Request for Proposal

for

Wireless Backhaul Network

to Interconnect

Advanced Metering Infrastructure

December 19, 2008

London Hydro Inc.
111 Horton Street
P.O. Box 2700
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1.0 INTRODUCTION

1.1 Background

Under the auspices of the provincial Smartmeter initiative, London Hydro previously issued a Request for Proposal for Advanced Metering Infrastructure (AMI), and carried out an exhaustive analysis of the various technology offerings. The evaluated "best buy" solution for implementation in London Hydro's franchise service territory is the FlexNet® tower-based system manufactured by Sensus Metering Systems. A contract has recently been executed for supply and delivery of such a system.

This FlexNet AMI system consists of:

- Revenue meters equipped with FlexNet radio modules;
- A series of nine (9) FlexNet transceivers, distributed throughout the service territory, that each communicate with a subset of the overall population of revenue meters in the licensed 931 / 941 MHz spectrum;
- A central master station that serves as a repository for meter readings and an Operator interface for control operations and alarming abnormal system conditions;
- A communications network that interconnects the master station with the population of FlexNet transceivers, a so-called backhaul wide area network.

An internal analysis has shown that a private wireless backhaul network to have the lowest overall long-term cost to London Hydro (in comparison to both wired and wireless public carrier options, and other media such as fibre-optic cable). Such a private wireless wide area network is the subject of this RFP.

1.2 Overview of Short- and Long-Term Objectives

London Hydro has an existing point-to-point data link between its Operations Control Center within the building at 111 Horton Street and a municipal communications tower located at Springbank Reservoir that uses licensed 900 MHz RF spectrum. As a condition of obtaining licensed 900 MHz spectrum for the FlexNet® communications between the FlexNet transceiver sites and the individual revenue meters, London Hydro is required to surrender the licensed channels presently used for the Springbank Reservoir data link. As a consequence, the first short-term objective of the wireless backhaul network (that is subject of this RFP) is to replace the point-to-point data link between London Hydro's Operations Control Centre and the Springbank Reservoir.

For the Smartmetering initiative, London Hydro will be installing FlexNet transceivers at nine (9) locations within its franchise service territory. The second short-term objective of the wireless backhaul network is therefore to provide WAN services between the central Sensus master station and the population of nine (9) Sensus FlexNet transceivers.

Over the longer term, various stakeholders within the City of London (e.g. fire department, police department, recreation facilities, water operations, etc.) envision a municipal wireless system that provides the lowest cost WAN services to all municipal user groups (based on the principle of shared resources / shared cost). Provided the technology selected by the RFP process for the backhaul network has inherent surplus capacity, the backhaul network will form a key building block for the future construction of a municipal wireless system. The first interface point between this WAN and the City of London's communications facilities will be at a new communications tower being constructed at 1795 Oxford Streer East.

This Wireless Backhaul Network will be deployed in three stages: interconnecting four (4) *AMRC* in the first stage, an additional five (5) *AMRC* in the second stage, and two (2) interconnections to other systems in the third stage.

1.3 Scope of Work for Successful Bidder

Successful bidder shall be required to meet the following objectives:

- Design a Wireless Backhaul Network that becomes an affordable, effective, flexible, scalable technological platform that has longevity to provide at least 15 years of service
- Create a Wireless Backhaul Network that is capable of managing the traffic loads of AMI and includes sufficient room for growth
- Build a Wireless Backhaul Network that is resilient and robust and is also able to provide secure and reliable communication services
- Institute an open architecture and standards-based solution
- Aptly install, test, commission and complete training during the implementation in order to avoid cost overruns and missed schedule milestones
- Responsible for IC Frequency Spectrum Approvals, if any, for all proposed licensed frequency spectrums before contract is awarded and P/O is issued.
- Understand full implications to build Wireless Backhaul Network in two-phase approach, but success of first phase is paramount.

1.4 Governing Principles

It is not intended that this *RFP* restrict bidder's ideas, inventions, advances in the state of art, or technological improvement, and therefore all bids will be given careful consideration. It must be noted, however, that *LH* requires sufficient explanations and descriptions to be able to make a good value judgment.

1.5 Abbreviations, Acronyms and Terminology

1.5.1 Abbreviations and Acronyms

3DES shall mean triple Data Encryption Standard.

ACL shall mean Access Control Lists.

AES shall mean Advanced Encryption Standard.

AMCC shall mean an Advanced Metering Control Computer that is used to retrieve or receive and temporarily store Meter Reads before or as they are being transmitted to the *MDM/R*. The information stored in the *AMCC* is available to log maintenance and transmission faults and issue reports on the overall health of the AMI to the distributor.

AMCD shall mean an Advanced Metering Communication Device that is housed either under the meter's glass or outside the meter. It transmits Meter Reads from the meter directly or indirectly to the *AMCC*.

AMI shall mean Advanced Metering Infrastructure. It includes the meter, *AMCD, LAN, AMRC, AMCC, WAN* and related hardware, software and connectivity required for a fully functioning system that complies with the Ontario Ministry of Energy's definitions of *AMI* terms referenced in *Section 3, Definitions*, of their publication Functional Specification *for an AMI*. An *AMI* does not include the *MDM/R*.

AMRC shall mean Advanced Metering Regional Collector that collects Meter Reads over the *LAN* from the *AMCD* and transmits these Meter Reads to the *AMCC*.

AP shall mean the Access Points of the Wireless Backhaul Network. *AP* is connected to *AMRC* with 10/100 Mb/s Ethernet cable with RJ-45 connector on back-to-back basis. Local *AP* Layer can be *Unicast, Multicast* or *Mesh* connections.

CC shall mean Common Criteria.

CIS shall mean the Customer Information System of *LH*.

CHAP shall mean Challenge Handshake Authentication Protocol.

CPE shall mean Customer Premises *Equipment*.

CRC shall mean Cyclic Redundancy Check.

CAN/CSA shall mean the Canadian Standards Association.

CRTC shall mean the Canadian Radio and Telecommunications Committee.

CTCPEC shall mean the Canadian Trusted Computer Product Evaluation Criteria.

DHCP shall mean Dynamic Host Configuration Protocol.

EIRP shall mean Equivalent Isotropically Radiated Power or, alternatively Effective Isotropic Radiated Power.

EM fields shall mean Electro-Magnetic fields.

ETSI shall mean the European Telecommunications Standards Institute.

FDD shall mean Frequency Division Duplex.

FEC shall mean Forward Error Correction.

FOB shall mean Freight on Board.

GIS shall mean the Geographic Information System of *LH*.

GST shall mean Canadian Goods and Services Tax.

IC shall mean Industry Canada.

IEEE shall mean The Institute of Electrical and Electronics Engineers, Inc., USA.

IETF shall mean The Internet Engineering Task Force, USA.

IP shall mean Internet Protocol in accordance with *IETF*. *LH* accepts *IP Version 4* (*IPv4*) or *IP Version 6* (*IPv6*).

IPsec/IKE shall mean the *IP* security/Internet Key Exchange protocol.

ISM shall mean the Industrial, Scientific and Medical frequency bands.

ISO/IEC shall mean the International Standards Organization/International Engineering Council.

ITU-T shall mean The International Telecommunication Union – Telecommunications, Geneva, Switzerland.

LAN shall mean a Local Area Network; the communication network that transmits Meter Reads between *AMCD* and *AMRC*.

LH shall mean London Hydro.

LOS shall mean Line Of Sight.

MAC Layer shall mean the Media Access Control Layer and is the *OSI* Layer II.

MBWA shall mean the Mobile Broadband Wireless Access based on *IEEE 802.20*.

MDM/R shall mean the Meter Data Management and Meter Data Repository functions within which Meter Reads are processed to produce rate-ready data and are stored for future use.

MIMO shall mean Multiple Input and Multiple Output.

MoE shall mean the former Ontario Ministry of Energy (now Ontario Ministry of Energy & Infrastructure)

MTBF shall mean Mean Time between Failures.

MTTR shall mean Mean Time to Repair.

NAT shall mean the Network Address Translation.

NLOS shall mean Non-Line Of Sight.

NMS shall mean the Network Management System of the Wireless Backhaul Network. *NMS* can be running on *Windows, UNIX* or *Linux* platform.

O&M shall mean Operations and Maintenance.

PAP shall mean Password Access Protocol.

PCB shall mean Printed Circuit Board.

PHY Layer shall mean the Physical Layer and is the *OSI* Model Layer I.

P/O shall mean Purchase Order.

PST shall mean Ontario Provincial Sales Tax.

OFDM shall mean Orthogonal Frequency Division Multiplex.

OS shall mean the Operating System.

OSI shall mean the Open System Interconnection that consists of seven (7) Layers in data communication architecture.

OMS shall mean the Outage Management System of *LH*.

***RF* system** shall mean Radio Frequency system.

RFP shall mean the Request For Proposal of *LH*.

RH shall mean the Relative Humidity.

SAT shall mean Standard Acceptance Test.

SIP shall mean Session Initiative Protocol.

SLA shall mean Service Level Agreement.

SNR shall mean Signal to Noise Ratio.

SSID shall mean Service Set Identifier.

***RF* system** shall mean Radio Frequency system.

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SIP shall mean Session Initiative Protocol.

SLA shall mean Service Level Agreement.

SNR shall mean Signal to Noise Ratio.

SSID shall mean Service Set Identifier.

TA shall mean Terminal Adapter.

TDD shall mean Time Division Duplex

TKIP shall mean Temporal Key Integrity Protocol.

T1 shall mean a 1.544Mb/s data rate or bandwidth.

VLAN shall mean Virtual Local Area Network.

VoIP system shall mean the Voice over *IP* system based on *SIP* of *LH*.

VPN shall mean Virtual Private Network.

WAN shall mean Wide Area Network; the communication network that transmits Meter Reads from the *AMRC* to the *AMCC*. WAN shall also mean Wireless Backhaul Network in this *RFP*.

WEP shall mean Wired Equivalent Privacy

Wi-Fi shall mean the Wireless Fidelity that is used generically of any type of *IEEE 802.11* networks. The term is promulgated by the *Wi-Fi Alliance*.

WiMAX shall mean the Worldwide Interoperability for Microwave Access by the *WiMAX* Forum, formed in June 2001 to promote conformance and interoperability of the *IEEE 802.16* standards. *WiMAX* aims to provide wireless data over long distances, in a variety of different ways, from point to point links to full mobile cellular type access.

