

Lakewood Water District Automated Meter Infrastructure System And Meter Replacement



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I. Request for Proposals (Publication Text)

LAKWOOD WATER DISTRICT

AUTOMATED METER INFRASTRUCTURE

Request for Proposals

The Lakewood Water District (District) is soliciting proposals for furnishing the District with an Automated Meter Infrastructure (AMI) system for its drinking water utility.

The District currently maintains a meter reading program that consists of bimonthly direct touch reading of approximately 16,131 water service meters, with approximately 2000 that currently have radio read capability. In order to increase meter reading efficiency and capture more water usage data, the District desires to procure and implement a fixed network AMI system. The project includes supplying all meters, transmitters, collectors and hardware required. Installation of new meters from 5/8" thru 2" including install of transmitters collectors with (supply only) for meters and transmitters sized 3" and above. provide and install all software, hardware and data storage capacity to operate and allow for future expansion of the turnkey AMI fix based star network.

The District is requiring proposals include a full AMI star network system allowing for full two-way communications with the endpoints, and on demand reads. Further meters 1" and smaller are to be pit mounted battery powered static meters, capable of reading in gallons and CF, and of storing 30 days of data. The balance of the meters required will be proposed by the respondents. The AMI system software must be capable of determining potential customer leaks, indicate low battery life for both meter and transmitter, detect and notify the District in the event of tampering, backflow, or fault in meter or transmitter. The AMI software must be able to transfer billing data to EmGov utility billing software. The intent of this RFP is to establish the most accurate and effective ready to operate metering and data collection system for the District, with an emphasis on capturing low flows usage, providing current information to the District, and decrease identification and notifications times for leak detection, while providing for more timely flow of information to the customers and District management. Therefore, the District is issuing this request for proposals (RFP) regarding provision and installation of an AMI and metering system to meet District needs and requirements. This project will be a multi-year endeavor starting in 2014.

The complete RFP for this project is available on the Lakewood Water District web Site at www.lakewood-water-dist.org

The District reserves the right to reject any and/or all proposals for good cause and to waive any and/or all informalities.

Questions should be directed to the District Representative, Ian Black, at: Lakewood Water District, 11900 Gravelly Lake Dr. Lakewood Washington 98496; Phone 253-588-4423; E-mail: iblack@lakewood-water-dist.org Proposals, the requirements for which are detailed in the RFP package, are due to the District Representative at the address listed above no later than 2:00 PM on January 10, 2014

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II. Purpose and Scope of Work

Project Purpose/Overview

The Lakewood Water District (District) currently maintains a meter reading program that consists of bimonthly direct manual reading of approximately 16,131 water service meters, with approximately 2000 that currently have radio read capability. In order to increase meter reading efficiency and capture more water usage data, the District desires to procure and implement a fixed Star network AMI system. Therefore, the District is issuing this request for proposals (RFP) regarding provision and installation of an AMI system and new meters to meet District needs and requirements. This project will be a multi-year endeavor starting in 2014.

Scope of Work

Base Scope of Work

The work involved under the terms of the contract with the Respondent shall be full and complete execution of the items noted below, and as described further throughout this RFP. This effort involves the furnishing and installation of new meters and AMI system, to include but not be limited to the following:

1. Furnish fixed network AMI system data collection units (DCUs) and associated repeaters. This includes installation of the DCUs/repeaters and required support structures and electrical power, capable of capturing signals from radio Transmitter Units (TUs).
2. Mobile radio interrogator units to be used in conjunction with the system in mobile drive-by mode, in the event the DCUs are inoperable.
3. Furnish all meters in sizes and numbers indicated in Estimate Meter Count chart, and furnish and install meters under 2" along with TUs capable of receiving information from said meter, and transmitting this and other relevant information to fixed location DCUs installed as part of this contract. Provide, if applicable, required cabling, splice kits, etc. to connect to the existing AMI compatible meters necessary to obtain a failure-free connection for the 20 year life of the installation with existing meters.
4. Furnish and install the communication or data transfer system capable of transferring data from DCUs to a meter reading system control computer located at District offices.
5. Furnish and install a meter reading system control computer or supply hosted services for data storage into which the data from the TUs and other information necessary to operate and maintain the AMI system may be input and stored.

6. Furnish the software or programming necessary to operate the system and communicate meter reading data to the District's customer information and billing systems.
7. Obtain all Federal, State and local permits required for the installation and operation of the system.
8. Provide technical and installation support to the District during system deployment of meters and transmitters on meters over 2", and complete installation and integration for meters 2" and below.
9. Provide documentation adequately describing the operation and maintenance of the AMI and metering system and its components, for use by District employees or agents.
10. Provide training sufficient to enable District personnel to operate and maintain the system.
11. Provide technical support for the system over its expected life, including on-site and telephone support for District personnel, and patches and upgrades to the system software and firmware to ensure that the system continues to perform to design criteria.
12. Enter into a separate service contract with the District for the on-going maintenance of the meter reading system equipment.

The contracted Respondent for this project shall comply with all Federal, State, County, City, and District codes and regulations applicable to such work and perform the work in accordance with the requirements and specifications of the contract documents. This is a prevailing wage contract please assure that you are utilizing the appropriate wages for engineering installation and programming.

The contracted Respondent will be required to enter in a contract with the Lakewood Water District using the District's standard construction contract, modified by the District as required to meet conditions of the AMI implementation. The contract will include but not be limited to District standards, bonding, insurance, limits of liability, and other general and specific contractual requirements.

The contracted Respondent shall first furnish and install the equipment necessary to implement the meter replacement program and AMI system within a small portion of the District's service area so that the District may confirm that the installed system functions appropriately. Once accepted, the Respondent will be given notice to proceed with the remainder of the Base Scope of Work. The Respondent must address how they will guarantee access to replacement and warranty parts inventory within a 48 hour window with a local warehouse, or propose an alternative method of inventory storage that provides the access at no additional cost to the District.

The District's goal is to have the meters exchange program and AMI system fully installed and operational for its entire water service area by end of 2015.

Additional Background Information

1. Demographics of Utility. The District maintains approximately 16,131 metered water service connections. The majority of service meters are 5/8-inch by 3/4-inch in diameter. The majority of existing water meters are installed in shallow pits.
2. Meter Count Estimate. The following table provides an estimate of the number of existing water service meters, based on District records as of September 30, 2013.

Estimated Number of Replacement Meters

Meter Size	Estimated Quantities
5/8"	12491
1"	2392
1.5"	891
2"	252
3"	53
4"	20
6"	16
8"	11
10"	4
12"	1
Est. Total	16131

The majority of meters are Sensus SR and SRII meters and registers not equipped for connection to AMI TUs. Approximately 2000 meters have RTR registers currently utilized in a mobile read system. All retail meters are proposed to be changed during this exchange, excluding fire meters.

3. Current Reading System. Most meters are currently touch read. As noted above, 2000 are read via a mobile read system. Export/import text files are created to connect to EmGov utility billing software.
4. Current Billing and Customer Information Systems.
 - a. Name of System/Vendor – EmGov
 - b. Platform – Windows/SQL
 - c. Bill Processing – Customers are billed bi-monthly. The bills are calculated by the EmGov system weekly and a third party vendor produces and mails the bills.
 - d. Payment Processing – All customers are given 30 days to pay. Payments are made by various methods including phone, drop-box, mail, or over-the counter, and web site.
5. Current Work Order System. Currently there is no linkage between the utility billing

system and the work order system. The District intends to implement the EmGov work order system within the next two years.

6. Current service order System. Currently service orders are processed through the EMGOV system. Specific codes generated by the handheld meter reading units automatically generate service orders.

III. Instructions to Respondents

1. Process for Proposal Evaluation and Contract Award

The District will follow the steps below in selecting the most qualified Respondent for an Automated Meter Infrastructure (AMI) system for its water utility.

- A. **STEP 1 (Proposal Evaluation).** Respondents shall submit a complete proposal in the period of time described in the Project Schedule (see Section 2 of these instructions) that follows the Proposal Response Format Requirements (see Section 3 of these instructions).

The District’s Selection Committee will evaluate the proposals submitted during Step 1 according to the evaluation criteria summarized below. This evaluation will be conducted on material related to the Base Scope of Work.

The evaluation of Criterion 1 will be based upon responses to the specific questions outlined in the Proposal Response Format Requirements (Item 3 of these instructions).

The evaluation of Criterion 2 will be based upon responses to the detailed Technical Specifications noted in Section IV of this RFP.

The evaluation of Criterion 3 will be based upon cost proposals submitted according to the format set forth in Section V of this RFP.

After the Step 1 evaluation the District will proceed to Step 2 for selection of the Preferred Respondent.

Step 1 Proposal Evaluation Criteria
1. Qualifications (This criterion will be evaluated based upon Respondent responses to the specific questions noted in the Proposal Response Format, Item 3 of these instructions.)
2. Response to Technical Specifications (This criterion will be evaluated based upon Respondent responses to each section of the Technical Specifications included in this RFP.)
3. Cost Proposals

- B. **STEP 2 (Selection of Preferred Respondent).** Based upon the results of Step 1, the District’s Selection Committee shall select the Respondent which, in its opinion, is best suited to furnish and install an AMI system to meet District needs.

- C. **STEP 3 (Negotiation).** The District may then enter into contract negotiations with the identified preferred Respondent. At this time the details of the technical specifications will be updated to reflect the selected AMI system. In addition, the District will make a decision at this time whether or not to authorize the Supplemental Scope of Work items.
- D. **STEP 4 (Contract Award).** Once contract terms are acceptable to the District, the District may award the contract to the Respondent. The award document will be a contract (Contract) incorporating by reference all the requirements, terms and conditions of the solicitation and the Respondent's proposal as negotiated. Selected Respondent shall be required to sign a Contract with the District incorporating all the legal requirements and provisions defined in this Request for Proposal. The Contract shall be the governing document for the project. The following documents shall be attached to the Contract and made a part thereof:
- i. This request for proposal.
 - ii. The successful Respondent's proposal, including any and all affirmations of compliance with the requirements contained in this Request for Proposal, cost proposals, and any exceptions or proposed alternatives to such requirements accepted by the District.
 - iii. Such other supplemental written requests by the District for additional information or specificity, and the Respondent's written responses.
 - iv. Any other documents governing the project as developed by the District and the Respondent in the course of negotiations.
 - v. In addition, specific schedules and procedures agreed to by the District and the Respondent for managing and conducting the project and providing the required services shall be incorporated into a Detailed Statement of Work, which shall be attached to the contract. Rules governing non-cost and non-schedule changes to the project embodied in the Detailed Statement of Work shall be defined in the Contract.

NOTE: To maintain a fair and impartial competitive selection process, the District must avoid private communication with prospective Respondents. Upon release of this RFP, all Respondent communications concerning this procurement must be directed to the District Representative identified in this document. Any questions from a single Respondent that are answered by the District Representative will be distributed to all Respondent representatives who make contact with the District Representative during the RFP period. Respondents may risk disqualification by contacting un-authorized District personnel about this Contract (other than the designated District Representative).

2. Schedule for Proposal Evaluation and Contract Award

The anticipated schedule of key events during the proposal evaluation and contract award is summarized below.

Milestone	Date
Advertise RFP	December 23, 2013
RFP Questions Due to District Representative	December 31, 2013
Responses to RFP Questions provided to Respondents	January 6, 2014
Proposals Due	January 10, 2014
Evaluate Proposals	January 15, 2014
Contract Negotiations and Award	February 14, 2014

3. Proposal Response Format

- A. Respondents shall submit a written proposal (per Step 1 of the evaluation process) that presents their qualifications and understanding of the work to be performed. Submittals shall be limited to a total of 50 pages (2-sided pages, excluding cover letter, front and back cover, attachments, and appendices). Proposals shall provide in detail all the information Respondent considers pertinent to its qualifications for this project as requested in this RFP.
- B. Respondents shall submit two (2) hard copies and one electronic version (PDF file) of the written proposal.
- C. The Respondent shall include in their proposal the following:
 - i. Table of Contents. All pages are to be numbered.
 - ii. Cover Letter. On company letterhead, signed by a person with authority to enter into contracts in the amount of the cost proposal (if selected).
 - iii. Responses to Step 1 Evaluation Criterion 1 (Qualifications). Provide narrative to address each item listed below. Include identification of any services that will be subcontracted. Provide names, experience, contact information, and qualifications of any subcontractors. This may be referenced as an attachment.
 - a. Describe how long the Respondent has been in business.
 - b. Provide a minimum of five (5) references regarding similar projects completed by the Respondent. References shall include contact names, telephone numbers, and project completion dates.
 - c. Provide evidence of past cost performance and ability to meet project schedules.
 - d. Describe experience of proposed Contract Manager and other key staff.

