CITY OF PORTSMOUTH, NH
WATER AND SEWER DIVISIONS

REQUEST FOR PROPOSAL
FOR

WATER METER REPLACEMENT AND AUTOMATED METER READING (AMR) DEPLOYMENT

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WATER AND SEWER DIVISION

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INVITATION TO PROPOSE

Sealed Proposals for the contract **"WATER METER REPLACEMENT AND AUTOMATIC METER READING (AMR) DEPLOYMENT" RFP #07-08** should be received by purchasing department for the City of Portsmouth located at 1 Junkins Avenue, Portsmouth, NH 03801, by **2:30 P.M**. on **September 7, 2007.**

Project Background:

The City of Portsmouth is a municipality providing water services to a population of 30,000 in 6 communities in the Portsmouth area. The City manages a meter population of about 8,000 water meters. The population includes about 70 irrigation meters, which are included in this project.

The City currently has the following meters in service: Neptune T-10/T-8 4,200, ABB C-700, 2,050; Trident T-8/T-10, 1,700; and 50 Hersey meters. Approximately 7,500 meters are read and billed every four months, the remaining meters are billed monthly.

The City intends to replace or retrofit its existing water meter population and to install a radio-based automatic meter reading system as a two year project. The purposes of this project are threefold: (1) to increase revenue generation by replacing old under-registering meters; (2) to reduce meter reading, billing and customer service operating expenses, and (3) to improve the quality of customer service, through the installation of an automated meter reading system.

Scope of Work:

The City is seeking qualified and experienced Proposers to perform the following tasks:

- Purchase and install approximately 4,000 residential and commercial meters meeting AWWA standards and the City's technical requirements. Meters will be ordered, purchased, shipped to, inventoried and installed by the Proposer.
- Purchase and install or furnish radio-based AMR equipment for about 4,000 meters to be replaced and 4,000 meters not to be replaced, including meter interface units

(MIUs), data collection units, control computers, firmware and software, installation and diagnostic field tools, portable field collection units, etc.
- Replace or modify existing meter box covers as necessary in conjunction with installation of the AMR system for approximately 80 meters 5/8" through 2" located in outside pits, to meet Proposers AMR system performance requirements
- Project management and handling of all materials and services to ensure the above services are coordinated.
- Communication, scheduling and reporting processes for all installation services.
- Technical support for the AMR system(s) and all accessories
- Training of appropriate City personnel on AMR system.
- Any other equipment and services necessary to ensure a complete and working system.
- Data transfer into Pentamation System.

Proposal Process:

A mandatory Pre-Proposal Conference will be held on **August 17, 2007,** at **10:00 a.m.** City Hall, Conference Room A 1 Junkins Avenue, Portsmouth, NH 03801. Representatives from the City including the Public Works, Billing office, Information Services, and Maintenance Department will be available for discussions at this meeting. Potential Proposers that intend to submit proposals on the project are required to attend the Pre-Proposal Conference.

Proposal Sequence includes:

- Pre-Proposal Conference– This conference is for Proposers to ask questions and be informed of the schedule and content requirements for the proposal and interviews.

- Proposal Due Date – Proposals are due on **September 7, 2007** at **2:30 p.m**. in accordance with the published requirements. All proposals shall be received at the time and place indicated in this document. Those proposals not submitted in strict accordance with these requirements will not be considered. This proposal submittal shall be prepared and submitted in a dual envelope system; one envelope containing the proposal, the second envelope including required project cost information. Project cost information will be evaluated as part of the final selection criteria; after all other selection criteria are evaluated. These requirements are more fully described in later sections.

- Additional Questions to Proposers – In the event that, during the review and evaluation of the proposals, the City has additional questions; the Proposer may be contacted at the sole discretion of the City.

- Review/rank Proposals– After all review and any additional questions are answered, the proposal review will be complete. It is expected that this review will result in the highest-ranked Proposers being short listed for further evaluation.

- Presentation – The City may schedule presentations for short listed firms. The presentations will allow the City to personally meet and listen to the Proposers' teams and to clarify any outstanding issues. If conducted the City will provide a presentation agenda for each Proposer.

- Contract Negotiations – The City and the successful Proposer will negotiate any outstanding issues concerning the proposal. If a mutually agreeable contract cannot be reached within a reasonable time frame, the City reserves the right to terminate negotiations with the first ranked Proposer and begin discussions with the second ranked Proposer.

The Request for Proposal, which includes an invitation to propose, instructions, technical specifications, and life cycle cost forms, will be made available as a PDF file on the City' web-site. The RFP will also be available in hard copy at the Purchasing Department 1 Junkins Avenue, Portsmouth, NH 03801. **PLEASE CONTINUE FOR THE COMPLETE REQUEST FOR PROPOSAL.**

Vendors who obtain the RFP via the City website should register their interest with the Purchasing Coordinator, to ensure that they will receive potential addenda. This is the Vendor's responsibility.

The City reserves the right to reject any and all Proposals, to waive any technicalities, and to accept any proposal in the best interest of the City of Portsmouth.

CITY OF PORTSMOUTH, NH
WATER AND SEWER DIVISIONS

REQUEST FOR PROPOSAL
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WATER METER REPLACEMENT AND AUTOMATED METER READING (AMR) DEPLOYMENT

CONTRACT NO.

PART 1

INSTRUCTIONS TO PROPOSERS

1.1. GENERAL INSTRUCTIONS AND CONDITIONS

1.1.1. All Proposers are required to complete the acknowledgement of City general instructions and conditions, attached as Appendix A.

1.2. RECEIPT AND OPENING OF PROPOSAL PACKAGES

1.2.1. Proposals submitted for the Project will be received as stated in the Invitation to Propose.

1.2.2. Proposals received prior to the advertised hour of opening will be kept secured and sealed. The officer whose duty it is to open them will decide when the specified time has arrived, and no Proposal received thereafter will be considered by the City.

1.2.3. Acceptance of a proposal from a Proposer does not automatically result in a presentation. The time that is indicated on the date stamped by the Purchasing Coordinator is considered the official time. Upon submission, all proposals become the property of the City. Proposals are retained confidentially until selection but are otherwise subject to the right to know law.

Proposals may be submitted in person or by mail to the following address:

Purchasing Coordinator

City of Portsmouth

1 Junkins Avenue

Portsmouth, NH 03801

1.3. PREPARATION OF PROPOSALS

1.3.1. All proposals shall be submitted as a set of seven (7), one (1) original and six (6) copies, and either typewritten or completed with pen and ink, signed by Proposers authorized representative(s).

1.3.2. The City may consider as irregular any conditions attached to the Proposal, on which there is an alteration of, or departure from, the Forms attached.

1.3.3. Erasures or other changes in the Forms attached must be explained or noted over the signature of Proposer. Failure to do so shall render Proposer non-responsive and may cause rejection of the Proposal.

1.4. ADDENDA AND INTERPRETATIONS

1.4.1. All questions by Proposer(s) as to the interpretations of the Request for Proposal must be submitted in writing to: Lori MacGinnis, Purchasing Coordinator, 1 Junkins Avenue, Portsmouth, NH 03801. RFP questions must be submitted by **August 24, 2007**.

1.4.2. Every interpretation made to a Proposer will be in the form of an addendum to the Request for Proposal, and when issued, will be on file in the office of the Purchasing Coordinator.

1.4.3. All addenda will be distributed to each person holding the Request for Proposal, but it shall be the Proposers responsibility to make inquiry as to the addenda issued. All such addenda shall become part of the Request for Proposal and all Proposers shall be bound by such addenda, whether or not received by the Proposers.

1.4.4. The City will not be bound by any information, explanation, clarification, or any interpretation, oral or written, by whosoever made, that is not incorporated into an addendum to the Request for Proposal. No response will be made to inquiries received after the RFP Questions Deadline.

1.5. MODIFICATION AND WITHDRAWAL OF PROPOSALS

1.5.1. Proposals may be modified after they have been submitted, but only before the deadline established for receipt of Proposals. Modifications must be signed by the Proposer(s) and must be received by the City no later than the deadline.

1.5.2. Proposals may be withdrawn after they have been submitted, but only before the deadline established for receipt of Proposals. Withdrawals must be signed by the Proposer(s) and must be received by the City no later than the deadline.

1.6. PRE-PROPOSAL CONFERENCE

1.6.1. At the Pre-Proposal Conference, the general requirements of the Project will be discussed. Any additional questions raised by Proposers will be discussed.

1.6.2. Also discussed will be questions regarding the preparation and submission of responses and general requirements for the Project.

1.6.3. It should be emphasized, however, that nothing stated or discussed during the course of this Pre-Proposal Conference shall be considered to modify, alter or change the requirements of the Request for Proposal, unless it shall be subsequently incorporated into an addendum to the Request for Proposal.

1.7. EVALUATION OF PROPOSERS' RESPONSES AND PROPOSALS

1.7.1. After the Proposals have been opened, the City will evaluate the Proposers' responses using the selection criteria which includes; financial data, Proposers' references, Proposers' experience and other data relating to the Proposers' responsibility and qualification to perform the Project satisfactorily. Proposers may be required to submit additional or supplemental information to the City, if necessary, for the City to determine whether the Proposer(s) meet all of the standards outlined. Costs will be reviewed of short-listed firms only after initial qualifications and evaluated. Cost proposals may result in re-ranking.

1.7.2. Proposers shall be required to submit, in writing, the names, addresses and telephone numbers of any proposed major subcontractors or equipment manufacturers, and to submit other material information relative to proposed major subcontractors or equipment manufacturers. The City reserves the right to disapprove any proposed subcontractor or

equipment manufacturer who's technical or financial ability or resources or whose experience is deemed inadequate.

1.7.3. The City reserves the right to cancel the Request for Proposal or to reject any or all responses to the Request for Proposal, or parts thereof, if it determines, in its sole discretion, that such cancellation or rejection is in the best interest of the City.

1.7.4. The City will determine which Proposers are responsive to the material terms and conditions of the Invitation to Propose and the Request for Proposal. The City will then determine who is technically, financially and otherwise responsible to perform the Project satisfactorily and who has the capacity to meet all other requirements of the proposed Project. Any response may be rejected if it is determined by the City to be non-responsive, provided, however, that the City reserves the right to waive any irregularities or technicalities which it determines, within its sole discretion, to be minor in nature and in the best interest of the public. Furthermore, any response may be rejected if it is determined by the City, in its sole discretion, that the Proposer is not capable of performing the proposed Project satisfactorily based upon review of its experience and technical and financial capabilities or the failure of such to provide information requested relating to such determination. Additionally, the City reserves the right to disqualify Proposers, before and after the Opening of Proposals, upon evidence of collusion with intent to defraud or other illegal practices upon the part of any Proposer(s).

1.8. PROPOSAL CONTENTS

1.8.1. Proposals are to be submitted in two parts, as described below, in separate sealed envelopes labeled:

Envelope #1

TECHNICAL PROPOSAL FOR WATER METER REPLACEMENT AND AUTOMATIC METER READING (AMR) DEPLOYMENT, PART 1

Envelope #2

PROJECT COST PROPOSAL FOR WATER METER REPLACEMENT AND AUTOMATIC METER READING (AMR) DEPLOYMENT, PART 2

1.8.2. **Part One - Technical Aspects** - The following information shall be provided in the order detailed:

1.8.2.1. Title Page - List the RFP title, the name of the Proposer, managing office address, telephone number, name of contact person and date.

1.8.2.2. Table of Contents - Include a clear identification of the material included in the proposal by page number.

1.8.2.3. Letter of Interest - Limit response to two (2) pages. Make a positive commitment to perform the required work within the time period requested. Identify the particular meter and AMR system being proposed upon by the Proposer. Also, give the name(s) of the person(s) who will be authorized to make representation for your organization, their title, and telephone number.

1.8.2.4. Management Section - Limit response to two (2) pages. State specific committed project team, percent dedication to the project, on-site personnel, and any other pertinent data, relative to the unique capabilities of the Proposer to meet the City' needs. Provide project management organization chart showing those functions (including individuals where possible) which make up the project team.