WPA and ***WPA2*** shall mean *Wi-Fi* Protected Access and *Wi-Fi* Protected Access version 2, both based on *IEEE 802.11i*.

1.5.2 Terminology

The definitions of terms contained in this *RFP* are not intended to embrace all legitimate meanings of the terms. They are applicable only to the subject treated in this *RFP*.

Acceptance shall mean the *Equipment*/Service has passed its Acceptance Testing and shall be formalized in a written notice from Purchaser to Contractor.

Acceptance Testing shall mean the process for ascertaining that the *Equipment* meets the standards set forth in the section titled *Wireless Backhaul Requirements* prior to Acceptance by the Purchaser.

Best Value is the basis for awarding all service and technology contracts to the bidder which optimizes quality, cost and efficiency, among responsive and responsible bidders. Such basis shall be, wherever possible, quantifiable.

Bidder shall mean one who submits a response to an Invitation to Bid, specifically this *RFP*.

Contract shall mean the *RFP*, the Response, *Contract* document, all schedules and exhibits and all amendments awarded pursuant to this *RFP*.

Contractor shall mean the person or business unit actually performing services, or manufacturing, producing, or shipping supplies required by the *Contract*.

Costs and Price – "Costs" in the case of "best value" are distinguished from "price". Costs include conversion costs, life-cycle costs, etc. and *embody* price, which is the amount charged by the bidder for the given commodity or service.

Distributor shall have the meaning provided in the Ontario Energy Board Act, *1998*.

Equipment shall mean the items needed to perform the requirements specified in the *RFP*, such as Wireless Backhaul Network hardware/software requirements, software interfaces, and support and component parts within the scope of the solicitation. This includes *AP*, *Base Station* and *NMS workstation* of Wireless Backhaul Network, and other devices for transmitting data between *AP*, *Base Station* and *NMS Workstation*, transmitters, antennas, other communication components, jumpers, bonding, surge protection devices, grounding, cabling, conduit, wire mould, outlet boxes, outlets and faceplates, and miscellaneous support products.

Installation, Testing and Commissioning shall mean the placement, testing and commissioning of the end-to-end Wireless Backhaul Network infrastructure; wiring, communications, and software loading and interfacing all necessary internal and external

wiring and associated equipment to support the integrity and operation of the Backhaul Wireless Network.

Maintenance shall mean any activity such as test, measurement, replacement, adjustment or repair, intended to eliminate faults or keep equipment functioning in compliance with the manufacturer's specifications and the requirements of this *RFP*.

Meter Reads shall mean a number generated by a meter that reflects cumulative electricity consumption at a specific point in time.

Multicast shall mean point-to-multipoint data communication.

RADIUS shall mean Remote Authentication Dial in User Service.

Response shall mean the written proposal submitted by Bidder to *LH* in accordance with this *RFP*. The Response shall include all written material submitted by Bidder as of the date set forth in the *RFP* Calendar of Events or as further requested by *LH*.

Subcontractor shall mean one not in the employ of the successful bidder, who is providing all or part of the equipment and/or services under the resulting master contract under separate contract with the successful bidder. The term of *subcontractor* means subcontractor(s) of any tier.

Unicast shall mean Point-To-Point data communication.

2.0 CALENDAR OF EVENTS

Issuance of *RFP* ..... *Friday, December 19, 2008*

Submit Notice of Intent to Propose..... *Tuesday, January 6, 2009*

Bidders Conference ..... *Tuesday, January 20, 2009*

Deadline for Submission of Questions ..... *Friday, January 23, 2009*

Proposal Due Date ..... *Friday, January 30, 2009*

3.0 CONTACT INFORMATION

Any bidder in doubt as to the true meaning of any part of *RFP*, or other proposed contract documents, or who finds discrepancies in, or omissions from the *RFP*, is instructed to use one of the contact mechanisms described below to request an interpretation or correction thereof.

3.1 Contact for Contractual Matters

The person to contact concerning contractual matters pertaining to this *RFP* is:

Mr. Tom Beacock
Purchasing Coordinator
London Hydro Inc.
P.O. Box 2700
111 Horton Street
London, Ontario
N6A 4H6

Telephone	(519) 661-5800 ext. 4775
Facsimile	(519) 661-2596
Email	beacockt@londonhydro.com

3.2 Contact for Technical Matters

The person to contact concerning technical matters pertaining to this *RFP* is:

Mr. Joe Lee, P. Eng.
Manager, Metering Technologies
London Hydro Inc.
P O Box 2700
111 Horton Street
London, Ontario
N6A 4H6

Telephone	(519) 661-5800 ext. 4519
Facsimile	(519) 661-5863
Email	leej@londonhydro.com

3.3 Bidders Conference

LH will host a Bidders Conference for this *RFP*. The Bidders Conference will be located at *LH*'s office at 111 Horton Street, London, Ontario at 10:00 AM on the date established in Section 2.0, *Calendar of Events* (on page 8 herein). Those planning to attend the Bidders Conference are encouraged to provide notification in writing of your intent to

attend three (3) days before the Bidders Conference via the above fax number indicating the names, titles and contact information of the attendees.

Bidders may submit their written questions at least three (3) working days before the pre-proposal meeting, and will have an opportunity at the meeting to seek clarifications from *LH* personnel on any general or specific matter. The proceedings of this meeting will be documented and distributed to all interested bidders. *LH* has identified contact person(s) to answer general or technical questions. Bidders are encouraged to avail themselves of this facility while preparing their proposals.

Bidders are not required to participate in the Bidders Conference in order to be eligible to submit a proposal. The purpose of the conference is to answer questions potential Bidders may have regarding the solicitation document and to discuss and clarify any issues. This is an opportunity for Bidders to raise concerns regarding specifications, terms, conditions, and any requirements of this solicitation. Failure to raise concerns over any issues at this opportunity will be a consideration in any protest filed regarding such items that were known as of this pre-proposal conference.

3.4 Requests for Clarification of Additional Information

Questions regarding clarification of the contents of the Specifications will be accepted from the time of receipt of this document until the date established in Section 2.0, Calendar of Events (on page 8 herein). After this date, *LH* cannot guarantee that responses will be completed in time before the due date. Questions must be sent in writing, emailed or faxed to the appropriate contact as given in Section 3.1 or Section 3.2 above. *LH* will respond to the questions via addenda.

It is essential that all requests for additional information or clarification of information in the Specification document include:

- The company name
- Contact person's name and title
- Contact person's business address and phone number
- Clear and concise question(s)
- References to specific points within the Specifications

3.5 Other Restrictions and Grounds for Disqualification

No verbal or written information, which is obtained other than through this *RFP* or its addenda, shall be binding on *LH*. No employee of *LH* is authorized to interpret any portion of this *RFP* or given information as to the requirements of this *RFP* in addition to that contained in or amended to this written *RFP* document except as set forth above.In addition to the restrictions set forth above, any contact, beyond that allowed in this *RFP*, with *LH* Board members, staff or *LH*'s consultants (if any) during the period of this *RFP* may be grounds for disqualification from the process.

4.0 TECHNICAL REQUIREMENTS FOR WIRELESS BACKHAUL NETWORK

4.1 Three-Tier Architecture

LH requires a three-tier hierarchical Wireless Backhaul Network to interconnect the *AMRC* and *AMCC*, consisting of:

- A local *AP* Layer containing nine (9) *AP*, which includes four (4) *AP* for the First Phase and another five (5) *AP* for the Second Phase, to interconnect to and from *AMRC*.
- *A Base Station* Layer that is the data collection hub for the entire wireless backhaul network, anchored by a Local *AP* Layer to provide network visibility across the *AMI*
- A *NMS* Layer

This is a three-tier architecture that reflects an opportunity for *LH* to put in place the best-case Wireless Backhaul Network architecture. While part of the project plan included in this *RFP* specifies the Wireless Backhaul Network infrastructure assets, use-cases, user requirements, and technologies available today, the bidders shall put forth a complete solution. This solution will be based on the preliminary understanding of *LH* context, current technologies available, and current conventional thinking regarding Wireless Backhaul Network solutions.

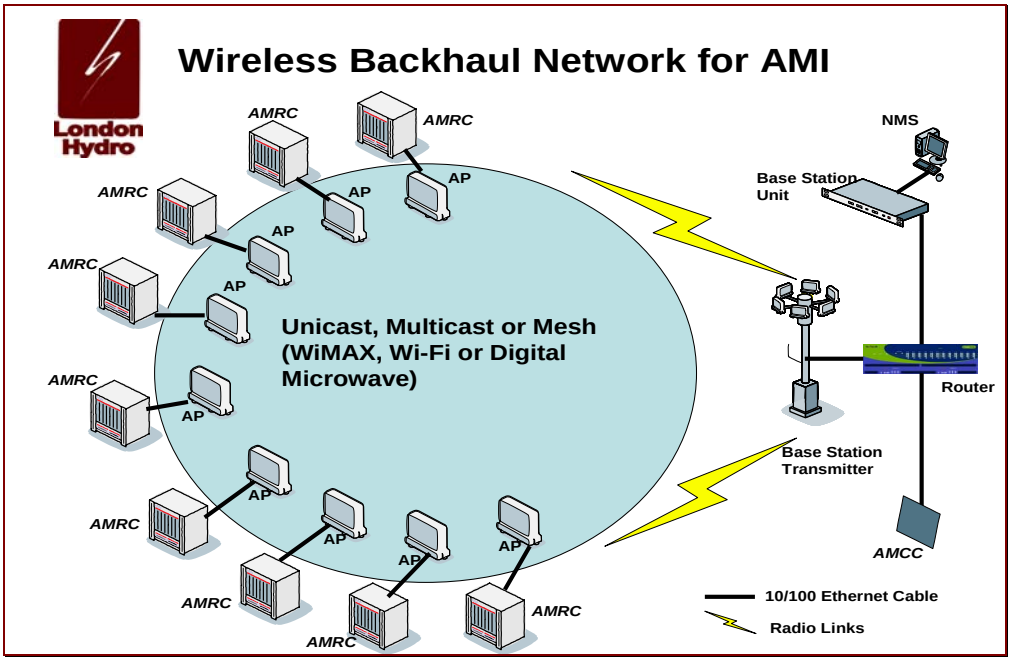

Figure 4-1, Conceptual Arrangement of Backhaul Network

Note: AMRC, AMCC and Router are out of scope of this RFP but the rest of the equipments are included in scope of this RFP.