- e. Describe the ability of the Respondent to meet the District’s bonding and insurance requirements.
- iv. Responses to Step 1 Evaluation Criterion 2 (Technical Specifications). Provide narrative to address each numbered/lettered section of the Technical Specifications (Section IV of this RFP). As directed by the text in the Technical Specifications, some responses may simply note that the Respondent’s proposed approach/system complies with the specification, while other responses may require explanation of how the approach/system meets the technical requirements.

The Respondent shall clearly identify any exceptions. All questions and requests for specificity in this RFP must be answered. All specifications incorporating “shall,” “must,” etc., are requirements, and failure to comply with these must be specifically noted as exceptions. All specifications incorporating “should,” “desires,” etc., are highly desirable features.

- v. Responses to Step 1 Evaluation Criterion 3 (Cost Proposal). Provide tabular summaries of a cost proposal, according to the detailed format and instructions provided in Section V of this RFP. Cost must include all applicable taxes and wage rates as determined by labor and industries, and Lakewood City Sales tax rates (9.4%)

- vi. Warranties. Provide response to Attachment A of the Technical Specifications. vii.

Failure Rates. Provide response to Attachment C of the Technical Specifications. viii.

Appendices. Optional for Respondents who wish to submit additional material that will clarify their response.

- D. Proposals (Step 1) will be received by the District at the location mentioned in the Request for Proposals, until the time and date specified in the Request for Proposals.

No proposal may be changed or withdrawn after the time set for receiving proposals. Proposals shall be submitted according to the format described herein.

- E. Any omissions, discrepancies or need for interpretation in the RFP should be brought, in writing, to the attention of the District Representative. Written addenda to clarify questions that arise may then be issued by the District, as appropriate.

No oral statements by District, District Representative, or other representative of the District shall, in any way, modify the Proposal, whether made before or after acceptance of the Proposal.

- F. The scope of work is described in the “Scope of Work” and “Technical Specifications” sections of the Request for Proposals (RFP) package. The District reserves the right to add or to eliminate portions of that work as deemed necessary.

- G. Respondents shall satisfy themselves as to the local conditions by inspection of the site to the extent necessary to respond to Step 1. The “site” is the District’s Water System Service area, as depicted in Attachment B.

H. The right is reserved to reject any and/or all proposals for good reason and to waive informalities if it is deemed advantageous to the District to do so.

4. Proposal Bond

The District requires that the Respondent's Proposal be accompanied by certified or cashier's check or postal money order payable to the order of Lakewood Water District for a sum not less than five percent of the amount of the Base Cost Proposal in Section V of this RFP (i.e., not considering the amounts associated with the Supplemental Cost Proposal), or accompanied by a bid (i.e., "proposal") bond in an amount not less than five percent of the Base Cost Proposal with a corporate surety licensed to do business in the State of Washington, conditioned that the Respondent shall pay the District as liquidated damages the amount specified in the bond, unless the Respondent, if selected by the District as the preferred Respondent, enters into a contract in accordance with the Respondent's Proposal. No Proposal shall be considered unless accompanied by such check, postal money order, or bid bond.

The District Board of Commissioners may reject all Proposals for good cause and in such case all checks, money orders, or bid bonds will be returned to the Respondents. If the contract is let, then all checks, money orders, or bid bonds shall be returned to the Respondents, except that of the successful Respondent, which shall be retained until a contract shall be entered into for doing the work, and a bond to perform such work is furnished with sureties satisfactory to the District.

IV. Technical Specifications

The following describes the technical requirements for meters and the AMI system. The District intends to procure the best-designed and operating AMI system to meet its long-term needs. For some items listed below, the District has identified minimum requirements that must be met. For other items, the District has identified desired end results and is open to various methods for achieving those results. The District is solely responsible for making judgments about the products and services being offered and whether they meet the intent of the Project. Taking exception to the District's requirements will not necessarily adversely affect consideration. In describing any exception, the Respondent shall note how the system achieves the performance and operational requirements specified and any potential benefits of the proposed system to the District.

The following sections of this document constitute a data request to gather technical data on the products proposed. Respondents must respond to the technical data request as set forth in the Instructions to Respondents. All Respondents must provide information in response to the Base Scope of Work. Information submitted in response to the Supplemental Scope of Work is optional.

Base Scope of Work

1. Meter Exchange / AMI Systems Overview

The District requires that all water service meters supplied in the exchange program be equipped with a fixed network AMI system that will enable it to obtain timely, accurate, and Automated Meter Infrastructures. The District also requires that the AMI system be compatible with the existing District Sensus AMI compatible meter bodies. AMI system features, characteristics, and performance that result from the interaction of components are to be addressed in this section. Component requirements and characteristics specific to individual components are to be addressed in this section. It shall be the Respondent's responsibility to propose any components, ancillary services, etc., not addressed in this Request for Proposal to ensure that the District obtains a complete and fully functional system.

A. System Design – Provide the following information for the meters and AMI system being proposed, include any charts, graphs or illustrations that would help communicate the information requested.

- i. Mode of operation. Describe the system's normal mode of operation (i.e., for obtaining periodic readings for billing and other purposes). Also describe the ability of the system to operate in mobile drive-by mode, if necessary when data collectors are out of service.
- ii. Frequency of reading. How often are meter readings normally obtained (default setting)? Describe any options for changing the reading frequency at which meter readings may be obtained. Describe how the changes to the reading frequency are made.

- iii. System capacity. Describe the capacity of each system component in terms of meters low flow reading capacity, range of flows and accuracy, meter battery life, internal memory and all applicable dimensional and capacity information for the transmitters and collectors describe the number of meter readings stored and/or the number of meter readings that can be transmitted or received in a given time interval.
- iv. Read on demand. Describe how the system obtains "off-cycle", special or on-demand readings from a particular meter.
- v. Demand profiling. Describe the capabilities of the system to obtain short-interval readings (e.g., hourly or several times per day) to monitor and profile water consumption patterns from a particular meter or group of meters.
- vi. Communication channels. Indicate the radio frequencies that are used for communication between the transmitters and data collectors proposed. Describe any licensing requirements and the process of obtaining and maintaining such licenses. Describe transmission power and receiver sensitivity with respect to retransmissions and number of collectors required. Describe the radio communication mode (s) used by the system in terms of radio technology (s) used.
- vii. Data transmission accuracy and security. The system must include provisions to guarantee data transmission accuracy, security and immunity from outside interference as well as signal degeneration, to prevent accidental loss or interception of customer or meter reading data. Describe how the proposed AMI system achieves these requirements.
- viii. Stored data system integrity and security. The system must guarantee data integrity and data security. The system must ensure against loss of data. Describe how the proposed AMI system achieves these requirements.
- ix. Tamper detection. The system must contain tamper detection capability which, when the meter, transmitter or any wiring between components has been tampered with (cut wire, tilting of meter, backflow, etc.), must cause a tamper message to be indicated when the transmitter sends its data. Indicate how quickly tampering with each component will be reported and how it will be reported. Address whether or not the system generates a notification if the register number of the field device changes or there is a mismatch between the register number of the field device and the current register number in the system database.
- x. Leak detection. The system must monitor water consumption through the meter and indicate when there is a suspected leak. Describe how the system identifies and communicates leak detection information at the time reading information communicated. Note if there are any other leak detection capabilities that the system has (e.g., can leak detection be configured at the individual meter level; or, can distribution leaks be detected via the AMI system using additional sensors?).
- xi. Other detection / status and trend monitoring. Describe what other detection and / or status and trend monitoring capabilities the system has, e.g., backflow detection, register malfunction detection (under registration, over registration, no registration),

trend analysis to aid in developing policies to promote water conservation, battery power levels (replacement predictions), signal-to-noise performance of transmissions (system tuning).

- B. Environmental tolerances. All system components (except the meter chamber) must operate over a temperature range of -20° F to 120° F, and a humidity range of 0% to 100% non-condensing.
- C. FCC Licensed. All applicable system components must be FCC licensed and approved.
- D. Component firmware. Vendor must include firmware for all system components, including transmitters, data collectors and portable interrogator/programming/testing units, at no additional cost. Vendor must provide any available upgrades or patches to such firmware to correct problems, add new standard features, and ensure system compatibility and full functionality for life of the system at no additional cost, including installation. Describe how firmware is updated.

2. *Transmitter Device*

Transmitter devices, designed to capture meter readings or accumulated consumption and other information from the meters and transmit this information to data collectors, must be installed at all water service meter locations, along with meter registers compatible with both Badger meter bodies and the proposed AMI solution. The information provided by the transmitter must be sufficient to enable the AMI system to replace the routine reading and physical inspection of meters by District staff.

- A. **Physical characteristics.** Describe the physical characteristics of the transmitter, including height, length, width and weight.
- B. **Transmitter configuration.** Describe the transmitter configuration that you are proposing.
Note if the transmitter will be integral to the register, remote or under the meter register. Note the features and benefits of the proposed configuration. Multiple configurations may be proposed.
- C. **Multiple meters/registers.** Describe how the transmitter handles multiple meter registers and multiple meters in close proximity. Note; if there is a price differential for a transmitter that can handle multiple registers.
- D. **Batteries.** What type of battery does the transmitter use? [Provide make, model number and spec sheet on those proposed for use in this system] What is the expected battery life? Is the battery removable and replaceable? If so, what is the current cost of replacement batteries? Can the battery be replaced in the field? If so, describe the process. How will the system prevent loss of programming or data if the battery expires? Describe any special transmitter battery disposal provisions, and indicate the current cost of providing battery disposal if special handling is required. Describe the impact additional reading frequency has on battery life and at what frequencies battery life may

be affected. Describe the end-of-battery-life indication of the system: a) at the battery level, and b) at the system software level.

- E. **ID Number.** Each transmitter must have a unique, permanent ID number that is transmitted with the meter readings. Note the length of the ID number and any other characteristics. Address whether or not the meter register ID is also transmitted with the meter readings and how the situation of one transmitter serving two or more meters is handled.
- F. **Programmability.** Describe all transmitter programmability options, features and procedures. Note whether programming of the transmitter is needed due to meter register or other maintenance.
- G. **Environmental tolerance.** The transmitter must operate in conditions subject to water submergence (i.e., meter boxes or vaults) and heat. Describe features of the transmitter that prevent corrosion or degradation of mechanical or electrical performance.
- H. **Labeling.** The transmitter must be permanently labeled with the manufacturer's name, model number, "Lakewood Water District Water Utility", a tamper warning, transmitter identification number, required FCC labeling, input/output connections, and date of manufacture. Labeling must include a bar code of the transmitter serial number.
- I. **Ease of Installation.** Briefly describe installation procedures. Indicate design provisions to avoid installers' mistakes in installation, connection to meters, and programming. Can successful installation be verified in the field to avoid return trip to transmitter radio / meter?
- J. **Ease of maintenance.** Briefly describe procedures that need to be followed to replace the transmitter should it fail. Describe procedures for the various transmitter configurations. Note any specialty tools, materials or supplies that are needed to perform this work.
- K. **Meter pit installation.** The District's water meters are located in a variety of enclosures: plastic boxes with plastic, cast iron or steel plate lids, concrete boxes with cast iron or steel plate lids, concrete vaults with steel plate lids and within mechanical rooms with a variety of exterior walls. Some of the meter pits are in vehicle traffic areas, including parking areas. Describe any issues with the meter pit installation that will affect long- term reading reliability and reading range and suggested solutions. Note; if the transmitter requires a through-the-lid solution. Note any requirements that must be met to avoid voiding or diminishment of system warranties and guarantees.
- L. **Connections to meter registers.** Describe the connection between the transmitter and the meter register(s), and provisions to prevent misconnection, corrosion or disruption of any connections.
- M. **Warranty.** Attach the transmitter warranty information for transmitter and battery in Attachment A, Section 1. Warranty transmitters and batteries needs to address frequency of reads.

