

STATE OF NORTH CAROLINA
UTILITIES COMMISSION
RALEIGH

DOCKET NO. W-218, SUB 497

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

In the Matter of		
Application by Aqua North Carolina,)	
Inc., 202 MacKenan Court, Cary, North)	PUBLIC STAFF COMMENTS
Carolina 27511 for Authority to Adjust)	ON AQUA NORTH CAROLINA,
and Increase Rates for Water and)	INC.'S AMR AFFIDAVIT FILING
Sewer Utility Service for all Areas)	
in North Carolina)	

NOW COMES THE PUBLIC STAFF – NORTH CAROLINA UTILITIES COMMISSION (Public Staff), by and through its Executive Director, Christopher J. Ayers, and respectfully submits the following comments for Commission consideration.

BACKGROUND

On December 18, 2018, in Docket No. W-218, Sub 497, the Commission issued an Order Approving Partial Settlement Agreement and Stipulation, Granting Partial Rate Increase, and Requiring Customer Notice.

Ordering Paragraph No. 26 of the Commission's December 18, 2018 Order, at page 186, provides as follows:

26. That Aqua NC shall take the appropriate measures to share the 40-day read history collected by the Company's AMR [advanced meter reading] technology with the AMR-metered customers and shall notify the Commission when such information is being shared, including how such information is being provided to customers.

Further, Ordering Paragraph No. 27 of the Commission's December 18, 2018 Order, at page 186, provides as follows:

27. That within six months following the issuance date of this Order, Aqua NC shall file a report informing the Commission regarding the specific nature of the expected benefits to be achieved on a consolidated basis for the Aqua America subsidiaries, including Aqua NC, once full deployment of AMR technology is completed in all Aqua America operating states. Such report shall also indicate the planned timing of such expected benefits.

On June 18, 2019, Aqua North Carolina, Inc. (Aqua NC or Company), filed in the above-captioned docket the affidavit of Lisa Gresehover, National Metrology Manager, Aqua America, Inc., in compliance with Ordering Paragraph Nos. 26 and 27 of the Commission's December 18, 2018 Order (Aqua Affidavit). Affiant Gresehover commented that, as required by Ordering Paragraph No. 26, Aqua NC will notify the Commission at such time as the Company determines that it will be in a position to share the 40-day read history collected by its AMR technology with its AMR-metered customers, including a description of how such information will be provided to its customers. Further, Affiant Gresehover provided Aqua NC's report on AMR benefits in compliance with Ordering Paragraph No. 27. Aqua NC requested that the Commission accept and acknowledge its June 18, 2019 Report on AMR benefits as being in full compliance with the requirements of Ordering Paragraph No. 27.

The Commission issued Order Allowing Comments on June 27, 2019, stating interested parties may file comments regarding Aqua NC's response to Ordering Paragraph Nos. 26 and 27, of the Commissions December 18, 2018, Order.

Public Staff Comments

Ordering Paragraph No. 26 – Share the 40-Day Read History with Customers

The Aqua NC general rate case evidentiary hearing was in September 2018. The Aqua Affidavit was filed on June 18, 2019, a total of nine months later, but the AMR 40-day read histories are still not accessible to customers that are paying in rates for rate base of more than \$6.0 million for Aqua NC installed AMR meters.

As stated on pages 6 and 7 of the Aqua Affidavit, it is anticipated to be the first quarter of 2020 before Aqua NC has operable Automated Meter Reading Application (AMRA) to store and present a graph of daily customer consumption data. The Aqua Affidavit states that with the AMRA on page 7:

“The usage of data is expected to be readily available for Aqua America representations to share this information with customers **upon their specific request** (emphasis added).”

The Aqua Affidavit further stated on page 7 that Aqua America will begin in 2020 a long-term Strategic Plan for Meter Data Management and Advanced Analytics, which plan is included in the five-year capital budget. However, the Aqua Affidavit did not state a planned or targeted completion date.

The Aqua Affidavit further stated on page 7:

“Options for sharing data include, but are not limited to, a self-service customer portal or expanded daily use section on the monthly customer bill.”