4.2 Wireless Technologies

For the wireless access component of the Wireless Backhaul Network, *LH* has technology choices. There are many deployments of *Wi-Fi* with *Unicast*, *Multicast* or *Mesh* in existence today. WiMAX with *Unicast*, *Multicast* or *Mesh* deployments, digital microwave *Unicast* or *Multicast*, and other wireless implementations are also available in the wireless industry.

The bidders shall bid for standard compliant wireless equipment. The standards of *WiMAX*, *Wi-Fi*, digital microwave or other wireless technologies shall be specified clearly in the proposals. The bidders can also propose different technologies as options for *LH's* consideration, provided that they meet the *RFP* requirements.

Each site of *AMRC* is assumed to provide either 48 V DC or 110 V AC single phase power source that is in a climate controlled environment suitable for local *AP* layer equipment to interconnect indoor *AMRC*. Backup for this power feed will also be provided at each site of the *AMRC*. While space required at each site of the *AMRC* is limited, it is assumed to be available with secure controlled access.

The Local *AP* Layer will be connected to the *Base Station* Layer with the proposed standard-based *RF* (licensed and/or license-exempt) by the bidders. *LH* prefers programmable *RF* via *NMS* or other methods remotely if possible. The frequency spectrums can be switched easily between license and license-exempt or vice versa. Please also read Section 4.11 herein, for details of *RF* Spectrum requirements.

4.3 Scalability

The Wireless Backhaul Network design must accommodate *AMI* implementation and future applications.

The Wireless Backhaul Network shall be able to support, in the future, the data communication requirements by interconnecting the neighboring systems including *CIS*, *GIS*, *OMS*, *SCADA*, *VoIP*, *WMS*, etc. These applications and potential additional applications can be facilitated through the Wireless Backhaul Network architecture without requiring replacement or major augmentation of Wireless Backhaul *Equipment* and facilities. The Wireless Backhaul Network shall also be able to physically expand to increase coverage area.

4.4 Throughput

Bidders shall specify the maximum throughputs in Mb/s of individual *Equipment* of the proposed Wireless Backhaul Network that is based on all *AMI* use-case bandwidth requirements as follows:

The bandwidth requirements for *AMI* are at least Nx56kb/s and up to T1 range, when considering individual *AMRC* requirement interconnecting each *AP*. However, the throughput shall be large enough to accommodate other applications of Section 4.3 (on page 12 herein).

4.5 Resilience

It is imperative that *AMI* data payloads are not impacted by faults and/or interference introduced into the Wireless Backhaul Network system. Bidders have to define their *WiMAX*, *Wi-Fi*, digital microwave or other wireless systems with encryption deployments achieving this seamlessly between the *RF* devices. Current technology provides capability for uninterrupted fault recovery and fail-over with no impact on meter data and applications. Resiliency, however, means link redundant or alternate-path links and diversity in Wireless Backhaul Network paths to ensure reachability. Bidders have to specify their ways to reduce Wireless Backhaul Network cost that also undermines the overall goal of network resiliency.

Bidders have to define their *NMS* Layer to achieve monitoring and provisioning capability at an extremely high level of availability. Architecturally, *LH* recommends the deployment of a hot standby backup *NMS* for the entire Wireless Backhaul Network, but it depends on the bidder. It is critical for an uninterrupted *NMS* Layer of the Wireless Backhaul Network, because the available *Equipment* does not require *NMS* functionality for any paths. The *Equipment* of the Wireless Backhaul Network shall continue to operate indefinitely without direct NMS access to this *Equipment*. *NMS* connectivity is required for provisioning of the connections and the introduction of changes to profiles.

4.6 Future-proof

The Wireless Backhaul Network requested by *LH* must be future-proofed, i.e. it must be able to adapt to changes in the regulatory environment, standards and increasing capacity.

The *NMS* Layer to manage the Local *AP* Layer connectivity via the *Base Station* Layer shall be inherently future-proofed, in that once the Wireless Backhaul Network is deployed, additional bandwidth, if required, can be facilitated without architectural or major *Equipment* upgrades. New high speed and/or high capacity interfaces if required shall be introduced without impacting existing meter data payloads. Wireless Network *Equipment* provides upgrade paths as new requirements and applications arise. The Local *AP* Layer consists of nine (9) *APs* by the end of the Second Phase, connecting to *AMRC* after the second phase of Wireless Backhaul Network is complete, and must be software programmable to adapt to changing standards, and be able to benefit from new advances in technology. This is clearly highlighted by two important aspects of Wireless Backhaul Networks as follows:

- Changes in encryption standards
- Ratification of new open standards required to meet new requirements

The *NMS* Layer capabilities are also scalable, to allow the addition of new users and new applications over time.

4.7 Open Standards

All *Equipment* of the Wireless Backhaul Network solution must comply with the existing published standards, for example *IEEE 802.16d/e* for *WiMAX*, *IEEE 802.11b/g/n/r/s* for

Wi-Fi, *ITU-T* and *ETSI* standards for digital microwave and other wireless systems, as are practically possible. This will ensure that the solution for *LH* is not locked in to a particular vendor from a technical perspective, without reasonable recourse for substituting alternative *Equipment*. This is necessary to protect *LH* from vendor insolvency, lack of *Equipment* supply, and vendor pricing policies.

4.8 LH Wireless Backhaul Network

LH has indicated that the *AMI* shall use nine (9) *AMRC* by the end of Second Phase as the anchor nodes in the Wireless Backhaul Network layers. *LH* prefers the *AP* to apply *multicast* or *mesh* configuration for economy and improved resiliency.

All *AMRC* are indoors suitable to *AP* connections via base-band 10/100 Mb/s Ethernet cable with RJ-45 connectors, back-to-back.

4.9 Local AP Layer

Connectivity between the *AP* is provided through wireless transmitters on the *WiMAX*, *Wi-Fi*, digital microwave or other wireless *Equipment*. Each *AP* has at least two (2) *RF* links for interconnection to other *APs* participating in the *multicast* or *mesh*. At least two (2) *APs* are provisioned with an additional *RF* link (total of three (3) minimum) for backhauling data to the *Base Station* Layer. These two (2) *AP RF* links are used for alternative path (link redundancy) purposes, but more may be configured this way depending on physical deployment, and any specific requirement to ensure *High Availability* especially specific physical areas. These wireless interconnections operate in either license-exempt or licensed frequency spectrums. Bidders shall specify their proposed frequencies. Please also read Section 4.11 (on page 16 herein) for details of *RF* Spectrum requirements.

Successful *RF* propagation shall be guaranteed by the bidders. Bidders can also propose the wireless relays, if required, between the Local *AP* and the *Base Station* Layers for data transmission back to the *NMS*.

All links of the Wireless Backhaul Network employ encryption at the data layer in addition to user application level security functionality such as passwords, privileges, *IP* addresses, etc. Please also read Section 4.17 (on page 21 herein) for details of data security requirements.

As an option, bidders shall propose two *AP* in parallel to interconnect individual *AMRC* for hot-standby, full redundancy purposes, but more may be configured this way depending on physical deployment, and any specific requirements for operation either in the licensed or license-exempt frequency spectrum. Please also read Section 4.11 (on page 16 herein) for details of *RF* Spectrum requirements.

All *Equipment* of the Wireless Backhaul Network shall be owned and managed by *LH*. But, the successful bidder will be responsible for design, installation, testing and commissioning of the Wireless Backhaul Network and also for the training of *LH* staff.

In summary, bidders shall propose open-standard *WiMAX*, *Wi-Fi*, digital microwave and/or other wireless *AP* with:

- Redundant/alternate path radio links
- Backhaul diversity
- Multiple *VLANs (Bidders shall confirm* the number of *VLAN* channels per link), and
- Multiple *SSID*'s per *VLAN*

Antennas and transmitters of Local *AP* Layer shall be mounted on existing infrastructure (poles, building or towers if any). This *Equipment* shall be designed for Canadian environment scenarios and only need to be solidly mounted, and power provisioned.

4.9.1 Antenna and Transceiver Design Objectives for Local AP Layer

Desirable features of the antennas and transceiver components integrated into the *AP* include: extend range (including ability to penetrate certain obstructions like foliage, windows, and walls), high modulation, interference mitigation, and 360 degrees coverage if required.

Bidders shall include a comprehensive description of their antennas and transceiver technology, paying particular attention to any design limitations to their implementation of the above-listed features, or expanding on design features that exceed the desired and provide true value to *LH*.

Specific *RF* performance information to be submitted includes (but is not necessarily limited to) the following:

- the spectral mask and *EIRP* measurements,
- the proposed frequencies,
- antenna pattern plots for both the *E*- and the *H*-planes,
- the antenna gain, polarity and type (e.g. omni-directional, directional, etc), as well as the power amplifier output levels,
- heights and angles of the antennas, transmitters and *AP*,
- modulation standards used,
- breakdown details of the data traffic identifying bandwidth, gross data rate, net data rate, alpha, *FEC*, and whether the *AP* is half or full duplex,
- heights of outdoor pole and/or tower required, and
- power supply on outdoor pole and/or tower required.

Note: Most, if not all, of this requested information would be included in a manufacturer's submission to IC for *Technical Acceptance Certificate (TAC) for "Category I"* RF *equipments*, pursuant to Radio Standards Procedure 100, *Radio Equipment Certification Procedure*.

4.10 Base Station Layer

With respect to the *Base Station* Layer: *Base Station* unit, *Base Station* transmitters, antennas and 10Mb/s/100Mb/s Ethernet cabling system as shown in the diagram of network topology on page 18, bidders shall include a comprehensive description of their antennas/coupling device and transceiver technology for *Base Station* Layer. The information to be submitted shall be the same as in:

Section 4.9.1, Antennas and Transceiver Design Objectives for Local AP Layer, on page 15 herein (as it applies to the Antennas and Transceiver for Base Station Layer)

Antennas and transmitters of Base Station Layer shall be mounted on existing infrastructure (buildings, poles or *LH* tower (70 feet) at 111 Horton Street). These *Equipments* shall be designed for Canadian environment scenarios and only need to be solidly mounted, and power provisioned.

Successful *RF* propagation between the *Base Station* and the Local *AP* layers shall be guaranteed by the bidders. All links of the Wireless Backhaul Network employ encryption at the data layer in addition to user application level security functionality such as passwords, privileges, *IP* addresses, etc. Please also read Section 4.17 (on page 21 herein) for details of data security requirements.