N. **Interoperability.** The transmitter must read at least two different makes of meter registers for all sizes of meters, including Sensus registers. Indicate these in the following table, as well as any needed programming or modifications to either the transmitter or meter. Are different transmitters needed for different makes and models of meters?

Manufacturer	AMI compatible register model	Programming or modification required (Describe or indicate “None”)	Encoder Resolution Transmitted and Stored in Database (Describe Number of Digits, etc)
AMCO	Digital		
AMCO	Absolute Encoder		
Badger	ADE		
Badger	RTR		
Hersey	Translator		
Neptune	E-coder		
Neptune	Pro-read		
Sensus	ICE		
Other	Other		
Other	Other		

3. *Mobile Interrogator*

The District requires vehicle-based mobile interrogators be available for use in the event that fixed network data collectors are out of service for an extended period of time. The mobile interrogators should be designed to be easily installed and removed from District vehicles. The mobile interrogator should safely and efficiently interact with the District employee driving the vehicle to guide him or her in obtaining readings from all the meters on a route and identifying meters that cannot be read. The District will provide the vehicles used for mobile meter reading.

- A. Mounting and power. A mobile interrogator may be either a portable interrogator designed to operate from within a vehicle, or a separate device mounted in a vehicle. Specify the dimensions and weight of the interrogator. There must be a back-up battery to preserve internal memory. If meter readings or critical system data are stored in the mobile interrogator, indicate the life of the back-up battery.
- B. Mode of operation. Describe all reading mode(s) using the mobile interrogator (e.g., individual alerting of transmitters, blanket alerting of any transmitters within range, simple reception of any transmitter signals while passing by, etc.). Indicate how the driver will be given meter route information. The mobile interrogator must indicate to the driver/meter reader which meters within the route being read have been missed. The mobile data collector must be capable of reading the transmitters in random order. The system must be capable of merging data collected from the mobile data collector together

with data collected from handheld reading units into files to be uploaded to the District's billing system.

- C. Capacity. Describe the capacity of the mobile unit in terms of total meter readings that can be captured, and rate of capture.
- D. Signals to driver. The mobile interrogator must provide signals to the driver during the reading of a route. The AMI system and mobile interrogator should incorporate or interface with a geopositioning system to enable the driver to see his/her position in relation to meters to be read.

4. Handheld Data Collectors

The District requires handheld data collectors that are equipped with AMI capabilities for manual meter reading where only a portion of the meters on the route have been equipped with AMI transmitters, for capturing meter readings from transmitters that are in radio "weak spots," for final and special reads, and for other purposes requiring individual readings. The handheld data collectors must enable District staff to manually read meters and key in meter readings, and will replace District's existing handheld meter reading devices while being compatible with the AMI system.

- A. System Functions. The District requires handheld meter reading devices, cradle/data transfer units, control computer, software, etc., to read meters equipped with transmitters as well as capture manual meter readings. The handheld device must present to the meter reader unambiguous and appropriate information needed to locate a water meter. It must also inform the meter reader of the next meter to read, any upcoming hazard (e.g., dog), special routing information, and special instructions (including the presence of an AMI-equipped meter, which is not manually read).
 - i. Time stamp. The handheld device must automatically time stamp each meter reading with unalterable date and time of read.
 - ii. Searching. The handheld device must allow for searching and viewing of data within the handheld meter reading device, by several fields or keys, including meter location address, meter number, unread account, sequence number and manually-entered flag/tag/bookmark.
 - iii. Out-of range warning. The handheld device must visually and audibly warn the meter reader of a meter reading entry that is out of range, including no consumption for an active account, or of an inactive account that has consumption since the previous reading. The device must allow the meter reader to override an out-of-range warning, to enter an unusual reading, or skip a reading and make a notation of the fact, if a meter has been removed from service.
 - iv. Data displayed. The handheld device must be capable of displaying the following information on the primary screen:

- a. Route number
- b. Meter reading sequence number
- c. Account identification number
- d. Customer name and number
- e. Billing cycle day (date when account will be read)
- f. Metered service code (telling system what to do with the volume recorded by the meter; examples are bill water and sewer, bill only water, deduct before calculating sewer volume, etc.)
- g. Meter number
- h. Meter manufacturer
- i. Meter address
- j. Meter location description, hazard descriptions, additional special instructions
- k. Previous unable-to-read code
- l. Account status code
- m. Meter status code
- n. Meter encoder ID number
- o. Current date and time
- p. Meter reader ID
- v. Data entry by meter reader. The handheld device must allow for field entry of data, including meter readings, and information on meters that are out of sequence or that were not transferred into the handheld meter reading device. The handheld device must allow the meter reader to modify or correct certain fields, including meter location, hazard, and special instructions to update the associated billing system data.
- vi. Codes and comments entry by meter reader. The handheld device must allow for entering an unable-to-read code and up to two additional special reporting codes and comments for each meter reading record.

B. Handheld Physical and Environmental Characteristics

- i. Size and weight. Indicate the size and weight (with batteries installed) of the handheld meter-reading device.

- ii. Resistance to dropping. The handheld unit must be able to withstand an impact of a five-foot drop onto a concrete surface without breaking or losing data.
- iii. Display. Must have a multi-line alpha/numeric display, large enough for easy reading of route data, readable in normal daylight, and have an internal display light for reading the display under low-light conditions.
- iv. Environmental. Indicate the temperature and humidity operating ranges for the handheld unit. The unit must be capable of being submerged for up to 20 seconds without loss of functionality.
- v. Carrying. The handheld device must be able to be carried by hand (left or right hand equally) and secured by a hand strap or supported by a belt and/or shoulder strap, to free up both hands when device is not in use.
- vi. Keypad. The handheld device must have alpha/numeric/special function keys that allow a meter reader to easily enter data correctly while wearing gloves.
- vii. Batteries. Rechargeable batteries must power the handheld device. These batteries should be user-replaceable. The unit must have provisions to retain all data while the primary batteries are being replaced. The handheld device batteries must be able to be fully recharged in eight hours.
- viii. Data/meter reading capacity. Describe the capacity of the handheld device, in terms of the number of meter readings that may be captured under normal circumstances.
- ix. Data fields. The handheld meter reading device must keep the following data internally, for use in calculations and validations:
 - a. Time and date of reading
 - b. Handheld meter reading device identification code
 - c. Meter reader identification code
 - d. High reading limit
 - e. Low reading limit
 - f. Table of utility-defined codes, with associated code descriptions

C. Handheld Device/Control Computer Data Transfer

- i. Data transfer method. Indicate the method used to transfer data between the handheld device and the control computer.

- ii. Data transfer rate. Indicate how long it normally takes to upload the data from a 200-meter route, and how long to download the next 200-meter route. How long for a 500-meter route?
- iii. Data protection in transfer process. Data sent to the handheld meter reading device must overwrite existing data, with proper warning and the opportunity to cancel the action before the transfer begins, so as not to allow the accidental erasure of untransferred meter reading data. The handheld meter reading device must display a message or other indications when data transfer is taking place and when the transfer is complete.
- iv. Device ID synchronization. The data transfer method must synchronize the meter reading data with the associated handheld meter-reading device, through identification validation, so that the handheld meter-reading device has the appropriate route data, for its assigned meter reader.

D. Handheld Meter Reading Control Computer

- i. Database and database management system. The control computer must store data in an ODBC SQL-compliant database, such as Oracle or Microsoft SQL Server, which can be queried for ad hoc data analysis and reporting.
- ii. Manual entry of data. The control computer must permit manual entry of meter readings not transferred from the handheld meter-reading device.
- iii. Route selection and sequencing. The control computer must allow for the selection of route data to be sent to and retrieved from the handheld meter reading device, including merging of two or more routes and splitting one route into several other routes. The system must allow for the sequencing of meter locations based on billing system information, or the re-sequencing of a meter reading route, based on previous meter reading time stamps.
- iv. Data validation. The control computer must have the capability to analyze the transferred handheld meter reading device data, to separate valid data from suspect data, and to report exceptions.
- v. Reports. The control computer must have built-in reporting capabilities that list all handheld meter reading device data, sort and list the data by various key fields, and list data that meets user-defined criteria. Report formats must be user-customizable, using a built-in report writer or a third-party commercially available report writer (such as Crystal Reports) that is included with the control computer software. Reports must be able to be directed to a printer, screen or data file.

5. Field Programming and Testing Devices

Field programming units may be required to program transmitters or meter registers. Portable field test units may be required to diagnose problems with meter registers,

transmitters or the system. Some or all of these functions may be incorporated into the handheld data collectors, or combined into one unit; e.g., programmer/tester.

A. Number of units. Respondent shall supply all units required for Respondent's sub contractor. Indicate how many units are required for maintenance by District employees after installation. Pricing and totals for these units shall be included as part of the proposal bid.

B. Functions/modes of operation. Describe all of the functions of each unit.

The field programmer must be capable of programming the transmitter with any information required for operation. The portable field programmer must be capable of providing instructions to the transmitter concerning the make, model and data protocol of the meter being connected, should the transmitter not be able to determine this itself.

The field tester must be able to locate and diagnose problems with a system component (meter register, transmitter or DCU) unless the system incorporates an alternate way to make such diagnoses. The field tester should be able to ascertain the condition of the battery in a transmitter. Can the field test unit simulate the functions of a transmitter?

C. Interface to control computer. Describe the mechanism and procedure for downloading data from and uploading data to the AMI control computer.

D. Capacity. Describe the capacity of each unit. If the unit stores work order information, how much data, or how many work orders, can it accommodate?

E. Physical Characteristics. Indicate unit weight and dimensions. Describe any features, such as shoulder or belt strap, to facilitate carrying and preventing it from being dropped.

F. Accessories. What connecting hardware and software, including cables, modem, cradle, battery, charger, etc. are required for the unit to be fully functional?

G. Bar code reader. The unit should be capable of accommodating a bar code reader to capture meter or transmitter numbers from bar codes pasted on these components.

H. Batteries. Does the unit use rechargeable batteries? If so, what type? If not, what does it use? How long does it take to fully recharge a battery after a full day of normal use? The unit must ensure against accidental data loss in case of a dead battery.

I. User interface. Indicate the display's overall dimensions, the number of characters displayed, and the height and width of the characters. Does the display allow alphanumeric characters? Include an illustration of the display screen and keypad. How does the unit enable the display to be easily readable in bright or dim light? Indicate the angular range readability. Describe any audible tones used by the unit, and their function (e.g., confirming a reading or successful programming, warning of an out-of-limits condition, low battery, etc.)?

- J. Manual entry. Does the unit permit manual entry of meter readings and other information (for example, the information necessary to complete a meter or transmitter investigation or repair work order)? If so, what other information? Describe its capability to record notes or comments.

6. Fixed Network Radio Data Collector

The District owns a number of facilities that may be used for locating fixed network data collectors. Location information is available from the District upon request and will be furnished upon the completion of a confidentiality statement. The District prefers that, to the extent practical, these existing sites be used for the mounting of fixed radio data collector units. Fixed radio data collection units must be mounted on roofs, utility poles, towers, etc., at sufficient height and density to enable the District to collect readings from all meters in that portion of its service territory designed for use by this system. The Respondent is responsible for estimating the number and location of fixed data collectors required in the District's service territory. The District may assist the Respondent in securing sites for collectors at sites other than District owned property. The District intends to avoid locations where leasing arrangements must be made.

