KENT COUNTY WATER AUTHORITY

REQUEST FOR INFORMATION

WATER METERS AND
AUTOMATIC METER READING (AMR) SYSTEM

I. INTRODUCTION

The Kent County Water Authority ("KCWA" or "Authority") is seeking information from water meter manufacturers regarding the technical capabilities of their water meters and related mobile drive-by, fixed network advanced meter infrastructure (AMI), and cellular automatic meter reading (AMR) systems to meet the current and future meter reading needs of the utility. The overall goal of this Request for Information (RFI) is to gather information to assist with development of bid or proposal specifications that will meet the KCWA' s short term and long term goals for meter reading and water system management.

Response to this RFI may be submitted by any meter manufacturer interested in providing the KCWA with information on two way communication mobile AMR with the capability of migrating to a fixed network AMI or cellular based system. The system must integrate with the KCWA's customer information (CIS) and billing system by Conduent, formally Affiliated Computer Services (ACS). Any proposer must demonstrate at least five years' experience in the manufacture and delivery of 1.) Cold Water Meter of positive displacement (PD) and/or solid state (SS) type with absolute encoder registers/meter interface units (MIU), and 2.) Radio frequency (RF) and cellular automatic meter reading (AMR) endpoint modules. RF endpoints must be able to migrate from mobile drive by system for use in a fixed network AMI system.

RESPONSES TO THIS REQUEST FOR INFORMATION (RFI) ARE DUE TO THE KCWA BY <u>AUGUST 31, 2017</u> RESPONSE TO THIS RFI IS A <u>MANDATORY</u> PREREQUISITE FOR ANY FUTURE SUBMITTAL OF A PROPOSAL OR BID IN AN UPCOMING KCWA REPLACEMENT METER AND AMR SYSTEM REQUEST FOR PROPOSALS (RFP) OR BID. Responses shall be submitted to Kent County Water Authority, PO Box 192, West Warwick, RI 02893. To acquire an electronic copy of this RFI go to the website http://kentcountywater.org/vendors-suppliers.aspx , or to submit questions, companies may mail questions to PO Box 192, West Warwick, RI 02893.

II. CURRENT KCWA WATER METER READING OVERVIEW

The Authority serves approximately 26,750 active metered customers in, West Warwick, Coventry, East Greenwich, West Greenwich, and parts of Warwick, Scituate, Cranston, and North Kingstown, Rhode Island. The service area encompasses approximately 50 square miles of varying elevations ranging between 0 to 450 feet above mean sea level in elevation.

The Authority's meter department consists of four meter readers and one supervisor that operate and maintain a hybrid of Neptune RF mobile radio and Neptune automatic reading box (ARB) walk-by/punch reading systems. There are approximately 5,750 Neptune RF radios and 21,000 ARBs, and ten (10) manual dial read accounts. Fifty four (54) meter books are read and billed quarterly based on cycles and routes, with the exception of 40 accounts that are read and billed monthly. On average, 1/3

(roughly 9000 meters) are read per month by the KCWA water meter reading staff. Approximately 437 of the accounts are located in meter pits. The remaining meters are located indoors. The Authority's customer information system (CIS) and billing system that integrates and reconciles the meter readings is Conduent and their contact information can be provided upon request.

Reading Workflow

At the start of each new billing cycle, meter reading book files are exported from the Conduent utility billing system and imported to the meter reading workstation/desktop computer hosting Neptune N_Sight software. The import file is in the form of a Neptune import file using a standard ASCII file format. Once imported into the host computer, the meter supervisor assigns books into meter reading routes and programs into five (5) Trimble Ranger handheld RF reading devices networked to the host computer. The Trimble Ranger reads both the RF readings and ARB punch box readings. However, in order to read and store the ARB readings in the Ranger, the meter reading personnel must also carry a Neptune Advantage II punch reader. The Neptune Advantage II Probe provides instant visual reads of the ARB and wirelessly transmits those reads to the Trimble handheld device via Bluetooth. Once the routes are completed, the Trimble handhelds are cradled back to the host computer and the reading files are then exported back to the Conduent utility billing system server. The customer service staff then reviews the readings for exceptions and potential problems via both printed reports and automatic checks each reading cycle within the quarter. Any issues that are noticed in the review process are evaluated and work orders are generated to fix any meter problems prior to posting to customers' accounts. Lastly, a spool billing file is created each month for the respective quarterly readings inclusive of current charges and is sent to the bill printing company that send out the bills to the customers.