As an option, bidders shall propose two *Base Stations* in parallel to interconnect the same *AP* for hot-standby, full redundancy purposes, but more may be configured this way depending on physical deployment, and any specific requirements for operation either in the licensed or license-exempt frequency spectrum.

4.11 RF Spectrum

It is essential that any proposed wireless technology that makes use of *RF* spectrum is fully compliant with the applicable *IC* criteria for frequency, bandwidth, power, modulation and radiation pattern.[1] Specifically, the *RF* energy radiated from a *RF* system should comply with the applicable spectral mask and *EIRP* as is dictated by *IC*, regardless if the frequency spectrum proposed is classified as licensed[2] or license-exempt[3]. *RF* systems will be deemed to include radios, cables, connectors, filters, antennae, and all associated *RF* paraphernalia and accessories. Bidders are responsible to ensure that all the possible system variations proposed for the *RF* package are compliant to *IC* criteria.

[1] Official publications of IC's Spectrum Management and Telecommunications Division are available electronically at URL: http://strategis.ic.gc.ca/epic/internet/insmt-gst.nsf/en/h_sf01841e.html.

[2] Licensed frequency spectrum: e.g. 700MHz/928-960MHz/1.4GHz/1.5GHz/1.8GHz/2.3GHz/2.5GHz/ 4.9GHz/10.4GHz.

[3] License-exempt frequency spectrum: e.g. 902-927MHz/2.4GHz/5.8GHz.

As *LH* is not included in the Security Group, the frequency bands *LH* most commonly used in wireless *LAN* solutions are *ISM* radio bands that are license-exempt. They were originally reserved internationally for non-commercial use of *RF EM* fields for *ISM* purposes. The *ISM* bands are defined by the *ITU-T in S5.138 and S5.150* of the Radio Regulations and can be used for license-exempt digital communications applications such as *Wi-Fi*, *WiMAX*, digital microwave or other wireless systems for *LH*. If interference occurs in the future, *LH* shall be able to apply the licensed frequency bands, in which the successful bidder shall be responsible for *IC* approval and the frequency switch-over shall be accommodated by using programmable radios.

These *ISM* bands do no require an *IC* license and are therefore open for any use by *LH*. All other bands are assumed to require a license for use as issued by *IC*. Depending upon the application, a *CRTC* license[4] may also be required.

Specific *IC* technical standard for emissions must be met by the bidders regardless the frequency.

4.12 Radio Upgrades

RF Equipment deployed in the Wireless Backhaul Network must be able to be upgraded remotely at any time from the *NMS*. This allows for reconfiguration of the architecture as bandwidth and applications evolve with the growth of *LH*, and also to allow future *AMI* phases (and additional future applications) to be supported by the Wireless Backhaul Network. As standards evolve and become ratified, the *RF Equipment* will need upgrades to support these new capabilities. All radios shall be software programmable.

4.13 Product Certification

Bidders shall include a photocopy of their Certificate of Compliance to CAN/CSA Standard C22.2 No. 60950-1-03, *Information Technology Equipment – Safety – Part I: General Requirements*, (or the CSA standard that is more applicable to their AP and base station) with the proposal.

Bidders shall also include a photocopy of their Technical Acceptance Certificate (TAC) for "Category I" equipment pursuant to IC's Radio Standards Procedure 100, *Radio Equipment Certification Procedure*.

4.14 Safe Implementation of RF Radiating Equipments and Systems

All Wireless Backhaul Network systems and installations meet or exceed all relevant regulations pertaining to the safe implementation of *RF* radiating *Equipments* and systems as directed by Health Canada within their publication entitled: *Limits of Human Exposure to Radio Frequency Electromagnetic Fields in the Frequency Range from 3*

[4] *LH* understands *CRTC* license may be required but it is out of scope at this moment.

kHz to 300 GHz – Safety Code 6; 1999.[5] To the extent that it may apply, proposed *Equipments* shall also be designed to meet or exceed the installation standards for mounting *RF* systems on poles, towers and structures as set forth in *CSA* Standard S37-01, *Antennas, Towers, and Antenna-Supporting Structures*. Furthermore, grounding of these *RF* systems shall be at set forth in *CSA* Standard C22.1-02, *Canadian Electrical Code, Part I (19th Edition) – Safety Standard for Electrical Installations*.

4.15 Low Temperature AP, Base Station Transmitters, Antennas and External Cabling System Operations

If the Wireless Backhaul Network *Equipment* is *outdoors*, bidders shall indicate the lowest ambient temperature for which all *AP*, *Base Station* transmitters, antennas and external cabling system, etc would successfully operate without frequency change, increase jitter, or other impairment (e.g. ceased operation).

LH prefers all *outdoor* Wireless Backhaul *Equipment*, if any, to function normally within the ambient temperature, - 40 degrees Celsius to + 85 degrees Celsius, at 98% *RH*.

4.16 NMS Layer

The *NMS* Layer shall provide remote system monitoring, and technical assistance regarding a variety of network related issues. Monitoring infrastructure is an important part of the *NMS* functions. The *NMS* workstation shall react promptly to infrastructure issues, to reduce the down-time. The priority shall be focused on problem prevention: detecting and reacting to potential problems before they arise. The *NMS* workstation is the focal point of all monitoring, problem tracking, remote management and problem resolution in supporting of the Wireless Backhaul Network system and users.

The *NMS* Layer shall be able to alert *LH* operation staff. The *NMS* workstation keeps the user informed of its status and dispatches the correct resource to ensure a speedy resolution to every issue. The *NMS* ensures that the users are always informed, in control, and receiving the best services available in the industry.

The *NMS* workstation shall have a range of complex operating support services that keep the user operations running at peak efficiency as follows:

- 24 hours per day and 7 days per week proactive wireless backhaul network monitoring
- Proactive management
- Remote support capability
- Remote server, user and *RF* support
- Infrastructure support

[5] This document is posted electronically on Health Canada's website at URL: http://www.hc-sc.gc.ca/ewh-semt/alt_formats/hecs-sesc/pdf/pubs/radiation/99ehd-dhm237/99ehd-dhm237_e.pdf.

- Backup verifications
- *OS* alerts
- Resource capacity
- Hardware and software failure monitoring
- Threshold breach

The *NMS* workstation is at the service of all applications and answers all their questions and inquires. All problems related to the Wireless Backhaul Network shall be recorded and immediately solved by *LH* engineers and the successful bidders under *SLA*. *NMS* shall have the capability to provide the trouble tickets in order to follow-up on its request, in case the trouble cannot be resolved immediately. *LH* engineers shall be properly trained by the successful bidder to proactively monitor and troubleshoot any kind of Wireless Backhaul Network related problems.

The *NMS* workstation must be positioned to accommodate growth of new applications and an ever-increasing area of coverage and greater number of users. The *NMS* capability shall also allow for application monitoring and also the partition of the problems for the overall Wireless Backhaul Network.

The Wireless Backhaul Network shall also be able to support data communications of other neighboring systems of *LH* in the future. The *NMS* workstation, therefore, shall be able to expand its capacity during the future expansion of the Wireless Backhaul Network.

It is assumed that there is available space at *LH* for the deployment of the *NMS* servers and a *RADIUS* server. Backup server space is available at one of the application administrative sites for the deployment of a hot-standby backup *NMS* workstation for redundancy purpose. This backup minimally must provide NMS functionality for the Wireless Backhaul Network *Equipments*, and also *RADIUS* server functionality.

The *NMS* is assumed to support the Wireless Backhaul Network for *AMI* initially. Additional application servers may be required to support other applications in the future.

4.16.1 Preferred Hardware and OS Platform

LH has deployed the following hardware and *OS Equipment* for corporate computing:

- Hewlett Packard's BladeSystem equipped with model BL25-p server blades (dual 64-bit AMD processors with 16GB of RAM)
- ESX Server, Version 2 (using both Windows 2000 and 2003 images) virtual machine software, and
- Red Hat Enterprise Linux, Version 4 (including updates 1 – 3).

Preference would be given to a *NMS* workstation that can operate on the above platforms.

To provide for fair comparison, bidders with product designed to operate on *LH*'s corporate computer system shall include a "cash allowance" in their submission to cover the procurement cost of the required number of additional server blades for Wireless Backhaul Network application.[6]

4.16.2 Redundant Configuration of NMS

The *NMS* workstation shall have a real-time, hot-standby redundant configuration (i.e. main and standby). The hot-standby server platform shall be maintained in a fully synchronized state; and on fail-over, all Wireless Backhaul *Equipment* shall be automatically transferred to the backup server platform without any operator intervention.

The hot-standby backup/synchronization software features shall include:

- secure synchronization of backup server, with error detection and database verification
- Continuous maintenance of backup server synchronization in real time, and
- Fail-over initiation by online or backup server on hardware or diagnostic routines failure.

LH is receptive to multi-processor architectures provided the underlying objective (i.e. fault tolerance and data preservation) is fulfilled.

Main and hot-standby *NMS* server platforms shall have independent connections to the Wireless Backhaul Network.

Other *NMS* features to preserve the integrity of the applications and data, and to minimize system recovery time shall include as a minimum:

- Software crash tolerance: The *NMS* shall be capable of restart and recovery after *NMS* failure with no loss of data or software components.
- Retort/Recovery: The *NMS* shall be capable of restart and recovery after system failure with no loss of data or software components.
- Integrity checking feature: Must provide the capability of identifying the existence of program and/or *NMS* discrepancies.
- File protection: This feature shall provide the capability to limit the types of operations (e.g. read, write, delete, data dictionary modification) that can be performed by individual users on given data or program files.

[6] As part of contract negotiation process with the successful bidder, LH may elect to procure the server blades via its normal supply channels and reduce the contract price by the stipulated "cash allowance" amount.

4.16.3 User Interface Design Requirements

The organization of information on visual displays, use of colors, and user interaction should conform to good human engineering design practices. MITRE Corporation publication ESD-TR-86-278, *Guidelines for Designing User Interface Software*, August 1986[7] shall be considered the reference publication for the design and evaluation of user interfaces to visual display terminals.

4.17 Data Security

Although wireless technology provides a solution for *AMI*, it opens up some security issues. Both bidders and *LH* shall understand these issues and shall ensure that the Wireless Backhaul Network system proposed by the bidders meets high security standards using best, cost effective, commercial and government practices available on the market today.