- A. Modes of operation. Indicate the mode of operation and schedule by which the data collector captures, stores and re-transmits data received from transmitters back to the AMI control computer.
- B. Communication to control computer. The Respondent must be responsible for a communication network or provisions to deliver meter readings and other AMI system data to the AMI control computer. Indicate available options and proposed method for transmitting data.
- C. Number of units. Indicate the estimated number of data collectors. The Respondent is responsible for providing a sufficient number of data collectors/repeaters so that 100% of all expected reads are obtained. Note in your design if meters might be read by more than one data collector. Describe the typical operating range of the data collector and conditions that might affect that range.
- D. Mounting. Indicate options for mounting data collectors/repeaters, and recommended configuration. Indicate minimum required height.
- E. Power supply. How is the data collector/repeater powered? What are the estimated one-time and continuing costs for powering data collector/repeaters? How does the system preserve data, and for how long, should power to a data collector/repeater be lost?
- F. Programming. Describe any programmable features, such as reporting schedules, for data collectors/repeaters, and procedures for programming or configuring.
- G. Electrical isolation. Indicate how the data collector/repeater is protected against electrical surges such as lightning.

- H. System installation schedule. The contracted Respondent will first furnish and install the necessary components of the AMI system within a small portion of the District's service area, so that the District may confirm that the installed system functions appropriately. Once accepted, the Respondent will be given notice to proceed with the remainder of the Scope of Work. In accordance with the implementation schedule, the respondent will be paid only for the installed portions of the contract that is accepted as being fully operational by the District. The entire AMI system will be fully deployed by the end of 2015. However, the data collection system must be installed and tested for territory-wide usage by June, 2014. It is acceptable to complete this installation sooner than indicated. Describe the proposed plan for achieving this schedule. Identify significant milestones in the system installation process. Identify any assistance that might be required from the District. Describe the plan for testing the design and operation of the AMI communication system prior to its submission to the District for acceptance.
- I. Warranty. Attach warranty information in Attachment A, Section 2.

7. *AMI System Radio Licenses*

The District requires the Respondent to secure on behalf of the District all radio licenses necessary to operate the AMI system on frequencies that will be sufficiently free of noise and interference so as to provide all proposed capabilities over the life of this system.

- A. FCC licenses. Indicate what FCC or other regulatory agency licenses, if any, the system will require. Indicate the expected length of time to acquire such licenses. Indicate what problems can occur in the process of obtaining such licenses. Note if licenses must be acquired prior to the installation of the AMI system equipment. Note if licenses have a renewal period.
- B. Obtaining licenses. Respondent must obtain all necessary licenses on behalf of the District. Licenses must be obtained and assigned radio frequencies verified as suitable for use with the AMI system before any AMI equipment may be installed. If the Respondent is unable to obtain the necessary licenses in a timely manner, the District reserves the right to cancel the contract and orders for all or part of the system, and receive a full refund from the Respondent of all amounts paid. The Respondent will be required to remove all installed AMI system equipment solely at their cost, including any AMI system equipment installed by the Vendor that cannot be operated due to the lack of a proper license.

8. *AMI Control Unit*

The AMI system will be operated from a control unit(s), which will be a server(s). This unit(s) may be the same one used to manage all reading collection devices. It may be the same one used to control the AMI system installation. The unit(s) must have sufficient capacity to handle all of the District's meter readings, including future expansion capability as the District grows. Hosted options will be considered based on respondent supplied twenty year costs of hosting.

The Respondent must design, furnish, and install the configuration (including control computer/server, operating system, and any other components necessary to interface with the District's network) most suitable for its system and the District's application. The District's technology standards include Windows 7 operating system, IE 8, Office, 3-5 year warranty and replacement.

The combination of hardware and software needs to be robust, fault tolerant and with applications and data easily restored from back-up files.

The specifications for the unit(s) should include the following:

- A. Operating system, memory, processor speed and hard drive requirements.
- B. Indicate the estimated number of units of the various hardware items (computers, servers, printers, etc.) and software (operating system, communications, etc.) that will be furnished for the District to properly operate the AMI system. Number purchased will be dependent upon final system design, and must provide for full system hardware backup. Hosted options will be considered and pricing for hosting should be included.
- C. The control unit(s) must be capable of residing as a node on the existing District data communications network.
- D. The control computer(s) must be capable of operating in a normal office environment and be easily moveable. The system software and functions must be quickly and easily transferable to another computer/server in the event of failure on the primary control unit.
- E. Warranty. Attach control computer warranty in Attachment A, Section 3.

9. *AMI System Software*

Respondent must provide all software, including third party software such as data compression software, operating system, relational database management system, and database report generator, necessary for District staff to operate and manage the AMI system. This software must include interfaces to the District's customer information system to enable transfer of meter readings, synchronization of databases, customer service functions, measures to protect data security, etc. Software must be provided with all licenses, and must be maintained by the AMI Respondent over the life of the system. The District will provide the record layout for its CIS and expects the Respondent to tailor an interface from its AMI system software to the CIS. The District IT staff will work closely with the Respondent to ensure that this is accomplished efficiently. However, the Respondent is solely responsible for ensuring that data from its system is being transferred properly to the District's CIS system. The software must be able to manage a minimum of 25,000 accounts and be expandable.

- A. Modes of operation. Respondent to provide information on their system operating modes, including batch processing and single meter reading query processing. Describe the steps a system operator must perform to obtain meter readings for the meters at customers'

premises. AMI software shall provide the user with reports of the current status and reading history of individual accounts and selectable groups of accounts. The software shall be able to sort and list accounts. The software shall be able to create user-defined account groups.

- B. Interface to billing system. The AMI system shall automatically provide data, corresponding to all the accounts in a billing cycle, meter reading route or other grouping presented to it, to the CIS, in a standard, nonproprietary format (e.g., comma separated value ASCII). The system shall use Microsoft SQL Server Enterprise (2005 is acceptable as of July 2012, but 2008 is preferred) as the underlying relational database system. Each record provided to the CIS shall contain at a minimum: account number, transmitter ID number and/or port number, billing cycle or route number, meter number, meter readings, error codes or flags, date and time for each meter reading, unable-to-read code, and tamper indications. Indicate what information is required by the AMI system from the CIS so that the former may respond; indicate what information is provided to the meter reading database; describe record layout, including field length and format. Describe any steps an operator must perform to initiate or schedule this process.
- C. Updating account data. Indicate arrangements for synchronizing data between the meter reading database and CIS.
- D. Recovery/restart. Describe procedures to recover/restart the system in the event of an interruption or software freeze.
- E. Multiple users. How many concurrent users can the system accommodate? What is the licensing arrangement for concurrent users?
- F. User interface. Respondent must include menus, navigators and major screen shots in its proposals. Describe provisions and guidelines for customizing screens, menus and navigators. Indicate whether the user interface is a client that must be installed on each work station or is browser based.
- G. User access. What provisions exist for data entry and editing by users? What restrictions are placed on such functions to ensure security and data integrity? The software shall include a security system, incorporating multiple levels of authorization and access to limit specific data, users, modules and/or specific tasks. The System Administrator must be able to modify the levels of security. Describe security features, logging and levels.
- H. Meter reading database. The underlying relational database system shall be Microsoft SQL Server Enterprise (2005 is acceptable, 2008 is preferred). The AMI system database shall contain at a minimum: account number, transmitter ID number and/or port number, billing cycle or route number, meter number, register number, customer number, meter readings, date and time for each meter reading. The meter-reading database may contain additional fields. The interface between the two databases must work during the transition period where some of the reads will be coming from the AMI and the remainder from existing meter reading methods. The plan is to implement the AMI reads into the utility billing system based upon existing routes – one route at a time. The

ability to run parallel billing is required. The Respondent shall provide a data dictionary for the underlying AMI data base so that the District can query the data via ODBC and generate data extractions and reports. The ability to create data views using tools built into the AMI software is a plus.

- I. Capacity. Describe any capacity limitations on the number of accounts, number of readings per account, etc. for the configuration proposed. Describe any provisions for archiving additional data.
- J. Back-up. Describe data back-up capabilities and procedures to ensure that system and consumption data is not corrupted or lost.
- K. Client / user interface. The preferred solution for the user interface is browser based. However, if client software is required, then it shall run on Windows 7 (or latest service pack). Indicate the minimum hardware and software requirements for the client / user interface [RAM, CPU speed, OS, browser types and versions, etc]. See discussion above regarding the District's preferences regarding the server side OS, etc.
- L. Reports. Provide a list, with brief descriptions and screen shots or sample pages, of the standard reports provided for system and component performance; missing or late data; errors, anomalies and alarm conditions; data transfer, management and administration; analysis of consumption for individual customers or groups of customers; and other major report categories.
- M. Traps for questionable readings. Describe any system capabilities to validate meter readings for reasonableness, unusually high or low readings, and potential meter rollovers.
- N. Meter reading system performance assessment and diagnostic tools. Describe any tools available to assess the performance of the system and to diagnose problems; e.g., radio transmission strength / problems, battery life status, etc.
- O. Support. Provide hours of operation and level of support on major US holidays.
- P. Software documentation. Documentation shall be provided with the software and shall include at a minimum: system overview, flow charts, file descriptions and record layouts, database structure diagrams, description of program function and logic, back-up and recovery procedures, operating procedures, screen layouts, data entry procedures, report descriptions, descriptions of all user options, and descriptions of all error messages.
- Q. Software license and warranty. All Respondent supplied software must be supplied with a license indicating the software's designer, owner and licensor, and detailing the terms and conditions, including annual cost of maintenance by the Respondent. Software license and warranty shall cover all patches and upgrades, including new versions, for the life of the system at no additional cost. Indicate how many workstations the software license will cover and the cost, if any, of additional workstation licenses. Indicate the length of the software license warranty.

- R. Maintenance and escrow. The Respondent supplied software shall be supported for 20 years with enhancements, patches and corrections of “bugs”, at no additional cost to the District beyond the annual maintenance fee. Respondent must be required to provide a “standard” source code escrow agreement and warranty.
- S. Third-party software. Indicate third party software (operating system, database, report writer, etc.) specifically required to support Respondent’s application. Indicate the warranty, licensing and support provisions for any such packages.
- T. Interface with GIS. Indicate any provisions in the database for integration with the District’s current version of GIS data related to meter or premises location.
- U. The system software should provide statistical reports on the usage of the product. The system must incorporate detailed incident reporting and logging feature. Methods of monitoring system performance shall be included.
- V. The software should provide a test environment for testing prior to placing changes into production. The software should enable simulation of operating with sample data before permanent changes are incorporated into the code or processes.
- W. The System must be capable of complete on-line, real-time record creation, maintenance, reporting, and retention.
- X. Data hosting. If data hosting is proposed, describe how this service will operate, what support is needed from the District, and the general benefits of such service.
- Y. Warranties. Attached software warranties in Attachment A, Section 4.

10. Documentation

The District must be provided with all documentation needed to install, operate, and maintain the AMI system and all of its components. Documentation must serve both for training and reference, and must be kept up to date with any system or software upgrades or corrections.

- A. System manuals. Respondent must provide manuals and customized written procedures sufficient for complete operation and maintenance – including installation, configuration, diagnostics and repair – of the system. Respondent must supply three (3) complete hard-copy sets as well as three (3) copies on CD-ROM in Word format prior to the start of the Project, which will be defined at the Pre-Deployment meeting.
- B. Third party software manuals. Respondent must provide at least two (2) sets of manuals for any third-party software or components incorporated in its system, both in hard copy and electronic copy on CD or DVD.
- C. Updates and revisions. Respondent must promptly inform the District of updates and revisions and provide replacement pages and CDs or DVDs whenever there are any revisions or additions to the manuals.

11. Training

The District requires training of all appropriate staff sufficient to enable them to effectively operate and maintain the system. To be effective, the District requires that training curriculum be provided in advance, that training be accompanied by course workbooks and materials, that training be provided by experienced instructors, and that all training be accompanied by tests or hands-on evaluation to ensure District employees or agents have absorbed the content of the training. The District will designate one or more District employees that the Respondent will train on all aspects of the AMI system and will become the lead trainer(s) for the District.