1.8.2.5. Project Implementation Methodology - Limit response to two (2) pages. Provide a description of the Proposers approach and understanding of the work required, specific to City. The content of the Project Implementation Methodology section must address:

1.8.2.5.1. Proposers understanding of the scope of work to include any deviations from specified program.

1.8.2.5.2. Outline of implementation plan

1.8.2.5.3. Organization and roles of Proposers team

1.8.2.5.4. Quality assurance approach (field and data)

1.8.2.6. Responses to Part 2, AMR Technical Specifications.

The response to Part 2, AMR Technical Specifications, should conform exactly to the order of the sections of the specification. Proposer's responses should be in the following form: section and paragraph number, label or title of section or paragraph, then proposal's response. Repeating the language of the specifications is not necessary. Wherever reasonable, the City is looking for specificity in proposal's responses, unless it is obvious that the word "comply" is all that is required.

1.8.3. **Part Two – Life Cycle Cost Aspects** - Using the forms presented in Part 3, Life Cycle Cost Analysis, the following information shall be provided in a separate sealed envelope for the City' evaluation after the technical capabilities of the Proposer are verified:

1.8.3.1. (Table A1) Inside meter location, meter replacement and MIU installation, product and installation cost

1.8.3.2. (Table A2) Inside meter location, meter retrofit and MIU installation, product and installation cost

1.8.3.3. (Table A3) Outside meter location, meter replacement and MIU installation, product and installation cost

1.8.3.4. (Table A4) Outside meter location, meter retrofit and MIU installation, product and installation cost

1.8.3.5. (Table A5) Meter box lid cost

1.8.3.6. (Table A6) AMR system component costs, including training

1.8.3.7. (Table A7) Annual Maintenance Cost

1.8.3.8. (Table A8) Annual Operating Cost

1.8.3.9. (Table A9) Cost Summary and Annual Increases for Years 3-5

1.8.3.10. (Table B1) Meter register failures

1.8.3.11. (Table B2) MIU failures

1.8.3.12. (Table B3) Data collection unit failures

1.8.3.13. (Table B4) Guaranteed maximum failure rates

1.8.4. **Format –** To facilitate the comparative analysis and evaluations of all proposals, it is required that the proposals be submitted in the format described in the preceeding sections. Section dividers should be used to separate each section of the proposal. Each section should include a cover page identifying the part and section. Pages within each section are to be numbered consecutively. Any additional information the vendor

believes would assist the City in the evaluation process should be included as an appendix to the proposal.

1.9 SELECTION CRITERIA:

Proposer offerings will be evaluated in nine key areas based on proposals submitted in the technical envelope #1 response to this RFP. The eight key areas are the following:

1.9.1. **Conformance to Requirements.** Degree to which proposal meets technical needs of the City. Exceptions will detract from overall rating.

1.9.2. **Clarity of Proposal.** Degree to which proposal clearly and concisely follows the Request for Proposal. Answers must include and correspond to questions.

1.9.3. **Inter-operability**. The number of different makes and models of water meters than can be read by the AMR system.

1.9.4. **Project Management.** Procedures, examples of and references for other similar projects. Experience of Contract Manager, Installation Manager and staff assigned to the project.

1.9.5. **Strength of Proposer.** Financial stability (solvency, revenue growth, projections, and profitability); staffing and facilities installed base (total number of units) for this type of system; ability to acquire bonding and insurance includes subcontractors.

1.9.6. **Warranty.** Period and extent of coverage on meters, meter reading system components, MIUs, batteries, etc. Systems and components performance guarantees. Protection in the event of excessive failure

1.9.7. **Support.** How the vendor proposes to deliver maintenance support and training. Response modes and times.

1.9.8. **Ease of Use.** Degree of difficulty for AMR components installation, maintenance, use of software, reporting capabilities, maintenance and field interrogators.

References. See section 2.15 for complete details.

The **Life-cycle Costs** will be evaluated as part of the project cost proposal submitted in envelope #2.

1.9.9. **Life-cycle Costs.** Total present value of initial and on-going costs to acquire, install, operate and maintain the system over 15 years, including any battery and capital replacements.

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PART 2

AMR TECHNICAL SPECIFICATIONS

2.1. AMR System Overall

2.1.1. The City requires (a) radio-based AMR system(s), which is (are) understood to consist of:

2.1.1.1. Meters with AMR-compatible registers capable of output that can be captured by reading devices;

2.1.1.2. Meter interface units (MIUs) capable of receiving the information from the meter registers, and transmitting this and other relevant information via radio signal to a receiving device;

2.1.1.3. Fixed location repeaters and/or data collection units capable of forwarding and capturing, respectively, the signals from the MIUs;

2.1.1.4. A secure communication or data transfer system infrastructure capable of transferring the data from the data collection units to a meter reading system control computer located at the City' office;

2.1.1.5. A meter reading system control computer into which the data from the MIUs and other information necessary to operate and maintain the AMR system may be uploaded, downloaded and stored. The purchase the control computer may be done independently of this request;

2.1.1.6. The software necessary to operate the system and communicate meter reading data to the City' customer information system; the City intends to locate the software on a network server. The information transmitted from the meters will be accessed from several locations within City departments.

2.1.1.7. If the system is designed to obtain normal meter readings more often than monthly, a database of meter reading data, and the software to operate the database;

2.1.1.8. Installation of the system, participation in a public outreach program which will include attending and participating up to three (3) public presentations; communicating with customers and scheduling appointments when necessary, and installation project management and control to ensure system integrity;

2.1.1.9. Ongoing support of the system hardware and software, and ongoing user support;

2.1.1.10. Documentation adequately describing the operation and maintenance of the system and its components, including data management and back-up, for use by City employees or agents in carrying out such operation and maintenance;

2.1.1.11. Training sufficient to enable City personnel to adequately operate and maintain the system, manage and back up data, and install additional AMR units as needed:

2.1.1.12. Ongoing software licenses, which cover patches and upgrades to ensure that the system and its software continue to perform to design criteria; and

2.1.1.13. Ongoing maintenance and service contracts for the certain system components, including data collection units, handheld devices, etc.

2.1.2. The City recognizes that AMR system features, characteristics and performance result from the interaction of components, and are to be addressed in this section. Component requirements and characteristics specific to individual components are to be addressed in response to the appropriate sections following.

2.1.3. All questions and requests for specificity 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 “may,” should,” “desires,” etc., are highly desirable features. In the case of a specific requirement not followed by a request for an explanation, Proposer must explicitly affirm that the system or component meets that requirement. Simply taking exception to a requirement without providing an explanation, and where appropriate an alternative, shall be deemed non-responsive, and may result in rejection of the proposal.

2.1.4. **Mode of operation.** Describe the system's normal mode of operation (i.e., for obtaining periodic readings for billing and other purposes). Describe how the system components interact to deliver readings to the City' offices. Provide a schematic or flow diagram depicting the system's normal mode of operation.

2.1.4.1. **Frequency of reading.** How often are meter readings normally obtained? Describe any options for the frequency (that is, number of reads per time interval) at which meter readings may be obtained. Are these options user-settable? If so, how is this accomplished?

2.1.4.2. **System capacity.** Describe the capacity of each system component in terms of the number of meter readings stored (in total and per meter) and/or the number of meter readings that can be transmitted or received in a given time interval. What happens as capacity is approached? What happens when it is exceeded? (For example, does new data overwrite old data?) Describe how old data is archived.

2.1.4.3. **Grouping of meters.** Briefly indicate any capabilities or limitations of the system to separate meters into groups (e.g., by routes, types of customer, billing cycles) for reading.

2.1.4.4. **Read on demand.** Can the system provide reads on demand? Describe how the system obtains "off-cycle", special or on-demand readings from a particular meter.

2.1.4.5. **Demand profiling.** Can the system obtain multiple readings at short intervals (e.g., hourly or several times per day) to monitor water consumption patterns from a particular meter or group of meters? If so, describe what and how. Are such short interval readings stored in memory at the MIU or DCU, transmitted all at once, or transmitted as they are received?

2.1.4.6. **Communication channels.** Indicate what radio frequencies are used for interactions between the MIUs and DCUs. What licenses are required? The proposer shall assist the City with obtaining necessary licensing.

2.1.4.7. **Data transmission accuracy and security**. The system shall include provisions to ensure data transmission accuracy (for example, error checking), security (for example, encryption) and immunity from outside (electromagnetic) interference as well as fading and other forms of signal degeneration or attenuation, to prevent accidental loss or interception of customer or meter reading data.

2.1.4.8. **Stored data system integrity and security.** The system must ensure data integrity (so that the readings from the meters, ID

numbers, and other data are always associated with the correct meter and customer) and data security (so data cannot be accessed by unauthorized parties). The system must ensure against loss of data. Describe how the system addresses these issues.

2.1.4.9. **Tamper detection**. The system must contain tamper detection capability which, when the meter, MIU or any wiring between components has been tampered (cut wire, tilting of meter, etc.) with, shall cause a tamper message to be indicated when the MIU transmits its data. The City desires the system to communicate to the control computer immediately upon tamper. Indicate how quickly tampering with each component will be reported and how will it be reported. How many times will the tamper indication be provided to the DCU or to the system operator? Indicate whether the tamper indication must be reset or reprogrammed, and how this is accomplished.

2.1.4.10. The system should give an indication of unauthorized usage; that is, when the customer account record indicates that the customer has been shut off, the system will flag and specifically report any unauthorized usage. Describe how this is accomplished.

2.1.4.11. **Leak detection.** The system should monitor water consumption through the meter and specifically indicate if there is an abnormal increase in water consumption, if there is no time interval (e.g., at night) when the rate of consumption is zero, or if there is a “running continuously” condition.

2.1.4.12. **No flow detection.** The system should indicate when there is an extended period (e.g., 10 days) of no flow through the meter.

2.1.4.13. **Other detection features.** List other conditions the system can detect. Describe these capabilities and how they are accomplished.

2.1.4.14. **Additional features.** Describe any additional capabilities of the AMR system(s) proposed, such as remote controlled shut-off or turn-on, pressure monitoring, etc.

2.1.4.15. **Current versus planned capabilities.** All responses must reflect current capabilities. Indicate any planned future capabilities for the equipment being proposed, the anticipated development and availability schedule, expected unit incremental costs, and the expected procedures for upgrading equipment already installed.

2.1.4.16. **Data transfer to control computer.** Indicate the proposed mode of data transfer between the DCUs and the AMR control computer.

2.1.4.17. **Range.** Indicate the maximum distance in feet the MIU and DCU can be apart and still always obtain meter readings.

Indicate how the system will obtain readings from meters in sub-basements.

2.1.4.18. **Environmental tolerances.** All system components (except the meter chamber) must operate over a temperature range of -40º F to 120º F, and a humidity range of 0% to 100% non-condensing.

2.1.4.19. **FCC Licensed.** All applicable system components must be FCC licensed and approved.

2.1.4.20. **Component firmware.** Proposer shall include firmware for all system components, including MIUs, DCUs and portable interrogator/programming/testing units, at no additional cost. Proposers shall provide any available upgrades or patches to such firmware to correct problems, add new standard features, and ensure system compatibility and full functionality for 15 years at no additional cost, including installation. Indicate how firmware patches or upgrades would be applied to each system component. There shall be no annual maintenance fees for component firmware.

2.2. **Meter Interface Unit (MIU).**

2.2.1. **Physical characteristics**. Is the MIU intended to be mounted away from the meter and attached to the register only by wire, or can it be integrated with the meter and/or register? Describe the physical characteristics of the MIU, including dimensions and weight. Provide pictures or drawings to scale.

2.2.2. **MIUs for different meter types and installation circumstances**. Can the MIU distinguish different makes and models of meter registers? Does the MIU have to be programmed or modified to accept different makes or models of meter registers? How and where is this accomplished? Are different MIUs required for different makes and models of registers? If so, how are these distinguished?

2.2.3. **Multiple meters/registers.** Does the MIU have the capacity to handle more than one register? How many ports for meter registers does the proposed MIU have? Describe any provisions of the MIU to handle dual-register compound meters, and multiple meters in close proximity. Indicate any restrictions on installing MIUs in close proximity to each other.