LHs approach to overcome the security issues is to implement a system layered approach. This shall ensure the integrity of the data used by the *AMI* service and its partitioned and proper use by appropriate *LH* users. It shall also prevent unauthorized use of Wireless Backhaul Network resources (*theft of service*), unauthorized access to private information (*theft of information*), and a user from blocking another user's legitimate access (*denial of service*).

Bidders shall specify the details of various security mechanisms in their Wireless Backhaul Network *equipment*: *ACL*, bandwidth restrictions (limited data rate per unit), built-in firewall, compliance with *CC* which is an *ISO/IEC 15408* or as a minimum *CTCPEC*, confidentiality and integrity, centralized password repository (e.g. regional, cluster or unit remote updates), *DHCP*, key management procedures, *MAC* address filtering, *NAT*, strong encryption algorithms (e.g. 128kb/s or 256kb/s *AES/3DES*, *IPsec/IKE*, *WPA/TKIP*, *WPA2/AES*, etc.), *PAP*, *SSID* broadcast disabling, user authentication (e.g. *CHAP*), traffic analysis restrictions (for irregular traffic flows), traffic logging, and other cost effective security mechanisms appropriate to the security level of the data communicated.

The Wireless Backhaul Network system shall be flexible in terms of expansion for applications. There must be an assurance that the data integrity is being maintained, and the Wireless Backhaul Network system has not been compromised. Bidders shall provide open standard security technology that meets the needs of *LH*.

[7] MITRE Corporation publication ESD-TR-86-278 available online at URL: http://heibib.org/sam/

4.18 Operational Requirements

4.18.1 Expandability/Scalability Requirements

The Wireless Backhaul Network shall have sufficient inherent expandability to sustain the system for at least fifteen (15) years, based on the following assumptions regarding growth of the AMI meter population:

- The existing electric meter population is approximately 140,000 that require nine (9) *AMRC* for meter data collection.
- Approximately, 2,400 new services (with associated revenue meters) are added each year.
- If the provincial government mandates conversion of bulk metered apartment buildings to individual tenant meters (via such instruments as Ontario proposed draft Regulation, Installation of Smart Meters and Smart Sub-Metering Systems in Condominiums), the conversions within 690 buildings will see the addition of 29,388 tenant meters.
- A 3% allowance shall be provided for anticipated other factors.

Based on the foregoing, the Wireless Backhaul Networks System shall be scalable to support at least fifteen (15) *AMRC* for 200,000 electric meters.

4.18.2 System Availability/Reliability Requirements

4.18.2.1 General

Availability is defined in the following formula as the ratio of uptime to total time (uptime + downtime):

Availability = uptime / (uptime + downtime)

and is normally expressed as a percent (of total time).

Downtime normally includes corrective and preventive maintenance. When system expansion activities compromise the user's ability to operate apparatus via the system, this shall also be included in downtime.

4.18.2.2 NMS Availability

The *NMS* (with its associated hot-standby redundant configuration and automatic fail-over functions) at network level shall provide an overall availability of 99.9% or greater. Bidders shall provide supporting predicted availability calculations *at product and network levels* within their proposals.

4.18.2.3 Local AP and Base Station Availability

The Local *AP* and *Base Station* Layers *at network level* shall have a minimum *MTBF* of at least 15 years. Bidders shall provide supporting predicted availability calculations *at component, product and network levels* within their proposals.

Bidders shall also describe the burn-in production tests of all Wireless Backhaul Network *Equipment* that are carried out to minimize infant mortality failures.

4.18.3 Maintainability

Maintainability requirements address the ease and efficiency with which servicing and preventive and corrective maintenance can be conducted; i.e. the ability of Wireless Backhaul Network *Equipments* to be repaired and restored to service when maintenance is conducted by personnel of specified skill levels and prescribed procedures and resources.

4.18.3.1 AP and Base Station Maintainability

Both AP and *Base Stations* are disposable items, meaning it is generally more cost-effective to replace malfunctioning units than to repair them. *LH*'s interest is in selecting the Local *AP* and *Base Station Equipment* with design and assembly features that are seen as robust and therefore likely to result in the lowest maintenance costs.

Upon request, bidders shall provide an *AP* and a *Base Station* for examination.

- Desirable features and attributes included:
- Surface-mounted circuitry
- Clean *PCB* layer
- Circuit-stability features for all Wireless Backhaul *Equipment* to ensure performance over a range of temperatures and humidity conditions as are experienced in Ontario
- Design aspects including technology, ergonomics, usability, human factors, and material technology.

Undesirable features and attributes include:

- Jumpers, bypasses or cut traces on the *PCB*
- Reroutes and kluges on the *PCB*
- Use of obsolete parts and components
- Poor shielding, isolation and heat dissipation
- Poor grounding and *RF* interference for the communication components
- Unstable oscillators and displays (if any) that may be affected by temperature or humidity
- Prototypes and untested components

- Weak or unstable connections
- Clumsy, hard to reach or illogical controls
- Poor weather-proofing for outdoor Wireless Backhaul *Equipment*

4.18.4 Response Requirements

4.18.4.1 Man-Machine Interface Performance

For *NMS* workstation, rapid, error, error-free access to the information required for the task shall be accomplished by ensuring that system response to any query is less than two (2) seconds and that user feedback to control action is less than 0.2 seconds or faster wherever possible.[8]

4.18.4.2 Disaster Recovery

With the *NMS* workstations, for failure of any hardware element of the primary workstation, the secondary workstation shall be synchronized and ready to automatically assume full control instantly with no loss of Wireless Backhaul Network data. Conversely, when the faulty hardware element has been replaced, the primary workstation shall be brought to full synchronized operation instantly as backup system.

In the unlikely event that the entire *NMS*, or the work area facility, becomes unavailable (e.g. fire, sabotage, etc.), it shall be possible for the Wireless Backhaul Network run normally without *NMS* management. It shall also be possible to reconstruct a working *NMS* (from backup media) instantly.

[8] Elaboration of requirements can be found in Tables 6 and 7 of U.S. Nuclear Regulatory Commission publication, NUREG/CR-2496, *Human Engineering Design Considerations for Cathode Ray Tube-Generated Displays*; April 1982.

5.0 PROJECT OVERVIEW

5.1 First and Second Phases of Wireless Backhaul Network Project

The entire Wireless Backhaul Network project shall be carried out in two phases. This procurement is for both phases. Based on the success of first phase, the contract may be extended to encompass the second phase works (or a subset thereof). The bidders have to provide a quotation with unit prices independently for both phases.

If the successful bidder *fails* to perform in the First Phase in accordance with this *RFP*, Statement of Work, contract, *P/O*, as well as terms and conditions, *all costs* during the First Phase shall be borne by the successful bidder.

If the Wireless Backhaul Network deployment in First Phase is considered first-rate[9] by *LH*, there will be

- a mutual agreement between the successful bidder and *LH*, and
- after the successful completion of the First Phase of contract is finished, the contract may be extended to encompass the Second Phase deployment (or a subset thereof).

The completion of the First Phase of the contract shall be targeted on or before March 31, 2009 while the completion of the Second Phase of the contract shall be targeted on or before June 30, 2009.

In order to make sure the proposed Wireless Backhaul Network's two-way data transmission is satisfactory in the environment of London, Ontario, all bidders are *highly recommended* to conduct a *feasibility survey* to meet the technical and functional requirements of the Wireless Backhaul Network, before the bidders prepare their proposals. There is *no line-of-sight* between *AP* locations and the *Base Station* Layer. *AP* locations, *except LH tower 111 Horton Street*, have *no towers* *except poles and buildings* for antennas, transmitters and/or *AP* mounting.

Before contract and *P/O* are issued to the successful bidder, the successful bidder shall perform an *RF survey* between *AP* locations and *LH* Headquarters. The successful bidder has to *prove with evidence* that the Wireless Backhaul Network *works* without any additional equipment and costs to be added during the deployment of Wireless Backhaul Network.

9 A first-rate deployment is one whereby in LH's opinion, the wireless products are clearly a state-of-art carrier-grade product optimized for the application, the successful bidder has extensive and intensive experience and expertise with wireless network, issues are addressed in a professional and timely manner, product support staff are available and effective, the documentation is complete and well-written, and there is clear evidence that the product is continuously being enhanced with new features and expanded functionality (which is very different than frequent updates to address shortcomings and chronic bugs.)

The successful bidder shall also be *responsible for* all matters of *IC Frequency Spectrum Approvals* for the *proposed licensed frequency spectrum* before the contract and *P/O* are issued to the successful bidder.

The locations of nine (9) *AMRC* (indoor)/*AP* are as follows:

Table 5-1, First Phase of AP Sites

Common Description of Site	Coordinates	
	Latitude	Longitude
LH tower (111 Horton Street)	42.977619	-81.250113
Municipal substation SUB-25 Oakridge	42.977619	-81.333408
Municipal substation SUB-27 Adelaide	43.011752	-81.243091
White Oak Road pumping station	42.901554	-81.241668

Table 5-2, Second Phase of AP Sites

Common Description of Site	Coordinates	
	Latitude	Longitude
Municipal substation SUB-52 Ridout	42.960869	-81.242933
Municipal substation SUB-15 Glen Cairn	42.96048	-81.200572
Municipal substation SUB-18 Fairmont	42.976641	-81.178358
Municipal substation SUB-92 Wavell	42.998977	-81.171427
Arva reservoir and pumping station	43.047805	-81.315772

Table 5-3, Third Phase of AP Sites

Common Description of Site	Coordinates	
	Latitude	Longitude
Springbank Reservoir Tower	xx	xx
Municipal Comm. Tower – 1795 Oxford St East	xx	xx

5.2 Spare Parts

Bidders shall provide as part of the system proposal, a list of quantities of spare parts calculated to be necessary to meet the specified availability and maintainability requirements.

Spare parts shall be grouped by *Equipment* category (i.e. Local *AP*, *Base Station* and *NMS* Layers)

The spare parts list shall include the part's generic name or description, its trade name, manufacturer's name, manufacturer's part number, list price and recommended quantity.

In establishing the quantities of spare parts, the supplier shall consider the time required to return the failed *Equipment* (field and/or factory service) to a serviceable condition.

The maintainability of *Equipment* is reflected in a figure of *MTTR*. The *MTTR* values used in the supplier's availability computations shall be based to the maximum extent possible upon maintenance experience.