III. GOALS FOR FUTURE WATER METER READING

KCWA's previous meter replacement program occurred from 1992-96. Since then, the meters have been incrementally updated with the most state-of-the-art Neptune metrology and meter interface units (MIUs) as meter failures, radio failures, and/or new customers have been added to the system. This approach has resulted in several generational changes specifically to the endpoint reading technologies attached to brass bodied nutating disk PD meters. The Authority's goal is to replace 26,500 meters with reading endpoints for all meters ≤ two inches and 284 endpoints for large and compound meters (≥ three inches). Of the 284 meters, there are 262 compounds meters that will require dual endpoints or a device that can read both MIUs. KCWA wants to evaluate available metrology and MIU endpoint solutions that will result in either a complete drive-by read system that is fully capable of migrating to a fixed network system; or if the total installed upfront cost of a fixed network solution can be demonstrated as cost competitive, via cellular or other communication protocol, it will be separately considered on its own in comparison to the desired migratable RF system. These meters will be a mix of radios coupled to the meter and/or wired to an appropriate location separated from the meter. The meter replacement program is being structured over a three year period through rate revenues authorized by the Public Utilities Commission. The new AMR software must be able to integrate and be compatible with the Conduent billing software including seamless parallel systems interfacing (import and export file creation) for the entire duration of the meter replacement program to maintain consistent billing and service continuity. The KCWA is contemplating moving to monthly reading and billing once the meter replacement project is completed.

Key system goals, beyond providing timely and accurate meter reading information for billing may include:

- Providing on off cycle readings without impacting equipment warranties,
- Providing granular usage information to educate consumers using web applications, monitor leaks and abnormal usage patterns,
- Maintaining AMR system control & ownership, and
- Enabling data use for advanced analytics, including hydraulic modeling, GIS mapping (ESRI or equivalent), among other applications.

IV. SUBMISSION REQUIREMENTS

1. Company name, mailing address, contact name, telephone number, fax number, and email address.

2. Projects and References - Provide descriptions of at least three meter installation programs utilizing the referenced products completed, under construction, or planned within the past five years, listing location, size, ownership entity, date of implementation, current status, date of completion if not completed to date, contact name and telephone number. Projects included shall be for water meters and radio transmission units where the number of units provided ranges between 5,000 and 25,000.

3. Response to the attached Questionnaire. Please respond to each question in a numbered list. Attach backup information as required.

4. Provide ten (10) copies of all submitted materials.

5. Faxed and e-mailed responses will not be accepted.

Kent County Water Authority
ATTN: RFI Water Meters
1072 Main Street
West Warwick, RI 02893

V.   SUBSEQUENT STEPS

At the KCWA's discretion, oral presentation and interviews may be scheduled with all respondents, some respondents or none. If interviews are held, respondents will be contacted by the KCWA.

The KCWA will only recognize future RFP responses or bids from companies who have responded to this RFI. The information collected during the RFI process will be used to assist in determining the specification requirements considered for the Authority's AMR system.

1.   Provide the name of the product(s) and system(s) for which information is provided. Attach pertinent product information to your response.

Qualifications:

2.   State how long you have been in business under the same business name and owner/management structure. State how long the described meter and AMR system products have been on the market.

3.   List a minimum of three (3) recent contracts under which you provided water meters and AMR system (5000-25000 units) of the type described, at least one should be in southern New England.

4.   Have you ever been terminated on an awarded contract or otherwise failed to complete any work awarded? If "yes", describe the circumstances.

5.   Do you make all components used in the proposed system? If not, identify all other suppliers and manufacturing locations for the products that they offer and if there is an affiliation with the supplier. Please include company name, contact, address, phone, fax, e-mail, and web site.

6.   What is the term, in years, that all components will be fully supported and replacement parts made available.

7.   How many New England communities have you provided AMR equipment and water meters to in the last ten years? Provide general project information including:
   Job Name
   Contract Amount
   Number of Meters and Manufacturer
   Range of Meter Size
   Number and Types of Transmitters
   Number of Data Collection Units (DCUs)/Repeaters
   Date Completed
   City, Town, Owner, or District

8.   Have you, within the previous five (5) years, provided an AMR system to any community that utilizes Conduent for water billing? List any utilities that you have successfully integrated with using Conduent.

AMR System:

9. Provide a brief description of your system including network diagrams and all required AMR technologies. Please keep the summary to less than five (5) pages.

