

**TOWN OF WATERTOWN
WATERTOWN, CONNECTICUT**

NOTICE OF BID

Water Meters and Related Reading System

Sealed bids are invited and will be received by the Purchasing Agent of the Town of Watertown at the office of the Purchasing Agent, Town Hall Annex, 424 Main Street, Watertown, Connecticut, until 11:00 A.M. , Tuesday, June 13, 2006 at which time and place they will be publicly opened and read aloud for furnishing water meters and related meter reading system to the Town of Watertown.

The Information for Bidders, Form of Bid, Form of Contract, Plans, Specifications, Form of Bid Bond, Performance and Payment Bonds, and other contract documents may be obtained or examined at the office of the Purchasing Agent, Town Hall Annex, 424 Main Street, Watertown, Connecticut 06795 or by accessing the Town of Watertown's website at <http://www.watertownct.org>. Proposals must be submitted on the forms provided and in a sealed envelope plainly marked "Bid – Water Meters ".

To receive consideration bids must be in the hands of the Purchasing Agent or his authorized representative no later than the day and hour mentioned above.

The Purchasing Agent reserves the right to accept or reject any or all bids; to waive any informality; or to accept any bid deemed in the best interests of the Town of Watertown.

The Town of Watertown reserves the right to take into account the residency of bidders within the Town of Watertown and/or the location of the bidder's business within the Town of Watertown in awarding this bid.

All bids will be considered valid for a period of sixty (60) days.

Charles Frigon
Purchasing Agent
Town of Watertown

PLEASE

**IT IS A REQUIREMENT OF
THIS BID THAT EACH
PROPOSAL SUBMITTED
MUST HAVE A
DUPLICATE COPY
ATTACHED.**

**YOUR COOPERATION IS
APPRECIATED**

INFORMATION FOR BIDDERS

TOWN OF WATERTOWN WATERTOWN, CONNECTICUT 06795

Water Meters and Related Reading System

BID OPENING: Tuesday, June 13, 2006

PROPOSALS RECEIVED

All bids must be in a sealed envelope and received prior to **Tuesday, June 13, 2006** at the office of the Purchasing Agent, 424 Main Street, Watertown, Connecticut 06795.

PREPARATION OF PROPOSALS

Proposals must be made upon forms contained herein. The blank spaces in the Proposal must be filled in correctly where indicated. The Bidder must state the prices for which he proposes to do each item of the work contemplated. In case of discrepancy where both words and the numerals are requested, the words shall govern. Ditto marks are not considered writing or printing and shall not be used. The Bidder shall sign his Proposal correctly. If the Proposal is made by an individual, his name, post office address and telephone number must be shown. If made by a firm, partnership, or corporation, the Proposal must be signed by an official of the firm, partnership, or corporation authorized to sign contracts, and must show the post office address and telephone number of the firm, partnership, or corporation. Failure to do so may disqualify the bid.

Each bid must be submitted in a sealed envelope bearing on the outside the name of the Bidder, post office address, and name of the project for which the bid is submitted. If forwarded by mail, the sealed envelope containing the bid must be enclosed in another envelope addressed to: The Purchasing Agent, Town Hall Annex, 424 Main Street, Watertown, CT 06795.

All information shall be entered in ink or by typewriter. Mistakes may be crossed out and corrections inserted before submission of your bid. The person signing the bid shall initial corrections in ink.

Corrections and/or modifications received after the closing time specified will not be accepted.

SUBMISSION OF PROPOSALS

All proposals and literature shall be submitted IN DUPLICATE on the proposal form, which is a part of these specifications.

Descriptive literature containing complete specifications must accompany each bid. If a bidder wishes to furnish additional information, more sheets may be added.

Adobe Acrobat® Reader is required to view electronic documents on-line. If you do not have Adobe Acrobat® Reader, you may download it for free from Adobe at <http://www.adobe.com/products/acrobat/readstep.html>.

Response summaries will be available online at <http://www.watertownct.org>. on the day of the bid opening.

Responses delivered via fax are received subject to the following qualifications and limitations:

1. The Town is not responsible for the confidentiality of the information transmitted.
2. The Town cannot guarantee that its fax equipment will be operational and able to receive transmittals by a particular time and date. It is the Bidder's responsibility to ensure that quotations are received in their entirety and on time at the required location. It is recommended that vendors be advised to call immediately after transmitting a document electronically to confirm complete and accurate receipt by the Town. The Town assumes no liability in the event that a bidder's electronic transmission is not received by the Town in a timely fashion, or is not received either in its entirety or error-free.
3. Bids transmitted electronically which have a bond requirement are subject to the same submittal requirements as those responses delivered via traditional means, such as mail or hand delivery, or as otherwise stipulated by appropriate authority.

INCURRING COSTS

The Town of Watertown is not liable for any cost incurred for the preparation of proposals or submission of samples by the firms submitting proposals for the work requested in this bid document or request for proposals.

FAMILIARITY WITH THE WORK

Each bidder is considered to have examined the work to fully acquaint himself with the exact existing conditions relating to the work and has fully informed himself as to the work involved and the difficulties and restrictions attending the performance of this bid. Failure to do so will not relieve a bidder of his obligation to furnish all equipment and related services necessary to carry out the work for the consideration set forth in this bid. The submission of a bid will be considered as conclusive evidence that the bidder has made such examination.

Where exploration or inspection data is shown on the Plans and/or specifications or made available to the Bidder, it is understood that such data were obtained in the usual manner and with reasonable care and are to be interpreted and used as the Bidder sees fit. There is no expressed or implied agreement that the data has been correctly indicated, and the Bidder is cautioned to take into account that conditions affecting the work may differ from those indicated.

CONSIDERATION OF PRIOR SERVICE

Previous performance, quality of service and merchandise will be considered.

ADDENDA AND INTERPRETATIONS & ALTERNATE PROPOSALS

Addenda information will be available online at <http://www.watertownct.org>. Adobe Acrobat®

Reader may be required to view this document. We strongly suggest that you check for any addenda a minimum of forty eight hours in advance of the bid deadline.

At the time of the opening of bids each bidder will be presumed to have inspected the work and to have read and to be thoroughly familiar with all of the Contract Documents (including all addenda). The failure or omission of any bidder to receive or examine any form, instruction or document shall in no way relieve any bidder from any obligation in respect to his bid.

If any person contemplating submitting a proposal is in doubt as to the true meaning of any part of these specifications, he may submit a written request for an interpretation to the Purchasing Agent. No interpretations as to the meaning of the plans, specifications or other Contract Documents will be made to any bidder orally.

Every request for such interpretation should be in writing addressed (duplicate copy) to the Town of Watertown, Purchasing Agent, 424 Main Street, Watertown, Connecticut 06795, and to be given consideration, must be received at least five (5) days prior to the date fixed for the opening of Bids. Any and all such interpretations and any supplementary instructions will be in the form of written Addenda to the Specifications which, if issued, will be mailed by Registered Mail with Return Receipt Requested to all prospective bidders at the respective addresses furnished for such purposes, not later than three (3) days prior to the date fixed for the opening of bids. Failure of any bidder to receive any such Addendum or interpretations shall not relieve any bidder from any obligations under his bid as submitted. All Addenda so issued shall become part of the Contract Documents. Oral explanations will not be binding on the Town.

The specifications listed are to be interpreted as meaning the minimum acceptable by the Town of Watertown. Bidders are requested to submit quotations on the basis of these specifications. Alternative bids providing a broader scope and/or services than requested in these specifications may receive consideration providing such equipment and/or service is clearly explained. Any exceptions to the specifications requested herein must be clearly noted in writing and are to be included as a part of your bid proposal. If none are included it will be assumed that there are none.

Definition of the word "complete" means that each unit of the equipment proposed shall include all appurtenances, fasteners, parts, accessories, and services ordinarily catalogued.

An item equal to that named or described in the specifications may be furnished by the Bidder, except where expressly noted as "no substitutions." The naming of any commercial name, trademark, or other identification shall not be construed to exclude any item of any manufacturer not mentioned by name, nor limit competition, but shall establish a standard of equality only. An item shall be considered equal to the item so named or described if:

- A. It is at least equal in quality, durability, appearance, strength and design.
- B. It will perform at least equally the function imposed by the design for the work being contracted for or the material being purchased.

- C. It conforms substantially, even with deviations, to the detailed requirements for the item in the specifications.

The Bidder shall hold the Town of Watertown, its officers, agents, servants, and employees, harmless from liability of any nature or kind because of use of any copyrighted or uncopied compositions, secret process, patented or unpatented inventions, articles or appliances furnished or used under this bid, and agrees to defend, at his own expense, any and all actions brought against the Town of Watertown or himself because of the unauthorized use of such articles.

QUOTATION LIMITATION

Bidders shall offer only ONE ITEM AND PRICE for each line item bid. If an or equal item is to be bid, the bidder is to select the brand and model that meets or exceeds the specified item, and submit his bid for that item.

ESTIMATE OF WORK

For bidding purposes, the work has been subdivided into unit price items. The quantities shown are to be considered as approximate only. The Purchasing Agent does not expressly or by implication agree that the actual quantity will correspond therewith, but reserves the right to increase or decrease the amount of any item or portion of the work as deemed necessary.

SAMPLES

Samples of articles, when required shall be furnished free of cost of any sort to the Town of Watertown. Samples received may be retained by the Town for future comparison. Samples which are not destroyed by testing, or which are not retained for future comparison will be returned upon request at the bidder's expense.

WITHDRAWAL OF BID

Bidders may withdraw their proposals at any time prior to the bid date. No agent/broker shall withdraw or cancel their proposal for a period of sixty (60) days after the bid closing date of Tuesday, June 13, 2006. The successful agent/broker shall not withdraw, cancel or modify their proposal.

POWER OF ATTORNEY

Attorneys-in-fact who sign contract bonds must file, with each bond, a certified and effectively dated copy of their power of attorney.

EXECUTION OF CONTRACT

The party to whom the Contract is awarded, or his authorized representative, will be required to attend at the office of the Purchasing Agent of the Town of Watertown, with the sureties offered by him or them, and a current certificate of Corporate good standing issued by the Office of the Secretary of State, in which the corporation is incorporated, and execute the Contract within five (5) days from the date of the award. If the party entering into this contract is a corporation, a Corporate Resolution duly executed by the President and Secretary of the Corporation authorizing the Corporation to enter into this Contract shall be provided. In case of his failure or neglect so to do,

the Town may, at its option, determine that the Bidder has abandoned the Contract, and thereupon the Proposal and acceptance shall be null and void, and bid security accompanying the Proposal shall be forfeited as liquidated damages to the Town. If the party entering into this contract is a partnership, a partnership resolution duly executed by a majority of the general partners authorizing the partnership to enter into this contract shall be provided.