MTTR is the sum of administrative, transport, and repair time. Administrative time is the time interval between the call for service and on-site arrival of a technician and the necessary replacement parts. Repair time is the time required by a trained technician, having the replacement parts and the recommended test *Equipment* on-site, to restore nominal operation of the failed *Equipment*.

For the purpose and duration of the Wireless Backhaul Network deployment, *LH* is interested in obtaining a hand-held provisioning tester that shall allow field staff to capture required information for the service orders, *RF* intensity, and any other configuration information required for *NMS* workstation.

Also of interest is a provisioning tester feature whereby field staff can carry out a quick end-to-end test to verify that the communication link, signal strength, noise, etc. are strong and that the *AP*, *Base Station*, etc are successfully communicating with the *NMS* workstation.

Bidders shall include descriptions and unit pricing for their recommended hand-held provisioning and diagnostic tools.

In assessing deployment costs with a Wireless Backhaul Network technology, *LH* will be considering the system features and tools that provide for an expedient and reliable Wireless Backhaul Network deployment. For example, a solution set that provides a *LH* maintenance technician with verification of communication with the *NMS* Workstation instantly, has a lower projected deployment cost than a solution whereby a *LH* maintenance technician has to wait until the end of a reporting interval (i.e. one minute or more) for such verification.

5.3 Documentation Requirements for Wireless Backhaul Network

The documentation shall be sufficient for operation and maintenance (including upgrades) of the Wireless Backhaul Network, as well as any special provisioning/diagnostic tools associated with the Wireless Backhaul Network.

5.3.1 Quick Reference Guides

Quick reference guides (or so-called *operator cards*) shall be available to provide a convenient reference for guiding the user in the installation and basic operation of the system and/or unit. The *operator cards* contain abbreviated pertinent information provided in the operating and service manuals and are useful to facilitate operation of the system and/or unit in customer locations.

The deliverables shall include five (5) printed and bound sets of the quick reference guides, and one electronic copy (preferably in *PDF* format) on a *CD-ROM*.

5.3.2 Operating and Service Manuals

Operating and service manuals for AP, *Base Station*, *NMS* and any other tools for provisioning or otherwise maintaining the Wireless Backhaul Network should contain, as a minimum:

- Information needed to perform scheduled preventive maintenance, fault isolation, and removal and replacement procedures for units down to the assembly or chassis-mounted component level.
- Part lists, component location diagrams, and schematic diagrams to aid in component level repair when this approach is cost effective.

The deliverables shall include three (3) printed and bound sets of the operating and service manuals, and one electronic copy (preferably in *PDF* format) on a C*D-ROM*.

5.3.3 Software User Manuals

Software user manuals for *NMS* workstation, *Base Station*, *AP* configuration programs, and any other software tools for provisioning or otherwise maintaining the Wireless Backhaul Network should contain, as a minimum:

- *OS* requirements (platforms, hard drive space minimum, hard drive space recommended, *RAM* minimum and *RAM* recommended)
- Installation instructions: step-by-step instructions with screen captures for reference
- Description of software features and functions
- Solved example problems, or a tutorial that demonstrates that main features of the software. These need to include step-by-step user instructions, inputs, and expected outputs.

The deliverables should include one (1) printed and bound set of the software user manuals, and one electronic copy (preferably in *PDF* format) on a *CD-ROM*.

5.4 Staff Training Requirements for Wireless Backhaul Network

The successful vendor shall provide on-site training to designated *LH* staff. Three (3) different training sessions are envisioned as outlined following:

- *Installation and maintenance training*, for *LH* maintenance staff that will be carrying out the maintenance of *AP*, *Base Station* and *NMS* workstation using the provisioning tools. These staff will perform the replacement of faulty *Equipment* and the complete system tests of *AP*, *Base Station* and *NMS* workstation after the cut-over day. The successful vendor may assume a class size of six (6) students.
- *General user training*, for a variety of users of the *NMS* workstation, to extract and interpret trouble reports, carry out functions (associated with Wireless Backhaul

Network) and to oversee *AP* and *Base Station*. The training shall include the functional operation and minor technical support of the installed systems such as *AP*, *Base Station* and *NMS* workstation. The successful vendor may assume a class size of eight (8) students.

- *System administrator training*, primarily for technical staff within *LH*'s Information System Department. This training is expected to be comprehensive in nature and cover all aspects of the software, database management system, security, and corporate *LAN* interfaces used within the Wireless Backhaul Network. The successful vendors may assume a class size of four (4) students.

LH recognizes that it may be more practical to carry out certain portions of the system administrator training at the successful vendors' facilities. In this case, the successful vendors may assume that *LH* will assume responsibility for all travel and accommodation expenses associated with staff training at the successful vendor's sites.

The successful vendor shall provide *one set* of printed training materials for *each trainee*.

For on-site training, *LH* will provide a suitable classroom facility with computer workstation *Equipment* for each staff member participating in the training session and a computer workstation for the training instructor. The room can be darkened and includes a projector as well as whiteboard or equivalent.

Within the proposal, the vendors shall provide an overview (e.g. table of contents for printed materials) of the training program that is included.

5.5 Wireless Backhaul Network Acceptance Testing

The successful vendor shall develop a formal *SAT* Plan to verify that the Wireless Backhaul Network system operates in accordance with *LH*'s specifications, which encompass those regulatory requirements of the federal, provincial and municipal governments, and the successful vendor's specified capabilities as set forth in their response to this *request*.

The *SAT* Plan shall also encompass the Wireless Backhaul Network connections. This element of the plan shall test the performance of the Wireless Backhaul Network form the perspective of signal strength (levels) and signal clarity (*SNR*) as a minimum. *RF* performance parameters and sufficient fade margin shall be determined once the successful vendors are known. It is envisioned at this time that these parameters shall be jointly determined and agreed to by the purchaser and the successful vendors. All parameters shall be set in advance of the purchase and the successful vendors shall need to agree to meet these parameters as a minimum expectation of satisfactory performance of the *RF* links. Penalty clauses shall be assigned for any under-performance of the test plan specifications.

For RF performance tests, *LH* prefers testing be carried out in June, July or August, if possible, when tree foliage has full moisture content.

The *SAT* Plan shall include, as a final element, a 30-day availability test. During the system availability test, the Wireless Backhaul Network shall not be altered in any way by either party other than normal day-to-day use. If during the 30 days of availability testing a problem is reported, the successful vendors shall correct and test the system. The 30-day system availability test shall start again at this point.

The structure of the *SAT* test plan shall generally conform to *IEEE standard 829-1998, Software Test Documentation*.

The *SAT* Plan developed by successful bidder shall be subject to approval by *LH*.

SAT shall be performed by qualified *LH* staff in the presence of a representative of the successful bidder.

5.6 Other Requirements

5.6.1 Warranties

5.6.1.1 System Level Functional Warranty (Twelve (12) Months)

Vendor warrant that their goods sold constitute a system suitable for the purposes articulated in the contract. The system comprises the hardware and software elements furnished by the successful vendor. The system shall perform and support the functions and performance required by the contract for a period of 12 calendar months following the *SAT* that is described earlier in Section 5.5. The successful vendor shall be responsible for any and all necessary additions, modifications, repair or replacement of all elements of the Wireless Backhaul Network including *AP*, *Base Station*, *NMS* workstation, etc. *without additional charge to LH*, to ensure satisfactory operation and subsequent expansion of the system. Such responsibility includes, at *LH*'s option, field labor to install, remove, or modify communications infrastructure, to modify any system software, and to test such modifications to confirm that the system operates satisfactorily. *LH* will notify supplier promptly of any failure of the system to meet functional and/or performance requirements. The vendor shall provide, at their expense, a remedy that returns the system to full functionality without delay.

5.6.1.2 Equipment Level Materials and Workmanship Warranty (Five (5) Years – Declining Share)

All hardware and software provided by the successful vendor shall be free of defects in materials and workmanship. The successful vendor shall bear a share of the cost of replacing material that is found by *LH* to be defective, as described in this section. The successful vendor shall provide to *LH* convenient and efficient instructions and procedures for shipping material to supplier for repair/replacement.

Materials provided by the vendor that are found by *LH* to be defective, shall be returned to the vendors within 30 days of when the defect is evident to *LH*.

If the defect is determined to have been a fault of the supplier, the pro-rated sharing of expenses shown below shall apply. Successful vendors shall repair or replace the defective item at its expense and return it to *LH* within 30 days. Successful vendors shall not be obligated to ship, repair, or replace the item at its expense if the defect is determined to have arisen from misuse, improper installation, neglect, modification, accident or exposure to adverse conditions exceeding performance levels required by applicable specifications.

In the five (5) year period of use and operation that follows the *SAT*, failures of any element of the system (including *AP, Base Station, NMS* workstation, etc.) exceeding one-half (1/2%) percent of *Equipment* per rolling twelve (12) month interval will be considered excessive, and become the responsibility of the successful vendor. The vendor shall bear a pro-rated share of the material and change-out labor costs to remedy such failures in accordance with the following schedule:

Cost Sharing Schedule for Warranty Repairs

Within 12 months of SAT..... 100%

Within 13 – 24 months of SAT..... 80%

Within 25 – 36 months of SAT..... 60%

Within 37 – 48 months of SAT..... 40%

Within 49 – 60 months of SAT..... 20%

More than 60 months after SAT 0%

The successful vendor's furnished commercially available NMS workstation (hardware) shall be subject to the repair or replacement warranties provided by its manufacturers or 24 months, whichever is greater.

5.6.1.3 Right to Operate Unsatisfactory Equipment

If the operation or use of the materials or *Equipment* after delivery and/or installation does not reasonably comply with the technical requirements set out in the contract, *LH* shall have the right to operate and use such materials or *Equipment* until such deficiency can be corrected, provided that such operation or use pending correction shall not unreasonably impede or delay the ability of the successful bidder to perform corrections.

Such operation shall not constitute an acceptance of any part of the work, nor shall it relieve the suppliers of any requirements of the contract, nor shall it act as a waiver by *LH* of any requirement in the contract.

5.6.1.4 Long Term Availability of Spare Parts

Bidders shall certify the availability of spare parts for the *Equipment* of the Wireless Backhaul Network for a period of at least fifteen (15) years from the date of final Wireless Backhaul Network system acceptance.

