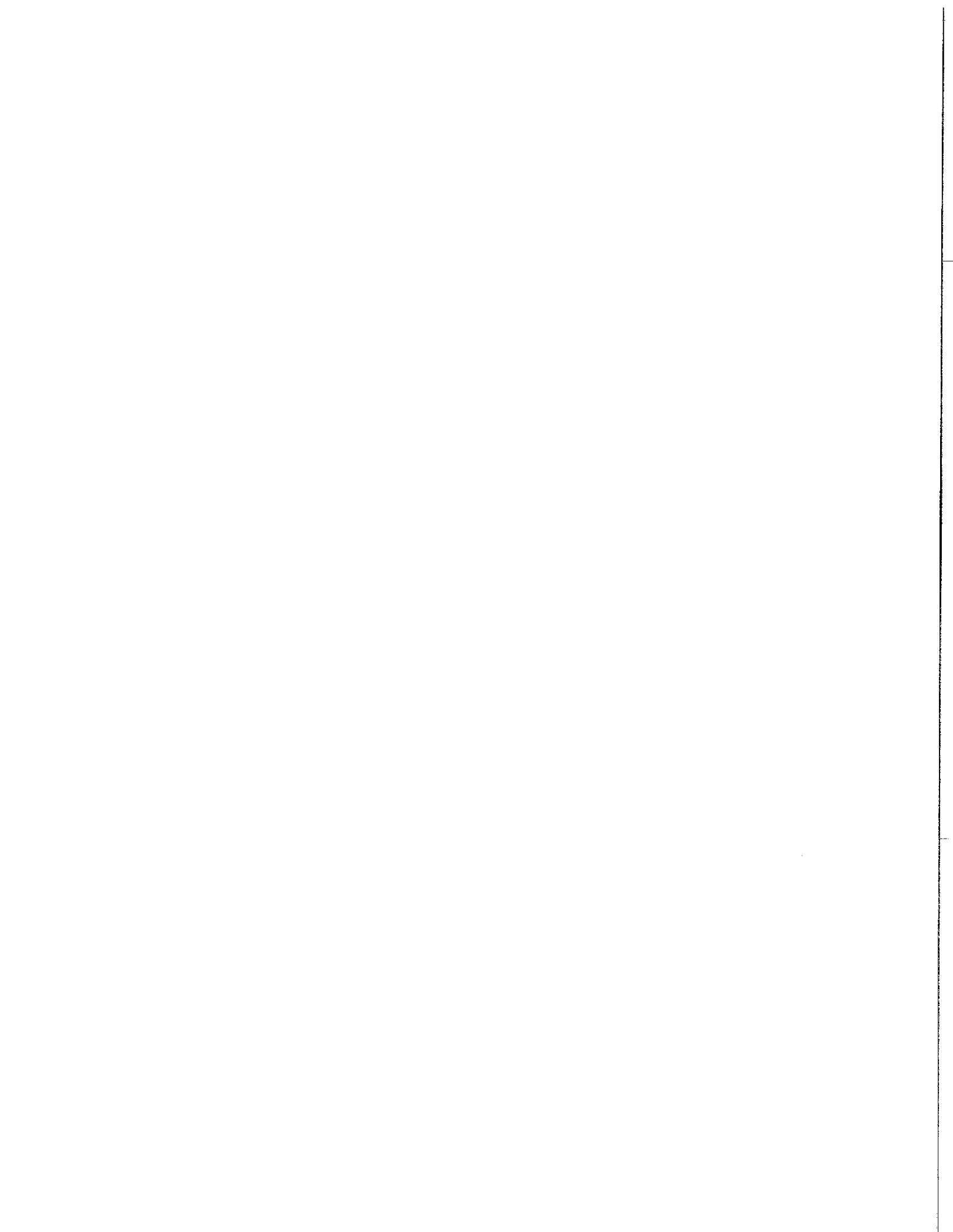
**IN LOVING
MEMORY OF
"HONEY"
GLADYS M.
SHELTON**
5/31/1938-6/2/2006
Death leaves a heartache
No one can heal.
Love leaves a memory No
one can steal.
**HAPPY BIRTHDAY!
DOLORES**

INVITATION TO BID
AUTOMATED METER INFRASTRUCTURE

SEALED BIDS for the construction of Automated Metering Infrastructure (AMI) will be received by Mayfield Electric and Water Systems (MEWS) at their office at 301 East Broadway in Mayfield, Kentucky until 3:30 p.m. local time on the 19th day of May 2009. Bids will be opened at the ensuing MEWS Board meeting.
The AMI project consists of the installation of Automated Metering Infrastructure to communicate with electric and water meters in the MEWS system. The project also includes the interfacing of data from electric and water meters with the MEWS customer service and billing system, including associated software and training.
All BIDS shall be submitted in duplicate, sealed, and marked on the outside of the envelope - Water Meter BID May 19, 2009. MEWS reserves the right to reject any and all BIDS and to waive any informalities or technicalities therein. No bidder may withdraw a bid for a period of sixty days after the date set for the bid opening.
Specifications and bid documents may be examined at the MEWS office or may be obtained by contacting Marty Ivy, General Superintendent, Mayfield Electric and Water Systems, 301 East Broadway, P.O. Box 347, Mayfield, KY 42066, telephone (270) 247-4661.

INVITATION
WATER METERS AND RA

SEALED BIDS for the acquisition of Water Meters and Radio Transmitters will be received by Mayfield Electric and Water Systems (MEWS) at their office at 301 East Broadway in Mayfield, Kentucky until 3:30 p.m. local time on the 19th day of May 2009. Bids will be opened at the ensuing MEWS Board meeting.
All BIDS shall be submitted in duplicate, sealed, and marked on the outside of the envelope - Water Meter BID May 19, 2009. MEWS reserves the right to reject any and all BIDS and to waive any informalities or technicalities therein. No bidder may withdraw a bid for a period of sixty days after the date set for the bid opening.
Specifications and bid documents may be examined at the MEWS office or may be obtained by contacting Marty Ivy, General Superintendent, Mayfield Electric and Water Systems, 301 East Broadway, P.O. Box 347, Mayfield, KY 42066, telephone (270) 247-4661.



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**INVITATION TO BID
WATER METERS AND RADIO TRANSMITTERS**

SEALED BIDS for the acquisition of Water Meters and Radio Transmitters will be received by Mayfield Electric and Water Systems (MEWS) at their office at 301 East Broadway in Mayfield, Kentucky until 3:30 p.m. local time on the 19th day of May 2009. Bids will be opened at the ensuing MEWS Board meeting.

All BIDS shall be submitted in duplicate, sealed, and marked on the outside of the envelope – Water Meter BID May 19, 2009. MEWS reserves the right to reject any and all BIDS and to waive any informalities or technicalities therein. No bidder may withdraw a bid for a period of sixty days after the date set for the bid opening.

Specifications and bid documents may be examined at the MEWS office or may be obtained by contacting Marty Ivy, General Superintendent, Mayfield Electric and Water Systems, 301 East Broadway, P.O. Box 347, Mayfield, KY 42066, telephone (270) 247-4661.

**INSTRUCTIONS TO BIDDERS
WATER METERS AND RADIO TRANSMITTERS**

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ARTICLE 1 – ISSUING OFFICE AND SUCCESSFUL BIDDER

- 1.01 The Issuing Office from which these bid documents are being issued and where the bids will be administered is:
- Mayfield Electric and Water Systems, 301 East Broadway, P.O. Box 347, Mayfield, KY 42066, telephone (270) 247-4661
- 1.02 The Successful Bidder will be the lowest priced, qualified, responsible bidder to whom the Owner (on the basis of the Owner's evaluation as hereinafter provided) makes an award.

ARTICLE 2 – COPIES OF BIDDING DOCUMENTS

- 2.01 Complete sets of the Bidding Documents in the number stated in the advertisement or invitation to bid may be obtained from the Issuing Office.
- 2.02 Complete sets of Bidding Documents shall be used in preparing Bids; Owner assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.
- 2.03 Owner, in making copies of Bidding Documents available on the above terms, do so only for the purpose of obtaining Bids for the Work and do not authorize or confer a license for any other use.

ARTICLE 3 – QUALIFICATIONS OF BIDDERS

- 3.01 To demonstrate Bidder's qualifications to perform the Work, within 5 days of OWNER's request, Bidder shall submit written evidence such as financial data, previous experience, present commitments, and such other data as may be called for by OWNER.
- 3.02 Bidder is advised to carefully review those portions of the Bid Form requiring Bidder's representations and certifications.

ARTICLE 4 – EXAMINATION OF BIDDING DOCUMENTS, OTHER RELATED DATA, AND SITE

- 4.01 It is the responsibility of each Bidder before submitting a Bid to:
- A. examine and carefully study the Bidding Documents, and the other related data identified in the Bidding Documents;

- B. determine that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the equipment to be supplied.

ARTICLE 5 – INTERPRETATIONS AND ADDENDA

- 5.01 All questions about the meaning or intent of the Bidding Documents are to be submitted to Owner in writing. Interpretations or clarifications considered necessary by Owner in response to such questions will be issued by Addenda mailed or delivered to all parties recorded by Owner as having received the Bidding Documents. Questions received less than ten days prior to the date for opening of Bids may not be answered. Only questions answered by Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.
- 5.02 Addenda may be issued to clarify, correct, or change the Bidding Documents as deemed advisable by Owner.

ARTICLE 6 – CONTRACT TIMES

- 6.01 The number of days within which, or the dates by which, any milestones are to be achieved and the Work is to be substantially completed and ready for final payment are set forth in the Agreement..
- 6.02 Contractor shall not be required to employ any Subcontractor, Supplier, individual, or entity against whom Contractor has reasonable objection.

ARTICLE 7 – PREPARATION OF BID

- 7.01 The Bid Form is included with the Bidding Documents. Additional copies may be obtained from Owner.
- 7.02 All blanks on the Bid Form shall be completed in ink and the Bid Form signed in ink. Erasures or alterations shall be initialed in ink by the person signing the Bid Form. A Bid price shall be indicated for each section, Bid item, alternative, adjustment unit price item, and unit price item listed therein. In the case of optional alternatives the words "No Bid," "No Change," or "Not Applicable" may be entered.
- 7.03 A Bid by a corporation shall be executed in the corporate name by the president or a vice-president or other corporate officer accompanied by evidence of authority to sign. The corporate seal shall be affixed and attested by the secretary or an assistant secretary. The corporate address and state of incorporation shall be shown.
- 7.04 A Bid by a partnership shall be executed in the partnership name and signed by a partner (whose title must appear under the signature), accompanied by

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evidence of authority to sign. The official address of the partnership shall be shown.