SUBCONTRACTORS

- A. Each bidder contemplating the use of any subcontractor shall submit a list of subcontractors as listed on the Bid Form.
- B. The apparent low bidder shall file with the Town of Watertown, within five (5) days after the date of bid opening, a complete list of the names and addresses of competent, responsible and qualified subcontractors who are actually to perform major portions of the work. This in no way restricts or limits the requirement that all subcontractors must be approved by the Town.
- C. Subcontractors listed on the Bid Form or those previously approved may not be changed without the approval of the Town of Watertown.

Local subcontractors, material suppliers, and labor in the Town of Watertown should be considered and sought insofar, as is practical in the performance of this project.

QUALIFICATION OF BIDDER

In determining the qualifications of a bidder, the Town may consider his record in the performance of any contracts for similar work into which he may have previously entered; and the Town expressly reserves the right to reject the bid of such bidder if such record discloses that such bidder, in the opinion of the Town, has not properly performed such contracts or has habitually, and without just cause, neglected the payment of bills or has otherwise disregarded his obligations to subcontractors, suppliers, state or local codes, men or employees of subcontractors.

The Town may make such investigation as he deems necessary to determine the ability of the bidder to perform the work and the bidder shall furnish to the Town all such information and data for this purpose as the Town may request. The Town reserves the right to reject any bid if the evidence submitted by or the investigation of such bidder fails to satisfy the Town that such bidder is properly qualified, or that such bidder misrepresented material facts in the bid documents.

DISQUALIFICATION OF BIDDERS

More than one proposal from an individual, firm, partnership, corporation, or an association under the same or different names will not be considered. Reasonable grounds for believing that any Bidder is interested in more than one proposal for the work contemplated will cause the rejection of all proposals in which such Bidder is interested. Any or all proposals in which such Bidder is interested will be rejected if there is reason for believing that collusion exists among the Bidders and all participants in such collusion will not be considered in future proposals for the same work. Proposals in which the prices are obviously unbalanced may be rejected. No Contract will be awarded except to competent Bidders capable of performing the class of work contemplated.

SERVICE CENTER REQUIREMENTS

Bidders must state the location of the nearest available factory authorized service center for all components of the equipment specified.

DELIVERY

Inasmuch as this work concerns a needed public improvement, the provisions of this bid relating to the time of delivery, performance and completion of the work are of the essence of this bid. Accordingly, the successful bidder shall commence work upon receipt of the signed Purchase Order unless the Town shall authorize or direct a further delay, and shall proceed with the work diligently so as to permit delivery no later than 60 calendar days after receipt of the Town's Purchase Order.

Time of delivery shall be stated as the number of calendar days following receipt of the Purchase Order by the Bidder to receipt of the goods or services by the Town of Watertown.

Prices quoted must include delivery to the Town of Watertown as specified on the Purchase Order. No charges will be allowed for parking, crating, freight, express or cartage unless specifically stated and included in this bid.

Time of delivery may be considered in the award.

PAYMENT

The Town, after inspection and acceptance of workmanship, and in consideration of the faithful performance by the Bidder of all and singular his covenants, promises, and agreements contained herein, agrees to pay the Bidder for the full completion by him of the work embraced in this Contract, within (30) Thirty Days of the receipt of the final invoice. When subcontractors or suppliers are utilized, the successful Bidder for this project shall be required to submit a Mechanics Lien Waiver, acceptable to the Town, with each progress payment and/or at time of final payment prior to any payment being made.

Time, in connection with any discount offered, will be computed from the date of delivery to the Town or from the date a correct invoice is received by the Town's Finance Department, if the latter date is later than the date of delivery.

Prices will be considered as NET, if no cash or payment discount is shown.

The successful bidder shall submit invoices to the following address:

Town of Watertown
Water & Sewer Authority
747 French Street
Oakville, CT 06779

IT IS UNDERSTOOD AND AGREED THAT SHOULD A BID BE ACCEPTED, IT WILL AUTOMATICALLY BECOME THE CONTRACT OR AN ADDENDUM TO ANY CONTRACT AGREED UPON.

Notification of the bid award will be made by issuance of a purchase order. Bidders are to list their bids on the appropriate attached sheets. Bidders may attach a letter of explanation. A clear notification should be made on the standard bid sheets at the appropriate point of explanation that there is a letter of explanation attached. All bids must be NET prices.

The successful bidder shall submit an itemized invoice to the Town of Watertown for the work as described herein.

The bidder shall be required to submit a Mechanics Lien Waiver, acceptable to the Town of Watertown, with each progress payment and at time of final payment prior to any payment being made.

At the time of award the successful bidder shall be required to supply the Town of Watertown a Certificate of Good Standing, certifying that the corporation is in fact a valid corporation and presently licensed to conduct business in the State of Connecticut.

SALES TAX

Certain materials and supplies incorporated in the work of this project are exempt from Connecticut Sales Tax. The Bidder shall familiarize himself with current regulations of the State Tax Department. The tax on materials or supplies exempted by such regulations shall not be included as part of the bid. The Town will furnish the successful Bidder sales tax exemption authorization.

CARE AND PROTECTION OF PROPERTY

The Bidder shall take particular care to avoid damages to all private and public property and to private or public improvements within the Town's right of way. He shall make good any damages to the satisfaction of the Town. There shall be no additional compensation for the repair or restoration of private or public property improvements.

COMPLIANCE WITH FEDERAL, STATE AND LOCAL CODES

The Bidder shall be responsible for full compliance with any Federal, State and/or Local codes, laws, regulations and standards, as applicable.

AWARD

The Town of Watertown reserves the right to accept or reject any bid to best serve its interests, or to hold the bids for sixty (60) days before decision.

The Town reserves the right to reject any and all bids (or any part thereof), to waive defects in proposals, or to accept any proposal deemed to be in its best interest.

Exceptions will be considered to the specification provided, providing they are listed and fully explained on a separate page entitled "EXCEPTIONS TO SPECIFICATIONS"

Each exception will be considered as to its degree of impact and total effect on the bid. The purchaser shall determine which (if any taken) exceptions are acceptable, and this determination shall be final.

The Town of Watertown reserves the right:

- 1) To award bids received on the basis of individual items, or groups of items, or on the entire list of items.
- 2) To reject any or all bids, or any part thereof.
- 3) To waive any informality in the bids.
- 4) The Town of Watertown reserves the right to take into account the residency of bidders within the Town of Watertown and/or the location of the bidders business within the Town of Watertown in awarding this bid.
- 5) To accept the bid that is in the best interest of the Town of Watertown. The Purchasing Agent's decision shall be final.

INSURANCE

A. General:

The Bidder shall be responsible for maintaining insurance coverage in force for the life of the contract of the kinds and adequate amounts to secure all of the Bidder's obligations under the contract with an insurance company with an AM Best Rating of A - VII or better licensed to write such insurance in Connecticut and acceptable to the Town of Watertown.

The insurer shall provide the Town of Watertown with Certificates of Insurance signed by an authorized representative of the insurance company(ies) prior to the performance of this contract describing the coverage and providing that the insurer shall give the Town of Watertown written notice at least thirty (30) days in advance of any termination, expiration, or any and all change in coverage.

Such insurance or renewals or replacements thereof shall remain in force during the Bidder's responsibility under this agreement.

The Bidder at his own cost and expense shall procure and maintain all insurance required and shall name the Town of Watertown as an additional insured on all contracts except Worker's Compensation and Professional Errors & Omissions coverage.

In order to facilitate this requirement for insurance, it is recommended that the bidder forward a copy of this exhibit to the bidder's insurance representative(s).

B. Specific Requirements:

- (1) Workers' Compensation Insurance

The Bidder shall provide Workers' Compensation Insurance required by law and the Employer's Liability Insurance for at least the amounts of liability for Bodily Injury by accident of \$100,000 each accident; Bodily Injury by Disease each employee of \$100,000; Bodily Injury by Disease, policy limit of \$500,000.

(2) Commercial General Liability Insurance

The Bidder shall carry Commercial General Liability policy (Insurance Services Office Incorporated Form CG-0001 or equivalent). A per occurrence limit of \$1,000,000 is required. The Aggregate Limit will be not less than \$1,000,000.

(3) Business Automobile Liability Insurance

The Bidder shall carry Business Automobile Liability Insurance. (Insurance Services Office Incorporated Form CA-00001 or equivalent). A per occurrence limit of \$1,000,000 is required. "Any Auto" (symbol 1 or equivalent) is required.

C. Hold Harmless & Subcontractor's Requirements:

The Bidder shall require the same insurance that it is required to carry by the Town of Watertown to be carried by any subcontractors and independent contractors hired by the Bidder and to obtain Certificates of Insurance before subcontractors and independent contractors are permitted to begin work.

The Bidder shall require that the Town of Watertown be named as Additional Insured on all subcontractor's and independent contractor's policies before they are permitted to begin work.

The Bidder and all subcontractors and independent contractors and their insurers shall waive all rights of subrogation against the Town of Watertown, and its officers, agents, servants and employees for losses arising from the work performed by each on this contract.

The Bidder assumes and agrees to hold harmless, indemnify, protect and defend the Town of Watertown against any and all liability for injuries and damages to Bidder and to Bidder's employees, agents, subcontractors and guests, third parties or otherwise incident to or resulting from any and all operations performed by a contractor under any terms of this contract.

D. Other Data:

NOTE 1: If Bidder is only a vender shipping goods via Common Carrier only, General Liability is required.

NOTE 2: If Bidder is a Professional, Errors & Omission coverage will be required.

NOTE 3: The Town reserves the right to amend amounts of coverage required and the types of

coverage provided based on work or service to be performed.

GUARANTEE

The bidder shall unconditionally guarantee for a period of one (1) year from the date of acceptance, all materials, supplies, equipment, and services; including but not limited to its workmanship, delivery and installation. If within the guarantee period there are any defects or signs of deterioration the bidder shall repair, adjust or replace the item(s) to the complete satisfaction of the Town. These repairs, adjustments, or replacements are at the sole expense of the bidder and shall be made at such times that are agreeable to the Purchasing Agent so that it is least detrimental to instructional programs.

NONDISCRIMINATION IN EMPLOYMENT

The successful bidder shall agree and warrant that, in the performance of this contract, he will not discriminate or permit discrimination against any person or group of persons on the grounds of race, color, sex, religion, or national origin in any manner prohibited by State, Federal, County, or Municipal law. A certification of Nonsegregated Facilities and a Certification Regarding Equal Employment Opportunity shall be considered a part of this contract.

MECHANICS LIEN WAIVERS

The successful Bidder shall be required to submit a Mechanics Lien Waiver, acceptable to the Town of Watertown, with each progress payment, and/or at time of final payment, prior to any payment made.