2.2.4. **Batteries.** What type of battery does the MIU use? 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? Does battery replacement require soldering or special tools? How will the system prevent loss of programming or data if the battery expires? Does the AMR system provide a warning well in advance of battery failure? If so, what is it and how is this accomplished? Is battery life

affected by the type of meter register the MIU is reading? If so, indicate the differences in expected and guaranteed lives from one type of register to another.

Describe any special MIU battery disposal provisions, and indicate the current cost of providing battery disposal if special handling is required.

2.2.5. **ID Number.** Each MIU shall have a unique, permanent ID number that is transmitted with the meter readings.

2.2.6. **Programmability.** The MIU shall be able to be initialized or programmed during or prior to field installation. Describe all MIU programmability options, features and procedures.

Can the MIU store an account or meter number? Will this number be transmitted with the meter reading data? Can this number be programmed into the MIU from a field programming unit based on information downloaded from an installation work order database? Indicate capabilities and procedures. Indicate field length of account number.

2.2.7. **Electromagnetic isolation.** Describe how the MIU will protect itself, the meter and the customer's premises against electrical surges or magnetic fields. Describe any risks of surges from MIU batteries.

2.2.8. **Tampering.** Describe features, including physical characteristics (seals, tamper resistant bolts, etc.) to minimize, detect and report tampering with the MIU.

2.2.9. **Environmental tolerance.** Describe features of the MIU that prevent corrosion or degradation of mechanical or electrical performance (e.g., encapsulation or coating). The MIU must operate in conditions subject to water submergence (i.e., meter boxes or vaults). The MIU enclosure shall be composed of UV-inhibiting ABS or similar material. All materials used in the MIU must be non-hazardous.

2.2.10. **Labeling.** The MIU shall be permanently labeled with manufacturer's name, model number, "City," a tamper warning, MIU identification number, required FCC labeling, input/output connections, and date of manufacture. The label should contain a bar code of the MIU identification number.

2.2.11. **Mounting.** Describe requirements for mounting MIU (elevation, orientation, etc.) to ensure adequate radio propagation.

2.2.12. **Ease of Installation.** MIU installation procedures must be simple and easy to perform. Briefly describe installation procedures. Indicate design provisions to avoid installers' mistakes in installation, connection to meters, and programming.

2.2.13. **Meter pit installation.** The installation of an MIU in a meter pit or vault may require drilling the meter pit or vault lid to accommodate the MIU, replacing the lid with a pre-drilled lid, or replacing the lid with a non-ferrous lid. No portion of the MIU may protrude above the plane of the meter lid. Alternatively, the MIU may be mounted on the wall of the pit or vault or on a bracket under the lid. The cost of any lid replacements/modifications or mounting hardware must be included in the Proposer's bid pricing. Proposer shall provide photographs and diagrams of any brackets or lid assemblies used to mount the MIU in pit applications.

2.2.14. **Connections to meter registers**. The City desires any cable between the meter register and the MIU to be factory-potted to the meter and pre-wired to the MIU. Describe the connection between the MIU and meter register(s), and provisions to prevent miswiring, disconnection or corrosion of any connections. Connection wires shall be in the form of a cable in a single protective jacket or fused as a single cable unit suitable for direct burial and exposed mounting. The City prefers solid molded cable.

Indicate the maximum length of cable between the MIU and the meter that will not result in any degradation of data or system reliability.

2.2.15. **Interoperability.** The MIU must read at least two different makes of meter registers for all sizes of meters. Proposer must provide a table showing the degree of compatibility of its MIUs with all makes and models of water meters currently available in the U.S. market. This table must provide at a minimum the information requested in Table A below. Provide clear, sufficient explanations of the reasons why the proposed MIU is unable to read any particular AMR-compatible meter register sold in the United States.

Table A. Meter/MIU Compatibility

Manufacturer	AMR compatible register model	Can read without programming or modifying the MIU or meter register	Can read with only programming of MIU	Technically feasible, requires modifying meter register or MIU (describe)	Technically infeasible (explain why)
AMCO	Digital				
AMCO	Absolute Encoder				
Neptune	E-coder				
Neptune	Pro-read				
Sensus	ICE				

2.3. **Fixed Radio Data Collection Unit.** If the data communication system consists of different levels of receiver/concentrators (e.g., data collection units, repeaters or relays, small area collectors, large area repeaters), Proposer shall provide responses for the equipment in each level.

2.3.1. **Modes of operation.** Indicate the mode of operation and schedule by which the DCU/repeater captures, stores and re-transmits data received from MIUs back to the AMR control computer. Do DCUs/repeaters relay data through each other to the control computer?

2.3.2. **Communication to control computer.** Proposer shall be responsible for communication network or provisions to deliver meter readings and other AMR system data to the control computer. Proposer must specify the capital, installation, operation and maintenance costs of such network or provisions. Indicate available options and proposed method for transmitting data.

2.3.3. **Number of units.** Indicate the estimated number of data collection units Proposer is responsible for providing a sufficient number of DCUs/repeaters so that 100% of all expected reads are obtained, unless there are temporary physical barriers beyond the control of the City of the Proposer.

2.3.4. **Mounting.** Indicate options for mounting DCUs/repeaters, and recommended configuration. Indicate minimum required height. Proposer must include the costs of mounting and any continuing site rental costs in its proposal.

2.3.5. **Power supply.** How is the DCU/repeater powered? What are the estimated one-time and continuing costs for powering DCUs/repeaters? How does the system preserve data should power to a DCU/repeater be lost?

2.3.6. **Programming.** Describe any programmable features, such as data reporting schedules, for DCUs/repeaters, and procedures for programming or configuring. Do DCUs/repeaters install themselves onto the system as they are powered up?

2.3.7. **Electrical Isolation.** Indicate how the DCU/repeater is protected against electrical surges such as lightning.

2.3.8. **Maintenance.** Indicate recommended fixed DCU maintenance intervals and procedures. Indicate maintenance procedures in the event of physical accident or damage.

2.4. **Radio Licenses**

2.4.1. **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.

2.4.2. **Obtaining licenses.** Proposer shall be responsible for obtaining all necessary licenses on behalf of the City. Licenses must be obtained and assigned radio frequencies verified as suitable for use with the AMR system(s) before any AMR equipment may be installed. If Proposer is unable to obtain the necessary licenses, the City reserves the right to cancel the contract and orders for all or part of the system, and receive a full refund from Proposer of all amounts paid.

2.4.3. **Protection from interference.** Indicate any provisions offered by the Proposer or its system to identify and remove interlopers on its licensed frequency(ies).

2.5. **Handheld Meter Reading Device/Data Collector**

2.5.1. **System Functions.** The City requires handheld meter reading devices, cradle/data transfer units, control computer, software, etc., to read meters equipped with MIUs 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 AMR-equipped meter, which is not manually read).

2.5.1.1. **Time stamp**. The handheld device must automatically time stamp each meter reading with unalterable date and time of read.

2.5.1.2. **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.

2.5.1.3. **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. Two high and low out of range limits, the second requiring more verification than just the meter reading, are preferred.

2.5.1.4. **Data displayed.** The handheld device must be capable of displaying the following information on the primary screen:

2.5.1.4.1. Route number

2.5.1.4.2. Meter reading sequence number

2.5.1.4.3. Account or premises identification number

2.5.1.4.4. Meter serial number

2.5.1.4.5. Meter encoder ID number

2.5.1.4.6. Meter AMR-equipped/MIU ID number

2.5.1.4.7. Premises address

2.5.1.4.8. Meter location or “mapping”, access notes, hazard descriptions, additional special instructions.

2.5.1.4.9. Previous unable-to-read code

2.5.1.4.10. Account status code

2.5.1.4.11. Meter status code

2.5.1.4.12. Assigned amount of time for next reading

2.5.1.4.13. Current date and time

2.5.1.5. **Display options.** The system should enable the system operator to select or customize the fields (such as previous unable-to-read code) that appear.

2.5.1.6. **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. The handheld device must allow the meter reader to modify or correct certain fields, including meter access notes, hazard, and special instructions to update the associated billing system data. The system must provide a capability for review and approval of any changed data by a supervisor before these changes may be applied to the meter reading database in the handheld control computer or the City's customer information system.

2.5.1.7. **Codes and comments entry by meter reader.** The handheld device must allow for entering an unable-to-read code, at least one additional special reporting code, and comments for each meter reading record.

2.5.1.8. **Auto configuration.** The handheld meter reading device must automatically be configured, and programs and data uploaded, whenever the state of the handheld meter reading device changes, such as when a memory card is removed and/or installed.

2.5.1.9. **AMR capability.** The handheld meter reading device shall be capable of alerting (if necessary) and receiving the signals from MIUs. Can the handheld meter reading device interrogate meter registers (if so, which ones)? The handheld meter reading device should be capable of downloading consumption profile data, if that is a capability of the system.

2.5.1.10. What is the maximum distance at which a portable interrogator will reliably receive the complete meter reading signal from an MIU?

2.5.1.11. Describe any provisions for mounting and operating the portable interrogator within a vehicle.

2.5.2. **Handheld Physical and Environmental Characteristics**

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

2.5.2.2. **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.

2.5.2.3. **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.

2.5.2.4. **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.

2.5.2.5. **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.

2.5.2.6. **Keypad.** The handheld device must have alpha/numeric/special function keys that allow a meter reader to easily enter data correctly while wearing gloves.

2.5.2.7. **Batteries.** The handheld device's primary batteries must be rechargeable. 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 and the charging unit must allow the batteries to be fully discharged prior to the start of the recharging process.

2.5.2.8. **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.

2.5.2.9. **Data fields.** The handheld meter reading device must keep the following data internally, for use in calculations and validations:

2.5.2.9.1. Time and date of reading

2.5.2.9.2. Handheld meter reading device identification code

2.5.2.9.3. Meter reader identification code

2.5.2.9.4. High reading limit(s)

2.5.2.9.5. Low reading limit(s)

2.5.2.9.6. Table of utility-defined codes, with associated code descriptions

2.5.3. **Handheld Device/Control Computer Data Transfer**

2.5.3.1. **Data transfer method**. Indicate the method(s) (e.g., memory card, data cradle, communication port, etc.) used to transfer data between the handheld device and the control computer.

2.5.3.2. **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 400-meter route?

2.5.3.3. **Data protection in transfer process.** The handheld meter reading device must not automatically delete its meter reading data after transfer to the control computer, so that the transfer can be reinitiated if problems occur. 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 non-transferred 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.

2.5.3.4. **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.

2.5.4. **Control Computer**

2.5.4.1. **Database and database management system.** The control computer must store data in an ODBC SQL-compliant database, which can be queried for ad hoc data analysis and reporting.

2.5.4.2. **Manual entry of data.** The control computer must permit manual entry of meter readings not transferred from the handheld meter reading device.

2.5.4.3. **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.

2.5.4.4. **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.

2.5.4.5. **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.

2.5.4.6. **Work order creation.** Describe any capabilities of the system to automatically generate field service orders in the City customer information system for such conditions as broken meter, broken or missing lid, etc.

2.6. **Portable Interrogation, Field Programming and Testing Devices.**

Portable interrogators may be required to capture reading from MIUs that are in radio "dead" spots, or for other special reading situations. If the proposed portable interrogator is not different than the handheld data collection unit, Proposer shall describe it in response to Section 2.6 above. Portable programming units may be required to program MIUs or meter registers. Portable field test units may be required to diagnose problems with meter registers, MIUs or the system. *Two or more of these functions may be combined into one unit; e.g., programmer/tester.* Vendor shall respond to this subsection separately for each device, denoting the responses 2.7.1, 2.7.2, etc.

2.6.1. **Number of units**. Proposer shall supply all units required for Contractor. Indicate how many units are recommended for maintenance by City employees after installation. Pricing and totals for these units shall be included in the proposal.

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

2.6.3. The portable interrogator (PI) shall be capable of alerting (if necessary) and receiving the signals from MIUs. Can the PI interrogate meter registers (if so, which ones)? The PI should be capable of downloading consumption profile data, if that is a capability of the system.

2.6.4. The field programmer must be capable of programming the MIU with any information required for operation and not pre-programmed. The portable field programmer must be capable of providing instructions to the MIU concerning the make, model and data protocol of the meter being connected, should the MIU not be able to determine this itself. Can the field programmer program a programmable meter register?