The Aqua Affidavit indicates it could be as late as 2025 before the customer self-service portal is available to customers, a period of up to seven years after the September 2018 Aqua NC general rate case evidentiary hearing. In addition, it does not appear the information will be real time or immediately available to customers, as the AMR meter readings are collected only once each month. Providing customer daily meter reading information as much as 30-days old provides the customer limited useful information.

Aqua America began installing AMR meters in 2005 as stated on the attached response to Public Staff Legal Data Request No. 1, Item 7, attached as Exhibit 1. As 14 years have passed, the Public Staff does not understand why Aqua America has not developed and made readily available to Aqua NC customers the AMR collected water meter readings.

Advanced Metering Infrastructure Technology (AMI)

The Aqua Affidavit on page 2 states:

“The Company is converting to AMR technology in a manner that will facilitate upgrades to Advanced Metering Infrastructure (AMI) technology if or when that upgrade is in the best interest of Aqua America customers.”

AMI records real time useful customer usage information daily on customer self-service portals.

Recently Public Staff Utilities Engineers Charles Junis and Lindsay Darden received during a site visit, a demonstration by a Commission regulated utility of the real time information AMI available to metered water customers. Both Lindsay

Darden and Charles Junis were very impressed with the customer access and available information.

On December 16, 2015, a significant group of Public Staff employees attended a presentation by Sensus, a major meter developer and manufacturer whose development group is located near Research Triangle Park. The Sensus presenter's only statement about AMR was that AMR was the equivalent of the "flip phone." The entire remaining two hours plus were about AMI.

The Public Staff in a recent water utility seminar learned that AMI cellular is now available at a capital cost similar to or below the AMR capital costs. The AMI meter readings go through cellular systems and are transmitted to the water/wastewater utility billing department. This process eliminates the need for the installation and operation of repeaters and/or transmitters on elevated water tanks, radio towers or other elevated structures. It also eliminates the need for the utility to monthly send a specially equipped AMR meter reading truck to the subdivision.

The Public Staff Legal Data Request No. 1, Item 4, requested that Aqua NC provide the estimated cost for equipment and installation for the conversion of the current AMR meters to AMI meters. This Data Request No. 1, Item 4 further stated, "Do not provide costs for antennae, repeaters, towers, etc." Aqua NC's response was:

"The company has not performed a cost analysis for the estimated costs for equipment and installation per meter for the conversion of the current AMR meters to AMI meters".

Attached as Exhibit 2, is a copy of Public Staff Legal Data Request No. 1, Item 4 and Aqua NC's response.

Public Staff Legal Data Request No. 1, Item 5 asked are the AMR meters that Aqua NC is currently installing compatible to be converted to AMI cellular. Aqua NC's response attached as Exhibit 3, states:

"AMI cellular technology was (as understood by Aqua) not considered an option. Therefore, the compatibility of the installed AMR meters to AMI cellular providers has not been evaluated. AMI technology (non-cellular) was identified as a potential future enhancement. This potential AMI solution was selected due to the complexity and evolution of cellular technology and related life when compared to a believed more sustainable and proved AMI fixed network platform".

Public Staff Legal Data Request No. 1, Item 6 requested Aqua NC to provide a copy of all cost benefit analyses comparing the operation costs of AMR radio read meters, with the operational costs of AMI cellular water meters. Aqua NC's response, attached as Exhibit 4, states no such cost benefit analyses have been performed.

On December 13, 2016, the Public Staff met with representatives of Aqua NC and Aqua America. In that meeting, the Public Staff suggested that as Aqua had six elevated water storage tanks well distributed on the Bayleaf/Leesville Master System serving approximately 6,000 water customers, that Aqua NC conduct an evaluation on the installation and operation of the AMI meters on the Bayleaf/Leesville Master System. Aqua declined stating such an evaluation would be too costly.

Aqua NC's current AMR meter reading requires an Aqua NC meter reading truck equipped with special AMR equipment to drive monthly through the customers' neighborhood and collect the meter readings. The AMI non-cellular technology described by Aqua NC in the response to Public Staff Legal Data Request No. 1, Item 5, requires elevated fixed structure receiver equipment which then transmit the data. However, Aqua NC only has elevated water storage tanks on nine of its more than 700 water systems.