For further technical or administrative information contact Mr. Charles Frigon, Purchasing Agent at (860) 945-5260 or via email at Frigon@watertownct.org.

**TOWN OF WATERTOWN
WATERTOWN, CONNECTICUT**

TECHNICAL SPECIFICATIONS

Water Meters and Related Reading System

Overview

The Town of Watertown, Water & Sewer Authority is seeking proposals from qualified vendors for the phase-in replacement of a “Metering and Meter Reading System”. Described herein are various approaches which the Water & Sewer Authority will consider. Final determination will be based on several aspects of those systems proposed, the most significant being both immediate as well as anticipated future costs. Please be clear that only one of the several systems described will be ultimately purchased.

The Town of Watertown Water and Sewer Authority (WSA) water metering system currently consists of approximately 39.4% AMCO/ABB Scancode Absolute Encoder meters and 13.4% Neptune ARB VI ProRead style Absolute Encoder meters. These meters are read with Northrop Grumman VersaProbe and written in traditional meter books. The remaining 47.2% of the meters are visual-read or direct-read. Eight hundred (800) of the direct or visual-read meters have been in service for over twenty years. The WSA intends to replace the 800 meters with radio-read meters within the next one to two years with its own forces and to convert from the traditional meter books to hand-held computer reading of the AMCO/ABB and visual-read meters using the VersaProbe. The Neptune ARB VI ProRead may be converted to radio-read by installing radios. The WSA forecasts that it will purchase and install approximately 275 to 350 drive-by radio-read meters each year for the next 15 to 20 years thereby phasing out all touch-read, visual-read and direct-read meters.

Radio-read transmitters shall be FCC 15.247 approved high power, 100 milliwatt with a drive-by range up to one mile, with at least a twenty (20) year warranty on the radio and battery. The vendor shall guarantee Encoder Compatibility assuring that the Automated Meter Reading System purchased today can be expanded from reading with hand-held devices to reading with mobile or fixed products. The radio transmitters will use frequency hopping spread spectrum on 50 channels, require no programming and be powered by a field replaceable battery.

The WSA is presently converting its water and sewer billing software to the Continental Utility Solutions, Inc. (CUSI) Continental Billing System for Windows. The CUSI software includes AMR route software for one manufacturer. If two or more versions of the route software are needed by any vendor to allow the WSA to continue touch-read and implement radio-read, the vendor must state the additional software costs. The WSA will only consider systems that require one version of route software for both radio-read and touch-read.

Guaranteed Compatibility With Installed Meter Base

The WSA intends to install a high-power radio-read meter system, which limits some competing products. We are willing to consider those vendors that guarantee 100% compatibility with the Neptune/Sensus reading protocol. Specifying the Neptune/Sensus protocol will maintain as open an architecture as possible while not limiting meter purchases to a single source vendor. The WSA intends to maintain an inventory of only one kind of radio that will eventually fit all the meters in our system. All systems offer some compatibility with our meters to varying degrees, however, to our knowledge, only Neptune and Sensus are signatory to the Sensus protocol which we intend to install with our new meters and existing inventory of Neptune meters. This alternative offers the highest compatibility with our existing AMCO/ABB touch-read meters by utilizing the Neptune CE 5320X Handheld with the VersaProbe.

PROPOSAL #1 WATER METERS WITH NEPTUNE/SENSUS PROTOCOL REGISTERS

- 1.1 General Description: Meters furnished under these specifications shall be the product of a manufacturer with at least ten (10) years experience in meter manufacturing for the market in the United States of America. Meters shall be new, first line quality, positive displacement type for cold water service that have registers utilizing the Neptune/Sensus Absolute Encoder protocol.
- 1.2 Meters shall comply with AWWA Standard C700 and C-707 latest revision and the minimum specifications herein. They shall be designed for use with potable water below 120 degrees F.
- 1.3 Meters must be magnetically driven. Meters with stuffing boxes, spindle and packing glands will not be acceptable.
- 2.1 Registration Accuracy: All meters shall meet the following flow requirements:

Size	Low Flow GPM @ 95%	Normal Flow GPM 98.5% - 101.5%	Continuous Flow GPM
5/8"	1/8	1/4 - 20	15
5/8" x 3/4"	1/8	1/4 - 20	15
3/4"	1/2	2 - 30	15
1"	3/4	3 - 50	25
1.5"	1.5	5 - 100	50
2"	2	8 - 160	80

- 3.1 Main Cases: The body main case shall be of high quality 100% no lead copper alloy that complies with ANSI/NSF 61 with raised markings to indicate the direction of flow and size. All cases shall have a minimum wall thickness of 1/8th of an inch. All 5/8" - 1" meter main cases shall include a bottom plate made of cast iron and held in place with stainless steel bolts with integral washer heads. All bottom plates shall be isolated from the potable water

by a full rubber liner. All 1 1/2" - 2" meter main cases shall include a top plate made of bronze only.

- 4.1 Register Housings: Register housings shall be constructed of a (suitable engineering polymer) (bronze) and provide full protection of the register assembly. Register assemblies shall be secured to the main case in a tamper resistant fashion to prohibit unauthorized removal. Seal screws, tamper-proof screws, or locking devices are acceptable.
- 5.1 Registers: Registers shall be of the absolute encoder type and permanently sealed in a vacuum purged, oil filled, or dry nitrogen gas filled copper or stainless steel can. Systems utilizing generator pulses, low voltage conversions or communications codes other than the Neptune/Sensus protocol are not acceptable under this standard. Similar size, type and registration of registers shall be interchangeable. Registers shall be equipped with low flow indicators and faceplates must be stamped with date of manufacture. Registers shall read in gallons.
- 5.2 Upon inquiry from a remote location, the absolute encoder register shall disclose the exact position of the six most prominent number rollers as well as the electronic identity number of the register without the use of internal power. All power necessary for data transmission shall be supplied from the interrogation device. All registers shall be compatible with various brands of interrogation equipment. Interrogation equipment will be covered under a separate specification.
- 5.3 All registers shall be easily upgraded to Automatic Meter Reading (AMR) with the use or substitution of the remote receptacle with a Meter Interface Unit (MIU) of the Outbound aka "bubble-up" type.
- 5.4 Data transmission shall be instantaneous and supplied in an ASCII format without conversion or modification.
- 5.5 Color-coded wire terminals (red, green and black) shall be provided, however, only the red and black terminals may be utilized for a two-wire connection to the interface remote receptacle, e.g., Touch Pad, Scan Pad. The green terminal need only be utilized to convert to radio-read via the use of a Meter Interface Unit. A suitable wire terminal cover shall be provided and be factory potted when ordered for underground pit installations or equal.
- 5.6 All registers that are removable without disassembly of meter or depressurizing the service line must have tamper-resistant locking mechanisms to discourage theft of water.
- 5.7 Lens covers shall be made of polycarbonate or other suitable engineering polymer for indoor installations and mineral glass for underground pit installations or equal. All other register assembly and material requirements stated herein shall also apply.
- 6.1 Measuring Chambers: Measuring chambers shall be of the two piece design and be made of an ANSI/NSI 61 compliant copper alloy containing not less than 85% copper or a suitable

engineering polymer. The chamber shall be separate from the outer casing and so secured in the main case that the accuracy of the meter will not be affected by slight distortion of the case. All wear-prone surfaces shall be reinforced with a nylon material.

- 6.2 All measuring chamber assemblies shall operate smoothly and be capable of sustaining long-term accuracy. All motion from the piston or nutating disk shall be transferred to the register via magnetic drive.
- 7.1 Pistons and disks shall be made of vulcanized hard rubber or a suitable engineering polymer with a specific gravity approximately equal to that of water.
- 7.2 Piston oscillations or disk nutations must not exceed the figure recommended in Table One (1) of AWWA Standards C-700 latest revision for the size of meter being bid.
- 8.1 Strainers: All meters shall be provided with a strainer screen installed in the meter. Strainer screens shall be rigid, fit snugly, be easy to remove and have an effective straining area at least two times that of the main case inlet.
- 9.1 Warranties: All meters shall carry the following published warranties:

Meters shall be guaranteed to be free from defects in materials and workmanship and to meet AWWA New Meter Accuracy Standards for a period of five years from the date of purchase. At the expiration of this period, meters shall be guaranteed to meet AWWA Repaired Meter Accuracy Standards for the following minimum time periods:

5/8" - 1"	5 - 20 years from date of shipment
1 1/2" - 2"	5 - 10 years from date of shipment

Electronic registers shall be guaranteed from defects in materials and workmanship for a minimum period of twenty (20) years from date of receipt.

- 10.1 Evaluation of Bids: Published guarantees and exchange/repair programs offered by the bidders will be carefully considered and will be an important factor, along with the prices quoted and experience of the bidders, in evaluating bids for an award.
- 11.1 Compatibility: The utility must have the flexibility to read all meters with the Neptune CE5320X Handheld or MRX920 Drive by Unit interrogation device regardless of brand. THIS IS AN ABSOLUTE REQUIREMENT.
- 12.1 Length of Contract: This contract shall run for a period of three (3) years.

PROPOSAL #2 - RELATED READING UNITS, INTERFACES AND SOFTWARE

A. GENERAL REQUIREMENTS

1. The vendor shall supply and install two (2) hand-held units with all associated battery charging and data interface hardware, including probes capable of reading all major manufacturers' encoded register type reading devices, and shall supply operating software and documentation. The vendor will also perform all necessary training to bring the system to operational status. The Town will provide the necessary personal computer (PC).
2. The system shall be supplied FOB the Watertown Water & Sewer Authority. The vendor shall unpack, install, interconnect and connect power to all vendor-supplied equipment, and shall be responsible for making the system operational. The bidder shall state clearly in their proposal what responsibilities the Town shall have relating to host billing system data, hardware installation and software support.
3. Bidders should include complete descriptions of the following items in their proposals:
 - All hardware components INCLUDING PROBES
 - System software features, functions and capabilities
 - Installation, training and documentation
 - Maintenance
 - Warrantees
 - Other items required herein
 - Prices
 - History of company
 - References
 - List of similar systems installed in Connecticut, Massachusetts, Rhode Island, other New England states, other northeast states, and elsewhere, in that order
 - Pricing for each individual item

In addition, the bidders are urged to submit any and all additional information and data which will significantly add to the client's ability to make an informed and accurate selection of the system best suited to its needs.

4. Questions regarding the project or proposal shall be addressed to Frank Jodaitis, Superintendent, Town of Watertown Water & Sewer Department, 747 French Street, Oakville, CT 06779. Phone: 860-945-5299; Fax: 860-945-5298. Questions regarding data processing should be addressed to Doug Burdett at 860-945-5263.