2.6.5. The field tester must be able to locate and diagnose problems with a system component (meter register, MIU or DCU) unless the system incorporates an alternate way to make such diagnoses. The field tester should be able to ascertain the condition or remaining life of the battery in a MIU. (If this is the case, such capabilities must be described in the appropriate section of the proposal.) Can the field test unit simulate the functions of an MIU? Can the field test unit simulate the functions of a

meter register to test the MIU? Can the field test unit communicate with a DCU?

2.6.6. **Interface to control computer.** Describe the mechanism and procedure for downloading data from and uploading data to the AMR control computer.

2.6.7. **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? How many meter readings can a portable interrogator accommodate?

2.6.8. **Portable interrogator range.** What is the maximum distance at which a portable interrogator will reliably receive the complete meter reading signal from an MIU?

2.6.9. **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.

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

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

2.6.12. **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? Can the batteries be recharged in charger cradles separate from the unit cradles? Can the battery be recharged from a 12 volt vehicle system? The unit must ensure against accidental data loss in case of a dead battery.

2.6.13. **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.

2.6.14. **Audible tones.** 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.)? Can the volume be adjusted?

2.6.15. **Manual entry.** Does the unit permit manual entry of meter readings and other information (for example, the information necessary to complete a meter or MIU investigation or repair work order)? If so, what other information? Describe its capability to record notes or comments. Describe how the unit processes and interfaces with the City's customer information system in the case of a meter change, register change, MIU change or any combination thereof.

2.7. Control Computer

2.7.1. **Hardware and network configuration**. The AMR system control computer operating system shall be the most recent Windows version currently available at the time of signing of the contract. Indicate the recommended configuration and number of units of the computer hardware (PCs, servers, other peripherals, printers, etc.) and software (operating system, communications, etc.) that the City must have to properly operate the AMR system or any current network operating system. Network switches, hubs or additional infrastructure changes required must be proposed and estimated costs must be reflected.

2.7.1.1.1. The control computer must be capable of residing as a node on the City existing network which is based on a Novell Netware 5.1 Server. Future plans – within the next twelve months – include an upgrade to a Microsoft Windows 2003 Server. Future support must be provided for Terminal Server access to all functionality of the system.

2.7.2. **Environmental**. The control computer shall be capable of operating in a normal office environment using normal office power supply, require no special installation, and be easily transferable.

2.7.3. **Uninterruptible power supply (UPS)**. The control computer shall include an uninterruptible power supply. Indicate capacity of UPS.

2.7.4. **Transferable system**. The system software and functions shall be quickly and easily movable to another computer or workstation in the event of a failure of the control computer.

2.7.5. **Remote access**. The AMR system functions, reports and data on the control computer should be securely accessible by properly authorized persons from other workstations on the City's network. Describe how this capability is provided.

2.8. System Software

2.8.1. Software may be required to (1) operate the control computer that interacts with other AMR system components to obtain meter readings, (2) manage the database of meter readings and other information, and (3) interface to

the City's CIS and other information systems. These applications may be integrated or separate. If they are separate, Proposer shall respond to this subsection for each application.

2.8.2. Should Proposer's AMR produce more than one reading per month under normal operations, the City requires as part of the AMR system an or SQL compliant Server-based meter reading database. This database will contain at a minimum: account number, MIU ID number and/or port number, billing cycle or route number, meter number, meter readings, date and time for each meter reading and tamper indications. If acquired as part of the AMR system, the meter reading database may contain additional fields. The City's CIS will obtain information necessary for preparing bills from this database.

2.8.3. **Modes of operation**. Indicate normal modes of operation of the AMR system software, including batch processing and single meter reading query processing. Describe the steps a system operator must perform to obtain meter readings from the meters at customers' premises, if the functions are not totally automated. Describe how a City customer service employee will obtain an individual current reading from the AMR system.

2.8.3.1.1. AMR 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.

2.8.4. **Interface to billing system**. The AMR 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., fixed field ASCII). Each record provided to the CIS shall contain at a minimum: premise number, MIU ID number and/or port number, billing cycle or route number, meter number, meter readings, meter readers' codes and comments, date and time for each meter reading, and tamper indications. Describe the process. Indicate what information is required by the AMR 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.

2.8.5. **Updating account data**. Indicate arrangements for updating relevant account information within the meter reading system and/or meter reading database when account information is changed in the CIS. What information is required from the CIS? Describe protocol including additional software, if necessary, for updating AMR system databases and synchronizing this information, including recommended frequency.

2.8.6. **Recovery/restart**. The AMR system must be easily recovered and restarted in the event of any interruption or software freeze. Describe the procedures.

2.8.7. **Database**. Any vendor-supplied database used to store and manage meter readings shall be non-proprietary, ODBC-compliant, SQL-compliant, or provided by a standard commercial database vendor. Describe major database tables and list fields with associated data types, all tables and field definitions must be provided. Can the City add or modify fields in database tables? If so, describe provisions and limitations.

2.8.8. **Multiple users**. The system should support multiple users at multiple locations in either a Web-based or client-sever configuration. How many concurrent users can the system accommodate? Can the system process batch transfer of meter reading data in the background while allowing users to conduct queries and other transactions?

2.8.9. **Multiple utilities**. Describe provisions for handling meter readings from multiple utilities (e.g., water, gas and electric utilities) within the same system.

2.8.10. **User interface**. Proposer shall include menus, navigators and major screen shots in its proposals. Describe provisions and guidelines for customizing screens, menus and navigators.

2.8.11. **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? Are edits traceable by the City? Are restriction settings customizable by the City?

2.8.12. **Customer access**. Describe any provisions for allowing customers to access their own consumption history and profiles, and comparisons for their usage to groups of similar customers, through the system.

2.8.13. **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 and retrieving additional data.

2.8.14. **Security**. The software shall include a security system, incorporating multiple levels of authorization and access. Describe security features, logging and levels.

2.8.15. **Back-up**. Describe data back-up capabilities and procedures to ensure that system and consumption data is not corrupted or lost.

2.8.16. **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.

2.8.17. **Questionable readings**. Describe any system capabilities to validate meter readings for reasonableness, unusually high or low readings, and potential meter rollovers.

2.8.18. **Customization**. Indicate the nature and extent to which standard reports can be customized. Permissible customization shall not void any software product warranties, nor prevent any overlay of future software releases. The City desires that the software or its associated database management system include a custom report generator.

2.8.19. **Software documentation**. Documentation shall be provided with the software and shall include at a minimum: system overview description, system 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.

2.8.20. **Software license and warranty**. All vendor supplied software must be supplied with a perpetual, irrevocable license indicating the software's designer, owner and licenser, and detailing the terms and conditions, including annual cost of maintenance by the vendor. Indicate how many servers or workstations the software license will cover and the cost, if any, of additional server or workstation licenses.

2.8.21. **Maintenance and escrow**. The vendor supplied software shall be supported for 15 years with enhancements, patches and corrections of "bugs", at no additional cost to the City beyond the annual maintenance fee.

2.8.22. **Third-party software**. Indicate any third party provider of software specifically designed to support Proposer's software. Indicate the warranty, licensing and support provisions for any such packages. Such specialized third-party software shall be under the control of Proposer, and be subject to the provisions of paragraphs 2.9.18 (license and warranty) and 2.9.19 (maintenance and escrow

2.8.23. **Interface with GIS**. Indicate any provisions in the database for integration with City's GIS data related to meter or premises location.

2.9. **Documentation**

2.9.1. **System manuals**. Proposer shall provide manuals and customized written procedures sufficient for complete operation and maintenance – including installation, configuration, diagnostics and repair – of the system, its software and its components. This shall include 5 complete hard-copy sets as well as 5 versions on CD-ROM.

2.9.2. **3rd party software manuals**. Proposer shall provide at least five (5) manuals for any third-party software or components incorporated in its system.

2.9.3. **Updates and revisions**. Proposer shall promptly provide replacement pages and CD-ROMs whenever there are any revisions or additions to the manuals.

2.9.4. **Change control tracking**. Provide a method to track and monitor all changes to software, hardware, operation and maintenance procedures and equipment.

2.10. **Training**

2.10.1. **Prerequisite to installation.** All City staff must be trained properly prior to the commencement of installations.

2.10.2. **Training on City's installed equipment**. The Proposer shall provide all additional training on the City's AMR system equipment (including the control computer and database) after it is installed, tested and accepted by the City. Training shall use real data from the City's own system.

2.10.3. **Location.** All training shall be done at the City's offices and facilities, or in the field.

2.10.4. **Training curriculum.** Proposer shall provide thorough training in each of the following areas for the designated number of people:

2.10.4.1. All aspects of the AMR system's operation, including obtaining reads and consumption data from the system, transferring reads and other information between the AMR system and the CIS, creating performance reports, diagnosing potential problems with system components, changing or adding customer accounts/MIU/meters to the system; for a minimum of 6 City employees or agents.

2.10.4.2. Meter reading database management, for a minimum of 6 City employees or agents.

2.10.4.3. Installation management and project control, for a minimum of 6 City employees or agents.

2.10.4.4. Field installation, for a minimum of 15 City employees or agents.

2.10.4.5. Field diagnostics and maintenance, for a minimum of 15 City employees or agents.

2.10.4.6. System software, hardware configuration and all technical equipment maintenance, for a minimum of 6 City employees or agents.

2.10.4.6.1. Proposer shall specify duration for each of these training sessions.

2.10.5. **Testing**. Proposer's training shall include evaluation of trainees to ensure that they have learned the course content and can perform all necessary functions on the system. Proposer shall notify the City of any employees that fail this evaluation, and provide them additional training as required. Proposer shall repeat a training session at no additional cost to the City if a majority of the trainees have not attained the skills from the training session or fail the evaluation at the end of the training.

2.10.6. **Training objectives and outline.** Proposer shall provide a detailed outline of each training session's objectives and content at least 2 weeks prior to the training session to the City for review.

2.10.7. **Training aids.** Proposer shall provide trainees' workbooks, training aids (including software and videotapes), and system technical manuals prior to or during the training session at no additional cost.

2.10.8. **Supplemental Training.** Proposer shall provide a schedule of costs for additional training beyond the initial training proposed.

2.10.9. **Restore equipment.** Proposer shall restore, repair or replace any City equipment damaged in training, and restore any hardware or software modified in training.

2.10.10. **Instructors.** The Proposer shall provide trained and experienced instructor(s), and ensure that they do not perform other duties during the training period that will interrupt instruction. Instructor will provide a checklist to trainees to evaluate presentation of course materials for effective feedback to the City.

2.11. **Support**

2.11.1. **Initial support period.** Proposer shall provide on-site support for a period of 5 years from the date on which the Proposer commences full-

scale installation at no additional cost to the City beyond the annual component and software maintenance fees.

2.11.2. **Extended support period.** Proposer shall provide telephone and on-site support for 15 years from the date on which the Proposer commences full-scale installation. Proposer shall include in this proposal a schedule of support costs, terms and conditions. Support shall be renewed at the City's discretion on an annual basis.

2.11.3. **Telephone support.** Proposer shall provide trained persons to answer technical questions and guide City employees through the use or diagnosis of the system through a toll-free number. Telephone support shall be available at a minimum from 7:00 a.m. through 5:00 p.m. Eastern time Monday through Friday. Indicate telephone support hours proposed. Response time to a City telephone query shall be within 30 minutes. Describe Proposer's current support operations (number of persons, location, hours, etc.) and any planned additions as a result of this project.

2.11.4. **On-site support.** Proposer shall be required to provide on-site assistance at the request of the City. On-site support shall be rendered within twenty four (24) hours of receiving a request for support.

2.11.5. **System monitoring by Proposer**. The AMR system should include a provision for Proposer to remotely connect to the control computer or database server to diagnose problems, load patches and upgrades, etc.

2.11.6. **Preventive maintenance provisions**. Proposer shall describe in its proposal recommendations and requirements for AMR system preventative maintenance, back-up, archiving, etc.

2.11.7. **Escalation provision**. Proposer shall provide an issues escalation provision in order to address issues unresolved within a reasonable time frame.