- 7.05 A Bid by a limited liability company shall be executed in the name of the firm by a member and accompanied by evidence of authority to sign. The state of formation of the firm and the official address of the firm shall be shown.
- 7.06 A Bid by an individual shall show the Bidder's name and official address.
- 7.07 A Bid by a joint venture shall be executed by each joint venturer in the manner indicated on the Bid Form. The official address of the joint venture shall be shown.
- 7.08 All names shall be printed in ink below the signatures.
- 7.09 The Bid shall contain an acknowledgment of receipt of all Addenda, the numbers of which shall be filled in on the Bid Form.
- 7.10 Postal and e-mail addresses and telephone number for communications regarding the Bid shall be shown.
- 7.11 The Bid shall contain evidence of Bidder's authority and qualification to do business in the state where the Project is located, or Bidder shall covenant in writing to obtain such authority and qualification prior to award of the Contract and attach such covenant to the Bid. Bidder's state contractor license number, if any, shall also be shown on the Bid Form.

ARTICLE 8 – BASIS OF BID

Bidders shall submit a Bid on a unit price basis as set forth in the Bid Form for the specified equipment.

ARTICLE 9 – SUBMITTAL OF BID

- 9.01 With each copy of the Bidding Documents, a Bidder is furnished one separate unbound copy of the Bid Form. The unbound copy of the Bid Form is to be completed and submitted.
- 9.02 A Bid shall be submitted no later than the date and time prescribed and at the place indicated in the advertisement or invitation to bid and shall be enclosed in a plainly marked package with the Project title (and, if applicable, the designated portion of the Project for which the Bid is submitted), the name and address of Bidder, and shall be accompanied other required documents. If a Bid is sent by mail or other delivery system, the sealed envelope containing the Bid shall be enclosed in a separate package plainly marked on the outside with the notation "BID ENCLOSED." WATER METER BID, May 19, 2009.

ARTICLE 10 – MODIFICATION AND WITHDRAWAL OF BID

- 10.01 A Bid may be modified or withdrawn by an appropriate document duly executed in the same manner that a Bid must be executed and delivered to the place where Bids are to be submitted prior to the date and time for the opening of Bids.
- 10.02 If within 24 hours after Bids are opened any Bidder files a duly signed written notice with Owner and promptly thereafter demonstrates to the reasonable satisfaction of Owner that there was a material and substantial mistake in the preparation of its Bid, that Bidder may withdraw its Bid. Thereafter, if the equipment is re-bid, that Bidder may be disqualified from further bidding on the equipment.

ARTICLE 11 – OPENING OF BIDS

- 11.01 Bids will be opened at the time and place indicated in the Advertisement or Invitation to Bid and, unless obviously non-responsive, read aloud publicly. An abstract of the amounts of the base Bids and major alternates, if any, will be made available to Bidders after the opening of Bids.

ARTICLE 12 – BIDS TO REMAIN SUBJECT TO ACCEPTANCE

- 12.01 All Bids will remain subject to acceptance for the period of time stated in the Bid Form.

ARTICLE 13 – EVALUATION OF BIDS AND AWARD OF CONTRACT

- 13.01 Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, non-responsive, unbalanced, or conditional Bids. Owner further reserves the right to reject the Bid of any Bidder whom it finds, after reasonable inquiry and evaluation, to not be responsible. Owner may also reject the Bid of any Bidder if Owner believes that it would not be in the best interest to make an award to that Bidder. Owner also reserves the right to waive all informalities not involving price, time, or changes in the equipment and to negotiate contract terms with the Successful Bidder.
- 13.02 More than one Bid for the same equipment from an individual or entity under the same or different names will not be considered. Reasonable grounds for believing that any Bidder has an interest in more than one Bid for the equipment may be cause for disqualification of that Bidder and the rejection of all Bids in which that Bidder has an interest.
- 13.03 In evaluating Bids, Owner will consider whether or not the Bids comply with the prescribed requirements, and such alternates, unit prices and other data, as may be requested in the Bid Form or prior to the Notice of Award.

13.04 In evaluating Bidders, Owner will consider the qualifications of Bidders. Owner will also consider the following in the evaluation of bids:

1. Price
2. Meter and Transmitter Capabilities
3. Availability of Service and Technical Support within a Reasonable Response Time
4. Terms of Warranty
5. Compatibility of Meter and Transmitter with MEWS AMI System
6. Proposed Time Schedule for Shipping Equipment

13.05 If the Contract is to be awarded, Owner will award the Contract to the Bidder whose Bid is in the best interests of the Owner.

ARTICLE 14 – SIGNING OF AGREEMENT

14.01 When Owner issues a Notice of Award to the Successful Bidder, it shall be accompanied by the required number of unsigned counterparts of the Agreement along with the other Contract Documents which are identified in the Agreement as attached thereto. Within 15 days thereafter, Successful Bidder shall sign and deliver the required number of counterparts of the Agreement and attached documents to Owner. Within ten days thereafter, Owner shall deliver one fully signed counterpart to Successful Bidder.

ARTICLE 15 – SALES AND USE TAXES

15.01 Owner is exempt from Kentucky state sales and use taxes on materials and equipment purchased by OWNER.

**BID FORM
WATER METERS AND RADIO TRANSMITTERS**

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ARTICLE 1 – BID RECIPIENT

1.01 This Bid is submitted to:

Mayfield Electric and Water Systems

1.02 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner to supply all equipment as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

ARTICLE 2 – BIDDER’S ACKNOWLEDGEMENTS

2.01 Bidder accepts all of the terms and conditions of the Instructions to Bidders. This Bid will remain subject to acceptance for 60 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

ARTICLE 3 – BIDDER’S REPRESENTATIONS

3.01 In submitting this Bid, Bidder represents that:

A. Bidder has examined and carefully studied the Bidding Documents, other related data identified in the Bidding Documents, and the following Addenda, receipt of which is hereby acknowledged:

<u>Addendum No.</u>	<u>Addendum Date</u>
_____	_____
_____	_____
_____	_____

B. Bidder has given Owner written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and the written resolution thereof by Owner is acceptable to Bidder.

C. The Bid Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the equipment for which this Bid is submitted.

ARTICLE 4 – BIDDER’S CERTIFICATION

4.01 Bidder certifies that:

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- A. This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation;
- B. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid;
- C. Bidder has not solicited or induced any individual or entity to refrain from bidding; and
- D. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 4.01.D:
 - 1. "corrupt practice" means the offering, giving, receiving, or soliciting of any thing of value likely to influence the action of a public official in the bidding process;
 - 2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;
 - 3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish bid prices at artificial, non-competitive levels; and
 - 4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

ARTICLE 5 – BASIS OF BID

5.01 Bidder shall supply the following equipment in accordance with the Specifications and Contract Documents for the following price(s):

BID ITEM	ESTIMATED QUANTITY	BID PRICE (Each)	TOTAL
Residential Water Meter (5/8" x 3/4")*	4,600	\$	\$
Residential Water Meter (1")*	400	\$	\$
Residential Water Meter (2")*	150	\$	\$
Commercial Water Meters (2")	150	\$	\$
Commercial Water Meter (3")*	10	\$	\$
Commercial Water Meter (6")*	10	\$	\$
Pit Set Radio Transmitter (Single Port)*	5,100	\$	\$
Pit Set Radio Transmitter (Dual Port)*	100	\$	\$
Total			\$

Note: Bidder shall enter the Bid Price, Total each line, and Total the right column.

* Bidder shall attach to this Bid Form technical information describing the manufacturer and model number of the residential meter and radio transmitters bid. Bidder shall also submit warranty information for all bid equipment with the Bid.

ARTICLE 6 – TIME OF SHIPMENT

Bidder shall submit with the Bid a proposed time schedule with quantity for the shipment of the entire quantity of meters and transmitters from the date of a completed Contract. Owner intends to order the 5/8" X 3/4" meters in quantities of a minimum of 1,000 meters. Bidder acknowledges that the bid quantities are estimates and there shall be no penalty assessed to the Owner if bid quantities are significantly less than the estimated quantities.

ARTICLE 7 – PAYMENT

Bidder may submit invoices for equipment received by Owner. Owner will inspect the equipment when received and inform Bidder of any damaged equipment. Damaged equipment will be immediately replaced or the value of the equipment will be taken off the invoice and payment made for the non-defective equipment. Owner will pay all

invoices for non-defective equipment within 30 days of receipt of the equipment and invoice.

ARTICLE 8 – BID SUBMITTAL

9.01 This Bid is submitted by:

If Bidder is an Individual:

Name (typed or printed): _____

By: _____
(Individual's signature)

Doing business as: _____

If Bidder is a Partnership:

Partnership Name: _____

By: _____
(Signature of general partner -- attach evidence of authority to sign)

Name (typed or printed): _____

If Bidder is a Corporation:

Corporation Name: _____ (SEAL)

State of Incorporation: _____
Type (General Business, Professional, Service, Limited Liability): _____

By: _____
(Signature -- attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____
(CORPORATE SEAL)

Attest _____

If Bidder is a Joint Venture:

Name of Joint Venture: _____

First Joint Venturer Name: _____ (SEAL)

By: _____
(Signature of first joint venture partner -- attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____

Second Joint Venturer Name: _____ (SEAL)

By: _____
(Signature of second joint venture partner -- attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____

(Each joint venturer must sign. The manner of signing for each individual, partnership, and corporation that is a party to the joint venture should be in the manner indicated above.)

Bidder's Business Address _____

Phone No. _____ Fax No. _____

E-mail _____

SUBMITTED on _____, 20____.

SPECIFICATION

Residential Cold Water Meter - Displacement Type with Direct Read Register (5/8" to 2")

Type

Meters shall be magnetic drive, sealed register, positive displacement type with oscillating piston.

Size

Meter size shall conform to American Water Works Standard C-700 as most recently revised.