B. HAND-HELD UNITS

Hand-held units will be used in the field to record meter readings, trouble or other reports, and comments keyed in by the meter reading personnel. The unit requirements are as follows:

1. The units shall be completely self-contained, easily held in one hand, and supplied with a protective cover and hand strap or shoulder strap. All meter types shall be capable of being read by a single probing device.
2. Each unit shall not weigh more than 33 ounces with batteries installed.
3. The hand-held units shall have a minimum of 384k memory with memory expansion options (specify).
4. The hand-held units shall use a liquid crystal display (LCD) with not less than 8 lines of display and a minimum of 20 characters per line. The display shall have a built-in back light feature and adjustable contrast.
5. Batteries shall provide sufficient power to read over a 10-hour shift.
6. Batteries used to provide main power shall be fully rechargeable, from a completely discharged state, in not more than 12 hours. A method of backup main power shall be provided. In the event of main power loss, data already collected shall be protected from loss for a minimum of five (5) days by a separate power source or other suitable method. Data so protected shall be retrievable for processing by the host billing computer.
7. Hand-held devices must have capability to display visually the remaining battery power capacity.
8. The keyboard shall be sealed against dust, water, mud and other environmental conditions. The hand-held units shall be submersible and float in water without damage, and be capable of being used in inclement weather without the use of external covers or cases.
9. Hand-held units shall be operable in severe weather extremes, including moisture and temperature.
10. Units shall be resistant to electrostatic shock and shall withstand a drop from the height of four (4) feet onto concrete.
11. Units shall have an audible and visual alert capability to signal the operator of certain conditions such as an improper input or a warning of a vicious dog.
12. Hand-held units shall allow input of both alpha and numeric characters, and provide tactile and/or audible feedback upon key entry.
13. Units shall be equipped with an internal real-time clock/calendar, which can be used to date and time stamp readings and other entries.
14. The operator shall be able to cycle from account to account one at a time or in high speed, forward or backward. He/She shall be able to search the entire displayable database for a

match on any input up to 16 characters. This search capability shall allow the operator to find an account using, for instance, a meter number or address (but not limited to those examples). The operator shall also be able to perform a high-speed search for unread meters. The operator shall be able to manually input the meter reading for a particular address.

15. The operator shall be able to input meter readings from right to left or vice versa.
16. Each meter reading shall be limit-checked against high and low limits pre-loaded with each account. If an input reading falls outside these limits, the unit shall signal the reader both visually and audibly and the reading shall not be accepted. The reader shall have the option however, to correct erroneous input or force the unit to accept the entry. A forced reading shall be recognized by the software system for use on reports. Input readings, which pass the limit test, shall be accepted by the unit with a unique audible and visual indication.
17. The operator shall be able to input trouble reports and comments in either coded or free text form.
18. The hand-held unit shall have built-in technology to take direct readings from scanning disks, devices which operate on the inductive coupling principle, or Neptune ARB I-V pins devices located remotely from the meter for encoder equipped meters. The hand-held unit shall automatically identify the type of meter. The vendor shall supply a signed affidavit stating that the hand-held unit is able to accept data from a single probing device. The probing device must be capable of direct interrogation and read all of the following meter brands: ABB Kent Scancoder; Sensus TouchRead; Schlumberger ProRead; Neptune ARB I through V; other absolute encoder meters (state). The hand-held unit shall be easily upgradeable to incorporate new meter technologies. A list of all manufacturers that can be read by the proposed equipment shall be supplied with the proposal. THIS IS AN ABSOLUTE REQUIREMENT.
19. A special clip for attachment to workman's belt shall be provided to securely hold probe device.

C. CHARGING AND DATA INTERFACE EQUIPMENT

Battery charging equipment shall fully recharge the main power batteries of the hand-held units in 12 hours or less. Means shall be provided to ensure that data collected will not be lost in the event that main battery power becomes low or lost. Means shall be available to keep discharge and recycle main power. Units must have capability to be charged separately from the communications device.

Data transfer to and from the PC and the hand-held units shall be affected automatically under software control. The transmission rate shall be selected by the user from the industry standard rates up to and including 19,200 bits per second. Error control/correction shall be utilized to ensure data integrity.

Each hand-held unit shall have its own battery charger.

Vendor shall state what types of computer interface connection will be provided.

D. SYSTEM SOFTWARE

The software provided by the vendor shall be designed for use in utility meter reading functions. The vendor shall be responsible for the installation of the system and for ensuring that it is operating in accordance with any published specifications and user's manuals for the system. The software shall:

1. Accept customer account files transmitted from the billing (host) computer to the PC and after the reading process is complete, prepare the files for retransmission to the host for billing and report generation. Changes in the format of the account file shall be accommodated by the software via inputs, which redefine the file. Subsequent runs of the software shall automatically adjust to the new format without the need to reprogram the system.
2. Allow the user to define the fields to be loaded into the hand-held unit by field name, characteristics, and order. This will allow the client to tailor the use of the unit to control the displays and the inputs, and to perform portable data collection applications other than meter reading. Typical field characteristics are:
 - Alphanumeric or numeric data
 - Display the field name with the data
 - Allow the reader to change displayed data
 - Apply limit checking to the input
 - Sound and display an alert
 - Time stamp and date stamp the input
 - Inhibit the unload of the data
 - Inhibit load of a field if data is blank or zero

Bidders shall explain how their system assigns attributes to each field loaded into the hand-held device and to state if and how the user can change those attributes.

3. Load and unload the hand-held units, including initial loading of existing database from our central computer. We can provide this database in flat ASCII format.
4. Include a report generator, which will allow the user to define reports using any field in the account files before or after meter readings have been added to the accounts. The user shall be able to define the report title, column headings, sort order, and filter characteristics (which accounts will be selected for printing) and shall be allowed to specify single, double or triple spacing. The user may specify the width of his printer (80 or 132 characters) and, if 80 is specified and a report needs more than 80, the report generator shall automatically compress the printing. It shall be possible to designate which reports will be printed during automatic operations.

5. Provide an automatic operations mode which will unload meter readings and other collected data, update the account files in the PC, prepare new routes for loading into the hand-held units, reload the units, and print those reports which are so designated. It shall be possible to have the system begin automatic operations at some specified day and time and, if interrupted, to resume proper operations again when restarted. The PC shall log all automatic operations, time-stamped, for operator review.

Reports shall be selectable to spool to a file for printing at a later time if desired. Report program shall allow for displaying on the PC screen for viewing, or sent to printer for hard copy.

6. Provide a manual mode, which operates under the direct control of the user. The system shall issue a warning to the user upon input of a command, which might result in loss of reading data.
7. Allow the user to split a route into as many as eight (8) parts, which can be added to other routes for reading or can be read independently. Bidders shall describe the options available for route splitting. The unit will allow multiple routes to be loaded into one device with each route maintaining its unique ID.
8. Allow the user to strip unread accounts from routes that have been read and create a master "unread route."
9. Upon operator request, display all account data resident in the PC before or after being loaded into a unit.
10. Allow the user to make changes in the definition of the account files, hand-held unit data and displays, and report formats without any system reprogramming or assistance from the vendor.

E. INSTALLATION, TRAINING AND DOCUMENTATION

Vendors shall install their equipment and oversee the connection of the data interface device(s) to the PC. All software shall be installed and tested, the initial database created from our data and initial data file verification and validation performed. Bidders shall describe their installation process in their proposals.

Training shall be performed for required personnel including meter readers and office personnel. Training shall be sufficient to provide the users with the required knowledge to generally operate the system without assistance from the vendor. Bidders shall include a training schedule in their proposals including the topics to be covered.

A minimum of 16 hours of on-site training by a factory trained representative intimately familiar with the software and hardware shall be provided.

All hardware and software shall be provided with full documentation for operation and maintenance.

Bidders shall list the documentation that will be provided with the system.

F. MAINTENANCE

The system to be procured will support a revenue generating function and will be in daily use by the Owner. Therefore, fast efficient maintenance is required to minimize the impact of equipment failures. Bidders shall describe the maintenance services available and the method of obtaining the same for both hardware and software. If maintenance is supplied by other than the bidders, so specify.

Bidders shall describe their policy, procedures, and fees for providing updates for the system software when such updates become available.

G. WARRANTY

The Bidder shall completely warrant all hardware, software, system installation and provide complete software and hardware support, including changes required by the Town to improve system performance or report capabilities, for a two (2) year period after installation and acceptance of the complete system by the Town.

Bidders shall state the warranty in their proposal and shall clearly define the terms and conditions of any warranty offered beyond that specified.

H. PRICES

1. Price shall include all costs associated with providing and installing the specified hardware, software, data conversion, installation, training, shipping, insurance, annual maintenance, and any other costs to provide a fully operational system complete in place. All terms and conditions shall be included.
2. Bidder shall state a guaranteed hourly rate for software support and changes for a one (1) year period after the two (2) year warranty.
3. Bidder shall state a guaranteed rate for complete hardware and software maintenance for the one (1) year period after the two (2) year warranty.

I. SYSTEM COMPATIBILITY

The software and hardware shall be compatible with Intel compatible window based workstations. It should be able to handle up to 10,000 accounts.

The software must be capable of generating fixed-field flat ASCII files for transfer to Town mainframe. The software should be compatible with VT terminal emulation software.

Meter Reading System and Radio Meter Interface (MIU) Specifications

1.0 Scope of Work

Watertown Water and Sewer Department issues these bid specifications to procure a meter reading system capable of meeting the current and future meter reading needs within our service area. The scope of work involves, but is not limited to, providing and installing a meter reading system which includes software, hardware and all necessary training and installation support. The reading equipment shall be capable of receiving meter readings while utilizing a handheld reading device and/or a mobile reading unit. It is the intent of Watertown Water and Sewer Department to have the Vendor provide the meter reading equipment compatible with Neptune and Sensus protocol water meters equipped with absolute encoder registers.

The system must have the capability to be upgraded to radio frequency technology to improve meter reading efficiency including addressing “hard-to-read” meters and increasing meter reader safety. The Vendor shall describe the upgrade requirements to incorporate RF technology.

Once upgraded to allow radio frequency reading, the system shall still be able to probe water meters or allow manual entry within the same route without detaching the probe or radio interface unit.

The proposed system must be provided by the same company or an equity partner (specifics must be submitted with the proposal).

All system parts furnished (reading equipment, RF transmitters, meters with absolute encoders) shall be produced from an ISO 9001 manufacturing facility.

2.0 System Overview

The meter reading system shall be adaptable to walk-by, mobile or targeted fixed network methods of collecting data.

The transition from walk-by to mobile to fixed network shall be seamless and allow all methods to operate together in a hybrid system.

The meter reading system shall include a walk-by system providing a migration path from the walk-by to mobile through to targeted fixed network applications. The difference between the three systems shall be the method of gathering the meter readings. The systems are not mutually exclusive — they can be used together seamlessly. The first shall use the handheld data collection device; the second shall use a mobile data collection device driven near the customer premises to collect reads; and the third shall use a fixed network data collector to continually receive, store and communicate data from meters within range. Each method shall add its unique value to the Watertown Water and Sewer Department and the choice shall be driven by the needs of the Watertown Water and Sewer Authority and its customers.