2.12. Water Meters

2.12.1. General meter requirements.

2.12.1.1. **Quality Control Statement**. The City expects each Proposer to submit their meters to a vigorous quality control and testing procedure before shipping. If any one shipment of meters exceeds a 0.5% failure rate, or if a manufacturer's meters exceed a 0.35% failure rate in aggregate, the City reserves the right, in addition to any legal remedies, to default the contract for a certain size meter or for all sizes of meters.

2.12.1.2. **Latest models.** Meters shall be new, of the latest production model, with the latest standard equipment, including items specified.

2.12.1.3. **Applicable documents.** The following documents of the issue in effect on the date of this Request for Proposal, form a part of these requirements to the extent specified herein:

2.12.1.3.1. ANSI B1.20.1 “Pipe Threads”

2.12.1.3.2. ANSI B 16.1 “Bronze Flanges”

2.12.1.3.3. AWWA C700, 701,702,703,704,706 AND 707, as applicable

2.12.1.4. **Unproven designs**. Parts or components not proven in service for a period of two (2) years, experimental or untried equipment will be acceptable only with the identification of such parts and a written guarantee that such parts are totally replaceable by the meter vendor, including all labor incurred by the City, for a period of four (4) years from the date of purchase. Failure to comply shall require the total replacement of the meter, including labor, provided by the vendor.

2.12.1.5. **Lead in Meters.** All meters must conform to NSF 61 standard.

2.12.1.6. **Tools**. Meter manufacturer shall furnish at no cost, within ninety (90) days from the date of Notice to Proceed, all specialty tools required for maintenance and service and initial installation, in reasonable quantities to be negotiated with the City.

2.12.1.7. **Serial numbers and labeling**. The manufacturer's serial number shall be stamped on the main case of all meters, as well as the register lid (if applicable), and shall be clearly visible when viewed from above. The serial number shall consist of all numeric digits. All meters shall have stamped or cast on them the size and model. The body shall also have stamped or cast on it in 3/8” letters “Property City”. The direction of the flow through the meter shall be properly indicated.

2.12.1.8. **Parts**. A complete parts catalog, and pricing sheets showing list prices and discounts from list, must be supplied with the proposal for all meter models incorporated in the proposal. The model number of each item being proposed must be indicated and the appropriate literature, data sheets, and specifications must be attached to the proposal. The proposed meter manufacturer must ensure that it will stock a sufficient supply of repair parts to fulfill the warranty requirements for the entire warranty period. All parts or interchangeable equivalent parts shall be available from the meter manufacturer for a period of twenty (20) years from the date of purchase.

2.12.1.9. **Shipping container marking**. Individual containers (if applicable) shall be marked to identify contents and quantity contained therein. The City desires that this information also be in the form of bar codes for scanning. Meter shipments shall be accompanied by a computer file of the meter serial numbers for the City's database.

2.12.1.10. **Technical data**. Proposer shall provide all manuals, diagrams, tolerance charts, exploded views, parts numbers, pricing, electronic diagrams, and any Materials Safety Data Sheets (MSDS) within thirty (30) days of the Notice to Proceed.

2.12.1.11. **Tamper resistance**. Split case meters shall have 3/32" seal wire holes through two (2) aligned case bolts *or one* (1) 3/32" seal wire hole through both halves of case.

2.12.1.12. **Strainers**. All meters shall contain removable non-corrosive strainer screens.

2.12.1.13. **External case bolts**. All external case bolts, cap bolts, washers, and nuts shall be of sufficient strength for the purpose and must be of non-corrosive material designed for easy removal after long service.

2.12.1.14. **Updates**. Manufacturer shall provide technical updates to the City and changes of technical information within thirty (30) days of publication.

2.12.1.15. **New design approval**. All meters shall be subject to the prior approval of the City. All new designs or new material must also be submitted for prior approval.

2.12.1.16. **Interchangeability**. All meters of the same size or capability shall be manufactured with accuracy to permit complete interchangeability of all parts, i.e., discs, piston, chamber tops, chamber bottoms etc., or any quantity of meters.

2.12.1.17. **Factory accuracy tests**. All meter accuracy tests shall be conducted in accordance with AWWA test methods and meter standards. The manufacturer shall furnish to the City an electronic copy of the test results for all meters shipped. Specific information contained within the test results shall include the manufacturer serial number, flow rates, results of each flow rate test, the size of the meters being tested, the model number, the date, and the tester. If test results are obtained through the use of any register other than the actual register shipped with the meter, the City must be notified in writing of such practice within thirty (30) days after the Notice to Proceed.

2.12.1.18. **Rejection**. Water meters that do not meet the requirements of this specification shall be rejected by the City, removed by the

manufacturer at its own expense and replaced within the delivery date specified.

2.12.2. **Meter registers**.

2.12.2.1. All meters shall be equipped with electronic pulse generating or dial-position (“direct read”) encoder registers that conform to the latest AWWA Standard C-707 except as amended herein. Electronic pulse registers must transmit a reliable pulse to the meter interface unit; Proposer must demonstrate through references and statistically significant test data the reliability and accuracy of accumulation of pulses so that transmitted reading always corresponds to reading on the meter register dial.

2.12.2.2. For meters to be used in meter pits or vaults, the register and wire connection shall be waterproof and corrosion proof. The City prefers factory-potted connections. Indicate the methods of manufacture and installation to ensure this.

2.12.2.3. Meter registers shall be hermetically sealed. The register must withstand long-term and repeated submersion in water.

2.12.2.4. The meter registers as well as the terminals or wire connections, must be tamper resistant. Indicate how this is accomplished.

2.12.2.5. Each encoder register shall have a unique identification number with a minimum of 8 digits that can be read electronically when the meter is interrogated and transmitted to or stored in the meter interface unit.

2.12.2.6. The dial that records the one and ten cubic foot increments, or the respective static zeros when appropriate, shall not be the same color as the larger quantity indicates.

2.12.2.7. The register(s) on the meter shall be straight (odometer-style), with at least six recording dial wheels, the information from which is transmitted to the meter interface unit. A visual leak detector indicator shall be included on sizes 5/8" through 2" registers.

2.12.2.8. Meters must have magnetic coupling drives. Gear combinations in the register must be the same from register to register, shipment to shipment, for all registers received of the same size.

2.12.3. **Displacement meters**

2.12.3.1. All meters shall conform to the latest AWWA Standard C-700 for Cold Water Meters except as amended herein.

2.12.3.2. The maximum pressure loss at safe maximum operating capacity shall be 10 psi.

2.12.3.3. **Meter cases**. All meters shall have an outer case with separate removable measuring chamber in which the disc or piston operates. The outer cases and any supplemental make-up pieces shall be made of a copper allow containing not less than 75% copper or suitable synthetic polymer. Cases for 1 ½" and 2" meters shall be all bronze. Casings may not be repaired, plugged, brazed or burned in.

2.12.3.4. **Pipe connections**. Connections shall be meter casing spuds having external straight threads conforming to ANSI B1.20.1 with pitch diameters as shown in Table Two (2)- Internal threaded spuds conform to ANSI B21 shall be used on 1-1/2" and 2" meter cases. Coupling tailpieces shall be made of copper alloy containing not less than 57% copper with external pipe threads conforming to ANSI B2~1 and internal diameters approximately equal to the nominal thread size of the tailpiece. Lengths and thread sizes shall be as shown in Table Two (2). Meters shall be designed for removal of all interior parts without disturbing the connections to the pipe line.

2.12.3.5. **Frost protection**. All meters must have frost protection devices of such design that they will break or yield under normal freezing conditions before damage is done to any other part of the meter. Frost-protection bottom designs may be used if the bottom is made of cast iron or a suitable synthetic polymer. The cross-section of the bottom shall break when subjected to freezing pressure of 600-850 psi. Cast iron bottoms must be protected with a non-corrosive treatment such as glass or enamel coating or lined with copper, bronze, non-warping plastic, or rubber. Meters may be of the split case design if the split case has breakable bolts with shear pins that will allow the case to separate under normal freezing conditions.

2.12.3.5.1.1. For meters to be located in pits or vaults, casts iron meter bottoms are not permitted.

2.12.3.6. **Measuring chamber**. The measuring chamber shall be of two (2) piece, snap-joint type. The chamber shall be made of non-hydrolyzing synthetic polymer and be smoothly and accurately machined. The control block assembly shall be designed so as not to allow any magnetic slippage which would result in loss of revenue. The control block assembly shall be removable to facilitate repairing.

2.12.3.7. **Revolution for various size meters**. Bidders shall submit with their bids the actual number of disc rotations or piston oscillations per cubic feet.

2.12.4. **Compound Meters**

2.12.4.1. All meters shall conform to the latest AWWA Standards C-702 for Cold Water Meters except as amended herein.

2.12.4.2. Meters shall be designed for easy removal of all interior parts without disturbing any connections to the pipeline.

2.12.4.3. **Flanges**. All meters shall be furnished with flanges on both ends. Flanges shall be of round type, faced and drilled and shall conform to the American National Standards Institute case iron pipe flange, class 125, ANSI 8 16.1 for diameter, drilling and thickness. All companion flanges shall be tapped American Standard internal taper pipe thread, ANS1 B2.1.

2.12.4.4. Installer must supply the necessary bolts, nuts, washers and gaskets for all meters 1-1/2 through 12".

2.12.4.5. **Pressure**. Meters shall be guaranteed to operate under a working pressure of 150 psi without leakage or damage to any part.

2.12.4.6. On compound meters designed with a single register totalizer, the register shall only display the totalizer reading to prevent accidental visual reading of the low side.

2.12.4.7. **Strainers**. Strainers shall be either an integral part of the meter or a separate flanged casting and shall be easily accessible for cleaning. Strainers shall be rigid, shall be easily removed and shall have an effective straining area as large as practicable and at least double that of the main meter case inlet.

2.12.5. Fire Flow Meters

2.12.5.1. All meters shall conform to the latest AWWA Standard C-703 for Cold Water Meters - Fire Service Type, except as amended herein.

2.12.5.2. All meters shall be furnished with round flanges at both ends. Companion flanges are not required.

2.12.5.3. The side arm meter on either side shall conform to the appropriate City specification for that size.

2.12.5.4. The manufacturer shall guarantee the entire meter, including the register, for a period of fifteen (15) years from the date of shipment against all defects in material and workmanship. Any other guarantee by the manufacturer shall be stated in its proposal.

2.12.5.5. Fire service strainers where specified shall be companion to meters and shall have cast iron cases and cover plates and stainless steel screens.

2.12.5.6. Fire Service meters and strainers shall have the Underwriter's Laboratories, Inc. (UL), and Fire Mutual (FM) approval for use on fire lines.

2.12.6. **Lay Lengths**. Fire Protection Meters (F.P.M.) and Compound meters shall include external strainer if replacing existing installation with an external strainer. Vendors having meters of a lesser lay length shall provide a steel spacer, no greater than four (4) inches long, or a flanged spool. Spools must be constructed of class 55 cement lined ductile iron pipe with welded or threaded on flanges. Spools must be no shorter than four (4) inches face to face, and guaranteed not to leak. Flanges shall be made of no less than 125-pound class material. Proposals shall include the cost of spacers or spools needed to meet the required laying length and any necessary bolts, nuts or other appurtenances.

2.13. **Installation**

2.13.1. **Project duration**. Project duration shall be implemented over two fiscal years.

2.13.2. **Installation sequence**. Contractor shall conduct installations by geographic proximity and logistics, and neighborhoods to be determined by the City in discussion with Contractor. Unless approved in writing by the City, Contractor shall complete at least 90% of the installations in the specified target area before commencing installation on any further geographic location. Exceptions to completion may be granted by the City on the basis of vacant or abandoned properties, could find no meter or no existing standard connections for a meter, piping or plumbing deteriorated or in fragile condition, bad control valves or curb stops or other factors as determined by the City.

2.13.3. **Installation schedule.** The City and Contractor shall establish an overall schedule for installation of the entire project. On the first work day of each week, Contractor will provide the City an updated schedule of where work is planned for the next 3 weeks.