Length

Meter length shall conform to American Water Works Standard C-700 as most recently revised.

Cases

All Meters shall have a non-corrosive bronze outer case with a separate measuring chamber which can be easily removed from the case. All Meters shall have cast on them, in raised characters, the size and direction of water flow through the meter. Synthetic Polymer frost bottoms shall be provided on 5/8" Meters. Cast Iron frost bottoms shall be provided on 3/4" and 1" Meters.

External Bolts and Washers

All external bolts and washers shall be of corrosion resistant material and be easily removed from the maincase. All threaded maincase bolt holes must be covered, to aid in removal of the bolts for repair.

Register

The register must be of the straight reading type and have a large red test or sweep hand and shall include a low flow indicator on the dial face. The numeral wheel assembly shall be located at the bottom of the dial face with reading obtained from left to right. All reduction gearing shall be contained in a permanently hermetically sealed, tamperproof enclosure made from a stainless steel material, covered with a heat tempered glass lens.

The register shall be attached to the meter utilizing a bronze or plastic bonnet register box. The register shall be secured to the maincase by means of a tamper-resistant locking screw so that the register cannot be removed by non-utility personnel. The register must be field replaceable by utility personnel with the use of a manufacturer-supplied field tool.

The field tool must not be commercially available. Seal wiring or a frangible head seal screw is not acceptable.

Measuring Chamber

The measuring chamber shall be a suitable synthetic polymer and shall not be cast as part of the maincase. All piston assemblies shall be interchangeable in all measuring chamber assemblies of the same size. The measuring chamber piston shall operate against a replaceable control roller, allowing for repair to AWWA standards. The control roller shall rotate on a stainless measuring chamber steel pin, to provide added strength, wear resistance and corrosion resistance. There shall be an elastomeric seal or seals between measured and unmeasured water, preventing leakage around the measuring element.

Magnetic Coupling

The motion of the piston will be transmitted to the sealed register through the use of a magnetic coupling.

Strainers

All meters must be provided with a corrosion-resistant strainer, with an effective straining area at least twice the bore diameter which can be easily removed from the meter without the meter itself being disconnected from the pipeline.

Change Gears

Change gears will not be allowed to calibrate the meter. All registers of a particular registration and meter size shall be identical and completely interchangeable. Should meters arrive with registers containing more than one gear combination, the entire shipment will be returned to the manufacturer freight collect.

Accuracy and Headloss Tests

Meters shall conform to current AWWA C-700, current revision, for test flows, headloss, and accuracy standards.

Pressure Capability

Meters shall operate up to a working pressure of 150 pounds per square inch (psi), without leakage or damage to any parts. The accuracy shall not be affected by variation in pressure up to 150 psi.

Performance Warranties

In evaluating bid submittals, warranty coverage will be considered. All bidders are required to submit their most current nationally published warranty statements for water meter maincases, registers and measuring chambers.

Shipment Verifications

A statistically controlled sample of each meter shipment will be tested by the utility to insure each shipment meets the utility performance and materials specifications.

Compatibility with Radio Transmitter

Meters shall be configured to be seamlessly compatible with easily installed pit set radio transmitters.

SPECIFICATION

Commercial Cold Water Meter - Turbine Type (1-1/2" to 6")

Scope

These specifications set forth the minimum acceptable design criteria and performance requirements for Turbine-type cold water meters including the following potential service applications and general considerations:

- Intended where a moderately wide flow range is anticipated
- Measurement of water usage for typical billing applications
- Measurement intended for typical commercial and industrial applications
- Measurement of constant medium to extended high flow usage

Compliance to Standards

The meter package shall meet or exceed all requirements of ANSI/AWWA Standard C701 for Class II turbine meter assemblies. Each meter assembly shall be performance tested to ensure compliance.

Maincase

The meter maincase shall be of epoxy coated ductile iron composition. The epoxy coating shall be provided as standard fusion-bonded and adhere to NSF for non-lead regulation compliance.

Performance

The meter assembly shall have performance capability of continuous operation up to the rated maximum flows as listed below without affecting long-term accuracy or causing any undue component wear. The meter assembly shall also provide a 25% flow capacity in excess of the maximum flows listed for intermittent flow demands. Maximum headloss through the meter/strainer assembly shall not exceed those listed in the following table per meter size.

Operating Characteristics

Meter Size	Low Flow (95% Min.)	Operating Range (98.5 - 101.5%)	Intermittent Flows (98.5 - 101.5%)	Pressure Loss (Not to Exceed)
1-1/2"	.75 gpm	1.25 to 160 gpm	200 gpm	6.9 psi @ 160 gpm
2"	1.0 gpm	1.5 to 200 gpm	250 gpm	7.0 psi @ 200 gpm
3"	1.5 gpm	2.5 to 500 gpm	650 gpm	5.1 psi @ 500 gpm
4"	2.0 gpm	3.0 to 1000 gpm	1250 gpm	8.7 psi @ 1000 gpm
6"	2.5 gpm	4.0 to 2000 gpm	2500 gpm	8.2 psi @ 2000 gpm

Measuring Chamber

The measuring chamber shall consist of a measuring element, removable housing, and all-electronic register. The measuring element shall be mounted on a horizontal,

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stationary stainless steel shaft with sleeve bearings and be essentially weightless in water. The measuring chamber shall be capable of operating within the above listed accuracy limits without calibration when transferred from one maincase to another of the same size. The measuring shall be so configured to capture all flows as specified above.

Direct Magnetic Drive System

The direct magnetic drive shall occur between the motion of the measuring element blade position and the electronic register. The direct drive system shall be designed to extend service life, enhance low flow sensitivity and provide extended flow capacity and overall accuracy of the meter assembly.

Electronic Register

The meter's register is all-electronic and does not contain any mechanical gearing to display flow and accurate totalization. The electronic register shall include the following list of features:

- AMR resolution units fully programmable
- Pulse output frequency fully programmable
- Integral data logging capability
- Integral resettable accuracy testing feature
- Large, easy-to-read LCD display
- 10-year battery life guarantee

Maximum Operating Pressure

The meter assembly shall operate properly without leakage, damage, or malfunction up to a maximum working pressure of 200 pounds per square inch (psig).

Strainer

The meter strainer shall be integral and cast as part of the meter's maincase. The strainer's screen shall have a minimum net open area of at least two (2) times the pipe opening and be a V-shaped configuration for the purpose of maintaining a full unobstructed flow pattern. The strainer body shall be a coated ductile iron fusion-bonded epoxy identical to that of the meter's maincase. All fasteners shall be stainless steel capable of maintaining the following static pressure ratings and physical dimensions:

Straightening Vane

A straightening vane assembly is mandatory and shall be positioned directly upstream of the measuring element. The straightening vane assembly shall be an integral component of the measuring chamber.

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Connection

Flanges for the 1-1/2" and 2" size meter assemblies shall be of the 2-bolt oval flange configuration. The 3" and 4" size meter assemblies shall have flanges of the Class 125 round type, flat faced and shall conform to ANSI B16.1 for specified diameter, drilling and thickness.

Certifications and Markings

All sizes of meter packages shall display the sizes, model, manufacturer name, and direction of flow. Such display shall be cast on the side of the meter maincase.

Guarantee and Maintenance Program

Meters shall be guaranteed against defects in material and workmanship for a period of one (1) year from date of shipment. In addition, the meter supplier shall submit nationally published literature clearly outlining its factory maintenance program and current price schedule covering complete measuring chamber exchange.

Shipment Verifications

A statistically controlled sample of each meter shipment will be tested by the utility to insure each shipment meets the utility performance and materials specifications.

Compatibility with Radio Transmitter

Meters shall be configured to be seamlessly compatible with easily installed pit set radio transmitters.

SPECIFICATION

Pit Set Radio Transmitters for Cold Water Meters

Environment

Radio Transmitter shall be suitable for operation in a 100% condensing environment and be subject to water submersion without interfering with operation.

Service

Radio Transmitter shall fit in a 1-3/4" diameter hole in meter pit lid and be capable of being attached to pit lid thicknesses of 1-3/4" or less.

Frequency

Radio Transmitter shall be capable of operating in a frequency range of 900-950 MHz, 8,000 channels by 6.25 kHz steps. Radio transmitter shall be capable of operating on FCC licensed exclusive-use (unshared) spectrum.

Operating Temperature

Radio Transmitter shall be capable of operating reliably in the temperature range of -30°F to +165°F.

Programming

Radio Transmitter shall be programmable to read the meter in intervals of one hour or daily.

Leak Detection

Radio Transmitter shall be capable of detecting a continuous flow over a programmable time period and broadcast a message that a leak is occurring.

Multiple Ports

Radio transmitter shall be available in one and two port models.

Transmission Power

Radio Transmitter shall be capable of transmitting with two watts of power

Transmit Time

Radio transmitter shall be capable of being programmed to transmit a minimum of four times in a 24-hour period.

Transmission History

Radio Transmitter shall transmit up to 168 reading with each transmission depending on the consumption of the meter.

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Compatibility with Mayfield AMI

Radio transmitters shall be compatible in all respects and able to communicate directly with the fixed based automated meter infrastructure system installed in Mayfield.

Battery

The battery for the Radio Transmitter shall have a 20 year life and shall be field replaceable. The transmitter shall be capable of sending a low battery alert to signal the need for battery replacement.

Meter Tampering

Radio Transmitter shall be capable of detecting meter tampering and shall transmit a signal to alert of tampering.

Performance Warranties

In evaluating bid submittals, warranty coverage will be considered. All bidders are required to submit their most current nationally published warranty statements for radio transmitters and batteries.

Shipment Verifications

A statistically controlled sample of each transmitter shipment will be tested by the utility to insure each shipment meets the utility performance and materials specifications.

NOTICE OF AWARD

Date: May 26, 2009

Project: Water Meters and Radio Transmitters	
Owner: Mayfield Electric and Water Systems	Owner's Contract No.:
Contract: Water Meters - 1	Engineer's Project No.:
Bidder: The C. I. Thornburg Co., Inc	
Bidder's Address:	
4034 Altizer Avenue, Huntington, WV 25705	

You are notified that your Bid dated May 19, 2009 for the above Project has been considered. You are the Successful Bidder and are awarded the bid for electric meters and radio transmitters.