5.6.2 Service Maintenance and Support

Bidders shall describe maintenance support for Wireless Backhaul Network system infrastructure, including problem notification and repair. Bidders shall include a description of the following:

- All parties with which *LH* will be working to obtain support services
- Response procedures for priority versus non-priority calls
- Level of support and hours of service for each level of support
- Response time for each level of support, and
- Remote-support capabilities, if available.

Bidders shall describe *SLA* options, and provide an illustrative quote for an annual maintenance contract beyond first and second phases.

5.6.3 Wireless Backhaul Network Equipments Design for End-of-Life Disassembly and Materials Recycling

In anticipation of future regulations and directives mandating the recycling of electronic waste (or e-waste), preference will be given to *AP, Base Station, NMS* workstation, etc. designed for simple end-of-life disassembly and material recycling. Such measures include, but are not limited to, the following:

- The resins used in the transparent cover, *AP*, *Base Station* and *NMS* workstation components shall be embossed with the appropriate recycling symbol (pursuant to the Society of the Plastics Industry's resin identification coding system) to make resin reprocessing possible.
- The number of parts and materials used in the Wireless Backhaul Network *Equipment* shall be minimized, making it simpler to sort and recycle.
- Parts that snap together are favored over screws or other fasteners. If screws must be used, the same type of screws, all oriented in the same direction (so that they can be removed in rapid succession, using one tool) is preferred.
- Gluing product parts together shall be avoided (because adhesives contaminate the recycled materials and make sorting next to impossible.)

Bidders shall indicate the types of resins used for both the cover and base of the Wireless Backhaul Network *Equipment*, and provide evidence (e.g. photograph) that each component is embossed with a recycling symbol.

6.0 PROPOSAL

6.1 Submittal

Companies interested in submitting a proposal in response to this *RFP* shall provide a Notice of Intent to Propose by the date noted on Section 2.0, *Calendar of Events*, via facsimile addressed to Tom Beacock, followed with the originals by regular mail. The notice should contain the name, address, phone number and email address of the bidder's designated contact person.

Three (3) hard copies of the proposal (the Technical and Cost sections of the proposal shall be separated; the Cost proposal shall be submitted in a sealed envelope) are due no later than the time and date noted in Section 3, Calendar of Events (on page 14 herein). All proposals should be delivered in a sealed package or packages, clearly marked as to contents, to:

London Hydro Inc.
111 Horton Street
London, Ontario
CANADA N6A 4H6

Attention: Marilyn McVeigh, 3rd Floor Executive Office

Hard copies of the proposal shall be provided on 8" x 11" paper. Electronic copies of the technical proposal are acceptable (as an alternative to hard copies of the technical proposal), if provided on a CD or memory stick in standard Microsoft Office format (.doc, .xls, .dbf, .mpp), Adobe (.pdf) or AutoCAD™ (dwg, .dwf).

Proposals received after the Proposal Due Date will not be considered, nor will faxed or emailed proposals, whenever received. Failure to submit a proposal on time shall not be waived by *LH* under any circumstances (e.g. traffic conditions, mail or courier failure, etc.).

LH may conduct interviews of those bidders found to be the most qualified to provide Wireless Backhaul Network. If interviews are conducted, the bidder selected for an interview shall be notified in advance of the interview date(s).

6.2 Requirements

The proposal package shall include the following information and documents in the following order:

- Cover letter signed by the appropriate authorities
- Table of conformance to specifications
- Detailed technical proposal
- Cost proposal

- Supporting literature and documentation

Four of the elements are further described in the sub-sections that follow. The fifth element is self-evident.

6.2.1 Cover Letter

Bidders shall submit a letter on company letterhead signed by an official who is authorized by and binding on the bidder's organization. The authorized official shall certify that all information is true, accurate and complete, and shall further certify that the proposal shall remain valid for 365 days from the date submitted, and that upon award of contract all prices shall be firm and valid for the duration of the contract.

If a bidder represents offerings to be made by different companies or organizations, *LH* will do business only with the bidder and will require the bidder's organization to assume responsibility for the total project.

6.2.2 Compliance Review

It is essential that bidders make very clear where exception is taken to any minimum specification in order to prevent disqualification of the proposal. Therefore, exceptions, conditions or qualifications to the provisions of *LH*'s minimum specifications shall be clearly identified as such, together with the reasons. If a bidder does not make it clear that an exception is taken, *LH* will assume that the proposal is responding to and shall meet the minimum specifications as written.

6.2.3 Detailed Technical and Project management Proposal

Bidders shall be aware that all technical and operational specifications, equipment descriptions, design documents and marketing materials submitted or made available by the bidder in connection with this *RFP* are a part of the contract. *LH* discourages the inclusion of general marketing materials unless they are used to provide specific information.

6.2.4 Cost Proposal

The cost proposal shall include the following elements:

- A pricing sheet with unit price of Wireless Backhaul Network *Equipment* in *Canadian dollars* only
- A reference list
- Company profile information

LH is interested in receiving any unique or creative comments or proposals that would enable it to reduce overall Capital and/or ongoing *O&M* costs.

No bid shall include the *PST* or the *GST*.

All bids shall be structured such that the successful bidders shall pay the shipping costs (and the insurance costs) from the point of manufacture to *LH*'s facilities, at which point *LH* will take responsibility (i.e. *FOB LH*).

6.3 Proposal Evaluation Criteria

All proposals received from vendors will be reviewed and evaluated by a committee of qualified personnel. *LH* Bid Evaluation Committee will recommend for selection the proposal that most closely meets the requirements of this *RFP*.

LH Bid Evaluation Committee will have representation from Electric Metering, Meter Data Management, Information Services, and Purchasing of *LH*.

6.3.1 Review Criteria

The award, if any, will be made to the best bidder. In evaluating whether a vendor is the best bidder, the review committee may utilize some or all of the following criteria in addition to any mentioned throughout this *RFP*.

- Information submitted in the proposal.
- Information obtained from the listed references.
- Technical merit.
- Experience, qualifications, and references of the company
- Proposal's responsiveness to the scope of work and minimum requirements
- Proposed timeline.
- Demonstrated experience in the design, implementation and operation of Wireless Backhaul Network.
- Competitive price.
- The quality of the product and services offered.
- The capacity of the vendor to perform the contract or provide the service promptly, within the time specified, and without delay or interference.
- The sufficiency of the vendor's financial resources.
- The character, integrity, reputation, judgment, training, experience and efficiency of the vendor.
- Vendor's use of open standards.

Bidders are advised that *LH*'s ability to evaluate proposals is dependent in part on the Bidder's ability and willingness to submit proposals which are well ordered, detailed, comprehensive, and readable. Clarity of language and adequate, accessible documentation is essential.

6.3.2 Basis of Award

The following criteria will be of major importance in making the selection.

Proposal Evaluation Weightings

a)	System and *Equipment* capabilities, including security and the proprietary or non-proprietary nature of the system	40 points
b)	Experience/qualifications/references	10 points
c)	Ability to provide local technical service/support	5 points
d)	Corporate integrity, values, quality systems, etc.	5 points
e)	Costs, including future cost	40 points

LH reserves the right to award in whole or in part, whatever is deemed to be in its best interest.

6.4 Selection Process

6.4.1 General

While *LH* staff recognizes that there is no ideal Wireless Backhaul Network system and that some concession to features and functionality shall need to be made, it is the intent of *LH* staff to evaluate the system features and financial impact of the proposals meeting the specifications of this *RFP* and choose the Wireless Backhaul Network system that best meets the needs and goals of *LH*.

6.4.2 Request for Additional Information

Prior to the final selection, bidders may be required to submit additional information which *LH* may deem necessary to further evaluate bidder's qualification or offering.

If *LH's* Bid Evaluation Committee considers a need, bidders shall be required to arrange demonstrations of items bid, preferably at *LH*'s facility or another facility within Ontario. Failure to be able to provide such working demonstration may disqualify the bidders' submission.

6.4.3 Proposals for Partial Solutions

LH will not accept proposals with interim or partial solutions that do not address the architecture specified in this document in its entirety.

6.5 Instructions and Conditions

6.5.1 Limitations

This *RFP* does not commit *LH* to award a contract, pay any costs incurred in the preparation of a proposal, or procure or contract for services of any kind whatsoever. *LH*

reserves the right, in its sole discretion, to accept or reject any or all responses to this *RFP*, to negotiate with any or all firms considered, or to cancel this *RFP* in whole or in part. *LH* reserves the right to request additional information from any or all bidders.

Bidders shall be requested to clarify the contents of their proposal. Other than providing such information that may be required by *LH*, no bidder will be allowed to alter their proposal, or to add new information after the proposal due date.

A bidder may be required to participate in Statement of Work negotiations and to submit any price, technical or other revisions to its proposal which may result from such negotiations.

6.5.2 Proposal Submission

Non-responsive proposals include, but are not limited to, those that:

- Are irregular or not in conformance with the *RFP* requirements and instructions;
- Are conditional (i.e. the proposal has conditions attached which are not authorized by the *RFP*), incomplete (i.e. significant omissions of required information), indefinite or ambiguous;
- Are intended to accomplish only part of the overall work;
- Have no signature or an improper one, or;
- Are not submitted on time or are submitted at any time via facsimile or email.

LH may waive minor informalities or irregularities in a proposal that are merely a matter of form and not substance and the correction of which would not be prejudicial to other proposals. Failure to submit a proposal on time will not be waived by *LH* under any circumstances, e.g. traffic conditions, mail or courier failure, etc.

6.5.3 Disqualification of Bidder

A bidder's proposal may also be disqualified for any of the following reasons:

- Having defaulted on a previous contract, or performing poorly on a previous contract;
- Reason to believe collusion exists among the bidders, or;
- Lack of competency, skill, judgment, financial capability, integrity, reputation, reliability or responsibility to perform the work as revealed by proposal questionnaires, financial statement, performance history or other relevant information obtained by *LH*.

6.5.4 Addenda: Errors and Omissions

If a bidder discovers any ambiguity, conflict, discrepancy, omission or other error in this *RFP*, immediately notify Tom Beacock, in writing, of such error and request clarification or modification to the document.

Should LH find it necessary, modification to the *RFP* will be made by written addenda to the *RFP*. Such modifications will be given to all parties who have been recorded by *LH* as having been furnished an *RFP*.

If a bidder fails to notify *LH* of a known error or an error that reasonably should have been known prior to the final filing date for submission, the bidder shall assume the risk. If awarded the contract, the bidders shall not be entitled to addition compensation or time by reason of the error or its late correction.