2.13.4. **Work hours.** Vendor shall propose normal work hours, which must be approved by the City. Installers must be available on a periodic basis for evening and Saturday installations, as well as for installations that must be conducted at other times because of special needs.

2.13.5. **Daily reports.** A listing of all installation appointments to be visited by Contractor's installers each day shall be electronically transmitted to the City each work day prior to 8:30 A.M. At the end of each day, Contractor shall transmit electronically to the City information on completed work orders in a City approved file format.

2.13.6. **24-hour customer response.** For 90 days after the City was notified of installation, Contractor must respond to calls from customers or the City concerning leaks, loss of service, low pressure and other problems (except for missed appointments) associated with installations on a 24-hour per day basis. Contractor must respond within one (1) hour of receiving the call and arrive at customer's premises ready to correct any problems within three (3) hours of receiving the call. If Contractor fails to respond, the City will assess liquidated damages of $300 plus the City's direct costs to make repairs, such penalties and costs to be deducted from the amount owed to the Contractor.

2.13.7. **City Project Manager.** The City will designate an employee or agent who will manage the project on behalf of the City. The function of this Project Manager is to coordinate with the contractor and ensure compliance by the Contractor with the specifications. The designation of a Project Manager shall not relieve the Contractor of its full responsibility to comply with the terms of the Contract and/or all plans and specifications.

2.13.8. **Installation acceptance.** Each Installation will be accepted by the City conditioned upon (1) electronic submission of a list of completed installations containing for that installation the premise identification number, address, old and new meter serial numbers, old and new meter readings, MIU ID number, location of meter and MIU, installer's name, Contractor's inspector's name, and all other information relevant to the installation; (2) satisfactory inspection by the City; (3) successful capture of a confirming meter reading or sequence of meter readings from that meter and MIU by the City operating the AMR system in a normal way; and (4) confirmation that MIU ID numbers, meter register numbers and other information have been correctly captured in the AMR control system database and/or the City's project management database for each customer's premises.

2.13.9. **Installation conditional acceptance.** If the City does not inspect the installation within 7 calendar days of being notified of the installation, or if the City does not attempt to obtain confirming readings for the installation within 7 calendar days of being notified of the installation, or if the City does not confirm that the correct information for the installation has been captured in the AMR control system database and/or the City's project management database within 7 calendar days of being notified of the installation, through no fault of the Contractor, then such installation shall be deemed by the City to be conditionally accepted, and the City

shall pay the Contractor for the installation. However, if the City finds discrepancies in the conditions of acceptance for 12 months after the date it was notified of installation, the City shall debit the payments from any amounts owed the Contractor, and remand the work to the Contractor for correction.

2.13.10. **Payments.** Contractor shall provide to the City on a weekly basis its list of newly completed installations and any authorized additional work in an itemized format. This list shall be attached to an electronic draft invoice. The City shall notify Contractor of any listed items that do not meet the conditions of Paragraph 2.13.8 above, so that Contractor may resolve any discrepancies. The City may at its discretion reject the entirety of any list on which there are discrepancies in more than 10% of the entries. The City shall process all other items as acceptable and arrange payment for these.

Payments will be based on the price schedules adopted by the City and the Contractor based on prices submitted by the Proposer.

2.13.11. **Automated project control system.** The Contractor shall utilize an automated installation information management process, so that little or no information has to be captured or entered manually. The system should use electronic tags, bar coding or the similar means to capture equipment identification numbers. 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. Proposer shall describe in detail its project control system in the proposal, including flow charts.

2.13.12. **No solicitation.** No Contractor, or its employees or agents, may solicit business from the City's water customers while engaged on any contract associated with this project

2.13.13. Contractor staff.

2.13.13.1. **Contract Manager.** Proposers will designate a Contract Manager, who shall have the authority to handle and resolve any disputes or contract issues with the City.

2.13.13.2. **Installation Manager.** Proposer will designate an Installation Manager, who shall be responsible for managing the entire installation project on a day-to-day basis on behalf of the Contractor and for seeing that all installations are carried out in a professional manner and in compliance with the procedures required by the system vendor/manufacturer, the City, and all other applicable local, state and federal regulations. The Installation Manager shall be available

throughout the duration of the project, except for holidays and vacations, during which the Contractor 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 City shall approve the Installation Manager or a change in the Installation Manager.

2.13.13.3. **Installers.** Contractor's employees or subcontractors shall be fully trained in the removal of existing meter and the installation of a new meter and MIU. They shall also be trained in retrofitting newer meters as requested with AMR-compatible registers and MIU, regardless of size. The City reserved the right to require Contractor to retrain, reassign or dismiss any employee or subcontractor who fails to perform workmanlike and competent work.

2.13.13.4. **Licensed plumbers**. Contractor shall engage by employment or subcontract at least one person who shall maintain a NH Plumber's License. This person(s) shall be responsible for supervising the work of all Installers, and correcting any problems or damage to plumbing occasioned by the changing of meters or registers and the installation of the AMR equipment under this contract. Proposer shall provide references for each such person. The City reserves the right to approve licensed plumbers for work on this project.

2.13.13.5. **Bonding, background checks**. The Contractor shall bond all Licensed Plumbers and Installers. Contractor shall subject all employees to a criminal offense background check and drug and alcohol testing. Contractor shall not employ as Installer any person who fails these checks. The City reserves the right to review all background checks, to reject any potential hire, and prevent any such employee from working on the City projects.

2.13.13.6. **Training of employees.** Describe training procedure, and probation provisions for new employees.

2.13.13.7. **Uniforms and identification.** Contractor's field personnel shall wear easily recognizable uniforms containing the Contractor's name, as well as prominently displayed picture identification badges containing Contractor's name, employee name, title and signature, employee picture and employee I.D. number. Employees shall also be issued and carry the City identification cards. The City shall approve the format of the identification cards. Contractor's employees who are no longer employed by Contractor shall be required to return their uniforms and identification cards immediately upon termination of employment and the Contractor shall immediately notify the City of all

such terminations and if identification cards were received from terminated employee.

2.13.14. Items to be supplied by Contractor

2.13.14.1. **General.** Contractor will supply the following components and aspects of installation: overall project management; training and direct supervision of installers; appointment scheduling; problem solving and complaint handling; inspection, testing and quality control.

2.13.14.2. **Tools and materials.** The Contractor shall furnish all supplies, materials, tools and equipment necessary for the successful and timely completion of all meter and AMR installations under this contract as specified herein.

2.13.14.3. **Meter box lids.** The AMR system shall be configured to obtain the maximum signal strength from MIUs installed in meter pits or vaults. Installation Contractor 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. The meter lids must incorporate locking design and have no holes to admit water to the meter box.

2.13.14.4. **Vehicles.** Contractor shall be responsible for all vehicles it uses on the project. Contractor shall provide service vehicles on site stocked with common fittings and supplies needed for normal service restoration and/or replacement. Contractor'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 Contractor 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.

2.13.14.5. **Parking.** The City requires that Contractor deploy vehicles to minimize parking problems and avoid blocking any streets. Contractor is required to follow all parking laws. Contractor shall be responsible for all parking violations.

2.13.14.6. **Field communications.** The City requires that all the Contractor's installers, plumbers, inspectors and supervisory personnel be equipped with cellular phones or radios so that problems or questions can be addressed immediately and the Installation Manager can be contacted immediately if needed.

2.13.15. Account data and installation scheduling

2.13.15.1. **Account data file.** Prior to the start of the installations, the Project Manager will provide the Contractor with an electronic file containing the information necessary to create work orders for meter/AMR

installation. The City will provide Contractor with weekly updates to this file for routes where the AMR system has not yet been installed. For each meter, the data file will indicate the meter size, make and serial number, whether the meter shall be retrofitted or replaced, the meter location (if known), access notes to the meter, and the name and phone number that may be listed on the account.

2.13.15.2. **Customer notification.** At least two weeks prior to the commencement of installations in a geographic area, Contractor shall send notices to the customers indicating the time when installations will occur and requesting that customers call the Contractor for appointments if the meter is inside or if the customer has special needs regarding the momentary disruption of water service. The City shall approve in writing the text of all Contractor letters, door hangers and other communications with customers at least one week prior to use. Contractor shall also develop and submit to the City the scripts for any telephone conversations with customers for approval by the City Project Manager at least one week prior to use.

2.13.15.3. **Notification of owners.** Contractor must notify the owner of a building of its intent to install the AMR system at a particular customer's premises. The owner may authorize the Contractor to make an appointment with a tenant or the owner's representative. The Contractor shall document such authorization.

2.13.15.4. **Appointment scheduling.** Contractor shall be responsible for scheduling and handling all installation appointments. Contractor shall provide a phone number which customers can call between the hours of 7:00 A.M. and 7:00 P.M. Eastern Time, Monday through Saturday to schedule installation appointments. The City desires that installation appointments be made with 1-hour precision. Whenever possible, Contractor shall notify customers of any changes in schedule at least one day in advance of the original appointment. The City reserves the right to impose a penalty of $100 for each instance where the Contractor has failed to properly notify the customer at least 24 hours in advance of the appointment time of the need to reschedule for another day. The City reserves the right to impose a penalty of $50 for each instance where the Contractor has failed to properly notify the customer at least 2 hours in advance of the appointment time of a late arrival. The City reserves the right to impose a penalty of $200 for each instance where the installer has completely failed to show up for an appointment.

2.13.15.5. **Repeat attempts.** Contractor shall make at least three different attempts to contact each customer for an installation appointment. Each attempt shall include a different method of customer notification. These may include door hangers, knocking on doors, letters,

registered letters, etc. All procedures must be approved by the City. Each attempt to notify a customer must be documented by the Contractor. Documentation shall include, at a minimum, customer name, account number, address, date and time of attempt, notification method, name of Contractor employee who made the attempt, and (if applicable) name of customer spoken to and reason for refusal.

Seasonal Properties- will be identified by the City and schedule will be drawn to complete installation of the meters for those properties.

2.13.15.6. **Non-accessible meter.** In the event a meter is obstructed or is not accessible, the Contractor will make at least three 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 three documented attempts to change the meter, Installation Manager may request the Project Manager schedule the meter changeout. The Contractor shall only be paid for completed installations and is expected to provide all reasonable support in resolving difficult installation situations.

2.13.15.7. **Failed attempts.** Contractor shall notify the City if it is unable to secure an installation appointment with a customer. Contractor will be responsible for installation if the City secures an appointment within 30 days of receiving written or electronic notice from Contractor.

2.13.16. **Installation procedures.**

2.13.16.1. **Procedures approval**. The Contractor shall propose detailed scheduling and installation procedures to the City for approval prior to scheduling or commencing installations. The procedures shall be designed to optimize the work of the Installers, the City field inspectors and all other staff working on the project.

2.13.16.2. **Procedures testing**. Prior to the commencement of full-scale installation, but after Vendor shall have installed the AMR system control computer and a sufficient quantity of data collection units, Contractor shall install the meters and meter reading equipment on approximately 50 meters) following the Contractor proposed procedures. During this test and a period not longer than twenty (20) business days following it, the City and the Contractor shall evaluate the procedures for public notification, scheduling installations, meter and MIU installation, data transfer to the City'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 City may require Contractor to modify any procedures that it deems are deficient or ineffective. No work will be started until the AMR system equipment is determined to be working to

performance requirements in the test area, the project control procedures and systems are determined to be performing accurate, and the installation procedures have been approved by the City.

2.13.16.3. **Work order processing.** Contractor shall be responsible for ensuring that all data transferred to and from the City's information systems is properly working before commencing any installations. The City desires access to the Vendor's database and reserves the right to audit the Vendor's database.

2.13.16.4. **Work order data.** The Installation Manager will provide work orders to Installers. Each work order will include at a minimum, the customer's address, premises identification number, meter location, meter access notes, designation of replacement or retrofit, existing meter number, existing register number, meter make, model and size, and most recent meter reading. The City desires that all work orders be electronic.

2.13.16.5. **Site conditions**. Before, or at the time of installation, the Installer, under the direct supervision of the Installation Manager and the Contractor's Licensed Plumbers, shall inspect the existing water meter setting, including piping and control valves. If the Contractor determines that conditions are such that damage to the existing piping would result, the Installation Manager shall immediately contact the City Project Manager, shall not attempt the installation until the site is inspected by an authorized the City representative, and shall postpone installation at that site until the Project Manager authorizes the Contractor to proceed with the work.