The Estimated Price of your award is shown below based on the number of meters and radio transmitters anticipated to be ordered.

Item	Description	Qty.	Cost	Total
1	Residential Water Meter (5/8" x 3/4")	4,500	\$ 84.00	\$ 378,000.00
2	Residential Water Meter (1")	265	\$ 149.00	\$ 39,485.00
3	Residential Water Meter (2")	0	\$ 534.00	\$
4	Commercial Water Meter (2")	150	\$ 751.45	\$ 112,717.50
5	Commercial Water Meter (3")	10	\$ 936.70	\$ 9,367.00
6	Commercial Water Meter (6")	10	\$ 3,283.20	\$ 32,832.00
7	Pit Set Radio Transmitter (Single Port)	4,600	\$ 120.00	\$ 552,000.00
8	Pit Set Radio Transmitter (Dual Port)	100	\$ 132.00	\$ 13,200.00
TOTAL UNIT PRICE BID				\$ 1,137,604.50

Note: The actual quantities ordered may vary but it is understood the above prices are good for one year from the date of this award letter regardless of the quantities ordered. All the other terms, delivery dates, specifications, and other information in your signed bid proposal titled Water Meters and Radio Transmitters dated May 19, 2009 shall be in full force and effect for one year from the date of this award letter.

This is the pricing quoted to Mayfield Electric. The same pricing is for GEWD until 10-31-2011.

Thanks!

Date: September 28th, 2010
 To: Graves County Water Board
 Attn: Kevin Leonard

Re: Graves County Water Board
 Cost Estimate of Advanced Meter Infrastructure Project
 Proposal for Implementing and Completion of AMI County Project

Quantity	Description	Unit Price(\$)	Total
3100	1/2" 3/4" water meter	100.00	310,000.00
30	1/2" 1" water meter	149.00	4,470.00
10	1.5" Ormni com. water meter	667.23	6,672.30
50	2" Ormni com. water meter	751.45	35,572.50
3	3" Ormni com. water meter	936.70	2,811.00
5	6" Ormni T2 com. water meter	3,283.20	16,416.00
3100	520m smartpoints	120.00	372,000.00
5	Lid replacement	30.00	93,000.00
5	S100 TGB	69,750.00	348,750.00
4	Installation Cost of TGBs(est.)	5,000.00	20,000.00
4	Buildings w/ Electrical ht & air	6,000.00	24,000.00
4	Backhauls 3.65	5,000.00	20,000.00
2600	4 Employees Labor	18.00 per hr	46,800.00
2600	2 Trucks	15.00 per hr	39,000.00
1	Upgrade Existing TGB 2-way	30,000.00	30,000.00
	TOTAL COST		\$1,330,491.30

Contingency Money from KIA
 (220,000.00) salvage mtrs
1,085,025.30

Total Cost Including Contingency Money
PROJECTED PAY BACK

LOAN	TERM	RATE	MONTHLY PRIN & INT	ANNUAL PRIN & INT
780,000.00	20 YRS	1% KIA	3,587.18	43,046.16
		2% KIA	3,945.89	47,350.68
		3% KIA	4,325.16	51,901.92

Pros
 \$50,000 estimated annual savings of meter reading/ offset the cost of Project
 Use of Mayfield existing infrastructure RNI \$45,454.00
 Better control and knowledge of your cash registers
 Advanced customer service
 Advanced leak detection
 Detection of theft of service
 Increased revenue with full meter changeout
 The most advanced and accurate water meter on the market
 AMI Infrastructure will be established and should last through multiple meter changes
 GPS location of all meters
 MEWS employee oversee county meters daily for alarms and non-communicating meters
 Salvage est. of water meters \$25,466.00, salvage value as of 6/21/11, can be deducted from cost of project

Cons
 Initial cost of project
 Cash Flo for Project
 May need equalized rates for entire water district
 Projected Payback

Date: September 28th, 2010
To: Graves County Water Board
Attn: Kevin Leonard

Re: Graves County Water Board
 Cost Estimate of Advanced Meter Infrastructure Project
 Proposal for Implementing and Completion of AMI County Project

<u>Quantity</u>	<u>Description</u>	<u>Unit Price(\$)</u>	<u>Total</u>
5000	iPerl 3/4" water meter	100.00	500,000.00
30	iPerl 1" water meter	149.00	4,470.00
10	1.5" Omni com. water meter	667.23	6,672.30
50	2" Omni com. water meter	751.45	35,572.00
3	3" Omni com. water meter	936.70	2,811.00
5	6" Omni T2 com. water meter	3,283.20	16,416.00
3000	520x smartpoints	105.00	315,000.00
2000	520x smartpoints	120.00	240,000.00
5000	Lid Drilling	4.00	20,000.00
7	Mini TGB	35,000.00	245,000.00
7	Installation Cost of TGBs(est.)	5,000.00	35,000.00
7	Buildings w/ Electrical ht & air	6,000.00	42,000.00
7	Backhauls 3.65	5,000.00	35,000.00
3120	4 Employees Labor	25.00 per hr	312,000.00
3120	2 Trucks	15.00 per hr	46,800.00
<u>TOTAL COST</u>			<u>\$1,856,741.30</u>

PROJECTED PAY BACK

<u>LOAN</u>	<u>TERM</u>	<u>RATE</u>	<u>MONTHLY</u> <u>PRIN. & INT.</u>	<u>ANNUAL</u> <u>PRIN. & INT</u>	<u>TERM</u> <u>PRIN. & INT</u>
2,000,000.00	20 YRS	1% KIA	9,197.89	110,374.68	\$ 2,207,493.60
		2% KIA	10,117.67	121,412.04	\$ 2,428,240.80
		3% KIA	11,091.96	133,103.52	\$ 2,662,070.40

D

BID DOCUMENTS

FOR

**ELECTRIC METERS WITH RADIO
TRANSMITTERS**

FOR THE

Mayfield Electric & Water Systems

MAY 2009

ELECTRIC METERS WITH RADIO TRANSMITTERS

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**INVITATION TO BID
ELECTRIC METERS WITH RADIO TRANSMITTERS**

SEALED BIDS for the acquisition of Electric Meters with Radio Transmitters will be received by Mayfield Electric and Water Systems (MEWS) at their office at 301 East Broadway in Mayfield, Kentucky until 3:30 p.m. local time on the 19th day of May 2009. Bids will be opened at the ensuing MEWS Board meeting.

All BIDS shall be submitted in duplicate, sealed, and marked on the outside of the envelope – Electric Meter BID May 19, 2009. MEWS reserves the right to reject any and all BIDS and to waive any informalities or technicalities therein. No bidder may withdraw a bid for a period of sixty days after the date set for the bid opening.

Specifications and bid documents may be examined at the MEWS office or may be obtained by contacting Marty Ivy, General Superintendent, Mayfield Electric and Water Systems, 301 East Broadway, P.O. Box 347, Mayfield, KY 42066, telephone (270) 247-4661.

INSTRUCTIONS TO BIDDERS
ELECTRIC METERS WITH RADIO TRANSMITTERS

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ARTICLE 1 – ISSUING OFFICE AND SUCCESSFUL BIDDER

- 1.01 The Issuing Office from which these bid documents are being issued and where the bids will be administered is:

Mayfield Electric and Water Systems, 301 East Broadway, P.O. Box 347,
Mayfield, KY 42066, telephone (270) 247-4661

- 1.02 The Successful Bidder will be the lowest priced, qualified, responsible bidder to whom the Owner (on the basis of the Owner's evaluation as hereinafter provided) makes an award.

ARTICLE 2 – COPIES OF BIDDING DOCUMENTS

- 2.01 Complete sets of the Bidding Documents in the number stated in the advertisement or invitation to bid may be obtained from the Issuing Office.
- 2.02 Complete sets of Bidding Documents shall be used in preparing Bids; Owner assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.
- 2.03 Owner, in making copies of Bidding Documents available on the above terms, do so only for the purpose of obtaining Bids for the Work and do not authorize or confer a license for any other use.

ARTICLE 3 – QUALIFICATIONS OF BIDDERS

- 3.01 To demonstrate Bidder's qualifications to perform the Work, within 5 days of OWNER's request, Bidder shall submit written evidence such as financial data, previous experience, present commitments, and such other data as may be called for by OWNER.
- 3.02 Bidder is advised to carefully review those portions of the Bid Form requiring Bidder's representations and certifications.

ARTICLE 4 – EXAMINATION OF BIDDING DOCUMENTS, OTHER RELATED DATA, AND SITE

- 4.01 It is the responsibility of each Bidder before submitting a Bid to:
- A. examine and carefully study the Bidding Documents, and the other related data identified in the Bidding Documents;

- B. determine that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the equipment to be supplied.

ARTICLE 5 – INTERPRETATIONS AND ADDENDA

- 5.01 ~~All questions about the meaning or intent of the Bidding Documents are to be submitted to Owner in writing. Interpretations or clarifications considered necessary by Owner in response to such questions will be issued by Addenda mailed or delivered to all parties recorded by Owner as having received the Bidding Documents. Questions received less than ten days prior to the date for opening of Bids may not be answered. Only questions answered by Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.~~
- 5.02 Addenda may be issued to clarify, correct, or change the Bidding Documents as deemed advisable by Owner.

ARTICLE 6 – CONTRACT TIMES

- 6.01 The number of days within which, or the dates by which, any milestones are to be achieved and the Work is to be substantially completed and ready for final payment are set forth in the Agreement..
- 6.02 Contractor shall not be required to employ any Subcontractor, Supplier, individual, or entity against whom Contractor has reasonable objection.

ARTICLE 7 – PREPARATION OF BID

- 7.01 The Bid Form is included with the Bidding Documents. Additional copies may be obtained from Owner.
- 7.02 All blanks on the Bid Form shall be completed in ink and the Bid Form signed in ink. Erasures or alterations shall be initialed in ink by the person signing the Bid Form. A Bid price shall be indicated for each section, Bid item, alternative, adjustment unit price item, and unit price item listed therein. In the case of optional alternatives the words "No Bid," "No Change," or "Not Applicable" may be entered.
- 7.03 A Bid by a corporation shall be executed in the corporate name by the president or a vice-president or other corporate officer accompanied by evidence of authority to sign. The corporate seal shall be affixed and attested by the secretary or an assistant secretary. The corporate address and state of incorporation shall be shown.
- 7.04 A Bid by a partnership shall be executed in the partnership name and signed by a partner (whose title must appear under the signature),

accompanied by evidence of authority to sign. The official address of the partnership shall be shown.