Aqua on its 2018 Annual Report for December 31, 2018, listed a total of 81,015 water customers. The nine water systems with elevated storage have approximately 26,000 water customers, being only approximately 32% of Aqua NC's total water customers. Therefore, the remaining approximately 700 Aqua NC water utility systems serving approximately 55,000 customers do not have access for AMI equipment on Aqua NC owned elevated tanks or towers.

Public Staff Supplemental Comments

On July 9, 2019, the Public Staff sent to Aqua NC Legal Data Request No. 1, with a requested return date of July 19, 2019, which is attached as Exhibit 5. The Public Staff as of the completion of these comments on July 25, 2019, has not received responses to Data Request Items 8, 10, 11, and 12. Aqua NC has advised the Public Staff that Aqua hopes to provide the remaining responses on or before Friday, July 26, 2019, which is the filing due date. Unfortunately, both the Public Staff Engineer and Staff Attorney William E. Grantmyre working on the AMR meter issue are out of the office and away from the area on Friday, July 26, 2019, on long

standing family commitments, and are not available to review Aqua NC's responses. Therefore, the Public Staff reserves the right to file supplemental comments after evaluating Aqua NC's responses to Items 8, 10, 11, and 12.

Conclusion

The Public Staff is very concerned that the customers do not have access to their daily meter readings through the Aqua NC AMR process. The Public Staff is also very concerned with the slow progress of Aqua America and/or Aqua NC in developing the customer self-service portal. The significant capital investment for the AMR meters, through depreciation and return on rate base have significantly increased the customer funded revenue requirement, but the customers have not received customer observable benefits.

The Public Staff also is concerned that although Aqua NC talks about upgrades to AMI technology, where customer real time information would be available, the Aqua Affidavit and Aqua NC responses to Public Staff Legal Data Request No. 1 do not provide any information that Aqua is evaluating that process. Aqua NC stated in response to Public Staff Legal Data Request No. 1, Item 3 that the planned completion of its AMR installations is 2027, a time period eight years from 2019. There was no mention of ongoing studies or a targeted date of conversion to AMI technology in Aqua's Affidavit or Aqua NC's data request responses.

The Public Staff recommendation:

1. That the Commission order Aqua NC to continue to file updated reports every six months on Aqua NC's progress on Ordering paragraphs 26 and 27, with the opportunity for the Public Staff and other intervenors to file comments.

Respectfully submitted, this the 26th day of July, 2019.

PUBLIC STAFF
Christopher J. Ayers
Executive Director

David T. Drooz
Chief Counsel

Electronically submitted
s/William E. Grantmyre
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CERTIFICATE OF SERVICE

I, William E. Grantmyre, hereby certifies that I served the foregoing Public Staff Comments on Aqua North Carolina, Inc.'s AMR Affidavit Filing has been served on the attorneys for Aqua North Carolina, Inc., Jo Anne Sanford and Robert H. Bennink, Jr., Margaret Force and Teresa Townsend of the Attorney General's Office, and Eric Galamb, Intervenor, by electronic delivery upon agreement of the parties.

This the 26th day of July, 2019.

Electronically submitted
s/William E. Grantmyre

**Aqua North Carolina, Inc.
Docket No. W-218, Sub 497
Public Staff Legal Data Request # 1
Date Requested: July 9, 2019
Date Due: July 19, 2019**

Public Staff Legal Contact: William E. Grantmyre
Phone #: (919) 733-0977
Email: william.grantmyre@psncuc.nc.gov

Subject of Data Request: AMR Benefits

Please provide any available responses electronically. If in Excel format, be sure to include all working formulas. In addition, please include (1) the name and title of the individual who has the responsibility for the subject matter addressed therein, and (2) the identity of the person making the response by name, occupation, and job title.

Question 7

- Q. Please provide the year and the state in which Aqua America (Philadelphia Suburban) first installed AMR water meters.
- A. There are some miscellaneous dates in asset records which indicate installations prior to 2005 but these dates are inaccurate. The first AMR meter project began in PA in 2005.