2.13.16.6. **Geopositioning coordinates**. For each meter installed in an outdoor pit, box or vault, Contractor shall capture GPS positioning with accuracy of 6 feet or better, using a geopositioning device. In the event the meter's GPS position cannot be acquired (because the GPS receiver is blocked), Installer must manually enter the descriptive location of meter into handheld data entry unit. Describe how Proposer intends to provide GPS data for each meter.

2.13.16.7. **Digital photographs**. The City requires that digital photographs be taken before and after installation to provide documentation of problematic pre-existing site conditions. 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 City in a database searchable by address, premises identification number, meter number or account number.

2.13.16.8. **Old meter reading disputes**. Contractor shall provide procedures for ensuring that any dial meter is read properly (such as a digital

photograph), and for providing evidence of the reading in the case of any customer disputes.

2.13.16.9. **Repairs**. At its option, the City may authorize the Contractor to make any necessary repairs to service lines or piping, order the customer to make such repairs, or undertake such repairs itself.

2.13.16.10. **Old piping**. Old piping *per se* shall not be grounds for the failure of the Installer to replace a meter designated for replacement. 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. Unless the City's Project Manager remands the particular installation to the City for further action, Contractor is still required to install the meter and AMR equipment after the piping has been repaired or replaced at any time during the installation period.

2.13.16.11. **Meter replacement.** Installer shall ensure he is at correct location and meter, and check for running water prior to commencing meter change-out. Installer shall then replace the meter, using new gaskets or washers. Installer 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 consumer's existing meter setup must be furnished by the Contractor.

2.13.16.12. **Strainers.** If the meter to be replaced has a strainer, Installation Contractor shall be responsible for replacing the strainer along with the meter, unless conditions prevent such replacement. The contractor 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.

2.13.16.13. **Verifying service working**. Installer shall flush water line after installing a new meter to ensure the meter is registering properly and verify service restoration to the entire premise.

2.13.16.14. **Valves.** If Installer can not shut off water using the inside control valve(s) (details must be documented on a work order), the Contractor shall have the option of closing the curb stop valve, or using a non-Freon-based freezing tool to restrict flow of water in the pipe. At no time shall an Installer use a crimping device to restrict water flow. The curb stop valve is an acceptable point to shutdown in the event of inoperable or defective control valve(s). If the curb stop valve can not be located or is inoperable the Contractor shall notify the City Project Manager and the City shall rectify the problem.

If shutoff valves cannot be reopened, Contractor shall replace such valves following the City rules, regulations and specifications, upon being authorized by the City. Valves provided by Contractor must conform to the City's specifications. The City shall compensate the Contractor for replacing such inside valves. Prior approval of costs for valve replacement is required.

2.13.16.15. **Internal plumbing irregularities.** The Contractor 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 and disconnected meters. The Contractor shall also notify the Project Manager of a condition in which a meter has been removed and replaced with connecting pipes, registers are disconnected from meters, there are illegal connections before a meter, or there are unmetered connections of a customer's plumbing to a service lateral, fire pipe or water main. The Contractor shall not proceed with the installation of a meter until the Project Manager has authorized such installation.

2.13.16.16. **Dirt or water around meter**. Contractor 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 such that there is a minimum of 2" clearance below the meter. Contractor shall attempt to expose connection to the service line and any piping between the service line connection and the meter to ensure that they are in a condition that won't be damaged by changing the meter. 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 pumped out water shall be disposed of in a safe and proper manner as to not cause harm to the surroundings or to others. 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 Contractor. The existing ring and lid, if replaced, shall be disposed of by the Contractor. If grass or shrubbery is damaged by the installation process, the Contractor must repair the damage to original condition to the satisfaction of the consumer by replanting, resodding or reseeding. The City reserves the right to inspect any installation and clean-up work within 30 days before payment is made to the Contractor. The City reserves the right to inspect any installation and clean-up work within 90 days after installation in response to customer complaints of damage. Contractor shall be responsible for claims resulting from damage caused by installation.

2.13.16.17. **Service line damage**. The Contractor shall be responsible for repairing 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 Contractor to proceed with the work. In the event a service line fails during or after the installation procedure has been authorized to proceed, the Contractor's licensed plumber will oversee the necessary repair work to the water service line. The cost of this work will be reimbursed to the Contractor at a price set out in the table below. This price will include site preparation, all labor, material and permits as required. All work must comply with the City's standards for service repairs or replacement. The City personnel shall inspect all work.

Any damage done by the Contractor outside the area and scope of the work of the contract shall be repaired or replaced at Contractor's sole cost and expense.

All plumbing work other than the replacement of a water meter must be authorized by the City and inspected by the City field inspector.

Service line size	Repair reimbursement
5/8"	$60/foot
¾"	$65/foot
1"	$70/foot
1 ½"	$75/foot
2"	$80/foot

2.13.16.18. **Seals**. Installer shall seal the meter register with the City-approved seals. Installer shall seal MIU if it is so equipped with the City approved seals. All unused seals and related tools shall be surrendered to the City at the completion of the project.

2.13.16.19. **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, MIU 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 Project Manager on a daily basis

2.13.17. Quality control

2.13.17.1. **Response to complaints**. Should the Contractor receive a call or complaint from a customer or the City regarding installation, the 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 City's Project Manager not less than once per day.

2.13.17.2. **Improper installations**. The Contractor shall be responsible for replacing any meter, MIU or appurtenances improperly set by its Installer. The Contractor shall correct any damage to couplings, threads, unions or meters by use of improper tools or cross threading by an Installer.

2.13.17.3. **Leaks after 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 City or customers within 90 days of installation.

2.13.17.4. **Installation control and audit procedures.** Proposer shall describe in detail its proposed system for ensuring that all data pertaining to installation is correctly recorded during installation, and that all data transferred to the CIS is accurate. Proposer shall describe procedures for eliminating any opportunities for a meter or MIU to be associated in the control computer or the CIS with the wrong address or account number.

2.13.17.5. **Regular meetings with the City.** Contract Manager shall meet with the City personnel periodically and not less than monthly to update them on progress against the installation schedule.

2.14. Warranties

2.14.1. **Meter warranties.** All meters supplied in connection with this proposal shall be guaranteed to be free from defects in workmanship, and to meet or exceed AWWA new meter accuracy standards, for a period of at least 5 years from the date of installation. Any meter that fails to meet these warranty provisions shall be replaced at manufacturer's sole cost and expense, including $20 to partially defray the cost of City's field visit.

2.14.2. **Meter register warranties.** All encoder registers supplied in connection with this proposal shall be guaranteed free from defects in workmanship for a period of at least 10 years from the date of installation. Any register that fails during this period shall be replaced at manufacturer's sole cost and expense, including $20 to partially defray the cost of City's field visit.

2.14.3. **AMR Component Warranties.** All MIU's supplied in connection with this proposal shall be guaranteed to be free from defects in workmanship for a period of at least 5 years. All other AMR system components shall be guaranteed against failure for one year from the date of installation. Any MIU that fails during this period shall be repaired or replaced at manufacturer's sole cost and expense, including $20 to partially defray the cost of City's field visit, clerical work, etc. MIUs shall be guaranteed against failure for an additional 5 years such that a failed component will be replaced at a 20% per year pro-rated increasing cost to City of the original purchase price, or the then currently available purchase price, whichever is less.

2.14.4. **Installation warranties.** All installation work, including materials used in the installation performed under this contract, shall be guaranteed against defects in workmanship for a period of one year from the date of acceptance by the City.

2.14.5. **Warranty against general nonperformance or excessive failures.** The Vendor of the AMR equipment shall warrant the system against failures that exceed the maximum failure rates defined in Tables B1-3 of the pricing section of the Request for Proposal. Should the failure rates exceed these levels, or should the system in its totality substantially fail to perform such that the City cannot reliably use the system for billing, or should the occurrence of erroneous or inaccurate meter readings exceed 10 per thousand per year, the City may notify the Vendor of this condition, whereupon Vendor shall be responsible for promptly restoring the system to its normal level of reliability and accuracy at its sole cost and expense.

2.15. References

2.15.1. The City requires that Proposers have a proven track record for water meter replacement and AMR deployment implementations with major water utilities. It is preferred that Proposers will have had experience in locations with a cold-weather environment similar to Portsmouth. These prerequisites apply both to product and installation services, including key personnel, described in the following sections.

2.15.2. **Meter and AMR references.** Proposers shall provide a list containing the total number of units, percentage completed and contact information for all water utility installations of the AMR equipment it is proposing that have commenced within a three-year interval ending with the date of its proposal. In addition, Proposer shall provide the names, addresses, and telephone numbers of three references, if available, from utilities of the comparable size using equipment specified in the proposal, where the installation has been substantially completed.

2.15.3. **Installation references.** Proposer shall provide a list of all AMR installation contracts performed by the installation contractor incorporated in its proposal, including the total number of units, percent completed, and contract information, that installation contractor shall have commenced within a three-year interval ending with the date of its proposal. Proposer shall provide the names, addresses, and telephone numbers of three references, if available, from utilities of the comparable size, where the installation has been substantially completed.

2.15.4. **Project management references.** Proposer shall provide resumes for key employees, including Contract Manager, Installation Manager and other staff who will be assigned to the project, consistent with the management description in Section 1.8.2.4.

2.16. **Financial Strength**

2.16.1. Short listed offerors may provide sufficient information to enable the City to assess relative financial strength. This information must be, at a minimum, a description of financial stability measured by average revenue growth over the past three years, profitability over the past three years, solvency as based on total liabilities to net worth, current ratio and the leverage ratio, and finally, credit standing. Audited financial statements for the past three years must be provided. All documents considered "Confidential" will be returned to after the selection process.

2.16.2. Each Offeror must also provide documentation as to the financial ability to fulfill the obligations of the contract. If financing is internal, a statement of cash flow that can be support this financing must be included. If financing is external, credit lines and sources must be indicated. Proposals from Offerors who are found in the judgment of the City to be financially insufficient to undertake this project will not be considered further.

2.17. **Litigation.** Vendor, and each of its subcontractors shall indicate if there are any anticipated or pending lawsuits against it, or any litigation within the past five (5) years or bankruptcy filings within the past ten (10) years, and, if so, shall describe them.

2.18. **Fee for Services Proposal.** As an alternative, Proposer may propose fees for services to provide meter reading data to the City.

2.18.1. **Ownership and Pricing**. Proposer shall indicate which system components shall be owned, operated and maintained by Proposer, and which system components shall be owned, operated and maintained by the City. The prices for all of the latter shall be included on the Pricing sheets.

2.18.2. **Normal reading charges**. Proposer shall indicate the monthly charge per meter to provide groups of reading for cycle billing and individual readings on demand for re-reads and initial and final reads. Proposer shall indicate if multiple register meters (e.g., certain compound meters or fire meter assemblies) are to be connected to single multi-port MIUs, or multiple MIUs, and whether the monthly read charge is different.

2.18.3. **Alarms**. Alarms and tamper flags shall be provided at the earliest possible time after detection at no additional charge.

2.18.4. **Profile data charges**. Proposer shall provide a price (if separate) for providing consumption profile information from a meter, the length of time over which the profile may be obtained (e.g., 30 days) and the interval of the meter reading data (e.g. every 15 minutes, every 4 hours, etc.)

2.18.5. **Time limit on read**. If the City attempts to obtain a reading from the system, and cannot within a 24-hour period, or if the reading obtained is more than 24-hours older than the request time, then the unit charge for the that account for that month shall be waived or credited, provided that the problem was not something that the City could have reasonably prevented or detected and corrected.

2.18.6. **Initiation and cancellation of accounts**. There should not be separate charges for adding an account to the system. There shall be no separate charges for changing account information or removing an account from the system. Indicate the unit initiation charge, if applicable.

2.18.7. **Performance guarantee**. If the system fails to deliver less than 98% of the required reads in any month, through no fault or negligence of the City, then the City may impose liquidated damages of $1000 per day for each day the system falls below this level.