- *Host Software* — The software package will be installed on the host system at the utility site. Its main function shall be to make route assignments to send to the data collection device and to transfer collected information to the billing/CIS system via a transfer file. The utility will be responsible for the transfer file.

- *Data Collection Device* — The means of communication between the meter interface unit (MIU) installed at the meter site and the host software. In a walk-by system, it must be a handheld computer capable of reading meters using keyed-entry, probing or RF communications with an attached receiver device. In the case of a mobile application, the data collection device must be a portable personal computer integrated to an RF receiver that can be installed in any vehicle. For the fixed network application, the data collection device must be an environmentally sealed control box able to adapt to various installation settings. It must also demonstrate the ability to receive, store and communicate meter readings to the host software for further use and analysis.

- *Meters/Meter Interface Units* — Meters connected to electronic devices that shall collect meter usage from an encoder meter register and shall transmit the meter reading and a unique ID number to the data collection device.

3.0 Host Software

The Host Software must be meter reading software that will transfer files between the Utility Billing/CIS System and the data collection devices. The utility will provide the transfer file to the vendor's file format provided it is a standard ASCII format. The host software must be configurable for either a standalone installation or operate in a client/server environment.

3.1 Computer Platform

The meter reading software must be capable of running in a standalone mode and have the capability to support a Windows Client / Server environment. When operating in either standalone or client/server configurations, the PC computer will be equipped with a minimum Intel 800MHz Processor with at least 256MB of RAM, 1.5 GB of available space on the hard disk space, Super VGA (1024x768) or higher resolution video adapter and monitor, keyboard and mouse or compatible pointing device, 24X minimum CD-ROM drive and compatible printer. In addition, the software must be able to operate with Windows 2000®/ Windows XP® or later operating system. System must be equipped with an Ethernet network adapter.

When operating in a client/server environment, the meter reading software shall operate on a server with Intel 800MHz or higher, with at least 256MB RAM, 4.0 GB of available space on the hard disk space, Super VGA (1024x768) or higher resolution video adapter and monitor, keyboard and mouse or compatible pointing device, 24X minimum CD-ROM drive and compatible printer. In addition, the software must be able to operate with Windows Server 2000®/Windows Server 2003®. Server must be equipped with an Ethernet network adapter.

3.2 Basic Functions

The software must provide easy management of the meter reading data. After the readings are collected, they must be unloaded to the PC for review and reporting and exported to a file to be sent to the Utility Billing/CIS System. New meter reading routes must then be imported into the database and prepared for loading into the handheld.

The meter reading software shall manage the routes that are loaded into the data collection device and be able to split them into multiple routes if necessary.

The meter reading software must include the following:

- Loads/unloads from the handhelds by serial communications at a minimum speed of 19,200 bps and via Ethernet communications at a minimum speed of 10 Mbps.
- Allows PC operator to review and edit any account in the meter reading database.
- Generates route and activity reports defined by the user.
- Provides database backup/restore functions.
- Allows user to merge several separate files into one database.
- Allows any unread accounts from a route to be loaded back onto the data collection device.
- Enables the user to setup and save custom report formats.
- Enables the user to specify the data to be exported from the database for transferring to the billing system.
- Allows for database records to be automatically deleted during the export process.
- Enables the user to search the database for records matching specified information.
- Allows the user to define up to 100 notes, which are reviewed and entered on the handheld as two digit numeric codes.

3.2.1 Typical Read Cycle

In a typical Read Cycle, the meter reading system must allow the following operations:

- Merging of routes into the existing database for loading onto a data collection device.
- The selection of routes to be read, splitting of routes and assignment of routes to a data collection device. Generate the route file and load it onto the data collection device or Flash Drive.
- Unloading routes from the data collection device.
- Posting of readings from the data collection device onto appropriate accounts within the database.
- Making a backup copy of the routes within the database (including current system configuration files).
- Printing pre-selected reports.
- Exporting routes out of the database to be sent back to the utility billing system.

3.2.2 Reports

Standard reports must include:

- Route Assignments
- Accounts with Readings
- Accounts without Readings
- ID Compare
- Returned With Notes
- Hi/Lo Fails
- Found Meters
- Dashes/Opens

The software must also provide a powerful custom report generator, allowing the user to select and order specific fields from the database to be printed; in addition, allows the entire database to be sorted by criteria such as date, reader ID or other specified fields.

3.2.3 Special Reports

Special Reports must provide meter reader productivity information. The reporting module must also be a detailed productivity report that will list total number of readings for a specific meter reader and book as well as the time elapsed between each read entered. Also available must be a summary of start time, stop time, elapsed time, mean, maximum and minimum read times.

4.0 Data Collection Devices

4.1 Walk-by System

In a walk-by system, the system must give the user the ability to collect metering data in several ways:

- Keyed entry
- Inductive probing
- RF communication: The meter must be attached to an RF meter interface unit (MIU); the handheld must have an RF receiving device (Handheld Interface Unit (HHIU))

The proposed walk-by data collection system must include:

- Handheld data collector device which shall be a combination of a handheld unit and an HHIU and its antenna.
- Communication cradles for charging and loading the handheld unit.
- Probes for interrogating Neptune, Sensus and AMCO/ABB absolute encoders.

4.1.1 Handheld Data Collector Device

4.1.1.1 Basic Functions

The handheld data collection device shall have the capability to collect and store meter readings at any time on the meter reading route by any of the following methods:

- Manual use through the use of an alphanumeric keypad.
- Probing of water meters equipped with supported absolute encoders.
- Via radio frequency.
- The unit shall be able to obtain all types of readings on any particular route without requiring:
 - Reprogramming of the handheld computer.
 - Physical change of software contained within the unit while in the field.
 - Access through special software menus contained within a given route/program.

The handheld data collection device must be able to multi-task by reading RF meters while in keyed entry (manual) meter reading mode.

4.1.1.2 Hardware Requirements

4.1.1.2.1 Processor and PC Compatibility

The handheld data collection device must be PC compatible and run Windows CE.NET 4.2. At

minimum, the handheld must operate with a Intel X-Scale PXA255 Processor at 400 MHz.

4.1.1.2. Case

- The unit must be able to withstand a minimum six-foot drop to concrete.
- The handheld must meet and exceed MIL-STD 810F standard, method 516.5, procedure IV for drop tests.
- The handheld shall be ergonomically designed to be comfortable for handheld meter reading.

4.1.1.2. Display

The handheld screen must be 3.5" (89mm) QVGA TFT transfective color LCD with backlighting. The size of the display characters must be selectable, allowing the use of larger characters that are easiest to read. The screen must have a minimum of 240 by 320 pixels (a total of 76,800 pixels) and is CGA compatible for both text and graphics.

The manufacturer's specification on the contrast ratio on the LCD display must be 9:1 at 76° F (25° Celsius) and provide automatic contrast adjustment based on temperature which will give clear readings in extreme temperature. There must also be a manual contrast adjustment feature, which will allow the user to adjust the contrast to his or her satisfaction.

The display must have no degradation when exposed to storage temperatures of -40°C to +70°C (-40°F to 158°F) and operating temperature of -20°C to + 50°C (-4°F to +122°F).

4.1.1.2.4 Keyboard

- The keyboard must have independent large keys of silicone rubber with adequate separation for use with gloved hand.
- The keyboard must provide tactile feedback and be fully alphanumeric.
- There must be an audible beep indicating key has been fully depressed; there must also be an auto-repeat function on keys and a rapid response between keying and seeing results on the screen.
- The keyboard must be fully PC compatible and programmable.

4.1.1.2.5 Battery

- The battery capacity must be sufficient for a minimum of 8 hours of meter reading.
- The handheld must come with a power management system designed to conserve power.
- The handheld must come with an integrated intelligent fast charge capability that allows for full charge in 4 hours.
- Rechargeable Lithium Ion batteries shall be made with a technology that does not develop memory effect.
- The back-up battery must be a rechargeable Nickel Metal Hydride battery.

4.1.1.2.6 Memory

The handheld data collection device must include 64MB of DRAM and 128MB FLASH memory.

4.1.1.2.7 Carrying Method

A hand strap must be provided with each unit and must provide ease of use for right- or left-handed operators.

4.1.1.2.8 Size

The handheld data collection device dimensions with RF HHIU must not be larger than:

- Length: 11.75" (298 mm)
- Width: 4.6" (117 mm)
- Height: 3.25" (83 mm)
- Weight: The unit's weight must be less than 2.4 lbs (1089g) with the battery pack installed.

4.1.1.3 Environmental Characteristics

- The handheld must include but not be limited to the following:
- The unit must operate in temperature range of -20°C to +50°C (-4° F to +122° F).
- The device shall be water resistant, capable of unlimited exposure to spray or splash (such as rain or snow).
- The device must be protected against an 8kV static discharge without loss of data.
- The unit must be resistant to various chemical products and must be sealed to keep out dust, humidity, and water.
- The device must be shock resistant exceeding IEC 68-2-32 method 1 (a 1-meter drop on concrete).
- The unit must be CE and FCC certified.

4.1.1.4 Software Requirements

4.1.1.4.1 Basic Functions

The handheld software must be easy to use and give the meter reader control over the route in searching for accounts, tagging accounts for later action, entering related notes and manually reading meters.

The handheld software must include entry of meter readings, identification numbers, up to four coded notes and 192 characters of free form notes for each account.

In addition, the handheld software shall include but shall not be limited to the following basic features:

- Definable function keys.
- Allows manual or automatic entry of meter readings, ID numbers and note codes.
- Performs high/low test on readings.
- Date and time stamped to each reading.
- Identifies type of reading — manual keyed, probed or RF MIU.
- Must be able to read ARB® I - VI and Sensus ECR® II AND ECR III (* denotes support for the ECR III encoder when programmed as an ECR II with 6 wheels) encoders via either wireless probed reading or via RF MIU.
- Performs unread meter search.
- Found meter processing for new accounts.

- Verifies meter ID numbers when entered with manual meter readings.
- Forward and reverse walk order allowed.
- Data search capability (Display, Notes and ID).
- Auto-Search for automatic reading of encoded meters.
- Displays the number of read and unread accounts on demand.
- Left-to-right, right-to-left or calculator entry of manual meter readings.
- Can capture multiple meter readings from a single ARB VI pad; i.e., two networked ARB VI encoders.
- Collect the information for the host to generate reports on leak detection, tamper detection, and backflow conditions when used with Neptune R900 encoder and E-Coder register.

4.1.1.4.2 Sounds

Successful meter readings will be confirmed by an audible tone.