- 7.05 A Bid by a limited liability company shall be executed in the name of the firm by a member and accompanied by evidence of authority to sign. The state of formation of the firm and the official address of the firm shall be shown.
- 7.06 A Bid by an individual shall show the Bidder's name and official address.
- 7.07 A Bid by a joint venture shall be executed by each joint venturer in the manner indicated on the Bid Form. The official address of the joint venture shall be shown.
- 7.08 All names shall be printed in ink below the signatures.
- 7.09 The Bid shall contain an acknowledgment of receipt of all Addenda, the numbers of which shall be filled in on the Bid Form.
- 7.10 Postal and e-mail addresses and telephone number for communications regarding the Bid shall be shown.
- 7.11 The Bid shall contain evidence of Bidder's authority and qualification to do business in the state where the Project is located, or Bidder shall covenant in writing to obtain such authority and qualification prior to award of the Contract and attach such covenant to the Bid. Bidder's state contractor license number, if any, shall also be shown on the Bid Form.

ARTICLE 8 – BASIS OF BID

Bidders shall submit a Bid on a unit price basis as set forth in the Bid Form for the specified equipment.

ARTICLE 9 – SUBMITTAL OF BID

- 9.01 With each copy of the Bidding Documents, a Bidder is furnished one separate unbound copy of the Bid Form. The unbound copy of the Bid Form is to be completed and submitted.
- 9.02 A Bid shall be submitted no later than the date and time prescribed and at the place indicated in the advertisement or invitation to bid and shall be enclosed in a plainly marked package with the Project title (and, if applicable, the designated portion of the Project for which the Bid is submitted), the name and address of Bidder, and shall be accompanied other required documents. If a Bid is sent by mail or other delivery system, the sealed envelope containing the Bid shall be enclosed in a separate

package plainly marked on the outside with the notation "BID ENCLOSED." ELECTRIC METER BID, May 19, 2009.

ARTICLE 10 – MODIFICATION AND WITHDRAWAL OF BID

10.01 A Bid may be modified or withdrawn by an appropriate document duly executed in the same manner that a Bid must be executed and delivered to the place where Bids are to be submitted prior to the date and time for the opening of Bids.

10.02 If within 24 hours after Bids are opened any Bidder files a duly signed written notice with Owner and promptly thereafter demonstrates to the reasonable satisfaction of Owner that there was a material and substantial mistake in the preparation of its Bid, that Bidder may withdraw its Bid. Thereafter, if the equipment is re-bid, that Bidder may be disqualified from further bidding on the equipment.

ARTICLE 11 – OPENING OF BIDS

11.01 Bids will be opened at the time and place indicated in the Advertisement or Invitation to Bid and, unless obviously non-responsive, read aloud publicly. An abstract of the amounts of the base Bids and major alternates, if any, will be made available to Bidders after the opening of Bids.

ARTICLE 12 – BIDS TO REMAIN SUBJECT TO ACCEPTANCE

12.01 All Bids will remain subject to acceptance for the period of time stated in the Bid Form.

ARTICLE 13 – EVALUATION OF BIDS AND AWARD OF CONTRACT

13.01 Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, non-responsive, unbalanced, or conditional Bids. Owner further reserves the right to reject the Bid of any Bidder whom it finds, after reasonable inquiry and evaluation, to not be responsible. Owner may also reject the Bid of any Bidder if Owner believes that it would not be in the best interest to make an award to that Bidder. Owner also reserves the right to waive all informalities not involving price, time, or changes in the equipment and to negotiate contract terms with the Successful Bidder.

13.02 More than one Bid for the same equipment from an individual or entity under the same or different names will not be considered. Reasonable grounds for believing that any Bidder has an interest in more than one Bid for the equipment may be cause for disqualification of that Bidder and the rejection of all Bids in which that Bidder has an interest.

13.03 In evaluating Bids, Owner will consider whether or not the Bids comply with the prescribed requirements, and such alternates, unit prices and other data, as may be requested in the Bid Form or prior to the Notice of Award.

13.04 In evaluating Bidders, Owner will consider the qualifications of Bidders. Owner will also consider the following in the evaluation of bids:

1. Price
2. Meter and Transmitter Capabilities
3. Availability of Service and Technical Support within a Reasonable Response Time
4. Terms of Warranty
5. Compatibility of Meter and Transmitter with MEWS AMI System
6. Proposed Time Schedule for Shipping Equipment

13.05 If the Contract is to be awarded, Owner will award the Contract to the Bidder whose Bid is in the best interests of the Owner.

ARTICLE 14 – SIGNING OF AGREEMENT

14.01 When Owner issues a Notice of Award to the Successful Bidder, it shall be accompanied by the required number of unsigned counterparts of the Agreement along with the other Contract Documents which are identified in the Agreement as attached thereto. Within 15 days thereafter, Successful Bidder shall sign and deliver the required number of counterparts of the Agreement and attached documents to Owner. Within ten days thereafter, Owner shall deliver one fully signed counterpart to Successful Bidder.

ARTICLE 15 – SALES AND USE TAXES

15.01 Owner is exempt from Kentucky state sales and use taxes on materials and equipment purchased by OWNER.

BID FORM
ELECTRIC METERS WITH RADIO TRANSMITTERS

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ARTICLE 1 – BID RECIPIENT

1.01 This Bid is submitted to:

Mayfield Electric and Water Systems

1.02 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner to supply all equipment as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

ARTICLE 2 – BIDDER'S ACKNOWLEDGEMENTS

2.01 Bidder accepts all of the terms and conditions of the Instructions to Bidders. This Bid will remain subject to acceptance for 60 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

ARTICLE 3 – BIDDER'S REPRESENTATIONS

3.01 In submitting this Bid, Bidder represents that:

A. Bidder has examined and carefully studied the Bidding Documents, other related data identified in the Bidding Documents, and the following Addenda, receipt of which is hereby acknowledged:

<u>Addendum No.</u>	<u>Addendum Date</u>
_____	_____
_____	_____
_____	_____

B. Bidder has given Owner written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and the written resolution thereof by Owner is acceptable to Bidder.

C. The Bid Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the equipment for which this Bid is submitted.

ARTICLE 4 – BIDDER'S CERTIFICATION

4.01 Bidder certifies that:

- A. This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation;**
- B. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid;**
- C. Bidder has not solicited or induced any individual or entity to refrain from bidding; and**
- D. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 4.01.D:**
 - 1. "corrupt practice" means the offering, giving, receiving, or soliciting of any thing of value likely to influence the action of a public official in the bidding process;**
 - 2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;**
 - 3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish bid prices at artificial, non-competitive levels; and**
 - 4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.**

ARTICLE 5 – BASIS OF BID

5.01 Bidder shall supply the following equipment in accordance with the Specifications and Contract Documents for the following price(s):

BID ITEM	ESTIMATED QUANTITY	BID PRICE (Each)	TOTAL
Residential Electric Meter (Class 200 Form 2S)*	5,376	\$	\$
Residential Electric Meter (Class 200 Form 2S) With Remote Disconnect*	100	\$	\$
Residential Electric Meter (Class 320 Form 2S)*	16	\$	\$
Residential Electric Meter (Class 320 Form 2S) With Remote Disconnect*	4	\$	\$
Residential Electric Meter (Class 100 Form 1S)*	6	\$	\$
Residential Electric Meter (Class 20 Form 4S)*	6	\$	\$
Commercial Electric Meter (Class 200 Form 15S & 16S)*	210	\$	\$
Commercial Electric Meter (Class 20 Form 8S & 9S)*	250	\$	\$
Radio Transmitter for Commercial Electric Meter*	460	\$	\$
Total			\$

Note: Bidder shall enter the Bid Price, Total each line, and Total the right column.

* Bidder shall attach to this Bid Form technical information describing the manufacturer and model number of the residential meter and radio transmitters bid. Bidder shall also submit warranty information for all bid equipment with the Bid.

ARTICLE 6 – TIME OF SHIPMENT

Bidder shall submit with the Bid a proposed time schedule with quantity for the shipment of the entire quantity of meters with transmitters from the date of a completed Contract. Owner intends to order the Class 200 Form 2S meters in quantities of a minimum of 1,000 meters. Bidder acknowledges that the bid quantities are estimates and there shall be no penalty assessed to the Owner if bid quantities are significantly less than the estimated quantities.

ARTICLE 7 – PAYMENT

Bidder may submit invoices for equipment received by Owner. Owner will inspect the equipment when received and inform Bidder of any damaged equipment. Damaged equipment will be immediately replaced or the value of the equipment will be taken off the invoice and payment made for the non-defective equipment. Owner will pay all invoices for non-defective equipment within 30 days of receipt of the equipment and invoice.

ARTICLE 8 – BID SUBMITTAL

9.01 This Bid is submitted by:

If Bidder is an Individual:

Name (typed or printed): _____

By: _____
(Individual's signature)

Doing business as: _____

If Bidder is a Partnership:

Partnership Name: _____

By: _____
(Signature of general partner -- attach evidence of authority to sign)

Name (typed or printed): _____

If Bidder is a Corporation:

Corporation Name: _____ (SEAL)

State of Incorporation: _____
Type (General Business, Professional, Service, Limited Liability): _____

By: _____
(Signature -- attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____
(CORPORATE SEAL)

Attest _____

If Bidder is a Joint Venture:

Name of Joint Venture: _____

First Joint Venturer Name: _____ (SEAL)

By: _____
(Signature of first joint venture partner -- attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____

Second Joint Venturer Name: _____ (SEAL)

By: _____
(Signature of second joint venture partner -- attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____

(Each joint venturer must sign. The manner of signing for each individual, partnership, and corporation that is a party to the joint venture should be in the manner indicated above.)

Bidder's Business Address _____

Phone No. _____ Fax No. _____

E-mail _____

SUBMITTED on _____, 20____.

SPECIFICATION

Residential Electric Meter with Integrated AMI Board

Service, Class, Form, and Voltage Rating

Meter shall be available for the following Service, Class, Form, and Voltage Rating.