Prepared by:

B. Thompson, Procurement Director

L. Gresehover, National Metrology Manager

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Question 4

- Q. Please provide the estimated costs for equipment and installation for the conversion of the current AMR meters to AMI meters. Please list separately the equipment cost per meter and installation cost per meter. (Do not provide costs for antennae, repeaters, towers, etc.)
- A. The company has not performed a cost analysis for the estimated costs for equipment and installation per meter for the conversion of the current AMR meters to AMI meters. The Endpoint Receiver Transmitters (ERTs) installed in North Carolina (100W ERTs) can operate in handheld, mobile, or fixed network mode, as described in the product spec sheet. See Attachment 1. Further and as specified in Mr. Thompson's rebuttal testimony on 9/4, page 9, lines 9-21 AMI was considered a potential future enhancement to our AMR conversion. It is premature to consider where AMI deployment is practical until AMR processes and benefits are first built out, implemented and realized.

Attachment 1 – Legal DR #1 Q4 Attachment 1 – Itron 100W ERT Spec Sheet

Prepared by:

B. Thompson, Procurement Director

L. Gresehover, National Metrology Manager



Legal DR 1 Q4



100W

Water Communication Module

The 100W ERT® communication module is the latest addition to Itron's portfolio of advanced metering devices for water utilities. Featuring a compact design, industry-leading battery life and technology designed to adapt and grow with your business, the 100W module can help you streamline your operations and maximize your resources today and into the future.

100W ERT modules are available in two housing designs, supporting both water pit and remote installations. The different 100W ERT modules are identified as follows:

- » 100W is to be utilized with encoder registers in a pit environment
- » 100WP for pulser registers in a pit environment
 - All new 100W ERT modules for pit applications will come standard with a red integral connector port to utilize the optional 100W Through-The-Lid (TTL) antenna

- » 100W-R for encoder registers in remote applications
- » 100WP-R for with pulser registers in remote applications

These modules offer advanced two-way meter data collection designed specifically for Itron collection systems using handheld, mobile, fixed network and combination hybrid solutions. 100W ERT modules differentiate themselves from other devices on the market by providing true two-way

communications capabilities. Engineered from the ground up to leverage the benefits of ChoiceConnect™ collection systems, 100W ERT modules enable easy migration from mobile to fixed network operations as your business needs evolve. With Itron's complementary communications technology, fixed and mobile network systems can be deployed side-by-side in hybrid configurations to ensure maximum efficiency and reliability in both high and low-density meter populations.



100W

Water Meter Compatibility

The 100W ERT module is compatible with industry-leading water meters from Itron—as well as those from all major manufacturers such as Badger, Elster AMCO, Hersey, Master Meter, Neptune and Sensus—enabling water utilities to consolidate all their water meters under a single reading system. Powered by proven, advanced lithium battery technology; the module is designed for 20 years of battery life in both fixed network and mobile modes.

Data Logging

The 100W ERT module stores 40 days of hourly consumption information, which can be collected by the fixed network system to leverage real time data collection or can be read by mobile or handheld systems. This data is presented in four basic use cases:

- » Any hourly reading within the last 40 days
- » A set of 24 consecutive hourly readings
- » A set of 40 daily readings
- » A set of 40 days of hourly interval data are available even in mobile mode

Superior Performance

The 100W ERT module utilizes 120 radio channels in Fixed Network and 50 radio channels in mobile and handheld modes, randomly selecting one channel for each data message. This multi-channel approach delivers higher read integrity over competing products by reducing the effect of interfering signals from other radio frequency (RF) signals in the area. The 100W ERT module will transmit the Fixed Network consumption messages at peak radiated power greater than 1 Watt.

Reliability

100W ERT modules feature a circuit assembly and battery pack that are fully encapsulated within a specially-formulated potting material to completely protect internal components from water, contaminants, corrosion, rough handling and temperature cycling. With their straight forward, rugged design, 100W ERT modules use substantially fewer components than most competing products, resulting in greater reliability. The advanced, integrated antenna operates effectively in a wide range of meter box installations. The 100W ERT module offers peace of mind with a 20 year limited warranty.