4.1.2 Communications/ Charging Equipment

4.1.2.1 Communication

Communications between the handheld and the PC software must be established using a cradle connected via an Ethernet 10 Base T Cradle with one additional option of an RS232 on Lemo connector, up to 230 kbps full duplex. The handheld must have an Ethernet connection for communication with the cradle. In addition, the following basic features must be included:

- Extensive error checking is provided to assure data integrity during communications between the handheld and the PC.
- A typical route of four to five hundred accounts could be loaded or unloaded in less than one minute and must be able to load 5000 accounts to one unit.
- Routes/books can be split at the PC level.
- Once loaded routes may be selected on the handheld.
- Charging / Communications Cradles
- The communications/charging cradle will be housed in a suitable material that can be wall or tabletop mounted.
- It will have the capability of recharging the handheld unit within 4 hours and also provide the communication port connection to the computer.
- The cradle will hold one handheld at a time and be capable of connecting in a series to accommodate additional units.
- The cradle will be capable of communicating with the host computer at 10 Mbps or an RS232 on Lemo connector up to 230 kbps full duplex.
- Multiple handhelds must be able to be connected to the host computer.
- The charging units must carry the Underwriters Laboratory (UL) seal of approval.

4.1.3 Probes

The handheld must be compatible with a wireless probe capable of reading Neptune ARB V, Neptune ProRead AutoDetect and Sensus ECR® II and ECR III * (*denotes support for the ECR III encoder when programmed as an ECR II with 6 wheels) encoder water meters.

4.1.4 Radio Frequency Capability

The reading system must be capable of being upgraded to radio frequency communications. Watertown Water and Sewer Department plans to read water meters equipped with radio frequency meter interface units. Only absolute encoder registers utilizing the Neptune / Sensus protocol will be acceptable. In the radio read system, the encoder registers will be connected to a MIU that shall provide the radio link from the meter to the handheld interface unit.

The handheld radio frequency adapter must be available as a retrofit kit for existing handheld units.

4.1.4.1 Radio Frequency Reading Function

The function of the handheld in radio frequency mode is to provide Watertown Water and Sewer Department the capability of reading meters via radio signals. The handheld must be capable of receiving RF readings. All transmissions from supported MIUs will be collected. The reading of any MIU shall be automatically stored in the proper account record without the intervention of the meter reader.

Should any MIU not be able to be read during the route, the software shall support storage of a flag in the account record, indicating clearly that the MIU could not be read.

When reading the meters in the RF mode, it should not require the meter reader to activate any wake-up tone.

The handheld reading equipment must provide a test mode to verify operation of the MIU. This test mode must be accessible from within the meter reading application as well as accessible from a device main screen (no login required). The test application must be capable of reporting statistics for an individual MIU or displaying all MIUs within range.

4.1.4.2 Handheld Interface Unit (HHIU)

The Handheld Interface Unit must be attached to the handheld to allow radio-frequency communications with water meters that have an RF MIU connected externally. The HHIU must be sealed and secured tightly to the handheld unit by a locking mechanism.

The antenna shall be externally mounted and replaceable.

The HHIU must be Part 15 FCC compliant.

The HHIU must collect the meter readings as well as the ID# of the MIU connected to the meter. The following specifications must be met:

Radio Characteristics:

Receiving Frequency: 910-920 MHz

Protocol: data error checking in every received data

Size and Weight: Physical specifications of the handheld unit with the HHIU must be within the following parameters:

Length without antenna: 11.75”

Width: 4.6”

Height: 3.25”

Weight (with battery pack): 2.4 lbs

Probe Compatibility:

Compatibility with Neptune Advantage II Probe, Neptune Pocket ProReader RF, Northrop Grumman Logicon Probe or Sensus AutoGun.

Environmental Operating Conditions:

Operating conditions: -4°F to +122°F (-20°C to +50°C)

Storage temperature: -22°F to +158°F (-30°C to +70°C)

Designed to withstand shock and vibrations per MIL-STD-810 F, method 516.5, procedure IV.

Designed to withstand electrostatic discharges per EN61000-4-2.

Humidity: 5 to 95% (non-condensing)

Data Collection Device Battery Life:

The data collection device batteries must provide enough power to support RF meter reading for a minimum of 8 hours.

Capabilities:

The HHIU must be capable of processing a minimum of 30 meter readings per minute. “Processing” must include accuracy of the message confirmation.

Retrofit Kit:

The HHIU adapter should be available as a retrofit kit for the existing handheld units and should not require the return of the handheld to the supplier.

4.2 Mobile Data Collection System

The mobile data collection device must be a portable, compact electronic system mountable in any vehicle. It must collect the data broadcast by the MIUs and store it onto a USB Flash Drive to be downloaded to the host computer at the utility office.

The unit shall be easily transportable from vehicle to vehicle or vehicle to office.

4.2.1 Hardware Specifications

The key components of the collection device must consist of a Portable Personal Computer (PPC) and an integrated radio receiver unit packaged in rugged, weatherproof, compact carrying case enclosure.

The mobile data collection device must be easily installed in any vehicle that will drive to the field for meter reading. It must be mounted securely in the passenger seat with a standard seat belt. Through a 12 VDC plug-in power cord, the unit must be powered from the vehicle's power supply (cigarette lighter).

The system must include a magnetic base antenna and the antenna chord as well as all necessary power and communication cables.

For water applications the dimensions must be no longer than the following parameters: 17"x10"x14" (43.2x25.4x35.6 cm). The weight shall not be more than 48 lbs.

For water and electric applications with wake-up ERTs, the dimensions must be no larger than the following parameters: 20"x20"x15 1/4" (50.8x50.8x38.74 cm). The weight shall not be more than 68 lbs.

The system must comply with FCC specification: Part 15.

The PPC must be a ruggedized laptop PC. The system must have flash upgradeable BIOS with advanced power management interface. The keyboard must have a spill-proof membrane and backlight with intensity control and built-in solid state mouse. The display must be transmissive, having a light sensor that automatically adjusts screen intensity per ambient light, a shock/scratch-resistant anti-glare plate and incorporate touch technology. The unit must be enclosed in a hard mount case including an extendable handle and wheels.

Mobile unit should also be capable of supporting Itron R300 and Itron electric bubble-up ERTs, in the event the utility supports electric meters.

4.2.2 Environmental Conditions

The mobile data collection device must work in the following environmental conditions:

- Operating Temperatures: 32°F to +122°F (0°C to +50°C)
- Storage Temperature: -40°F to +185°F (-40°C to +85°C)
- Operating Humidity: 5 to 95% non-condensing relative humidity

4.2.3 Software Requirements

4.2.3.1 Computer Platform

The laptop computer must use Windows XP as a minimum for the platform operating system.

4.2.3.2 Basic Functions

The software must be a dialog-based, intuitive, easy-to-use meter reading application. After the

meter reader starts the reading process, the software must be fully automated to collect the meter reading data received from the radio receiver unit and store it in an Export file which can be used by the host software to update the mainframe route data. The system must utilize a USB flash drive for data storage and transfer.

Self-diagnostic tests must be run upon booting up the laptop or on request to ensure the good functionality of the system, including the collection method.

Unit must be capable of optimizing the memory storage space by filtering out the duplicate readings from the same MIU and keeping only the last reading received.

Each reading record must contain a MIU ID and a time stamp of the reading.

The software must have the option to provide found meter processing for new accounts.

The software must be capable of performing high/ low test on readings.

The software interface must allow the user to select a single route to view the route status.

The mobile data collection software unit must allow a manual reading to be entered into the account record.

The software must allow freeform notes to be entered to record conditions in the field that require noting and may require an additional Work Order created to address at a later date.

The software must be capable of displaying meter points and read success and unread accounts via GIS mapping interface. The software must be capable of collecting the following information for the host to generate reports: leak detection, tamper detection and backflow conditions (when used with Neptune R900 encoder and E-Coder register).

4.2.4 Performance Requirements

The antenna must be omni-directional and support a gain of 5 dB minimum.

The receiver utilized must operate with a minimum sensitivity of greater than 110 dBm.

The receiver module must process at minimum 72 discrete channels across a 10 MHz bandwidth utilizing a digital signal processor capable of capturing 8 meter readings simultaneously from these channels.

The receiver module must operate with a dynamic range of greater than or equal to 100 dB with a message success rate greater than 50%.

The mobile data collection device must be able to maintain a minimum sustained processing rate of 70 unique meter reading accounts per second.

The mobile data collection device must reject a minimum 45 dB of noise energy above the target message in adjacent channels.

The mobile data collection device must operate effectively at posted speed limits

5.0 Radio Frequency Meter Interface Unit Specifications

5.1 Meter Interface Unit (MIU)

The MIUs must be compact electronic devices connected to the water meters. They shall interrogate the encoder register and transmit the meter reading and other information to a remote reading device. They shall be compatible with Neptune / Sensus protocol absolute encoder registers. The same RF MIUs must be capable of being read by a walk-by handheld computer equipped with a RF interface unit, a mobile system with a unit mounted in a vehicle, and/or a fixed network data collection system. This shall allow an easy migration between the three systems without any change to devices or revisiting the site. The MIUs shall be attached to new meters, or they shall retrofit to existing meters in the field. The MIUs shall be manufactured in both wall and pit models. The wall MIU shall have the ability to be mounted in a basement or on the outside of a house and the pit MIU shall have the ability to be mounted in a pit or an underground vault. The wall MIU shall have a water resistant enclosure and the pit MIU shall be a fully potted waterproof design.

5.2 Physical / Mechanical Requirements

5.2.1 Wall Unit

- The meter interface unit housing shall be constructed of a polycarbonate plastic compound and be capable of mounting both indoors and outdoors on a wall or pole or capable of mounting directly at the meter. The device must be water-resistant and capable of exposure to spray and splash. The device must be able to withstand a 200-hour salt fog test as specified in NEMA 4 standard.
- The device shall provide a location for a tamper deterrent seal. Tampering with the device functions or connections shall not be possible without causing visible damage to the device exterior or to the seal.
- The device shall be capable of operating at temperatures of -22°F to 149°F (-30°C to +65°C) with a humidity factor of 0 to 95%.
- The circuit board will be coated for moisture protection.
- The battery will be protected by encapsulation in a hard potting material.
- The unit must be capable of retrofitting to existing installations.
- The MIU device must be protected against static discharge without loss of data per IEC 801-2, issue 2.

5.2.2 Pit Unit

- For pit or vault applications, the MIU shall be designed to be installed through the industry standard 1-3/4" hole in the pit lid with no degradation of transmission range. The meter

interface unit antenna will be capable of mounting to various thickness of pit lids from 1/2” to 2-1/2”.