10. Provide a list and definitions of any acronyms, trademarks or trade names used to describe your AMR offering.

11. List absolute encoder water meters that the proposed AMR system currently supports.

12. Describe whether your system could communicate with existing Neptune absolute encoder ARB or RF systems. Describe how your system might be adaptable to existing Neptune meters with either MIU register or endpoint replacement. If only the endpoint transmitter gets replaced, what information is carried from the Neptune meter to the transmitter? Please provide a few references systems where this has been successfully employed.

13. How many register heads can one AMR module read? Describe how multiple register heads effect battery life and warranty.

14. What RF frequency is used? Is the frequency licensed or unlicensed? How many frequencies or channels are required? How are the frequencies or channels coordinated?

15. What is the RF module power rating (watts)? Describe any variable capability for power output to extend battery life.

16. Does AMR system offer a cellular endpoint offering? If so, what are the carrier agreements that are in place and what is the monthly cost per read per endpoint? Are the cellular reads only available to the end user only through the carrier-to-cloud or can a read also be obtained through a drive-by system or other on demand read.

17. Does AMR system have other endpoint signal transmitter technology offerings that employ Long Range (LoRa) or Low Power Wide Area Network (LPWAN) wireless platforms, Wifi, or other type? If so, please describe the technology being employed what the monthly cost per read? Are there local systems piloting this reading technology? Are the communication endpoints integrated into the MIU?

18. Describe the duration between transmissions of daily and hourly read data from the RF module to the DCU in each mobile and fixed network modes. Describe redundancy built-in to transmissions and how the head end systems backfills data for periods when data might have been missing.

19. Can the AMR endpoint module be remotely installed away from the meter? Please describe. Describe the preferred location for RF module deployment for migration to a fixed network system in the future to achieve minimal fixed network equipment.

20. How do you prevent RF interference (from outside sources and from the AMR network) from affecting network performance?

21. Describe the method for correcting performance issues related to low elevations, obstructions, or deep basement mountings or meter pits?

22. Describe how your system identifies meter signals from other contiguous water systems and separates them from customer base route prior to download to the billing system software.

23. Does the system provide bi-directional two way communication to the AMR module in fixed network mode? What are the advantages of bi-directional communications to the system? What are the disadvantages? Describe the typical duration required to execute an on-demand read request.

24. How is AMR network traffic controlled? For example:
a. Can RF modules initiate traffic?
b. Do RF modules require to be polled?

25. Please describe the memory in each RF module or register.
    a. What data is stored?
    b. How much data is stored?
        i. Interval
        ii. Other
    c. What happens if battery dies? Is memory maintained or retrievable?

26. Is the battery in the radio device field replaceable? Is the battery potted? Does the RF module transmit a low-battery alarm? How soon before failure is the alarm transmitted? What type of usage would impact validity of battery warranty?

27. Describe the process of waking-up or programming the RF module and the procedure by which a meter/RF module installer would test a newly installed RF module for successful operation. State in your response how long the installer must wait before readings can be verified on both the register head and the transmitted read from the endpoint. If applicable, how much water needs to flow through the meter before a reading can be verified on both the register head and the transmitted read?

28. Describe mobile data collection system and the process for administering a mobile meter reading operation. Describe whether drive and/or walk by meter reading can collect interval data and event flag information.

29. Describe the process to migrate from mobile to fixed network operational modes. Note whether the migration can be initiated remotely. Describe hardware, software, and support services recommended at transition. Include any meter or RF module modifications necessary to make transition.

30. Describe the process of firmware updates to the meter registers and endpoints.

31. Describe how the proposed system would be configured and operated in parallel with the existing reading system.

32. How many data collection units (DCU's) would be required to serve the KWCA service area upon transition to fixed network? What is the cost/unit? Where would the DCU's be located or mounted? Did you perform a radio propagation analysis of the system? If so, provide a copy. Would your organization be able to certify that the noted AMR system would cover 100% of water meter accounts in the system? For the purpose of preparing a propagation study, the KCWA will make available a list of addresses in their service area and a GIS Shape File or Google Earth KML, with KCWA owned facilities, upon request to dsimmons@kentcountywater.org.

33. Describe the WAN communications infrastructure used to communicate with the DCU and retrieve the meter data. Describe how this WAN will effectively reduce operating costs, provide the best performance and reliability to the KCWA, and securely transmit meter data.