2.18.8. **Network siting**. Proposer shall be responsible for all arrangements for siting and access to its data collectors, if their operation and maintenance is to be incorporated in the normal per read services charges.

2.18.9. **Price adjustments**. The usage fees may be adjusted annually by not more than the producer price index applicable to City. Notification of such increases shall be provided in writing at least 90 days in advance.

2.18.10. **Term**. The term of the Fee for Services Proposal shall be 15-years.

2.18.11. **Surety**. Proposer shall provide sureties that it will continue to operate and maintain those portions of the system for which it is charging fees for services for the term of the contract.

2.19. **Lease/Purchase Option.** The City as an alternative to immediate purchase, would like to consider the option of a lease/purchase agreement. Please indicate whether this option would be considered by your firm and what those terms and pricing would be.

PORTSMOUTH WATER AND SEWER CITY

REQUEST FOR PROPOSAL
FOR
WATER METER REPLACEMENT AND AUTOMATED METER READING (AMR) DEPLOYMENT

CONTRACT NO.

PART 3
LIFE CYCLE COST ANALYSIS

3.1. Component Pricing

3.1.1. Proposer must provide prices for the equipment specified below. Indicate "NA" (Not Applicable) if the particular equipment described is not incorporated in Proposer's system. Proposer must respond to each line item listed below; lump sum proposals will not be accepted. Proposer must include any additional equipment not listed in the tables below that is required to provide a complete and working system.

3.1.2. City intends to install MIUs on relatively new meters and replace meters as indicated in the tables below, assume all 5/8"-2" meters installed before 1/1/01, and all larger meters older than 10 years on 1/1/2007, will be replaced. However, Proposer may, at its option, provide quotations for the replacement, including labor, of some or all of the meters City intended only to retrofit with MIUs.

3.1.3. Proposer shall provide pricing for all meters in the following tables even if the indicated quantity is zero so that the price will be known in case a decision is made at a later time to replace or retrofit one of these meters.

3.1.4. Prices indicated shall be for normal installations, exclusive of repairs to or modification or replacement of service lines, pits (other than the replacement of lids and rings), valves or customer's plumbing.

3.1.5. The City wants the maximum signal power from the MIUs installed in meter boxes. Proposer shall indicate where a lid with a pre-existing hole may be used, and where the lid shall be drilled or replaced. Indicate the unit pricing for modification or replacement of lids in Tables A3 and 4, and the details of pricing and associated information for replacement lids in Table A5. The total lid replacement cost from Table A5 should be included in Tables A3 and 4.

3.1.6. Replacement lids (and rings where necessary) may be cast iron,

composite or plastic. However, heavy-duty lids are required in paved or traffic areas. Rings shall be replaced as necessary to accommodate new lids or where a safety hazard is present. Meter box lids and rings are to be provided as part of the proposal.

3.1.7. Pricing shall be firm for three years from the date of the Notice to Proceed. Percentage increases for years 4-5, if necessary, should be included on the Cost Summary Table A9.

3.1.8. The goal of the City is to install and read all meters with a fixed network technology; however based on cost and/or geographic restraints the City will consider retaining the current meter and reading device at some locations. Please indicate.

Table A1. Inside Meters to be Replaced

The number of meters indicated in this table is based on preliminary analysis of City records. The actual number of meters required may differ after consultation with City Staff and selected vendor.

Meter Size & Type	No. of Meters	Unit Cost, Meter / Register	Unit Salvage Credit	Net Unit Cost, Meter / Register	Total Cost, Meters / Registers	Unit Cost, MIU	Total Cost, MIU	Unit Cost, Installation	Total Cost, Installation
5/8"	3,400								
3/4"									
1"	130								
1.5"	140								
2"	50								
3" compound	15								
4" compound	15								
4" fire cmpd									
6" compound	2								
6" fire cmpd									
8" compound									
10" fire cmpd									
Total	3,752								

Total – Table A1_____

Table A2. Inside Meters to be Retrofitted

The number of meters indicated in this table is based on preliminary analysis of City records. The actual number of meters required may differ after consultation with City Staff and selected vendor.

Meter Size & Type	No. of Meters	Unit Cost, Meter / Register	Unit Salvage Credit	Net Unit Cost, Meters / Register	Total Cost, Meters / Registers	Unit Cost, MIU	Total Cost, MIU	Unit Cost, Installation	Total Cost, Installation
5/8"	3200								
3/4"	8								
1"	490								
1.5"	210								
2"	280								
3" compound	30								
4" compound	15								
4” fire cmpd									
6" compound									
6" fire cmpd	4								
8" compound	4								
10" fire turb									
10" fire cmpd									
Total	4,240								

Total – Table A2_____

Table A3. Pit Meters to be Replaced

The number of meters indicated in this table is based on preliminary analysis of City records. The actual number of meters required may differ after consultation with City Staff and selected vendor.

Meter Size & Type	No. of Meters	Unit Cost, Meter / Register	Unit Salvage Credit	Net Unit Cost, Meters / Register	Total Cost, Meters / Registers	Unit Cost, Pit Lids	Unit Cost, MIU	Total Cost, MIU/Pit Lid	Unit Cost, Installation	Total Cost, Installation
5/8"										
3/4"										
1"										
1.5"										
2"										
3" compound	7									
4" compound	16									
4" fire cmpd										
6" compound	5									
6" fire cmpd										
8" compound	2									
10" fire cmpd										
Total	32									

Total – Table A3_____

Table A4. Pit Meters to be Retrofitted

The number of meters indicated in this table is based on preliminary analysis of City records. The actual number of meters required may differ after consultation with City Staff and selected vendor.

Meter Size & Type	No. of Meters	Unit Cost, Meter / Register	Unit Salvage Credit	Net Unit Cost, Meters / Register	Total Cost, Meters / Registers	Unit Cost, Pit Lids	Unit Cost, MIU	Total Cost, MIU/Pit Lid	Unit Cost, Installation	Total Cost, Installation
5/8"										
3/4"										
1"										
1.5"										
2"										
3" compound	1									
4" compound										
4” fire cmpd										
6" compound	1									
6" fire cmpd										
8" compound	2									
10" fire cmpd										
Total	4									

Total – Table A4_____

Table A5. Meter Box Lid Costs

Type	Approx. No.	Manufacturer	Lid type	Unit Cost to replace meter box lid	Unit Salvage Cost for existing lid	Total Cost to replace meter box lids
Total						

Table A6. Other AMR System Equipment

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

Quantity to be supplied	Equipment Size and Description	Unit Price	Total Cost
***	Mobile data collection units, including cradles, accessories and firmware.		
***	Fixed data collection units, including firmware and installation.		
***	Handheld meter reading units, including firmware		
**	Handheld meter reading control computer		
***	Handheld meter reading control computer software		
***	Portable interrogators, including cradles, accessories, firmware and software		
***	Field programmers, including cradles, accessories, firmware and software		
***	Field tester, including cradles, accessories, firmware and software		
***	AMR control computer		
***	AMR control computer software		
***	Consumption database application software		
***	Interface to billing system		
***	Other (describe)		
***	Other (describe)		
	Grand Total Other Radio System Equipment:		

Table A7. Annual Maintenance Costs

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

Quantity to be supplied	Equipment Size and Description	Annual Maintenance Cost	Total Cost
***	Mobile data collection units, including cradles, accessories and firmware.		
***	Fixed data collection units, including firmware.		
***	Handheld meter reading units, including firmware		
***	Handheld meter reading control computer software		
***	Portable interrogators, including cradles, accessories, firmware and software		
***	Field programmers, including cradles, accessories, firmware and software		
***	Field tester, including cradles, accessories, firmware and software		
***	AMR control computer software		
***	Consumption database application software		
***	Interface to billing system		
***	Other (describe)		
***	Other (describe)		
	Grand Total System Maintenance Cost		

Table A8. Annual Operating Cost

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

Quantity to be supplied	Equipment Size and Description	Annual Operating Cost	Total Cost
***	Fixed data collection unit backhaul communication costs		
***	Other (describe)		
***	Other (describe)		
	Grand Total System Operating Cost		

3.2. Failure Rates and Replacement Costs

3.2.1. Proposer shall provide in the tables below the expected failure rates, repair prices and costs of battery change-out (if required) and other maintenance and operating costs for meters (including registers), MIUs and DCUs that will give the City a true representation of expected operating and maintenance costs. These costs shall be included in the City's evaluation of total system costs.

3.2.2. All MIUs supplied in connection with this proposal shall be guaranteed to be free from defects in workmanship for a period of at least 5 years from the date of installation. Any MIU that fails during this period shall be repaired or replaced at manufacturer's sole cost and expense. MIUs shall be guaranteed against failure for an additional 5 years such that a failed component will be replaced at a 20% per year pro-rated increasing cost to the City of the original purchase price, or the then currently available purchase price, whichever is less.

3.2.3. Failure Rates. Proposer shall indicate the expected life in service of the system, if other than 10 years, and modify the replacements costs referred to in Table B1. below. Proposer shall provide annotation for any underlying assumptions that may reasonably be deemed necessary to explain these numbers.

Table B1. 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		0%			
2		0%			
3		0%			
4		0%			
5		0%			
6		20%			
7		40%			
8		60%			
9		80%			
10		100%			
11		100%			
12		100%			
13		100%			
14		100%			
15		100%			

[1] For example, an MIU that the City paid $100 for that fails in the 6th year after being installed and accepted will be replaced at a cost to the City of $20.

Table B2. Meter Register Failures

Year After Unit is Installed & Accepted	Expected Failure Rate (failures/1000 units/yr)	Unit Repair or Replacement Cost (less pro-rata warranty adjustment)	Guaranteed Maximum Failure Rate (failures/1000 units/yr)
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			

Table B3. Data Collection Unit Failures

Provide tables for both mobile data collection units and fixed data collection units, if both 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			
11			
12			
13			
14			
15			

APPENDIX A

GENERAL INSTRUCTIONS AND CONDITIONS
PORTSMOUTH WATER AND SEWER DIVISION

The City reserves the right to evaluate the submitted proposals, waive any irregularity therein, and to select any firm which submits a proposal to do the work and/or reject any or all proposals should it be deemed in the best interest of the City. The City reserves absolute discretion in reviewing the qualifications of the Vendor and may reject any prospective Vendor at the City's sole option. In submitting its RFP Response, the Vendor agrees and acknowledges that the City has the right to exercise its absolute and sole discretion in its consideration of any responses and in the conduct of the evaluation and selection process. Specifically, the City retains the right to reject any or all bids, to accept any proposal which is deemed most favorable to the City, including the selection of a Vendor whose fee arrangements may not be the lowest, or the waiver of any informality or failure to meet any of the requirements or qualifications set forth in this Request. The vendor also agrees and acknowledges that the City's determinations shall all be final and there are no appeals to any other authority, specifically including the courts of NH or the United States.

Alternate proposals must be clearly identified.

If the time within which the proposal must be accepted is not stated, it is understood and agreed that the City shall have sixty days to accept.

The City reserves the right to maintain confidentiality of proposals.

Proof of Insurance is required WITH YOUR PROPOSAL.

Vendor shall indemnify, defend and hold harmless the City from all claims, suits actions, losses, damages, liabilities, cost and expenses of any nature whatsoever resulting from, arising out of, or relating to the activities of your company or its officers, employees, subcontractors, or agents under the Purchase Order resulting from this RFP.

Changes herein shall not be made except upon prior written application to and written approval of the City.

Vendor agrees to comply with the provisions of the Occupational Safety and Health Act of 1970 and the standards and regulations issued there under and certifies that all actions furnished under this order will conform to and comply with said standards and regulations. Supplier further agrees to indemnify and hold harmless the City for all damages assessed against the City as a result of Vendors' failure to comply with the Act and standards issued there under.

Subcontracting will not be allowed unless the City has given written approval.

- - - - - - - - - - - - - - - - - - - ----- - - - - -PROPOSAL -

In compliance with the above invitation for proposals, and subject to all the conditions thereof, the undersigned offers and agrees, if this proposal is accepted, to furnish any or all of the items upon which prices are proposed, at the price set opposite each item or the lump sum.

Submitting Firm Name	Address
By	Title
Signature of Person Quoting	