- A. Prerequisite for training. Training must be sufficient to prepare the District staff to fully and completely administer and maintain the system without further reliance on Respondent staff beyond normal assistance covered by maintenance agreement. The District requires that training occur once the system is fully operational, with the exception of TU installation training, which is to occur prior to system installation.
- B. Training on the AMI system equipment. The Respondent must provide training to District staff on any and all AMI system equipment, whether provided by the Respondent or purchased by the District (including the control computer and database) after it is installed, tested and accepted by the District. Training must use real data from the District's own system.
- C. Location. All training shall be done at the District's offices and facilities, or in the field, at District specified hours.
- D. Training curriculum. Respondent must provide thorough training in each of the following areas for the designated number of people:
 - i. All aspects of the AMI system's operation, including obtaining reads and consumption data from the system, transferring reads and other information between the AMI system and the CIS, creating performance reports, diagnosing potential problems with system components, changing or adding customer accounts/transmitters/meter registers/meters to the system; for a minimum of 10 District employees or agents for a minimum of 16 hours.
 - ii. Meter reading database management, for a minimum of 5 District employees or agents for a minimum of 8 hours.
 - iii. Installation management and project control, for a minimum of 5 District employees or agents for a minimum of 12 hours.
 - iv. Field installation, for a minimum of 15 the employees or agents for a minimum of 4 hours.
 - v. Field diagnostics and maintenance, for a minimum of 15 District employees or agents for a minimum of 8 hours.

- vi. Application software administration, for a minimum of 5 District employees or agents for a minimum of 12 hours.
- vii. The District may add additional personnel to the initial training sessions noted above without incurring any additional training costs from the Respondent.

The Respondent must specify duration for each of these training sessions if different than what is noted above.

- E. Training aids. User training will include detailed documentation and reference materials for each end-user. Respondent must provide trainees' workbooks, training aids (including software and videotapes), and system technical manuals prior to or during the training session.
- F. Supplemental training. Respondent must provide a schedule of costs for additional training beyond the initial training proposed contained in the Cost Proposal.
- G. Restore equipment. Respondent must restore, repair or replace any District equipment damaged in training, and restore any hardware or software modified during training sessions.
- H. Instructors. The Respondent must provide trained and experienced instructor(s), and ensure that they do not perform other duties during the training period that will interrupt instruction. The Respondent must provide resumes of trainers assigned to the Project for District review and approval.
- I. Testing. The Respondent must create and design tests to determine the level of comprehension of the subject matter presented to the participants. The Respondent must submit tests to the District for review and approval. Participants that score less than 75% will be retrained by the Respondent at no additional cost to the District. If the District participant should fail to pass the second test, the District and the Respondent will determine the reason for the failure. Should failure be a result of Respondent trainer issues, the Respondent will provide a different trainer and be responsible for subsequent training at no additional cost to the District.
- J. Evaluation. The Respondent must provide evaluation forms for each training session conducted to solicit feedback from participants regarding the training. At the District's sole discretion, training sessions that appear to be inadequate will be repeated at no additional cost to the District.
- K. User group conferences. For the period from the effective date of the AMI System contract until the date of final system acceptance, the Respondent will provide the District with up to five (5) complementary registrations for any User Group Conferences or similar training activities designed to increase the training and proficiency in the use of the Respondent's AMI system equipment and software. The District will be responsible for all other costs of attendance. The Respondent must provide the District with sixty (60) days notice of such conferences.

12. Support

The Respondent must provide on-site and telephone support as needed by the District over the estimated 20-year life of the system to ensure its proposed performance. As this support will be requested when software or equipment malfunctions, response must be rapid, accurate and efficient. Local, hands-on support for necessary repairs on warranty items is to be provided with a response time of 24 hours.

- A. Initial support period. Respondent must provide telephone and on-site support, as needed from the effective date of the AMI System contract until the date of final system acceptance at no additional cost to the District.
- B. Extended support period. Respondent must provide telephone and on-site support, as needed, for 10 years from the expiration of the initial support period or third anniversary date of the Notice to Proceed, whichever is longer. Support must be renewed at the District’s discretion on an annual basis.
- C. Telephone support. Respondent must provide trained persons to answer technical questions and guide District employees through the use or diagnosis of the AMI and metering system through a toll-free number. The District must have unlimited access to a 24/7 technical support line. Indicate telephone support hours proposed. In the chart below, indicate the types of problems that would be addressed via telephone support and the response time the District will receive. Indicate what company(ies) will be providing the support and where their office (s) are located.

Types of Problems/Problem Severity	Response Time

- D. On-site support. Respondent must provide on-site assistance when phone line technical support fails to timely address the issue or at the request of the District during the initial support period and extended support period noted above. In the chart below, indicate the types of problems that would need to be addressed by on-site support and the response time the District will receive. Indicate what company (ies) will be providing the support and where their office (s) are located.

Types of Problems/Problem Severity	Response Time

- E. Preventive maintenance provisions. Describe the Respondent’s recommendations and requirements for AMI system preventative maintenance, back up, archiving, etc.
- F. Loaner equipment. The District intends to procure additional AMI system equipment, based on the recommendations of the Respondent to account for product failures or repairs. Given the critical nature of utility operations, the Respondent must make available loaner equipment in a timely manner to ensure continued, seamless utility operations of the meter reading, maintenance and billing functions affected by the AMI system. In the chart below, list the AMI system equipment that will be loaned to the District and the response time in which the District will receive the equipment. The costs of any loaner equipment are to be included in the annual maintenance agreement.

AMI System Equipment	Response Time

13. Payment

The District will make payment on systems and equipment that meet the requirements of, and have been accepted by, the District. Acceptance will be based upon demonstration that the system components under consideration for payment have been placed into full operation to include meter reading data being successfully passed to the utility billing system (CIS) in production mode and other monitoring / trending / alerting / analysis functions being successfully used in production / operational mode. An invoicing format acceptable to the District will be determined during contract negotiations. After contract award, and prior to the Pre-Deployment meeting, the Respondent shall submit a preliminary cost-loaded installation and deployment schedule to the District for review and comment. Prior to the Pre-Deployment meeting the District shall provide Respondent with comments on the preliminary cost-loaded schedule. The cost-loaded schedule will be finalized at the Pre-Deployment meeting (or shortly thereafter) and will be used as the basis for partial payments during system deployment.

14. Project Staffing

The success of this Project is critical to the operation of the District. Describe the organization structure that the Respondent will provide to support this project. Name the personnel that are planned to be assigned to the Project, their roles and responsibilities. Provide a list of project staff’s experience in delivering projects of similar size and scope.

15. Deployment Plan

Prior to the Pre-Deployment meeting, the District in conjunction with the Respondent will develop a detailed deployment plan. The Respondent must participate in these meetings,

whose costs will be included in the equipment prices furnished in the Cost Proposal (Section V of this RFP). Describe in general terms the process that the Respondent takes in deploying a project similar to the District's Project.

The District intends to conduct an initial deployment phase of approximately 750 accounts in a concentrated area of the District to test the AMI system and installation services policies, procedures and control systems. The Respondent must be an integral part of this initial phase of work. The entire cost of the Respondent for participating in the initial phase shall be included in the Cost Proposal developed per Section V of this RFP.

16. Quality Control

The District is expecting the Respondent to design and furnish an AMI system that has an estimated operating life of 20 years requiring a minimum of repair, maintenance and replacement due to design, materials, and workmanship failures. Describe the quality control policies and procedures that the Respondent has adopted to ensure quality system design, manufacturing, component sourcing, installation and any other aspect that affect the serviceability and useful life of the equipment and software that will be furnished for the Project. Also describe the failure analysis process that is used when product is returned.

17. Project Administration

The Respondent will be required to participate in various on-site meetings from time to time, issue reports, establish and amend delivery schedules and other routine items to administer the Project. Please describe the general plan that the Respondent will follow regarding project administration issues. The District in its sole discretion may revise the project schedule and timelines or suspend the project due to funding or implementation issues.

18. System Performance Warranty

The District expects the Respondent to design and provide an AMI and metering system that reliably and accurately transmits the reading on the water meter along with other information contained in that transmission. The Respondent must warrant that the system will achieve a 99.5% reading rate, by comparing the number of actual reads received versus the number of reading attempts made at any time reading activity is performed, when the transmitter is installed and the reading equipment is operated and maintained according to the Respondent's instructions. Propose the Respondent's plan for addressing equipment failures that result in a reading rate of less than 99.5%. Describe the support that is expected from the District to assist the Respondent in addressing such failures.

- A. Failure rates. Complete the chart in Attachment C regarding product failure rates and warranty replacement costs.
- B. Product failure. List the types of failures that the Respondent considers beyond their reasonable control.

- C. Failure analysis. On a quarterly basis the Respondent will provide a failure analysis report for any and all product returned by the District to the Respondent. The report will include an analysis of similar failures that have occurred on other projects, the cause of such failures, the actions that the Respondent is taking to minimize such failures and an assessment regarding the likelihood of continued failure. The Respondent will provide a proposed analysis report format and content for District approval at the Pre-Deployment meeting.

19. Installation Process and Data Management

The District requires a clear and detailed process for managing equipment inventory data (e.g., account information, old register information, new register information, etc.) during system deployment. Describe the step-by-step process used for meter register and transmitter installations at existing meter locations, and all equipment (e.g., handheld devices) required to complete such installations, including the importing of this information into the District's billing system. Note if equipment used for installation is different than (i.e., additional to) that used during ongoing operation of the system.

Supplemental Scope of Work

1. *Supplement A. Installation.*

This includes installation of the meters, registers and AMI transmitter unit equipment, project management and control by the Successful Respondent's Subcontractor to ensure that all equipment is installed properly and all information about the system is correct, and field inspection of installers' work to ensure that it is performed properly. Contractor will follow the District's Standard Operating Procedure on meter change outs for each service.

- A. Project duration. Project duration shall be eighteen (18) months from the date of Notice to Proceed.
- B. Installation sequence. Successful Respondent's Subcontractor shall conduct installations in sequence to be determined by the District in discussion with Successful Respondent's Subcontractor. The District and Successful Respondent's Subcontractor shall establish an overall schedule for installation of the entire project. On the first workday of each week, Successful Respondent's Subcontractor will provide the District an updated schedule of where work is planned for the next 3 weeks.
- C. Work hours. No work shall be done between 6:00 pm and 7:00 am except where required or authorized by the District. No work shall be done on Sundays and legal holidays. Legal holidays shall be defined as those holidays annually observed by the District. These are: Labor Day, Veterans Day, Thanksgiving (2 days), Christmas (2 days), New Year's Day, Martin Luther King Day, Memorial Day, and Independence Day (a total of 11 days).
- D. Daily reports. At the end of each day, Successful Respondent's Subcontractor shall transmit electronically to the District, information on completed work orders, as well as a listing all installation appointments to be visited by Successful Respondent's Subcontractor's Installers the next day.
- E. 24-hour customer access. Successful Respondent's Subcontractor must respond to calls from customers or the District concerning leaks, loss of service and other problems associated with installations on a 24-hour per day basis. Successful Respondent's Subcontractor must respond within one (1) hour of receiving the call and mobilize to correct any problems within three (3) hours of receiving the call.
- F. District Project Manager. The District will designate an employee or agent who will manage the project on behalf of the District. The function of this Project Manager is to coordinate with the Successful Respondent's Subcontractor and ensure compliance by the Successful Respondent's Subcontractor with the specifications. The designation of a Project Manager shall not relieve the Successful Respondent's Subcontractor of its full responsibility to comply with the terms of the Contract and/or all plans and specifications.

G. Installation acceptance. Each Installation will be accepted by the District conditioned upon (1) electronic submission of a list of completed installations containing for that installation the premise identification number, address, old and new meter ID numbers, old and new meter readings, transmitter ID number, location of meter and transmitter, Successful Respondent's Subcontractor's name, Successful Respondent's Subcontractor's inspector's name, and all other information relevant to the installation; (2) satisfactory inspection by the District; and (3) successful capture of a confirming meter reading or sequence of meter readings from that meter and transmitter by the District operating the AMI system in a normal way.

H. Payments. Successful Respondent shall provide to the District on a weekly basis its list of newly completed installations and any itemized additional work. The District will consider for approval installations within ten business days after notification that the installation has been completed and is ready for District inspection. The District shall notify Successful Respondent of any listed items that do not meet the conditions of Paragraph G above, so that Successful Respondent may resolve any discrepancies. The District may at its discretion reject the entirety of any list on which there are discrepancies in more than 20% of the entries. Successful Respondent shall submit and District will pay invoices monthly, except for any disputed amounts. The District will provide payment within 45 days of receipt of acceptable invoice. Indicate in your proposal any discount for prompt payment (amount of discount and applicable number of days).