Lower Cost of Ownership

100W ERT module devices feature industry-leading battery life, ensuring your meter data collection investment achieves substantially better financial returns than competing products with batteries that typically last only ten or twelve years. When one considers the advancements in leak, reverse flow (absolute encoder version only) and tamper detection, 100W modules necessitate fewer field investigations and substantially lower expenditures for installation, meter reading, customer service and field service. And with a low battery alarm, these modules help utilities better plan and manage the replacement of units in the field.

Leak Management

Water loss management is critical to any water utility's success. 100 Series modules can be paired with Itron's advanced acoustic Leak Sensor. The Leak Sensor collects and analyzes changes in pipe acoustics that indicate probable leaks in the distribution system environment to detect both new and pre-existing leaks automatically. Leak Sensor technology, coupled with the module's internal customer-side leak detection algorithm and the option to use data from groups of 100W ERT modules (District Metering) provide the utility with a highly accurate picture of the overall health of the water distribution system.

Leak Data

The 100 Series collects and stores the data from the Leak Sensor. The Leak Sensor samples the pipe conditions every 22.5 minutes or 64 times daily. The 100 Series stores the 8 quietest analyses daily and will hold 20 days worth of data. This data is picked up during normal meter reading operations and seamlessly transfers the data to our hosted web based solution (mlogonline).



100WR

100W ERT MODULE SPECIFICATIONS

Functional

- » Power Source: Two "A" cell lithium batteries warranted for 20 years
- » Maximum meter register pulse frequency (pulse version only): 4 Hertz
- » Operating temperature:
 - -40°C to +70°C for remote applications
 - -20°C to +60°C for pit applications
- » Storage temperature: -40°C to + 75°C for maximum of 1,000 hours
- » Humidity limits: 0 to 100% (submersible)
- » Maximum register cable dimension: 300 feet with Itron-approved cable and splice connectors
- » Meter compatibility: See Water Module Meter Compatibility Guide (PUB-0063-002)

Transmission Parameters

- » Data message:

Multiple RF channel transmissions of meter register value, cut cable and or communication error tamper(s), reverse flow (encoder version only) and system leak status messages, as well as low battery indicator is transmitted every nine seconds in mobile mode. All this information and last 7 time synchronized consumption intervals is transmitted every five minutes along with a contingency SCM (Standard Consumption Message) every 60 seconds in fixed network mode
- » Transmitter frequencies:
 - 908 - 924 MHz (Standard Power) in mobile mode
 - 903 - 926.8 MHz (High Power) in fixed network mode
- » Operates in bubble-up mode and does not require a license from the Federal Communications Commission (FCC) or Industry Canada (IC)
 - FCC Part 15.247
 - Industry Canada RSS-210

Approved Reading Devices for Collecting Datalogging Reads

- » Network system: Itron Fixed Network 100 Collectors and Repeaters (CCU 100 and Repeater 100) which offer full two-way communication capability.
- » Drive-by system:
 - MC3 with MV-RS v8.0 or higher and FCS with v2.2 or higher
 - MC Lite with MV-RS v8.1 or higher and FCS with v2.3 or higher
- » Walk-by system:
 - FC300 with SRead handheld computers with MV-RS v8.1 or higher and FCS with v2.3 or higher
 - FC200SR (part number FC2-0005-004 or FC2-0006-004 will support datalogging) handheld computer with MV-RS v8.1 or higher and FCS with v2.3 or higher

Approved Reading Applications

- » Multi Vendor Reading System (MV-RS) v8.1 or higher or FCS v2.2 or higher software can read the 100W ERT module Standard Consumption Message (SCM) and Datalogging with the following reading devices: MC3 v3.3 or higher
- » Multi Vendor Reading System (MV-RS) v8.2 or higher can read the 100W ERT module Standard Consumption Message (SCM) and Datalogging with the following reading devices: MC3 v3.3 or higher, FC300SR, FC200SR, and MCLite

Approved Programming Devices

- » FC200SR with Field Deployment Manager (FDM) version 1.1 or higher software
- » FC300SR with Field Deployment Manager (FDM) version 1.1 or higher software
- » 900 MHz Belt Clip Radio Field Deployment Manager (FDM) version 1.1 or higher software

The 100W encoder version does not require any programming—it automatically detects the register type within one hour of being connected. 100W ERT modules do not require a FCC license.