- The device shall be capable of operating at temperatures of -22°F to 149°F (-30°C to +65°C) and operating humidity of 0 to 95%.
- The range will not be affected when the pit is flooded.
- The circuit board and the battery will be protected by encapsulation in a hard potting material.
- The antenna shall be made of a metallic and polymer material to withstand traffic and shall have a dual seal connection to the MIU housing.
- The MIU device must be protected against static discharge without loss of data per IEC 801-2, issue 2.

5.3 Operation Specifications

- For reliability and meter reading integrity, the vendor shall be the sole manufacturer of the different components of the system (water meters, RF transmitters, meter reading equipment, and route management software), and provide a turn-key system offering to the utility.
- The manufacturer will guarantee that the reading obtained electronically matches the mechanical odometer read on the register when the register is interrogated by the MIU and that the manufacturer will pay the difference at the current rates whenever a discrepancy appears. Synchronization of electronic reading and mechanical read for any reason (battery change, register change, cut wire, register roll-over...) is not acceptable.
- For the purpose of ease of implementation, the system shall not require any special licensing, including licenses from FCC. The system must, therefore, operate in the 902 MHz to 928 MHz unlicensed bandwidth.
- The system implementation shall not be delayed due to the uncertainty of Federal licensing requirements.
- The system must be expandable at any time without getting authorization from the FCC.
- No wake-up tone shall be necessary.
- To minimize the potential for RF interference from other devices, the MIU shall transmit using the Frequency Hopping Spread Spectrum technique comprised of alternating pseudo-random frequencies within the 902 MHz to 928 MHz unlicensed bandwidth.
- The meter interface unit shall operate within FCC Part 15 regulations for devices operating in the 902 MHz to 928 MHz unlicensed bandwidth. The output power of the devices will be governed by their conformance with these relevant FCC standards.
- Output power shall meet FCC Part 15.247 requirements. (min. 100mw)
- Power shall be supplied to the MIU by a lithium battery. The Vendor shall warrant that any battery provided and installed in the MIUs by the Vendor shall be free of manufacture and design defects for a period of twenty years - the first ten (10) years from their date of shipment from factory without pro-rating, and the second ten (10) years with pro-rating, as long as the MIU is working under the environmental and meter reading conditions specified.
- The battery life shall not be affected by outside erroneous wake-up tones (i.e. other water, gas, or electric utilities reading and therefore sending out a wake-up tone).
- The number of reads performed must not affect the battery life.
- The batteries shall be field replaceable (the replacement shall be demonstrated) and be

designed for minimum ten (10) years life expectancy. The MIU shall not require reprogramming if the battery discharges before it is replaced.

- No MIU programming shall be necessary for installation.
- The MIUs must be capable of reading two networked Neptune encoder registers at one time.
- The MIU shall interface to Neptune ARB® III, IV, V, ProRead™ (ARB VI), E-Coder™ (ARB VII), or Sensus ECR® II & III* absolute encoder registers via a 3-conductor wire without need for special configuration to the MIU.
- The MIU shall not send readings older than an hour. Sending a reading older than an hour when wire is cut is not acceptable, as it can lead to mis-billing.
- The MIU shall transmit the meter reading continuously at a predetermined transmission interval for a single encoder register configuration and alternate transmissions with two networked Neptune encoder registers to maximize battery life.
- The MIU shall be able to be connected to two networked Neptune encoder registers for compound meter applications.
- Each device shall have two unique pre-programmed identification numbers of 10 characters (meter (1) = HI side and meter (2) = LOW side). ID numbers will be permanent and shall not be altered. Each device shall be labeled with the ID number in numeric and BAR code form. The label shall also display FCC approval information, manufacturer's designation, and date of manufacture. A duplicate self-stick tear-off label must also be provided. The duplicate can be affixed to the work order and scanned to ensure accurate and efficient data entry.
- The MIU shall transmit the encoder meter reading and a unique MIU ID number.
- Tamper - If wiring has been disconnected, a "non-reading" or a reading of all colons shall be provided indicating wire tamper; a reading that gives the last available reading is an incorrect reading.
- The MIU shall be mounted per the manufacturer's installation instructions.
- The handheld reading equipment shall provide a test mode to verify proper operation of the MIU by displaying the MIU ID number and meter reading.
- The MIU shall be capable of being received by either a handheld receiver, mobile receiver.

** The ECR III register is supported when programmed with the same format used in the "6 wheel ECR II register."*

PROPOSAL #2
WATER BID ITEMS FOR DRIVE-BY METER READING SYSTEM

Item Number And Description	Estimated Quantities	Computed Totals
Item 1. Neptune Drive-By Unit Complete (Including computer, antenna and power supply.) The unit price of _____ Dollars and _____ Cents (\$ _____) Per each	1	\$ _____
Item 2. Neptune Handheld Reader (including cradle/charging stand.) The unit price of _____ Dollars and _____ Cents (\$ _____) Per each	2	\$ _____
Item 3. Neptune Reader/Tester for Radio Installations The unit price of _____ Dollars and _____ Cents (\$ _____) Per each	2	\$ _____
Item 4. Meter Interface Unit - Wall Mount The unit price of _____ Dollars and _____ Cents (\$ _____) Per each	550	\$ _____
Item 5. Meter Interface Unit – Pit Mount The unit price of _____ Dollars and _____ Cents (\$ _____) Per each	15	\$ _____
Item 6. Neptune Meter Reading Software and Interface (customization to import Authority data.) _____ Dollars and _____ Cents (\$ _____) Per each	1	\$ _____
Computed Total		\$ _____

PROPOSAL #3 - INTEGRATED SOLID STATE ENCODER AND RF METER INTERFACE UNIT (INSIDE AND PIT VERSIONS) SPECIFICATIONS

INTEGRATED ENCODER AND METER INTERFACE UNIT (IMIU)

These specifications cover a fully integrated self-contained solid state absolute register and a radio frequency meter interface unit metering system designed to obtain simultaneous water meter registration that is guaranteed to exactly match the registration on the register odometer. The metering information shall be obtained through a full integrated radio frequency device using a compatible data capture system. The above system shall be configured as follows:

- Solid state absolute encoder meter register—Direct mounting, electro-magnetically encoded measuring element into an electronic solid-state odometer. Encoder shall provide value-added flow data including leak, tamper and reverse flow detection. Digital counters requiring batteries and volatile memory for consumption data re not allowed. Encoder register shall periodically display flow rate information at register.
- Fully integrated radio frequency meter interface unit providing a communication link for the transmission of information from the register.
- Data acquisition equipment with which the above components ca be interrogated. Such equipment shall be configured in two types:
 1. A device that captures information and displays it visually to confirm correct system installation.
 2. A device that is pre-programmed with route information and is capable of storing collected data in solid-state memory. This device shall also electronically transfer the data for use by the utility billing company.

INTEGRATED METER INTERFACE UNIT (IMIU) DESCRIPTION—GENERAL

The unit shall interrogate the solid state odometer of the absolute encoder register and transmit the meter reading and other information to a data collection reading device. The unit shall be capable of being read by a walk-by handheld computer equipped with a RF interface unit, a mobile system with a unit mounted in a vehicle, and/or a targeted fixed network data collection system. This shall allow an easy migration between the three systems without any change to devices or need to revisit the site. The absolute solid state encoder register with IMIU shall be attached to new meters, or they shall retrofit existing meters in the field via a bayonet mount on top of the meter maincase. The absolute solid-state encoder register with IMIU shall be manufactured in both inside and pit models.

The inside IMIU will be mounted inside without degradation of performance and the pit MIU shall have the ability to be mounted in a pit or an underground vault. The inside IMIU shall have a water-resistant enclosure and a permanent antenna, while the pit IMIU enclosure shall be a roll-sealed copper can and glass lens design to ensure a water-tight seal, and offer a short whip antenna or an optional through-the-pit-lid antenna to address various applications. The IMIU battery shall be field replaceable on both the inside set and pit set designs.

ENCODER DESCRIPTION-GENERAL

The self-contained solid-state absolute encoder register metering system shall be designed to obtain remote simultaneous water meter registration that is guaranteed to exactly match the registration on the register odometer. The solid-state absolute encoder meter register shall be a direct mounting, electromagnetically encoded measuring element into an electronic solid-state odometer. The encoder shall provide value-added flow data including leak, tamper and reverse flow detection when communicating with a compatible RF AMR MIU. Batteries and digital counters using volatile memory are not allowed. Encoder register shall display flow rate information at register.

IMIU PHYSICAL/MECHANICAL REQUIREMENTS

Inside Unit

- The integrated meter interface unit (IMIU) housing shall be constructed of a poly-carbonate plastic compound and be capable of mounting indoors. The device must be water-resistant and capable of exposure to spray and splash. The device must be able to withstand a 200-hour salt fog test as specified in NEMA 4 standard.
- The device shall provide a location for a tamper deterrent seal. Tampering with the device functions or connections shall not be possible without causing visible damage to the device exterior or to the seal.
- The device shall be capable of operating at temperatures of -22F to 149F (-30C to +65C) with a humidity factor of 0 to 95%.
- The circuit board will be coated for moisture protection.
- The battery will be protected by encapsulation in a hard potting and will be easily field replaceable.
- The unit must retrofit to existing installations.
- The IMIU device must be protected against static discharge without loss of data per IEC 801-2, issue 2.

Pit Unit

- For pit or vault applications, the IMIU shall be designed with a whip-type antenna for below-the-pit-lid applications.
- The device shall be designed for an optional remote antenna capable of being installed through the industry standard 1-3/4" hole in the pit lid for maximum transmission range. The meter interface unit will be capable of mounting to various thicknesses of pit lids from 1/2" to 2-1/2" and various distances from meters.

- The through-the-pit-lid antenna option shall be rigid in design to withstand traffic and shall have a dual seal connection to the IMIU housing.
- The IMIU device must be protected against static discharge without loss of data per IEC 801-2, issue 2.

ENCODER REGISTER UNIT

Registration

- The solid-state absolute encoder register shall provide at least a 9-digit visual registration at the meter.
- The unit shall provide an 8-digit meter reading for transmission through the radio MIU.
- The register shall employ a visual LCD leak indicator as well as provide remote leak indication through an ASCII format to the data collection device.
- The register shall provide reverse flow detection, days of no consumption and number of days of leak or reverse flow condition.
- Internal batteries shall not be allowed. Battery must be external to register and field replaceable.
- The manufacturer will guarantee that the reading obtained electronically matches the LCD odometer reading on the register and that the manufacturer will pay the difference at the current rate whenever a discrepancy appears.
- The register shall display flow rate information.

Mechanical Construction

- The basement set enclosure shall feature a hermetic sonic weld seal. The pit set enclosure shall be a roll-sealed glass and copper can design to protect the internal components against moisture intrusion.
- The register and IMIU shall be attached to the meter case by a bayonet attachment. Fastening screws or nuts shall not be required. A tamper-proof seal pin shall be used to secure the register to the maincase.
- The register shall be removable from the meter without disassembling the meter body and shall permit field installation and/or removal without taking the meter out of service.