Service	Class	Form	Voltage Rating
2-wire	200	1S	120, 240
3-wire	200,320	2S	240
3-wire	200	12S	120
3-wire	200	25S	120

Power Requirement

Meter shall operate at 60 Hz.

Accuracy

Meter accuracy shall exceed ANSI C12.20 (Class 0.2).

Burden

Meter shall operate with the following burden.

- Power Supply < 0.8 watts/7.9 VA @ 240 VAC
- Voltage Circuit per phase: 0.03 watts at 240 VAC
- Current circuit per phase 0.1 milliohms, Typical at 25°C

LCD Display

Meter shall contain a six-digit liquid crystal display with a data digit height of at least 0.4 inches. Meter shall be capable of simulated mechanical disk emulation in 1 watt-hour increments. Meter shall contain a power flow indicator and kWh display with segment check option.

Operating Environment

Meter shall be capable of operating in a temperature environment of -40°C to +85°C at a non-condensing humidity of 0 - 95%. Transient/surge suppression shall be in compliance with EN600-4-4, 1995 and EN61000-4-5, 1995 and exceed voltage and current surge requirements per Category 4.

Standards Compliance

Meter shall comply with ANSI C12.1, 2001; ANSI C12.10, 1997; ANSI C37.90.1, 1989; and FCC Part 15.

Characteristic Data

Meter shall consume no more than five starting watts and meet ANSI C12.1 Section 4.7.2.9 temperature rise specifications.

Tamper Detection

Meter shall continue to add electricity in the forward direction if the meter is reversed in the socket. Meter shall place a tamper message in the display that alternates with the kWh reading and send a tamper message.

Integrated Meter Display/AMI Board

Meter shall contain one circuit board with combined display and radio transmitter.

Operating Spectrum

Meter shall be capable of operating on unshared primary-use licensed spectrum.

Read Intervals

Meter shall be capable of being programmable to read in intervals of daily, hourly, 15-minutes, and 5-minutes.

Performance Warranties

In evaluating bid submittals, warranty coverage will be considered. All bidders are required to submit their most current nationally published warranty statements for water meter maincases, registers and measuring chambers.

Shipment Verifications

A statistically controlled sample of each meter shipment will be tested by the utility to insure each shipment meets the utility performance and materials specifications.

SPECIFICATION

Residential Electric Meter with Integrated AMI Board and Remote Connect/Disconnect

Service, Class, Form, and Voltage Rating

Meter shall be available for the following Service, Class, Form, and Voltage Rating.

Service	Class	Form	Voltage Rating
2-wire	100, 200	1S	120, 240
3-wire	200, 320	2S	240
2-wire	20	3S	120, 240
3-wire	20	4S	120, 240
3-wire	200	12S	120
3-wire	200	25S	120

Power Requirement

Meter shall operate at 60 Hz.

Accuracy

Meter accuracy shall exceed ANSI C12.20 (Class 0.2).

Burden

Meter shall operate with the following burden.

- Power Supply < 0.8 watts/7.9 VA @ 240 VAC
- Voltage Circuit per phase: 0.03 watts at 240 VAC
- Current circuit per phase 0.1 milliohms, Typical at 25°C

LCD Display

Meter shall contain a six-digit liquid crystal display with a data digit height of at least 0.4 inches. Meter shall be capable of simulated mechanical disk emulation in 1 watt-hour increments. Meter shall contain a power flow indicator and kWh display with segment check option.

Operating Environment

Meter shall be capable of operating in a temperature environment of -40°C to +85°C at a non-condensing humidity of 0 - 95%. Transient/surge suppression shall be in compliance with EN600-4-4, 1995 and EN61000-4-5, 1995 and exceed voltage and current surge requirements per Category 4.

Standards Compliance

Meter shall comply with ANSI C12.1, 2001; ANSI C12.10, 1997; ANSI C37.90.1, 1989; and FCC Part 15.

Characteristic Data

Meter shall consume no more than five starting watts and meet ANSI C12.1 Section 4.7.2.9 temperature rise specifications.

Tamper Detection

Meter shall continue to add electricity in the forward direction if the meter is reversed in the socket. Meter shall place a tamper message in the display that alternates with the kWh reading and send a tamper message.

Integrated Meter Display/AMI Board

Meter shall contain one circuit board with combined display and radio transmitter.

Operating Spectrum

Meter shall be capable of operating on unshared primary-use licensed spectrum.

Read Intervals

Meter shall be capable of being programmable to read in intervals of daily, hourly, 15-minutes, and 5-minutes.

Remote Disconnect

Remote connect/disconnect shall be available on Meter Forms 1S, 2S, and 12S. Disconnect shall operate 2-pole, single throw and be magnetic latching. Disconnect rating shall be 200A, 230 VAC, 50/60 Hz, and Power Factor 0.7/0.8 lagging. Disconnect shall maintain an endurance of 6,000 cycles, 200 A, 230 VAC, 50/60 Hz, and a Power Factor of 1.0. Overload shall be 50 OPS, 300 A, 230 VAC, 50/60 Hz, and Power Factor of 1.0. Disconnect shall be capable of withstanding current per IEC 1036, ANSI C12.1: 7,000 A Peak (5,000 rms) 230 VAC, 50/60 Hz for 6 cycles at 0.7/0.8 Power Factor with normal operation after exposure and 12,000 A rms for 4 cycles with fail safe conditions after exposure.

Performance Warranties

In evaluating bid submittals, warranty coverage will be considered. All bidders are required to submit their most current nationally published warranty statements for water meter maincases, registers and measuring chambers.

Shipment Verifications

A statistically controlled sample of each meter shipment will be tested by the utility to insure each shipment meets the utility performance and materials specifications.

SPECIFICATION

Commercial Electric Meter

Service, Class, Form, and Voltage Rating

Meter shall be available for the following Service, Class, Form, and Voltage Rating...

Service	Class	Form	Voltage Rating
4-wire	20	8S/9S	120-480
4-wire	200	15S/16S	120-480

Power Requirement

Meter shall operate at 60 Hz.

Accuracy

Meter accuracy shall exceed ANSI C12.20 (Class 0.2).

Burden

Meter shall operate with the following burden.

- Power Supply < 4VA @ 240VAC, < 7VA @ 240VAC, < 7VA @ 277VAC
- Voltage Circuit per phase: 0.03 watts at 240 VAC
- Current circuit per phase 0.1 milliohms, Typical at 25°C

LCD Display

Meter shall contain a six-digit liquid crystal display with a data digit height of at least 0.4 inches. Meter shall be capable of simulated mechanical disk emulation in 1 watt-hour increments. Meter shall contain a power quadrant and annunciators.

Operating Environment

Meter shall be capable of operating in a temperature environment of -40°C to +85°C at a non-condensing humidity of 0 - 95%. Transient/surge suppression shall be in compliance with EN600-4-4, 1995 and EN61000-4-5, 1995 and exceed voltage and current surge requirements per Category 4.

Standards Compliance

Meter shall comply with ANSI C12.1, 2001; ANSI C12.10, 1997; ANSI C12.2, 1998; ANSI C37.90.1, 1989; and FCC Part 15 (Class B).

Characteristic Data

Meter shall have a starting current of less than 10mA and meet ANSI C12.1 Section 4.7.2.9 temperature rise specifications.

Tamper Detection

Meter shall continue to add electricity in the forward direction if the meter is reversed in the socket.

Open Architecture

Meter shall be designed with open architecture to allow for easy AMI device integration.

Performance Warranties

In evaluating bid submittals, warranty coverage will be considered. All bidders are required to submit their most current nationally published warranty statements for water meter maincases, registers and measuring chambers.

Shipment Verifications

A statistically controlled sample of each meter shipment will be tested by the utility to insure each shipment meets the utility performance and materials specifications.

SPECIFICATION

Radio Transmitters for Commercial Electric Meters

Service

Radio Transmitter shall be suitable for mounting and operation inside the electric meter and operating off the power at the meter.

Frequency

Radio transmitter shall be capable of operating on FCC licensed exclusive-use (unshared) spectrum.

Operating Temperature

Radio Transmitter shall be capable of operating reliably in the temperature range of -30°F to +165°F.

Programming

Radio Transmitter shall be programmable to read the meter in intervals of one hour or daily.

Transmission Power

Radio Transmitter shall be capable of transmitting with two watts of power.

Transmit Time

Radio transmitter shall be capable of being programmed to transmit a minimum of four times in a 24-hour period.

Transmission History

Radio Transmitter shall transmit up to 168 readings with each transmission depending on the consumption of the meter.

Compatibility with Mayfield AMI

Radio transmitters shall be compatible in all respects and able to communicate directly with the fixed based automated meter infrastructure system installed in Mayfield.

Meter Tampering

Radio Transmitter shall be capable of detecting meter tampering and shall transmit a signal to alert of tampering.

Performance Warranties

In evaluating bid submittals, warranty coverage will be considered. All bidders are required to submit their most current nationally published warranty statements for radio transmitters and batteries.

Shipment Verifications

A statistically controlled sample of each transmitter shipment will be tested by the utility to insure each shipment meets the utility performance and materials specifications.

Automated Metering Infrastructure Feasibility Study Mayfield Water and Electric Systems

Introduction

The feasibility of installing automated meter reading infrastructure (AMI) for the Mayfield Electric and Water Systems (MEWS) has been investigated. This report briefly describes the technology, how it works, and the benefits of using AMI. The report also evaluates the cash flow available to implement AMI for Mayfield and the economic feasibility of the project based on three economic models; Payback Period Analysis, Internal Rate of Return, and Net Present Value.

Automated Meter Infrastructure

Automated meter infrastructure (AMI) is a term applied to a system that measures, collects, and analyzes usage information through various communication media on request or on a pre-defined schedule. This infrastructure includes hardware, software, communications, customer associated systems and meter data management software. AMI includes smart meters with wireless transmitters, field data collectors receiving the wireless data from a series of meters, a central data collector receiving information from the field data collectors. The central data collector is then integrated with the utility's data management and billing system. AMI systems are sometimes referred to as fixed network meter reading systems. They are distinguished from automated meter reading (AMR) systems that generally consist of meters that transmit a wireless signal to a mobile data collector that is driven by the meter. Mobile AMR systems read meters once a month; whereas, AMI systems generally read the meters at a frequency selected by the utility, i.e. daily, hourly, etc. AMI systems are also generally differentiated from AMR systems because they have two way communications between the meter and the utility's office.