Programmable Mode Options

- » Mobile/Handheld Mode
 - This is the standard mode in which all 100W ERT modules will be shipped. This mode should be utilized when mobile or handheld meter reading will be the primary method of collecting the Standard Consumption Message (SCM) or datalogging reads.
 - The SCM will bubble-up in this mode every 9 sec. at standard power optimized for mobile read rate performance.
 - The battery life for this mode is 20 years
- » Fixed Network (FN) Mode
 - This mode is to be utilized when fixed network will be the method of meter data collection
 - A high power Network Interval Message (NIM) will be transmitted every 5 minutes with a contingency SCM message transmitted every minute at standard power
 - FN mode can be programmed at the factory, during installation with an approved handheld device or through mobile application after initial installation and programming
 - The battery life for this mode is 20 years
- » Hard-to-Read Mobile/Handheld Mode
 - This mode should only be used when communication modules are installed in difficult to read locations where standard mobile mode is not sufficient for satisfactory reading performance
 - This mode will bubble-up an SCM at 30 seconds with high power output to optimize performance of these unique applications
 - The battery life of this mode is greater than 10 years

- » High Power Mobile Mode
 - This mode should be used when communication modules are installed in difficult to read environments where there is a high concentration of unfriendly RF and where standard mobile mode is not sufficient for satisfactory reading performance
 - This mode will bubble-up and SCM at 60 seconds with a higher power output to optimize performance of these unique applications
 - Battery life for this mode is 20 years

100W & 100WP Pit Dimensions

- » Height: 4.5 inches
- » Maximum diameter:
 - Lower: 3.90 inches
 - Upper: Approx. 1.70 inches
- » Weight: Approx. 9.6 oz.
- » Module cable length without integral connector: 5 feet and 20 inches (for register direct mounting)

- » In-line connector register cables: 5 feet and 25 feet (ordered separately)
- » Pit models can be installed up to 300 ft. from meter

100WR & 100WP-R Remote Dimensions

- » Height: 4.5 inches
- » Width: 5.05 inches
- » Depth: 1.47 inches
- » Weight: Approx. 9.6 oz.
- » Module cable length 10 inches
- » Remote models can be installed up to 300 ft. from meter

Mounting Options

The 100W and 100WP models have a compact housing and features specifically designed for water pit mounting options

- » Direct-mount for Badger, Elster and Hersey meters
- » Rod-mount on a ½ inch diameter fiberglass or other non-metallic rods

- » Shelf-mount for pit lid manufactures that contain recessed cavity on the underside of the pit lid

- » Through-the-lid mounting with a pre-drilled 1.75 inch hole and up to 2.5-inch maximum lid thickness

- » Direct-mount to any flat surface with screw kit

The 100W-R and 100WP-R models are designed for remote mounting applications

- » Wall-mount for installation to the side of residence or building using screw kit
- » Pipe-mount for installation on pipe sizes from ¾ inch up to 4 inch
- » Direct-mount for Badger and Elster meters

Regulatory and Standards

- » FCC Part 15.247
- » Industry Canada RSS-210



At Itron, we're dedicated to delivering end-to-end smart grid and smart distribution solutions to electric, gas and water utilities around the globe. Our company is the world's leading provider of smart metering, data collection and utility software systems, with over 8,000 utilities worldwide relying on our technology to optimize the delivery and use of energy and water.

To realize your smarter energy and water future, start here: www.itron.com

CORPORATE HEADQUARTERS

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Subject of Data Request: AMR Benefits

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Question 5

- Q. a. Are the AMR meters that Aqua is currently installing compatible to be converted to AMI cellular?
- b. Please provide the make and model number of the AMR meters Aqua is currently installing; and
- c. Please provide the estimated costs for equipment and installation for the conversion of Aqua's current AMR meters to AMI cellular. Please list separately the equipment needed, the equipment cost, and the installation costs.
- A. Aqua America has contracts with multiple meter vendors to satisfy all conditions and metering applications. The standard residential meter (5/8", 3/4", and 1" in size) that is currently installed by Aqua NC is a Badger Recordall Disc Series. However, the Neptune T-10 is a comparable product that is available to Aqua America and therefore Aqua, NC at a comparable price. Each of these meters is compatible with the Itron 100W ERTs and AMR reading system and therefore future meter selection for this type of installation will be price based, given the products are comparable and both compatible with our AMR program.