- Provision shall be made in the register for the use of seal wires to further secure the register.

Electrical Construction

- The solid-state absolute encoder register shall incorporate an Application Specific Integrated Circuit (ASIC) and firmware designed to verify accurate measurement, information transmission and data integrity.

Meter Reading Information

- The solid-state absolute encoder register shall provide to the reading equipment an 8-digit meter reading.
- The solid-state absolute encoder register shall provide additional value-added information remotely, such as detailed leak detection data, days of leak state, days of no consumption, and reverse flow indication. This information shall be communicated through the encoder protocol and RF IMIU to the route management software to allow the seamless integration of data into a CIS package.

OPERATION SPECIFICATIONS

- For reliability and meter reading integrity, the vendor shall be the sole manufacturer of the different components of the system (water meters, RF transmitter, meter reading equipment, and route management software) and provide a turn-key system offering to the utility.
- The manufacturer will guarantee that the reading obtained electronically matches the visual reading on the register when the register is interrogated by the IMIU and that the manufacturer will pay the difference at the current rates whenever a discrepancy appears. Synchronization of electronic reading and mechanical reading for any reason (battery change, register change, cut wire, register roll-over...) is not acceptable.
- For the purpose of ease of implementation, the system shall not require any special licensing, including licenses from the FCC. The system must, therefore, operate in the 902 MHz to 928 MHz unlicensed bandwidth.
- The system implementation shall not be delayed due to the uncertainty of Federal licensing requirements.
- The system must be expandable at any time without getting authorization from the FCC.
- No wake-up tone shall be necessary.
- To minimize the potential for RF interference from other devices, the IMIU shall transmit

using the Frequency Hopping Spread Spectrum technique comprised of alternating pseudo-random frequencies within the 902 MHz to 928 MHz unlicensed bandwidth.

- The IMIU shall operate within FCC Part 15 regulations for devices operating in the 902 MHz to 928 MHz unlicensed bandwidth. The output power of the devices will be governed by their conformance with these relevant FCC standards.
- Power shall be supplied to the IMIU by a lithium battery. The Vendor shall warrant that any battery provided with the IMIUs by the Vendor shall be free of manufacture and design defects for a period of twenty years—the first ten (10) years from their date of shipment from factory without pro-rating, and the second ten (10) years with pro-rating, as long as the IMIU is working under the environmental and meter reading conditions specified.
- The battery life shall not be affected by ambient erroneous wake-up tones (i.e., other water, electric or gas utilities reading and therefore sending out a wake-up tone.)
- The number of reads performed must not affect the battery life.
- The batteries shall be field replaceable (the replacement shall be demonstrated) and be designed for minimum twenty (20) years life expectancy. The IMIU shall not require reprogramming if the battery discharges before it is replaced.
- No IMIU programming shall be necessary for installation.
- The IMIU shall not send readings older than an hour. Sending a reading older than an hour is not acceptable, as it can lead to incorrect billing.
- The IMIU shall transmit the meter reading continuously at a predetermined transmission interval to maximize battery life.
- Each device shall have a unique pre-programmed identification number of 10 characters. ID numbers will be permanent and shall not be altered. Each device shall be labeled with the ID number in numeric and bar code form. The label shall also display FCC approval information, manufacturer's designation and date of manufacture.
- The IMIU shall transmit the encoder meter reading and a unique IMIU ID number.
- The handheld reading equipment shall provide a test mode to verify proper operation of the IMIU by displaying the IMIU ID number and meter reading.
- The IMIU reading shall be capable of being received by either a handheld receiver, mobile receiver, or fixed network receiver without special configuration or re-manufacture.

7.0 Installation and Training

Complete installation and operating instructions will be included for all of the supplied hardware and software equipment. The system manufacturer, using accredited factory trainers, must supply the training. Costs associated with any additional training and assistance to install and begin operation of the system, shall be included in bid prices for the hardware. The Vendor will also inform the customer of what pre-installation activities are to be completed and what support material will be needed for the initial installation.

The Contractor will provide any customization of the software required to allow import of Authority meter and billing data into the supplied software, or for export of such data back to the Authority billing system. Any required training shall take place at Water and Sewer Department Office, 747 French Street, Oakville.

8.0 Performance Warranties

In evaluating bid submittals, warranty coverage will be considered. The Vendor shall be required to state its warranty and/or guarantee policy with respect to each item of proposed equipment. The procedure for submitting warranty claims must also be provided.

As a minimum, the electronics shall be warranted for one year from date of shipment for defects in material and workmanship.

9.0 System Maintenance and Support

Software maintenance and upgrades must be included at a minimum for the duration of this contract. In addition to warranty periods, Vendors are required to supply information on required or optional maintenance programs beyond the warranty period for both hardware and software. Vendor must offer multiple-year maintenance contracts so the Authority can take advantage of multi-year discounts. The location of and procedures for obtaining such support shall be stated. A toll-free support number must be provided for system support.

10.0 Vendor Qualifications

The qualified Vendor will have a minimum of twenty years experience with reading systems. The selected Vendor shall be thoroughly versed in encoder meter technology and be a major supplier in the marketplace. The proposed system shall be manufactured and maintained by the selected Vendor or an equity partner. All Vendors shall document which manufacturers and models they are capable of interrogating with the proposed meter reading equipment.

PROPOSAL #3

Manufacturer Neptune Model E-Coder R-900i-Inside Version

Description/Unit Price	Estimated Quantities/Year	Computer Totals
Item #11 – 5/8" Water Meters		
The unit price of _____ Dollars		
and _____ Cents		
(\$ _____) Per each	10	\$ _____
Item #12 – 5/8" x 3/4" Water Meters		
The unit price of _____ Dollars		
and _____ Cents		
(\$ _____) Per each	400	\$ _____
Item #13 – 3/4" Water Meters		
The unit price of _____ Dollars		
and _____ Cents		
(\$ _____) Per each	3	\$ _____
Item #14 – 1" Water Meters		
The unit price of _____ Dollars		
and _____ Cents		
(\$ _____) Per each	1	\$ _____
Item #15 – 1.5" Water Meters		
The unit price of _____ Dollars		
and _____ Cents		
(\$ _____) Per each	2	\$ _____
Item #16 – 2" Water Meters		
The unit price of _____ Dollars		
and _____ Cents		
(\$ _____) Per each	2	\$ _____
Computed Total (This Section)		\$ _____

PROPOSAL #3

Manufacturer Neptune Model E-Coder R-900i-Pit Version

Description/Unit Price	Estimated Quantities/Year	Computer Totals
------------------------	---------------------------	-----------------

Item #17 – 5/8" Water Meters

The unit price of

_____ Dollars		
and _____ Cents		
(\$ _____) Per each	1	\$ _____

Item #18 – 5/8" x 3/4" Water Meters

The unit price of

_____ Dollars		
and _____ Cents		
(\$ _____) Per each	10	\$ _____

Item #19 – 3/4" Water Meters

The unit price of

_____ Dollars		
and _____ Cents		
(\$ _____) Per each	1	\$ _____

Item #20 – 1" Water Meters

The unit price of

_____ Dollars		
and _____ Cents		
(\$ _____) Per each	1	\$ _____

Item #21 – 1.5" Water Meters

The unit price of

_____ Dollars		
and _____ Cents		
(\$ _____) Per each	1	\$ _____

Item #22 – 2" Water Meters

The unit price of

_____ Dollars		
and _____ Cents		
(\$ _____) Per each	1	\$ _____

Computed Total (This Section) \$ _____

PROPOSAL #3

**TOWN OF WATERTOWN
WATERTOWN, CONNECTICUT 06795**

BID PROPOSAL

Water Meters and Related Reading System

BID OPENING: Tuesday, June 13, 2006

TO: *Charles Frigon, Purchasing Agent
Town of Watertown
Town Hall Annex
424 Main Street
Watertown, CT 06795*

The undersigned, as bidder, agrees to furnish the equipment and related services as specified herein and declares that no person or persons, other than those named herein, are interested in this Proposal; that this Proposal is made without collusion with any person, firm, or corporation; that he has carefully examined the location of the proposed work, that no person or persons acting in any official capacity for the Town is directly or indirectly interested therein or in any portion of the profit thereof; and that he proposes and agrees, if this Proposal is accepted, to execute a Form of Contract with the Town; to provide all necessary equipment, tools, labor and deliver and to do all work and furnish all materials specified in the Contract, in the manner and time therein prescribed, and according to the requirements of the Town as therein set forth, and that he will take in full payment therefor, the unit prices and lump sums, to wit:

FIRM _____

Name

Street

City

State

Zip Code

NAME _____

Please Print

TELEPHONE NUMBER _____

FAX NUMBER _____

EMAIL ADDRESS _____

SIGNED _____ DATE _____

Payment Terms _____

Time To Delivery _____ Working Days

Warranty _____

Have you taken any exceptions or have you deviated from our printed Specification and, if so, are such suggested changes clearly noted on the page provided for exceptions to Specifications?:

Yes _____

No _____

RECEIPT OF ADDENDA

ADDENDUM #	SIGNATURE	DATE
1.	_____	___/___/___
2.	_____	___/___/___
3.	_____	___/___/___
4.	_____	___/___/___

NAME OF BIDDER: _____

OFFICIAL ADDRESS: _____

PHONE NUMBER: _____

BY: _____ TITLE: _____
(Please Print)

DATE: _____

SIGNATURE: _____

PROPOSED SUBCONTRACTORS

FIRM _____
Name _____
Street _____
City State Zip Code

CONTACT _____ TELEPHONE _____
Please Print
TYPE OF WORK TO BE PERFORMED _____

.....

FIRM _____
Name _____
Street _____
City State Zip Code

CONTACT _____ TELEPHONE _____
Please Print
TYPE OF WORK TO BE PERFORMED _____

.....

FIRM _____
Name _____
Street _____
City State Zip Code

CONTACT _____ TELEPHONE _____
Please Print
TYPE OF WORK TO BE PERFORMED _____

REFERENCES

Please list a minimum of three references of similar work performed within the last three years.

FIRM _____
Name _____
Street _____
City State Zip Code

CONTACT _____ TELEPHONE _____
Please Print
TYPE OF WORK TO BE PERFORMED _____

.....

FIRM _____
Name _____
Street _____
City State Zip Code

CONTACT _____ TELEPHONE _____
Please Print
TYPE OF WORK TO BE PERFORMED _____

.....

FIRM _____
Name _____
Street _____
City State Zip Code

CONTACT _____ TELEPHONE _____
Please Print
TYPE OF WORK TO BE PERFORMED _____