Payments will be based on the price schedules negotiated as part of this Proposal by the District and the Successful Respondent's Subcontractor, Meter Vendor and AMI Equipment Vendor, based on prices submitted by the Respondent.

I. Automated project control system. The Successful Respondent's Subcontractor shall utilize an automated installation information management process, so that little or no information has to be captured or entered manually. The system shall have a redundant backup process, so that all information is preserved in the event of a breakdown in the primary system. The system should enable the correction of any incorrect information pertaining to meter or service size, meter type, meter location, address, etc. Respondent shall describe in detail its project control system in the proposal.

J. No solicitation. The Successful Respondent and its Subcontractor and agents shall not solicit business from the District's water customers while engaged on any contract associated with this project.

K. Successful Respondent's Subcontractor staff requirements.

i. Contract Manager. Each contractor shall designate a Contract Manager who is a direct employee of the selected firm for the duration of the contract, and who shall have the authority to handle and resolve any disputes or contract issues with the District. The District is seeking a sole point of contact for the entire project that will have direct oversight over all elements to include installation. Please indicate the percentage of the Contract Manager's time that will be dedicated to this project, and

that will be spent on site. A change of Contract Manager may be made only with the approval of the District.

- ii. Installation manager. Successful Respondent's Subcontractor shall designate an Installation Manager, who shall be responsible for managing the entire installation project on a day-to-day basis on behalf of the Successful Respondent's Subcontractor and for seeing that all installations are carried out in a professional manner and in compliance with the procedures required by the Respondent/manufacture, the District, and all other applicable local, state and federal regulations. The Installation Manager shall be on site continuously throughout the duration of the project, except for holidays and vacations, during which the Successful Respondent's Subcontractor shall provide a qualified substitute. The Installation Manager shall be experienced in supervising meter installation contracts, and familiar with applicable regulations and safe and proper installation procedures. The District shall approve the Installation Manager or a change in the Installation Manager.
- iii. Installers. All AMI installations, retrofitting AMI-compatible registers on meters of any size, and meter changeouts must be performed by Successful Respondent's Subcontractor's employees or subcontractors who are properly trained and experienced.
- iv. Training of employees. Describe training procedure, and probation provisions for new employees.
- v. Uniforms and identification. Successful Respondent's Subcontractor's field personnel shall wear easily recognizable uniforms containing the Successful Respondent's Subcontractor's name, as well as prominently displayed picture identification badges containing Successful Respondent's Subcontractor's name, employee name, title and signature, employee picture and employee I.D. number. Employees shall also be issued and carry a letter. Successful Respondent's Subcontractor's employees who are no longer employed by Successful Respondent's Subcontractor shall be required to return their uniforms and letter immediately upon termination of employment and the Successful Respondent's Subcontractor shall immediately notify the District of all such terminations.

L. Items to be supplied by Successful Respondent's Subcontractor

- i. General. Successful Respondent's Subcontractor shall supply the following components and aspects of installation: overall project management; training and direct supervision of installers; appointment scheduling; large meter vault refurbishment/replacement; problem solving and complaint handling; inspection, testing and quality control.
- ii. Tools and materials. The Successful Respondent's Subcontractor shall furnish all supplies, materials, tools and equipment necessary for the successful and timely

completion of all meter and AMI installations under this contract as specified herein.

- iii. Meter box lids. The AMI system shall be configured to obtain the maximum signal strength from transmitters installed in meter pits or vaults. Successful Respondent's Subcontractor shall replace or retrofit all meter box lids and any other lids needed to obtain the performance requirements specified herein. Under no circumstance will a meter pit or vault be left uncovered and unsupervised. Lids currently have touch read pit lid adapters and radio transmitters limited retrofitting is anticipated.

Lids may be replaced, drilled or left alone, depending on Respondent's determination of what is required to ensure maximum signal output from transmitters installed in meter pits.

Should a meter box lid need to be replaced, Respondent must ensure that the ring or collar matches the lid for a secure fit. Notification of the District project manager is required prior to replacement, and a per each price established for this work.

- iv. Vehicles. Successful Respondent's Subcontractor shall be responsible for all vehicles it uses on the project. Successful Respondent's Subcontractor shall provide service vehicles on site stocked with common fittings and supplies needed for normal service restoration and/or replacement. Successful Respondent's Subcontractor's vehicles, including private vehicles used for the work, shall have the company logo prominently displayed on both sides of the vehicle. Any employee of the Successful Respondent's Subcontractor or its subcontractors that drives a vehicle in connection with this project must have a valid driver's license for the class of vehicle being driven.
- v. Parking. The District desires that Successful Respondent's Subcontractor deploy vehicles to minimize parking problems and avoid blocking any streets. Successful Respondent's Subcontractor shall be responsible for all parking violations.
- vi. Field communications. The District requires that the Successful Respondent's Subcontractor's installers, plumbers, inspectors and supervisory personnel be equipped with cellular phones or radios so that problems or questions can be addressed immediately and that the Installation Manager can be contacted if needed.
- vii. Meter salvage. The Successful Respondent will be responsible for delivery of meters removed from service. Salvage values if offered by Respondent should be fixed for the term of the contract, and not be tied to some prevailing rate at the time of salvage.

M. Account data and installation scheduling

- i. Account data file. Prior to the start of the installations, the Project Manager will provide the Successful Respondent's Subcontractor with an electronic file containing the information necessary to create work orders for meter/AMI installation. For each meter, the data file will indicate the account number, meter reading route number, meter size, make and serial number, the meter location (if

known), access notes to the meter, and the name and phone number that may be listed on the account. Existing meter manufacturer is not known. Any unmetered accounts that may exist are not to be addressed.

- ii. The District will provide Successful Respondent's Subcontractor with weekly updates to this file for routes where the AMI system has not yet been installed. For each meter, the data file will indicate whether the meter register only is to be removed and an AMI-compatible retrofit register installed, or whether the meter is to be completely replaced; the location of the meter (inside or outside); and any third-party (e.g., landlord) who is responsible for the account.
- iii. Customer notification. At least two weeks prior to the commencement of installations on a particular route, Successful Respondent's Subcontractor shall send notices (letters, post cards, door hangers, etc.) to the customers on that route indicating the approximate time when installations will occur and requesting that customers call the Successful Respondent's Subcontractor for appointments if the meter is not readily accessible or if the customer has special needs regarding the momentary disruption of water service. The District shall approve in writing the text of all Successful Respondent's Subcontractor letters, door hangers and other communications with customers. Successful Respondent's Subcontractor shall also develop and submit to the District the scripts for any telephone conversations with customers for approval by the District's Project Manager prior to use. The District will be responsible for mass media publicity and general notices to customers (e.g. bill stuffers)
- iv. Appointment scheduling. Successful Respondent's Subcontractor shall be responsible for scheduling and handling all installation appointments. Whenever possible, Successful Respondent's Subcontractor shall notify customers of any changes in schedule at least one day in advance of the original appointment. The District reserves the right to impose liquidated damages of \$50 for each instance where the Successful Respondent's Subcontractor has failed to properly notify the customer if an appointment cannot be kept on time.
- v. Non-accessible meter. In the event a meter is obstructed or is not accessible, the Successful Respondent's Subcontractor will make no less than two attempts at any reasonable time to contact the customer to gain access to the meter. These attempts must be documented on the work order. After two documented attempts to change the meter, Installation Manager may request the District's Project Manager to schedule the meter changeout. The Successful Respondent's Subcontractor shall only be paid for completed installations and is expected to provide all reasonable support in resolving installs that are difficult to schedule. Successful Respondent's Subcontractor will be responsible for installation if the District secures an appointment within 4-weeks of receiving written or electronic notice from Successful Respondent's Subcontractor.

N. Installation Procedures

- i. Procedures approval. The Successful Respondent's Subcontractor shall propose detailed scheduling and installation procedures to the District for approval prior to scheduling or commencing installations. The procedures shall be designed to optimize the work of the Installers, the District inspectors and all other staff working on the project.
- ii. Acceptance testing. Prior to the commencement of full-scale installation, but after Vendor shall have installed the AMI system control computer and a sufficient quantity of data collection units, Successful Respondent's Subcontractor shall install the meters and meter reading equipment on a mutually agreed upon number of meter reading routes, following the Successful Respondent's Subcontractor proposed procedures. During this test and a period not longer than ten (10) business days following it, the District and the Successful Respondent's Subcontractor shall evaluate the procedures for meter and transmitter installation, data transfer to the District's billing system, meter reading over the system, installation data management and project control, and problem resolution, to ensure they are working and effective. The District may require Successful Respondent's Subcontractor to modify any procedures that it deems are deficient or ineffective. No work will be started on other routes until the AMI system equipment is determined to be working to performance requirements on the test routes, the project control procedures and systems are determined to be performing accurate, and the installation procedures have been approved by the District.

The District's IT staff will be available to provide assistance in the development and testing of data transfer procedures during installation and to establish operational transfers.

- iii. Work order processing. Successful Respondent's Subcontractor shall be responsible for ensuring that all data transferred to and from the District's information systems is properly working before commencing any installations.
- iv. Work order data. The Installation Manager will provide work orders to Successful Respondent's Subcontractor. Each work order will include at a minimum, the customer's address, premises identification number, meter location, designation of replacement or retrofit, existing meter number, existing register number, meter make, model and size, and most recent meter reading. The District desires that all work orders be electronic.
- v. Site conditions. Before, or at the time of installation, the Successful Respondent's Subcontractor shall inspect the existing water meter setting, including piping and shut-off valves. If the Successful Respondent's Subcontractor determines that conditions are such that damage to the existing piping would result, the Installation Manager shall so inform the District, shall not attempt the installation until the site is inspected by an authorized District representative, and shall postpone installation

at that site until the Project Manager authorizes the Successful Respondent's Subcontractor to proceed with the work.

- vi. Location of meters. The District personnel will be available to assist in locating meters in the field. Meter locations are not visually marked.
- vii. Location of transmitter. On large meter boxes that may bear traffic loads, the transmitter shall not be installed in the lid. Depending on the Respondent's specifications, the transmitter may be installed on the sidewall of the vault, or in a small pit exterior to the vault and connected to the meter register(s) by shielded, weatherproof cable running through the wall of the vault.
- viii. Geopositioning coordinates. For each meter installed in an outdoor pit, box or vault, Successful Respondent's Subcontractor shall capture GPS positioning with sub-meter accuracy (+/- 3feet), using a geopositioning device. Describe how Respondent intends to provide GPS data for each meter.
- ix. Digital photographs. The District requires that digital photographs be taken before and after installation to provide documentation of problematic pre-existing site conditions. Problematic site conditions are defined, as any condition that the Contractor believes requires some repair or District investigation before installation should proceed. Examples of problematic conditions are described in 14.k (Repairs), 14.l (Old Piping), 14.q (Plumbing Irregularities), and 14.s (Service Line Damage). The photo should have an accurate date and time stamp and the file name of the photo shall include the applicable register number. Digital photographs should be available to the District in a database searchable by address, premises identification number, and meter number or account number.
- x. Old meter reading disputes. Successful Respondent's Subcontractor shall provide procedures for ensuring that any dial meter is read properly and for providing evidence of the reading in the case of any customer disputes. Evidence of the reading is required at a minimum for any meter that fails a high/low audit check, or for any meter that shows any signs of a defect. The District requires that evidence be in the form of a digital photo clearly showing the register face.
- xi. Repairs. At its option, the District may authorize the Successful Respondent's Subcontractor to make any necessary repairs to service lines or piping at District's expense, order the customer to make such repairs, or undertake such repairs itself. If the District elects to assume responsibility for repairs, it will make the repairs within 30 days of notification by the Successful Respondent. Successful Respondent shall not anticipate returning to any site requiring a repair in less time. The District will notify the Successful Respondent when repairs are complete.
- xii. Old piping. Only when old piping is leaking or deteriorated to a point that damage to it could reasonably be expected by changing the meter will poor piping be

accepted as a reason for not replacing the meter during the installation period. Unless the District's Project Manager permanently remands the particular installation to the District, Successful Respondent's Subcontractor is still required to install the meter and AMI equipment after the piping has been repaired or replaced at any time during the installation period.