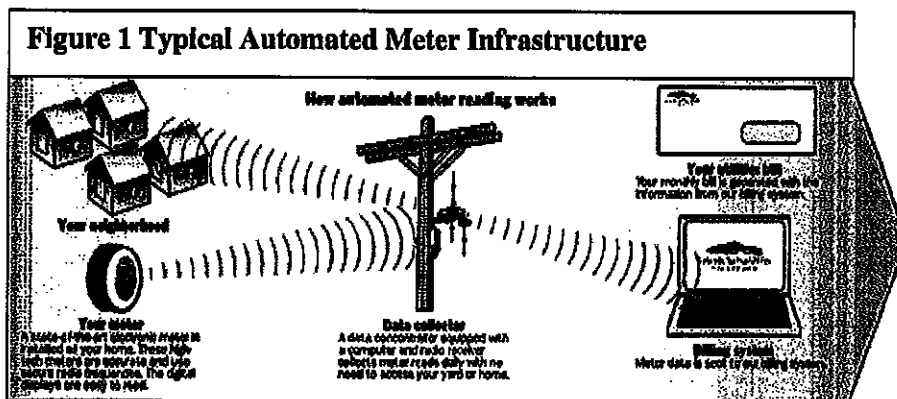
Historically, the fixed nature of the AMI made these systems prohibitively expensive compared to the AMR systems. However, the advent of the less expensive wireless networks have reduced the cost so that AMI is generally the system of choice in population concentrated areas, especially those that already have wireless networks. In some instances, the use of hybrid systems incorporating the use of both fixed and mobile networks may be the most cost effective approach to data collection from utility meters.



How AMI Works

The concepts of using AMI are simple on the surface but rather complex underneath. The meter must be read by the meter interface that translates the data into a digital format to facilitate transmission. A code is added to the meter data reading so that the data can be attributed to the correct subscriber.

Wireless radio transmitters send the digital data, including usage, from the interface at the customer meters to field data collectors or gateways. The field data collectors or gateways, either wirelessly or using fixed line systems, transfer the data to a central collector that is integrated with the utility's information management system. The information management system can generally communicate back to the meter to query for data or activate/inactivate the service. Figure 1 illustrates a typical AMI system.



Benefits of Using AMI

The three main reasons for the automation of meter reading are to reduce labor costs, to collect data that is otherwise unattainable, and to improve customer service. The connectivity between the measurement devices and business management systems allows collection and distribution of information to customers. This enables these customers, generally businesses, to understand their usage patterns so they can change from their normal consumption patterns, either in response to changes in price, incentives designed to encourage lower energy usage use at times of peak-demand periods, higher wholesale prices, or during periods of low operational systems reliability. The connectivity also allows for quicker response to disconnects and reconnects. Listed below are general benefits that apply to most utilities, including MEWS and some other benefits that apply specifically to MEWS.

1. General Benefits

Benefits that have been cited by vendors and other utilities for using AMI systems are listed below. While some of these benefits can be equated to savings in meter reading costs, many of them are intangible benefits that relate to better customer service and increased efficiency in the management of the utility.

- AMI reduces the need for meter readers to manually gather utility meter readings each month.
- AMI means fewer vehicles are necessary for the meter reading process, thereby saving energy.
- AMI provides daily meter reads, which has the potential to show customers a true picture of their usage so they can conserve and better manage their utilities bill.
- AMI leads to fewer employee injuries, especially in areas with fenced yards, dogs and landscaping.
- AMI results in improved customer service, where billing calls can be handled more quickly due to availability of more frequent meter readings and connects and reconnects can be accomplished without the need for a service call.
- AMI results in accurate meter readings eliminating the need for estimates.
- AMI allows events alarms to be incorporated for things like tamper, leak detection, low battery, or reverse flow.
- AMI allows usage conservation events to be easily enforced.
- AMI results in logged data that can be used to collect or control time of use or rate of use data that can be used for water or energy usage profiling, time of use billing, and demand forecasting.
- AMI allows more flexible billing cycles to be available to customers instead of following the standard utility read cycles.
- AMI automatically maintains a detailed usage profile for every meter.
- AMI allows one network to read both water and electric meters.
- AMI systems are available to enable the shut off and reconnect of water services without ever touching a wrench.
- AMI requires less manpower and resources for meter reading and data gathering; customer service personnel only need to access the main database to get the information they need for billing and analysis.
- AMI results in electrical outage areas being automatically identified and crews dispatched quickly without the need for customer calls.
- AMI allows electrical outage repairs to be automatically detected to facilitate the reporting of repair crews.
- AMI allows outage management (detection, notification, and restoration), the area that provides the biggest increase in customer service.
- AMI gives the ability to turn power on and off for customers in remote areas and among high transient accounts from the office.

- AMI allows detection of meter tampering and the theft of water and electricity.
- AMI allows the detection of transmission losses.
- AMI results in lower user charges.
- AMI provides data that can be used to optimize the distribution network.
- AMI provides customers the ability to receive an automated alert on their usage, along with helpful conservation tips.

2. National Association of Regulatory Utility Commissioners Statement

In 2007 the National Association of Regulatory Utility Commissioners (NARUC) recognized the benefits of AMI and passed a resolution to eliminate regulatory barriers to the broad implementation of the technology. The resolution acknowledged AMI as beneficial to consumers by supporting the implementation of dynamic pricing. The resolution also identified the value of AMI in achieving significant utility operational cost savings in the areas of outage management, revenue protection and asset management. The resolution also called for AMI business case analysis to identify cost-effective deployment strategies, endorsed timely cost recovery for prudently incurred AMI expenditures, and made additional recommendations on rate making and tax treatment of such investments.

3. Tennessee Valley Authority Wholesale Power

The Tennessee Valley Authority (TVA) has indicated that time of day demand monitoring will be used by TVA for billing at some future time. Implementation of the AMI project will allow MEWS to begin to build a database to establish peak demand periods and the users that contribute to those demands. This database can be used to MEWS for developing programs and strategies for saving wholesale power costs by reducing peak demands through conservation and incentives for the more significant users of electrical energy. Implementation of the AMI project will give MEWS a head start so it will be ready when TVA implements demand billing for wholesale electricity.

4. Customer Prepays Instead of Deposits

The large number of customer in the past that defaulted paying bills that were more than their deposits have resulted in MEWS adopting high deposits for both electric and water/sewer. An AMI system will allow the pre-payment for services rather than taking a deposit. A prepaid account could be flagged to alert MEWS that the pre-paid usage was close to being extinguished. The customer could then be alerted to prepay again or the account could be terminated. The pre-paying for services, at least in the short term, would benefit MEWS cash flow.

5. Potential to Read Gas Meters

Atmos Energy is considering a program to install gas meters that would be compatible with the AMI system being considered by MEWS. The possibility exists that ATMOS may choose to contract with MEWS for the automated reading of gas meters within range of the Mayfield AMI system. Contracting with Atmos would allow an additional return on the AMI investment.

6. Project Enhances the Environment

Protecting the environment through the reduction of the "carbon foot print" is becoming more and more important to the general population. The projects that have a positive environmental impact are generally referred to as "Green Projects". The AMI project is "Green" in that it uses wireless technology to read meters thereby reducing the use of petroleum fuels. In addition, the reduction in fuel use will be responsible for a corresponding reduction in emissions to the atmosphere. Also, the enhanced usage data collected by the AMI system can form the foundation for an energy conservation program that would further lessen Mayfield's "carbon foot print".

Costs of AMI Implementation

The costs to implement AMI for Mayfield have been determined from vendor quotes and from an estimate by MEWS management of the staff time and contract labor envisioned to install and maintain the equipment. A summary of the implementation costs is shown in Table 1.

Vendor Quotes

The equipment necessary to implement AMI consists of the following:

Approximately 6,000 electric meters (5,476 residential and 524 commercial)

Approximately 5,000 water meters with radio transmitters

Base Station Receiver

Network Interface and Portal

Vendor quotes were used for establishing a budget for the AMI project. The vendor quoted price of \$138,540 for the above equipment includes a handheld reading device; software; training; and installation of the base station receiver, network interface and portal, and the software. The vendor quoted price for the electric meters is \$602,665; the vendor quote for the water meters and radio modules for those meters is \$1,125,000.

Installation Labor

Installation labor was based on 3 employees working 6 months for the water meters and one employee working 6 months for the electric meters, A labor rate of \$26.00 per hour and an overhead ratio of 1.6 were used. In addition, a vehicle at the rate of \$15.00 per hour for the 3 month period was used. A work week of 40 hours was also used. All calculations were rounded before entry in Table 1. A contingency of approximately 10% was used over the 20 year project period to cover unexpected expenditures, system maintenance, and staff time utilized by training.

Item	Cost
Gateway Base Station, Network Interface, and Portal	\$139,000
Electric Meters, including radio modules	603,000
Water Meters, including radio modules	1,125,000
In-house Labor for Electric Meter Installation (6 months)	60,000
In house labor for Water Meter Installation (6 months)	60,000
Contract labor for Water Meter Installation (6 months)	120,000
Contingencies/System Maintenance/Staff Training	200,000
Total	\$2,307,000

Note: In-house labor costs are included for Economic Analysis purposes.

Cost Savings/Revenue Enhancement of AMI Implementation

The benefits to implement AMI for Mayfield consist of operational cost savings and revenue enhancements from replacing old, inaccurate meters in the system and have been estimated by MEWS management. Direct cost savings result from elimination of the outside vendor contract to read the meters. Other operational costs savings result from the elimination of meter re-reads, customer service meter checks, meter disconnects, electric meter testing, and swimming pool adjustment meter reads. A summary of the implementation costs is shown in Table 1.