AMI cellular technology (as understood by Aqua) was not considered an option. Therefore, compatibility of the installed AMR meters to AMI cellular providers has not been evaluated. AMI technology (non-cellular) was identified as a potential future enhancement. This potential AMI solution was selected due to the complexity and evolution of cellular technology and

related life when compared to a believed more sustainable and proven AMI fixed network platform.

Prepared by:

B. Thompson, Procurement Director

L. Gresehover, National Metrology Manager

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Question 6

- Q. Please provide a copy of all cost benefit analyses performed by Aqua NC or Aqua America or presented to Aqua NC or Aqua America by a third-party or vendor, comparing the operational costs of Aqua NC's or Aqua America's AMR radio read water meters, with the operational costs of AMI cellular water meters.
- A. The company has not performed or asked a third party to perform a cost benefit analysis of the operational costs of AMR radio read water meters as compared to the operational costs of AMI cellular water meters.

Prepared by:

B. Thompson, Procurement Director

L. Gresehover, National Metrology Manager

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1.
 - a. Please provide the name of each water system that Aqua replaced conventional water meters with AMR water meters from January 1, 2018 through June 30, 2019.
 - b. For each such water system, please provide the number of conventional water meters replaced with AMR meters, and the month the replacements took place.
2. Please provide the total number of conventional water meters replaced with AMR meters from Aqua beginning the replacements through June 30, 2019 for:
 - a. Brookwood/La Grange;
 - b. Aqua-Uniform rate water systems; and
 - c. Fairways Water.
3. Please provide the number of planned conventional water meter replacements with AMR meters for each year 2019 through 2027.
4. Please provide the estimated costs for equipment and installation for the conversion of the current AMR meters to AMI meters. Please list separately the equipment cost per meter and installation cost per meter. (Do not provide costs for antennae, repeaters, towers, etc.)
5.
 - a. Are the AMR meters that Aqua is currently installing compatible to be converted to AMI cellular?
 - b. Please provide the make and model number of the AMR meters Aqua is currently installing; and

- c. Please provide the estimated costs for equipment and installation for the conversion of Aqua's current AMR meters to AMI cellular. Please list separately the equipment needed, the equipment cost, and the installation costs.
6. Please provide a copy of all cost benefit analyses performed by Aqua NC or Aqua America, or presented to Aqua NC or Aqua America by a third-party or vendor, comparing the operational costs of Aqua NC's or Aqua America's AMR radio read water meters, with the operational costs of AMI cellular water meters.
7. Please provide the year and the state in which Aqua America (Philadelphia Suburban) first installed AMR water meters.
8. Please provide copies of all priority service orders as described on page 5 of Ms. Gresehover's affidavit for May 2019 involving:
 - a. Tamper reports;
 - b. High usage and customer leaks;
 - c. Zero use; and
 - d. Meter malfunctions.
9. Please provide a copy of the Aqua NC AMR automated report for May 2019 as described on page 5 of Ms. Gresehover's affidavit.
10. Please provide a detailed explanation why 10 months after the Aqua NC Sub 497 general rate case hearing in September 2019, when the Aqua NC customers are paying in rates for more than \$6.0 million in rate base for AMR water meters, yet the meter readings are not available to customers upon the customers' specific request.
11. Aqua states on page 7 and 8 of Ms. Gresehover's affidavit that to share data with customers, the options include:

"a self-service customer portal or an expanded daily use section on a monthly customer bill"

and that 49% of Aqua America's customers currently have the equipment installed to collect this information.
 - a. Why is this equipment is not installed for Aqua NC's AMR customers?
12. As stated in the Conclusion on page 8 of Ms. Gresehover's affidavit, why will it take Aqua NC until 2027, a period of 8 years, for the future implementation of full customer benefits of AMR technology.

13. Please state whether the future AMR technology that Aqua NC describes in this affidavit will allow a customer to access immediately that customers' current meter reading and past readings that month, at any time prior to the Aqua end-of-the-month AMR radio read.