- xiii. Meter replacement. Successful Respondent's Subcontractor shall ensure he is at correct location and meter, and check for running water prior to commencing meter change-out. If water is running, Installer must notify the customer before commencing meter changeout. Successful Respondent's Subcontractor shall then replace the meter, using new gaskets or washers. Successful Respondent's Subcontractor shall put plastic caps on the inlet and outlet of the old meter and handle meter with care in the event of post-removal testing. All conversion bushings or other hardware necessary to install the new water meter in the customer's existing meter setup must be furnished by the Successful Respondent's Subcontractor.
- xiv. Strainers. If the meter to be replaced has a strainer, Successful Respondent's Subcontractor shall be responsible for replacing the strainer along with the meter, unless conditions prevent such replacement. Successful Respondent's Subcontractor shall otherwise be responsible for repairing or cleaning the strainer to ensure that is in good working order and will not adversely affect meter performance.
- xv. Verifying service working. Successful Respondent's Subcontractor shall flush water line after installing a new meter to ensure the meter is registering properly and verify service restoration to the entire premise.
- xvi. Valves. If Successful Respondent's Subcontractor cannot shut off water using the valve at the meter (details must be documented on a work order), Successful Respondent's Subcontractor shall have the option of closing the corporation stop, however, it must notify District's on-site inspector immediately before doing this. If the shut-off valve at the meter is inoperable, Successful Respondent's Subcontractor shall immediately notify the District's on-site inspector to arrange for repair. Successful Respondent's Subcontractor may not use a crimping tool to stop the flow of water. Successful Respondent's Subcontractor may use a non-Freon freezing tool.
- xvii. Plumbing irregularities. The Successful Respondent's Subcontractor shall report to the Project Manager, prior to the installation of a meter, any meter and/or plumbing irregularities including but not limited to meters installed backwards, registers are disconnected from meters, taps are located before a meter, there are unmetered connections of a customer's plumbing to a service lateral, fire pipe or water main or any other violations of the District's Regulations. The Successful Respondent's Subcontractor shall not proceed with the installation of a meter until the District's Project Manager has authorized such installation.

- xviii. Dirt or water around meter. Successful Respondent's Subcontractor shall be responsible for removing and properly disposing of any reasonable amount of dirt needed to access a meter in a meter pit or vault. Dirt shall be removed only as necessary to prevent dirt from entering the line during the installation. If a water meter box or vault is flooded so that the meter is fully or partially submerged, the Installer must pump out the box before changing the meter. The Installer must ensure that the water service is not in any way contaminated, even intermittently, by standing water in the meter vault or box. All waste resulting from cleaning the meter pit as well as replacing the ring and lid must be cleaned up and hauled off by the Successful Respondent's Subcontractor and disposed of in a legal manner. The existing ring and lid, if replaced, shall be disposed of by the Successful Respondent's Subcontractor. If grass or shrubbery is damaged by the installation process, the Successful Respondent's Subcontractor must repair the damage to original condition to the satisfaction of the consumer by replanting, resodding or reseeded. The District reserves the right to inspect any installation and clean-up work within 30 days after payment is made to the Successful Respondent's Subcontractor for said work.
- xix. Service line damage. The Successful Respondent's Subcontractor shall be responsible for the repair of any service lines it damages at its sole cost and expense, unless Installation Manager has reported (prior to commencement of installation) a condition of antiquated or inferior plumbing to the Project Manager and the Project Manager has authorized the Successful Respondent's Subcontractor to proceed with the work. In the event a service line fails during the installation procedure, the Successful Respondent's Subcontractor will notify District's on-site inspector, who shall arrange for the repair by District. Reasonable direct labor and material costs for such repair will be deducted from Subcontractor's invoices for repair of service lines unless District's Project Manager authorized Subcontractor to proceed with the work.
- xx. Returned work orders. Returned work orders shall include: meter size and meter type, verification or correction of existing meter and account information, old meter serial number, final reading on old meter, new meter number, new meter register number, premises identification number, TRANSMITTER ID number, reading on new meter register, date and time of installation, name of installer, notice of any problems encountered or repairs made. All information requested on the work order must be completely filled out for the installation to be considered complete and eligible for payment. An electronic copy of all the work order information must be provided to the District's Project Manager on a daily basis.

O. Quality control

- i. The Successful Respondent shall describe its quality control program for its installation crews, including the parameters and the numbers or percentages of installations to be inspected, minimum acceptable performance and provisions for dealing with unacceptable performance.

- ii. Response to complaints. Should the Installation Contractor receive a call or complaint from a customer or the District regarding installation, the Installation Contractor shall immediately log the call, including caller's name, address, account number if available, date and time of call, nature of problem and the action taken. Copies of all call logs shall be forwarded to the District's manager not less than once per day.
- iii. Improper installations. The Installation Contractor shall be responsible for replacing any meter, transmitter or appurtenances improperly set by its Installer. The Installation Contractor shall correct any damage to couplings, threads, unions or meters by use of improper tools or cross threading by an Installer.
- iv. Leaks after installation. Installation Contractor shall be responsible for correcting any leaks at the valves, couplings or service lines that could reasonably be attributed to the meter installation if reported by the District or customers within 30 days of installation.
- v. Regular meetings with the District. Contract Manager shall meet with District personnel periodically and not less than monthly to update them on progress against the installation schedule.

V. Cost Proposals

Instructions to Respondents

Respondent must provide prices for the equipment and services specified in Section IV of this RFP (Technical Specifications). All quantities are estimated, and the District may purchase more or less as indicated at the prices quoted, except for the data collectors and repeaters required to establish the communications network for a fixed network system, or any other ancillary equipment needed for a fully functional AMI system, whose quantities are to be furnished by the Respondent.

Respondent must respond to each line item listed in the base cost proposal tables; lump sum proposals will not be accepted. Indicate “NA” (Not Applicable) if the particular equipment described is not incorporated in the Respondent’s proposed AMI system design. In addition, provide responses in the boxes provided for questions listed under the “Notes” section for each table. Respondent must include any additional equipment or service not listed in the tables that is required to provide a complete, fully operational and functional system.

The District may authorize supplemental services, as noted previously in the RFP. The supplemental cost proposal is comprised of:

- x **Supplement A – Installation.** This includes installation of the meter registers and transmitter units furnished with the base cost proposal.

Additional Notes/Requirements

1. Pricing is to be firm for the period of the contract, which is estimated to be through December 31, 2015, unless extended by the District. Where future costs are requested, all values are to be provided in 2013 dollars.
2. Future (i.e., beyond December 31, 2015) purchases of equipment, including new equipment needed to extend AMI system service to new District customers or an expanded District service area, as well as replacement products (including those replacement purchases to which pro-rated warranty coverage applies), will be based on the lesser of the following:
 - a. Published list price of the equipment in effect for the year of purchase; or,
 - b. Contract prices shown in this cost proposal, with inflation applied as calculated according to the published Consumer Price Index for All Urban Consumers (CPI-U) for the Seattle-Tacoma-Bremerton area.
3. AMI system equipment purchased under this contract will be based upon orders placed by the District. Deliveries of ordered equipment will be shipped to the District. The Respondent will pay all freight charges for such deliveries, including return of equipment that the District is submitting for warranty replacement.

4. As noted in the cost proposal tables that follow, the District requests **a fully-warranted AMI system for the first 15 years of operation**, with 5 additional years prorated with the Respondent providing all repair, replacement, and maintenance services at no cost additional to those outlined in this cost proposal.
5. As a part of this Cost Proposal, Respondent is to provide warranty documents reflecting items 2 and 4 noted above.

Table 1 Meter Registers

Meter Size	No. of Registers⁽¹⁾	Unit Cost of Meter and Register	Total Cost of Meter and Register
5/8"	12491		
1"	2,392		
1.5"	891		
2"	252		
3"	53		
4"	20		
6"	16		
8"	11		
10"	4		
12"	1		
Total	16,131		

(1) Estimated, as of September 30, 2013.

Notes:

1. Meter and Registers and radios are to be of the same manufacture, meters smaller than 1.5" shall be battery operated Static meters with magnetic or ultrasonic metering, measuring in cubic feet and gallons.
2. Connection to AMI transmitter unit to existing AMI compatible meters is to be via potted or inline type of connector, not requiring a field wire splice.
3. The quantities listed above are shown for estimation purposes only. The actual requirement of the District may be more or less than the quantities specified. The District will acquire and pay for only those items which it orders during the term of the Contract.

Table 2 Transmitters

For systems with only one port transmitters (one transmitter per meter):

No. of Transmitters	Unit Cost of Transmitter	Total Cost of Transmitters
16,131		

For systems with one port and two port transmitters (either one transmitter per meter or one transmitter per two meters):

Number of Transmitter Ports	No. of Transmitters ⁽¹⁾	Unit Cost of Transmitter	Subtotal Cost of Transmitters
One	14,131		
Two	2,000		
Total Cost of Transmitters:			

(1) Estimated breakdown, as of September 30, 2013.

Notes:

1. Describe the standard length of wire connecting the transmitter to the register (note: must be a minimum of five feet). Are additional lengths available, and if so, at what additional cost?

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2. The quantities listed above are shown for estimation purposes only. The actual requirement of the District may be more or less than the quantities specified. The District will acquire and pay for only those items which it orders during the term of the Contract.

Table 3 AMI System Reading Equipment and Services

*Respondent must identify recommended quantities where indicated by triple asterisks (***)*

Respondent must identify any additional items/quantities that it recommends the District purchase to operate its system, and reasons for the additional quantities.

Equipment Description	Quantity to be supplied	Unit Cost	Total Cost
Fixed data collection units, including firmware and installation	***		
Fixed network system repeaters, including installation	***		
Mobile drive-by interrogators (handheld or laptop) to be used in the event the fixed data collection units are out of service	***		
Costs associated with leasing space on infrastructure not owned by the District that is required for installation of DCUs and/or repeaters (20-year estimated costs)	***		
Backhaul communications infrastructure, including installation and total 20-year estimated operating fees (e.g., cell service fees)	***		
Field programmers, including cradles, accessories, firmware and software	***		
Field tester/reader, including cradles, accessories, firmware and software	***		
AMI system control computer	***		
AMI system control computer software	***		
Consumption database application software (if different than or additional to the control computer software)	***		
Interface to billing system	***		
Other (describe)	***		
Other (describe)	***		
Total:			

Notes:

1. Describe additional quantities of items other than those specified by the District and reason for the District purchasing these additional quantities for operating the AMI system?

2. Computer and software components or Hosted option must be able to readily provide at least the most

recent 12 months of consumption data for analysis and customer service purposes. In addition, the system must be capable of storing/archiving up to 10 years of historical data, retrievable for data analysis purposes.

3. Describe data hosting options provided by the Respondent. What additional costs would be incurred, and to what extent would costs noted above be deducted from the total in Table 3?

4. The Respondent will determine the number of data collectors and repeaters required to achieve the reading performance and frequency requirements established by the District. If additional data collectors and repeaters are required to achieve the stated requirements than originally estimated by the Respondent, the Respondent will be responsible for furnishing and installing any additional collectors and repeaters at their expense. The District will pay for additional collectors and repeaters needed to expand the original service territory, as needed.

5. Describe proposed backhaul communications methodology and basis for pricing?

Table 4 Annual Costs of Maintenance or Service Contracts/Agreements

Respondent must specify the annual cost of the system’s maintenance or service contract or agreement, for each year during the projected 20-year life of the system, inclusive of both software and hardware maintenance. Note if coverage would change during the course of this time period. Reference may be made to appended contract/agreement documents.

The District requires that the maintenance or service contract/agreement for the initial 10-year period cover all necessary materials and labor to repair or replace system components.

The contract or agreement for the second 10-year period is to be based on Respondent’s standard contract or agreement.