A summary of the costs savings estimated by MEWS management follows:

- Currently have an average of 250 re-reads in the Mayfield only system for various reasons including access, bad readings, etc. This process consumes approximately 200 hours a month for a service rep paid at \$26 per hour. The labor overhead at MEWS is 60%. In addition MEWS allocates \$15 per hour for the service truck used for this process. Total Annual Cost ...\$135,840 per year

- Calls to customer service requesting read checks number about 60 per month. Labor rate for this task is \$27.32. Overhead is 60% and the truck rate is \$15 per hour. Estimated time consumed is approximately 20 hours per month - Total Annual Cost\$14,090
- Disconnects consume approximately 3 days per month. Same labor and equipment assumptions as above. Projected annual cost...\$16,870 per year.
- Eliminates need to test electric meters...consumes approximately 6 hours a day, every day. Labor rate is \$29.44, overhead 60%, truck rate \$15.00 per hour. Projected annual cost is \$96,882.
- Eliminates readings for pool adjustments to water bill. Estimated current cost of meter reading for adjustments is \$11,294 per year using a labor rate of \$25.92 per hour and the other assumptions listed above.
- Accounting Dept. savings is estimated to be an average 40 hours per month. At a rate of \$20.08, overhead of 60%, the annual savings is projected to be \$15,421 per year.

All numbers from the above calculations were rounded prior to entry in Table 2.

The enhancement of yearly revenue from the addition of new electric meters was estimated by MEWS management as 2% of the current yearly electric revenue of approximately \$13 million or \$260,000. The yearly enhancement of water and sewer revenue from the addition of new water meters was estimated at 5% of the current revenue of approximately \$1.3 million for water and \$1.5 million for sewer for a total of \$140,000.

Table 2.	
Estimated Yearly Cost Savings/Revenue Enhancement from AMI Implementation	
Item	Cost
Savings from Meter Reading Contract	\$99,000
Savings from Meter Re-reads	136,000
Saving from Customer Service Meter Read Checks	14,000
Savings from Meter Disconnects	17,000
Savings from Testing of Electric Meters	97,000
Savings from Water Meter Reading for Swimming Pool Adjustment	11,000
Savings in Accounting Department	15,000
Additional Revenue from Electric Meter Replacement	260,000
Additional Water and Sewer Revenue from Water Meter Replacement	140,000
Total	\$769,000
Note: In-house labor costs are included for Economic Analysis purposes.	

Cash Flow Analysis

The financial analyses shown later in this section were conducted to assess the value of the AMI investment in terms of being able to return the investment's cost to the utility over the life of the equipment. The analyses included staff time provided by MEWS management that would be saved from implementation of the project and staff time used for project implementation. The assumption is being made that the staff time saved would be allocated to other projects and the staff time used for project implementation would be taken from other projects. This means that staff time does not contribute to the flow of cash necessary to implement the project.

This cash flow analysis also assumes that MEWS would use a combination of grant and loan funds to implement the project. Loan funds might be available from the Kentucky Infrastructure Authority and the Kentucky League of Cities; a combination of grant and loan funds are available from USDA Rural Development.

The USDA Rural Development (RD) has a program favorable for the project. Based on its median income, Mayfield is eligible for up to 75% grant funds, with the remaining 25% being a loan at a rate of 3.0% for generally up to 40 years; however, 20 years would be the time period for a water meter project. Being eligible for 75% grant funds does not guarantee that Mayfield will be offered grant funds at that level; however, a grant level of at least 50% could be anticipated. The availability of the Economic Recovery Funds may increase the chance of a higher level of grant funding. The only drawback is that the RD funds can only be used for the water meter portion of the project. The USDA electrical program is not available for municipal electric utilities.

Funds for the electric meter portion of the project might be available from the Kentucky Infrastructure Authority or from the Kentucky League of Cities. These funds would most likely be at market rate, around 6% or less for a 20-year term.

For the cash flow analysis it is assumed that 67% of the total project cost will be for the water meter portion of the project and 33% for the electric meter portion. Also assumed is that of the total project amount to be financed (\$2,187,000), the water meter portion (\$1,472,000) would be eligible for a 50% grant (\$736,000) and an interest rate of 3.0% for a 20 year term on the remaining \$736,000. The electric meter portion (\$715,000) would be financed at 6.0% for a 20 year term. The combination of the grant and these two loans would result in payments of approximately \$114,000 per year. The funds available to make the loan payments would be the \$99,000 from the meter reading contract, plus the \$400,000 estimated yearly increased revenue from the replacement of the meters for a total of \$499,000. Therefore, the project has a net positive cash flow of \$385,000 per year.

The break down of the water and electric portions of the project in the preceding paragraph are estimates based on an allocation of the common costs using the ratio of the dedicated costs. Including more of what is classified above as common costs in the RD portion of the project would be desirable and might be feasible.

Financial Analysis

The three most common methods of evaluating the economic feasibility of investments are "payback period analysis", net present value, and internal rate of return. The "payback period analysis" is the simplest of the three and gives a quick indication of investment's feasibility. The other two methods, "net present value" and "internal rate of return", are slightly more complex in that they include the time value of money not considered in the "payback period analysis". All three methods were used to examine the potential investment of MEWS in AMI.

Payback Period

The payback method tells how long it will take to earn back the funds spent on the AMI project. When the payback method is used to choose among competing projects, investments with shorter payback periods rank higher than those with longer paybacks. The idea is that projects with shorter paybacks are more liquid, and thus less risky allowing the investment to be recouped sooner and the recouped funds can be reinvested quicker in other projects. With any project there are a lot of variables that grow increasingly fuzzy as you look out into the future. With a shorter payback period, there's less of a chance that market conditions, interest rates, the economy, or other factors affecting the investment will drastically change.

In general business, a payback period of three years or less is preferred. However, payback periods for utilities are generally much longer. Payback periods for investments in water systems are generally much longer than those for investments in electrical systems. Some advisors say that if the payback period is less than a year, the project should be considered essential.

The simplicity of the payback method leads to several drawbacks. One is that it ignores any benefits that occur after the payback period, A second is that the inclusion of interest paid on borrowed funds is cumbersome. The third and major drawback is that a straight payback method ignores the time value of money.

The formula is:

Payback Period = Cost of Project/Annual Savings and Cash Inflow

Payback Period = 2,307,000 / 789,000 = 2.9 years, the interest paid during this period would extend the payback period slightly greater than 3 years.

Net Present Value

The net present value method (NPV) allows the time value of money to be considered. It helps find the present value in "today's dollars" of the future net cash flow of a project. Then, that amount of money can be compared with the amount of money needed to implement the project.

If the NPV is greater than the cost, the project will be feasible (assuming that the cost savings from implementing the project is reasonably close to reality). In choosing between two projects, the NPV of both is calculated and the one with the greatest difference between NPV and cost has a larger payback.

The NPV analysis assumes a useful life of 20 years for all the equipment except for the water meters. A 10 year life for the water meters is used in the analysis. This means another expenditure of \$1,305,000 would need to be made in the 11th year of the analysis. The assumption is made that the utility rates and the resulting revenue would increase at the same rate of inflation as the labor costs and equipment, thereby taking inflation out of the analysis. The assumption is also made that the decrease in accuracy of both the electric and water meters will not be significant throughout the 20-year analysis period. An interest rate of 6% is used for the analysis.

NPV = present value of 20 years of cost savings and revenue enhancements minus present value of purchase and installation of water meters after 10 years.

$$\text{NPV} = [\text{pwf}(1) \times 789,000] - [\text{pwf}(2) \times (1,125,000 + 180,000)]$$

$$\text{NPV} = (11.47 \times 789,000) - (0.31 \times 1,305,000) = 9,050,000 - 405,000$$

$$\text{NPV} = \$8,645,000, \text{ much greater than the initial investment of } \$2,307,000$$

Internal Rate of Return

The internal rate of return (IRR) method of analyzing a project also allows the time value of money to be considered. It calculates the interest rate that is equivalent to the dollar return expected from the project. Once the rate is known, it can be compared to the rates that could be earned by investing in other projects or investments.

If the internal rate of return is less than the cost of borrowing used to fund the project, the project will clearly be a money-loser. For a project to be feasible, it must be expected to earn an IRR that is at least several percentage points higher than the cost of borrowing, to compensate the company for its risk, time, and trouble associated with the project.

IRR = rate of return for cost savings/revenue enhancements compared to the capital investments for the 20 year analysis period. The second investment in water meters at the end of 10 years has to be discounted for the 10 year period and added to the initial investment.

Interest Rate Factor (IRF) = (total discounted investment / recurring income/cost savings) = $[(2,307,000 + (1,305,000 \times \text{pwf}(2))) / 789,000]$, [pwf(2) = 0.31]

$\text{IRF} = ((2,307,000 + 405,000) / 789,000) = 3.43$

From interest rate tables for 20 year analysis period,

IRR = 29%.

This is much greater than the 6% or lesser interest rate required to borrow the funds for the investment.

Procurement

Under the Kentucky Model Procurement Code, the procurement of technology like AMI can be done under a Competitive Negotiation rather than a Sealed Bid. This type of procurement is allowed because no two vendor's systems are the same and comparing systems strictly on price is very difficult. Using this type of procurement requires the issuance of a Request for Proposals (RFP). The RFP requires a general idea of the system being sought, with as much detail as is available. The RFP must include an objective evaluation criteria and cost only has to be one of the factors. Once the RFP's are submitted and reviewed, MEWS may negotiate with all vendors submitting proposals until a satisfactory system at an acceptable price is obtained.

Summary and Conclusions

The benefits and costs of the implementation of AMI for Mayfield have been evaluated. Based on vendor budget quotes and the estimates of MEWS management of the other costs of implementation and the operational cost savings and revenue enhancements of the project, a financial analysis and a cash flow analysis have been conducted.

The results of these analyses are shown in Table 3. The results show a payback period of the project of approximately 3 years. The results also show a net present value of \$8,645,000 that is considerable greater than the initial investment of \$2,307,000 plus the additional investment after 10 years for the replacement of water meters of \$1,305,000. The results also show an internal rate of return of approximately 29%, much greater than the cost of borrowing the funds.

Table 3 Summary of the Financial Analyses for the MEWS AMI Project		
Analysis Method	Result	Conclusion
Payback Period	3 years	Excellent
Net Present Value	\$8,645,000	Excellent
Internal Rate of Return	29%	Excellent
Net Cash Flow	\$385,000	Excellent

The results in Table 3 indicate that the implementation of AMI in Mayfield is a good project with an excellent return on the investment to be made. Based on the assumptions used in this study, the implementation of the project is recommended.