34. Describe redundancy, backup system, and DCU/endpoint data storage in the event of data collector failure.

<u>Software and Features:</u>

35. Describe the features and capabilities of the AMR system software. This should include, but not be limited to, identifying the software's capabilities for notifying the KCWA of unusual occurrences, such as tampering, temperature, backflow, unusually high usage, and zero usage. Please indicate the nearest water utility location where the KCWA could view the software in actual use. Your response should include a description of any upcoming software enhancements.

36. Describe in detail how the following items are accomplished:
    a. Are read intervals fixed or adjustable?
    b. Describe the process and timing of data transfer between the meter, RF module, DCU, and office. Are all readings time correlated?
    c. Tamper detection (cut wire, other)
    d. What is the complete list of tamper detection features supported?
    e. Leak detection
    f. Backflow detection
    g. Remote programming and firmware upgrade
    h. Online web portal presentation – list standard offerings or modular solutions offered through paired systems
    i. Customer grouping, comparison, district metering analysis, or other data analytics
    j. Reading route optimization analytics if drive-by system.

37. Describe whether and how your system could communicate leak data to the Conduent system for presentment through the billing interface. Provide the names of all billing systems with which you have integrated leak notification information.

38. Does the system provide for email notification of system trouble reports or events such as leaks detected or data collector failure?

39. Identify AMR readings supported:
    a. 15-Min interval, transferred daily
    b. 15-Min interval, transferred weekly or monthly
    c. 1-Hour interval, transferred daily
    d. 1-Hour interval, transferred weekly or monthly

35. Describe the process for synchronizing customer name, address, and other account information between the billing system and the AMR system. Identify manual and automatic portions of the process. Identify whether you have automated synchronization of account data with Conduent.

36. Describe how the RF module and system software accommodates compound meters.

37. Do you offer each hosted and local head end systems If hosted is offered:
    a. How does the KCWA access the data?

_____

  b. Are reports automatically generated? If so please describe most common reports.

  c. How much historical data is available to the KCWA?

  d. Is the transfer of data to the KCWA (all daily reports, reading, etc.) covered by a monthly service fee? If not, please describe in general the pricing structure.

38. Describe data validation available in the system including automated reading estimation, gap filling, extrapolation, and manual read editing.

39. Describe integrated mapping software or extensions that are used in concert with the meter reading system.

40. Describe system data maintenance and backup. Describe the period of historical data maintained by the system at a given time.

41. Describe local network, server, and operating system requirements.

42. Describe any other features that make the proposed system advantageous to KCWA.

Water Meters:

The Authority is looking to standardize all of the system meters sized 5/8, 5/8" x 3/4", 1", 1-1/2" & 2" to a specific metrology. The one inch (1") and one and one half inch (1-1/2") have a mix of both screw and flanged end types.

43. Describe compliance with industry manufacture standards and lead regulation for each type and size of water meter described. Describe meter accuracy at all flow ranges and head loss performance relative to the applicable AWWA standards for all sizes.

44. The Authority is considering possible alternatives to the brass bodied nutating disc meter. Proposals on alternative water meter types meeting AWWA meter standards or materials should include typical cased price differences and benefits of the noted systems.

45. Describe UL listing and FM rating on compound and fire meters.

46. If meter register is battery powered will the meter continue to record flow and can it be manually read if the battery dies? Describe.

47. Describe product delivery including the timing of the date of order and the arrival product arrival .

Product Warranties, Support, & Maintenance:

48. **What are the warranties and guarantees that will be provided for the equipment and system, including all terms and conditions**? For RF modules clearly identify the communication setting (number of transmittals per day, on-demand enabled, single or dual port) for which the warranty is valid. Identify the current list price of modules against which the prorated warranty might currently apply.

49. Provide a history of the company's product line for water meters and meter reading technology. As new technology has been introduced to the market have they been compatible with previous products

or product lines? State the % failure rate of meter registers, meter bodies, and RF or cellular endpoints.

50. Provide a brief description of additional devices or changes that are planned for the meters or AMR system within the next three years.

51. What does the cellular, LORA, Wi-Fi, or other contract cost cover/ include in terms of annual software maintenance agreements?

52. Describe where your meter and AMR equipment components are manufactured. Explain how dynamic trade provisions might impact equipment availability and pricing.

53. Describe typical structure of technical support offered by the manufacturer, and renewable maintenance agreement options including costs.

54. Describe all battery warranties in detail. Please describe when the warranty begins relative to date of manufacture or the date of install.