Year of System Life*	Annual Maintenance Cost	Description of Contract/Agreement Coverage Change that Occurs at Specific Years
<i>Initial 10-Year Full System Repair, Replacement, Servicing</i>		
Year 1 (2015)		
Year 2 (2016)		
Year 3 (2017)		
Year 4 (2018)		
Year 5 (2019)		
Year 6 (2020)		
Year 7 (2021)		
Year 8 (2022)		
Year 9 (2023)		
Year 10 (2024)		
<i>Standard Maintenance/Service Contract/Agreement</i>		
Year 11 (2025)		
Year 12 (2026)		
Year 13 (2027)		
Year 14 (2028)		
Year 15 (2029)		
Year 16 (2030)		
Year 17 (2031)		
Year 18 (2032)		
Year 19 (2033)		
Year 20 (2034)		
Total Maintenance Contract Costs over 20-Year Project Life:		

Notes:

1. Assumes the first year a maintenance/service contract/agreement will be required is 2015, since the initial system elements are anticipated to be furnished and installed, with testing and mutual (i.e., District and Respondent) acceptance of the initial phase of deployment by the end of 2014. The initial system elements are anticipated to include those items listed in Tables 1 through 3 that are necessary to provide a fully functioning AMI system to obtain meter readings from approximately 750 water service meters located within a concentrated area of the District, as noted in Section IV.15 of the RFP.

Acceptance of the initial deployment phase will be achieved when the initial system elements are installed, functioning, and providing system performance that has reached or exceeded a reading rate of 99.5% for a mutually-agreed-upon reading period (e.g., a three-day billing period), as set forth in Section IV.18 of the RFP. The reading rate is defined as the number of transmitter units installed on the AMI system that successfully provide a reading during the defined reading period, divided by the total number of transmitter units installed on the system at that time. A transmitter unit will not be included in the reading rate calculation if any of the following situations apply:

- x The unit is adversely affected by a Force Majeure Event or an Act of God.
- x The unit cannot communicate with the system due to an object being placed over it (e.g., a parked automobile).
- x The unit is removed from service during the reading period.

By accepting the initial deployment phase, both the District and the Respondent will be acknowledging the following, with regard to all initial system elements (including transmitter units):

- x The system elements have been installed in compliance with the procedures and specifications approved and provided by the Respondent.
- x Their performance or functioning has not been adversely affected by a failure of the District to perform its obligations or tasks for which it is responsible relative to the initial deployment phase.

Acceptance of subsequent installation phases will involve similar acknowledgements regarding system elements installed at each phase.

2. During the initial 10-year warranty period, the servicing of a transmitter unit that experiences failure (i.e., repair or replacement of said unit, and subsequent re-installation) is to be completed within one week (i.e., seven calendar days) of Respondent being notified by District of unit failure. A fee of \$300 per unit will be assessed to the Respondent in the event this requirement is not met.
3. What are the key features/elements of the maintenance/service contract/agreement that you propose in the above table?

4. Note if other levels of service agreements are available, and how they vary in cost from what is depicted above.

Table 5 Proposed Transmitter Unit Replacement Costs (Years 15-20)

The District is expecting 20 years of useful life from the AMI system provided through regular and routine maintenance and replacement of system components to keep the system fully functional.

As noted in Table 4, the selected Respondent will be expected to provide all replacement materials and labor for the initial 15 years, including that associated with transmitter units. For the following 15-year period, replacement transmitters will be purchased by the District, based upon pro-rated warranty percentages. Installation is to be provided by the Respondent.

In the table below, specify the expected failure rate of transmitter units and associated replacement costs, in 2013 dollars (i.e., without considering inflation).

Year After Unit is Installed & Accepted	Expected Failure Rate (failures per year)	Warranty Pro-Rata Replacement Cost Percentage	Unit Replacement Cost (total cost less pro-rata warranty adjustment)	Unit Installation Cost	Total Replacement Cost
15					
16					
17					
18					
19					
20					

Notes:

1. Installation costs are those costs paid by the District to the Respondent for all services/costs aside from the Unit Replacement Cost necessary for full repair or replacement of a failed transmitter.

Table 6 Proposed Additional Replacement Costs (Years 15-20)

This table is similar to Table 5, in that replacement costs are requested for system components (other than transmitter units) during years 15-20 of the life of the AMI system.

In the table below, specify the expected failure rate of equipment other than transmitter units and associated replacement costs, in 2013 dollars (i.e., without considering inflation).

Year After Unit is Installed & Accepted	Item Needing Replacement	Warranty Pro-Rata Replacement Cost Percentage	Item Replacement Cost (total cost less pro-rata warranty adjustment)	Item Installation Cost	Total Replacement Cost
15					
16					
17					
18					
19					
20					

Notes:

1. Installation costs are those costs paid by the District to the Respondent for all services/costs aside from the Item Replacement Cost necessary for full repair or replacement of the item.

Table 7 Ancillary Operational Support, Materials & Supplies

*Respondent must specify recommended quantities where indicated by triple asterisks (***)*

Item Description	Quantity to be supplied	Unit Cost	Total Cost
Initial and/or only on-site training, 8 hour day. Includes all travel costs.	***		
Subsequent training, 8 hour days. Includes all travel costs.	***		
Other (describe)	***		
Other (describe)	***		
Total:			

Table 8 Fixed System Cost Proposal Summary

Incorporate totals shown on Tables 1 through 7.

Table No.	Description	Total Cost
1	Meters and Registers	
2	Transmitters	
3	AMI System Reading Equipment & Services	
4	Annual Maintenance/Service Contract Costs (Total Costs over 20-Year Project Life)	
5	Transmitter Unit Replacement Costs (Yrs 15-20)	
6	Additional Replacement Costs (Yrs 15-20)	
7	Ancillary Support, Materials & Supplies	
	Total:	

SIGNATURE

This fixed AMI system cost proposal is submitted by:

NAME OF RESPONDENT COMPANY: _____

SIGNATURE OF AUTHORIZED PERSON: _____

PRINTED NAME OF AUTHORIZED PERSON AND TITLE: _____

DATE: _____

SUPPLEMENT A – INSTALLATION

Table A.1 Installation of Meters Registers and Transmitter Units

Meter Size	No. of Registers⁽¹⁾	Install Cost of Meter and Register and Radio	Total Cost of Meter and Register and Radio
5/8"	12491		
1"	2,392		
1.5"	891		
2"	252		
3"	53		
4"	20		
6"	16		
8"	11		
10"	4		
12"	1		
Total	16,131		

(1) Estimated, as of September 30, 2013.

Notes:

1. Installation to be provided according to the Technical Specifications, Supplement A.

**Attachment A – Warranties (Respondents to supply the following warranties
with the section headers)**

Section 1 – Transmitters (including batteries)

Section 2 – Mobile Radio Interrogators and Data Collectors (Fixed Network)

Section 3 – Control Computer

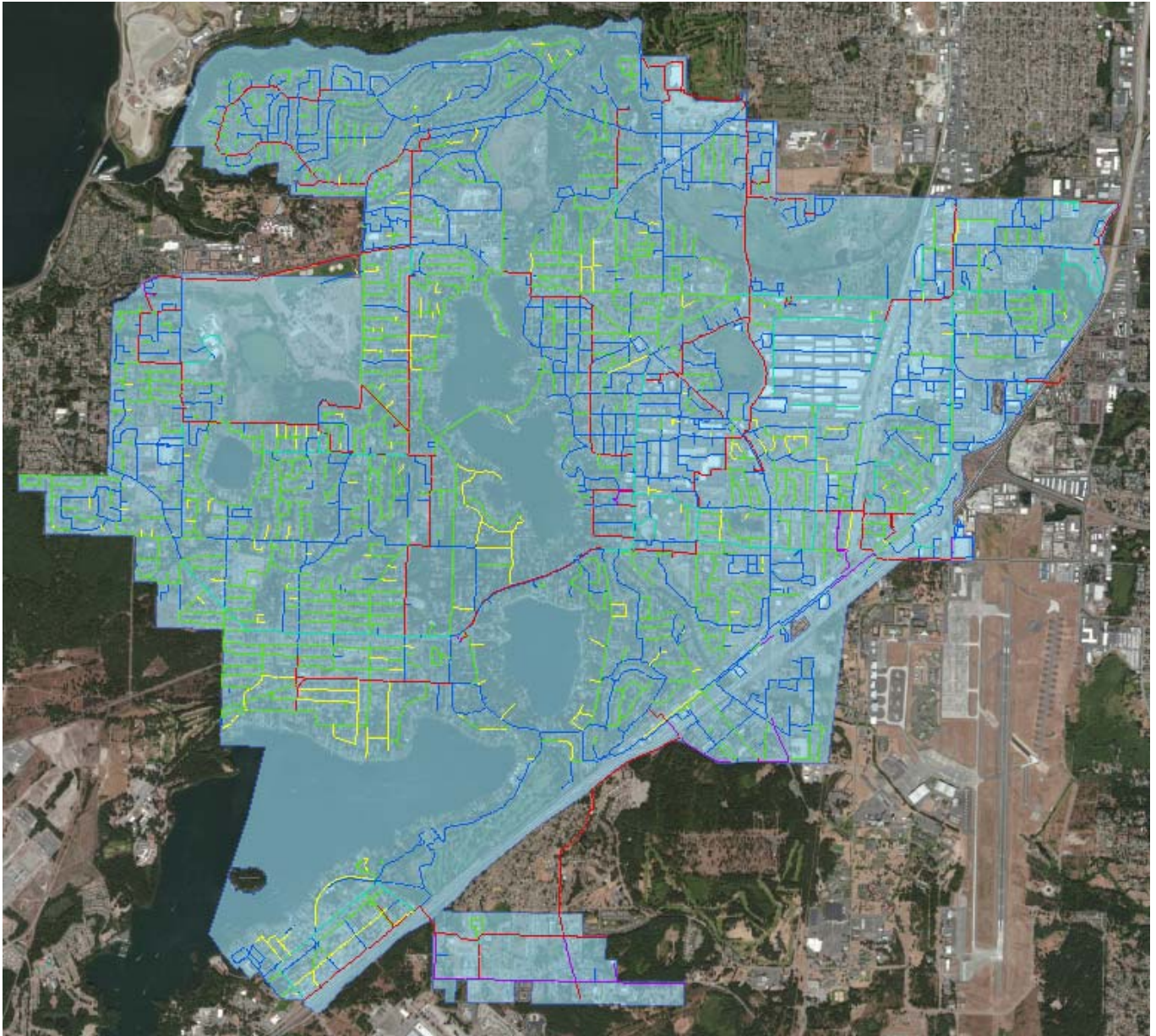
Section 4 – AMI System Software

Section 5 – Overall System

Section 6 – Other

Attachment B – District Service Area Map

Note: For meter box standard drawings and specifications please refer to the District web site at www.lakewood-water-dist.org . This information is included under the Developer Extension Agreement Document.



Attachment C - Failure Rates and Replacement Costs

Respondent must provide expected failure rates, repair prices and costs of battery change-out (if required) and other maintenance costs for meters (including registers), transmitters, and data collectors that will give the District a true representation of expected operating and maintenance costs. These costs will be included in District’s evaluation of total whole life cost of operation. The Respondent will be responsible for addressing failure rates that exceed the values included in these tables, including labor, materials, supplies, superintendence and all other costs that can be reasonably ascribed to returning the system to its minimum failure rate.

The Respondent must indicate the expected life in service of the system. If expected life is other than 10 years included in the table, then modify the table to align with Respondent’s warranty included in this proposal. Respondent must provide annotation for any underlying assumptions that may reasonably be deemed necessary to explain these numbers.

Table C1. Meter Interface Unit Failures

Year After Unit is Installed & Accepted	Expected Failure Rate (failures/1000 units/yr)	Pro-Rata Replacement Cost Percentage	Unit Repair Cost or Replacement (less pro-rata warranty adjustment)¹	Unit Preventative Maintenance Program Cost (e.g., battery replacement)	Guaranteed Maximum Failure Rate (failures/1000 units/yr)
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

Table C2. Data Collection Unit Failures

Provide a table for fixed data collection units that are being proposed.

Year	Expected Failure Rate (failures/unit/yr.)	Unit Repair Cost (less warranty adjustment)	Unit Cost of Preventative Maintenance Program
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			