6.5.5 Public Records

After award of contract, proposal responses shall be considered public record and subject to review. If a bidder believes a specific section of its proposal response is confidential, the bidder shall mark the page(s) confidential and isolate the pages marked confidential in a specific and clearly labelled section of its proposal response. The bidder shall include a written statement as to the basis for considering the marked pages confidential and *LH* will review the material and make a determination.

6.5.6 Insurance

LH does not require proof of insurance with the submittal of responses to this *RFP*. However, prior to award of contract, *LH* shall require proof of insurance from the successful bidder. The insurance requirements are outlined below:

- Comprehensive general liability insurance on an occurrence basis for an amount not less than two million Canadian dollars (Can$2,000,000.00) and shall include *LH* as an additional insured with respect to the successful bidder's operations, acts and omissions relating to its obligations under the Agreement.
- Automobile liability insurance for an amount not less than two million Canadian dollars (Can$2,000,000.00) covering all vehicles used in any manner in connection with the performance of the terms of the Agreement.

LH's standard insurance forms will be provided to the successful bidder.

The successful bidder will be allowed five (5) business days to provide insurance after they receive the Notice to Award letter. If *LH* requires corrections, the bidder has five (5) days from such request to complete all corrections. Failure to meet these deadlines will allow *LH* the right to reject the proposal and proceed to the next finalist.

6.5.7 Period that Proposals Remain Valid

Each bidder agrees that proposals shall remain firm for a period of two hundred and forty (240) calendar days after the date specified for receipt of proposals.

6.5.8 Contract Terms and Conditions

LH's standard contract Terms and Conditions are provided in Appendix A. Bidders shall assume full compliance to *LH*'s terms and conditions in submitting proposal. Submittal of a response will serve as agreement to all *LH*'s terms and conditions as attached.

However, bidders may request exceptions as part of their submittal. *LH* will consider exceptions proposed by the bidder and may agree to such exceptions as part of contract negotiations. Exceptions requested by bidders shall be substantially similar to *LH*'s terms and conditions.

6.5.9 Bid Securities

Bids shall be accompanied with a certified or cashier's cheque or bidder's bond in the amount of five thousand Canadian dollars (Can$5,000.00) and made payable to London Hydro Inc.. Said cheque or bond shall be given as a guarantee that the bidders shall, if selected, enter into final contract negotiations (as outlined in Section 7.5.14 on page 51 herein).

If a bidder's proposal is not accepted by *LH* within the validity period as set forth In Section 7.5.7 (on page 49 herein) the contract, or if the successful bidders execute and deliver the contract, the certified cheques or bid bonds will be returned.

6.5.10 Milestone Payment Schedule

The proposed milestone payment schedule in *Canadian dollars* is based on the successful completion of the milestones outlined below. Bidders shall either state in acceptance of this schedule or provide an alternate milestone payment schedule in the proposal for *LH*'s evaluation.

Table 6-1, Proposed Milestone Payment Schedule

Milestone	Activity	Percentage of Total Contract
1	Project initiation (contract execution)	5%
2	Completion of installation fo first AP, Base Station, NMS workstation, testing and interconnection to AMRC	40%, payable in monthly payments over installation timeframe
3	Completion of staff training, supply of documentation (including warranties and licenses) and supply of spare parts.	5%
4	Complation of wireless backhaul network first phase SAT	25%
5	Final system acceptance (successful, continuous operation of the wireless backhaul network – first phase for six months after conclusion of SAT).	25%

Due to the nature of this project, unless bidders wish to provide a 100% performance bond, *LH* will only accept milestone payment schedules that are heavily weighted toward the end of the project when overall success of demonstrable.

The making of a progress payment to the successful bidder does not relieve the bidder of responsibility for faulty material of workmanship and *LH* by such payment does not waive any claims of overpayment resulting from mathematical error, unauthorized work, or from any other cause.

6.5.11 Software License

6.5.11.1 Software Elements

Bidders shall provide all software elements, licensing information, costs, and agreements for all developed and third party software, used in their proposal submission.

6.5.11.2 Future Software Upgrades Delivery

The information shall describe how the bidder shall price, deliver and install future software upgrades for both bidder's and third-party software.

6.5.11.3 Non-titled Perpetual Software Licenses

LH does not seek to obtain title to software, which is proposed. It is, however, the intention of this acquisition to obtain all necessary software licenses.

By submitting a proposal, bidders agree that upon award, *LH* will automatically obtain a perpetual, non-transferable (except as specifically provided herein), and non-exclusive license to use all of the successful bidder's software which is acquired as the result of these specifications, including all documentation comprising the same. No further license fees or expenses shall be charged to *LH* for current and/or future use of such software, documentation, etc., except for support and maintenance charges after any warranty period as herein provided.

6.5.11.4 Software Upgrade License and Documentation

The license granted through these specifications shall include, in addition to its description herein or in any documents furnished to *LH*, any improvements, additions or modifications of the version or versions of the software which the bidder licenses to *LH*, as well as all materials, documentation and technical information provided to *LH* in written form and identified in any document furnished to *LH*. *LH* shall have the right, as part of the license obtained through these specifications, to make as many copies of the documentation for its own use as it may determine to be needed.

6.5.11.5 Title (Software)

If bidder intends that *LH* acquire title to any software, document, etc., bidder must specifically so state in its proposal. In such case, upon passage of title to *LH*, *LH* shall own and possess all rights and interest in such software, documentation, etc.

6.5.12 Prime Contract Responsibility

If the bidder's proposal includes hardware, software, or services to be provided by other entities, it is mandatory for the successful bidder to be able to furnish all of the products and services proposed to meet the mandatory specifications. The successful bidder shall be the sole point of contact for any and all charges resulting from the purchase of the proposed hardware, software and services for the initial procurement, as well as any additional items that are proposed to be supplied directly by the successful bidder.

The successful bidder shall take full responsibility for design, demonstration, delivery, installation, commissioning and acceptance testing of the items proposed to be supplied directly by the bidder. The successful bidder shall also provide and specify maintenance and warranties for its products and pass through warranties of other entities. The bidder's proposal shall clearly indicate the hardware, software or services which are note marketed or maintained by their companies.

6.5.13 Incorporation of RFP and Proposal in Contract

This *RFP* and the successful bidder's response, including all promises, warranties, commitments, and representations made in the successful proposal, shall be binding and incorporated by references in *LH*'s contract with the successful bidder.

6.5.14 Final Contract Negotiations

Any conditions and provisions that a bidder seeks shall be a part of this proposal. Notwithstanding, nothing herein shall be interpreted to prohibit *LH* from introducing or modifying contract terms and conditions during negotiation of the final contract.

LH has scheduled two (2) weeks for contract negotiations (if necessary), and expects the successful bidder to maintain a prompt and responsive negotiation to accomplish and complete final contract agreement within that time period. If contract negotiations exceed an interval acceptable to *LH*, *LH* retains the option to terminate negotiations and continue to the next apparent successful bidder, at the sole discretion of *LH*. Said interval shall in no event be less than three (3) weeks.

6.5.15 News Release by Vendors

As a matter of policy, *LH* does not endorse the products or services of a contractor. News release concerning any resultant contract from this solicitation shall not be made by a contractor without the prior written approval of *LH*. All proposed news releases shall be routed to *LH* for review and approval.

6.5.16 Debriefing of Unsuccessful Bidders

Upon written request, a debriefing will be scheduled with unsuccessful bidder after LH has provided notice of its selection of the successful bidder.

Discussion shall be limited to a critique of the requesting bidder's proposal. Comparison between proposals or evaluations of the other proposals shall not be discussed. Debriefings may be conducted in person or on the telephone.

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Appendices

Appendix A: Standard Contract Terms and Conditions

LH's Standard Contract Terms and Conditions

London Hydro Inc

STANDARD CLAUSES INCLUDED IN PROPOSALS

RIGHT TO ACCEPT OR REJECT PROPOSAL

London Hydro reserves the right to reject any and all proposals, the right to accept other than the lowest bidder, and also the right to not accept any bid.

London Hydro reserves the right to cancel this Request for Proposal, at any time without penalty or cost.

It is recognized that the acceptance or awarding of a bid for the benefit of London Hydro may require authorization by the London Hydro Board of Directors, which has the sole discretion of accepting or rejecting any bid for London Hydro's benefit.

PERFORMANCE

London Hydro has the right to immediately cancel the Contract before the expiration of term and select a different bidder if there is non-compliance with any laws, rules or regulations of Ontario, or any of the terms outlined in this Request for Proposal.

If the quality of product or service is unsatisfactory or the Contractor fails to comply with London Hydro's requirements, London Hydro shall notify the Contractor in writing (e-mail accepted) of the problem and the Contractor shall respond and correct the problem within twenty-four (24) hours or provide a plan to rectify the problem. The terms of the plan must be agreed upon by London Hydro to constitute its acceptance. Failure to comply with the above may result in termination of the Contract.

PROPOSAL RESPONSE

Any variation(s) from the information contained in this proposal must be noted on this document. Proposals may include attachments to expand on your service or product. London Hydro reserves the right to contact bidders for submission clarification purposes during the evaluation process.

The person signing this application shall initial erasures, overwriting or strikeouts.

Failure to provide response to all the information asked for may cause the response to be declared "incomplete". Incomplete responses, unless they are to the advantage of London Hydro, will be disqualified.

Your signature of authorization and acceptance of this document is placed herein. This implies you have read, fully understood and agree to abide by all information contained within this document.

This Request for Proposal and the resulting submissions should not be considered a commitment by London Hydro to enter into any contract. As stated elsewhere in this Request, London Hydro reserves the right to reject any and all submissions.

London Hydro will not be responsible for any cost, expense, liability, loss or damage incurred or suffered by a Bidder because of acceptance or rejection of any proposal, delay in acceptance of a proposal, or non-award of contract.

DELIVERY

DELIVERY IS THE SOLE RESPONSIBILITY OF THE RESPONDENT. PROPOSALS MUST BE RECEIVED BY THE CLOSING TIME AT THE EXECUTIVE OFFICE NOTED ABOVE TO BE CONSIDERED FOR EVALUATION. UPON REQUEST, LONDON HYDRO WILL PROVIDE A RECEIPT TO BIDDERS AT THE TIME OF SUBMISSION. PROPOSALS RECEIVED AFTER THE CLOSING TIME WILL BE REJECTED AND RETURNED TO THE BIDDER UNOPENED.

A contractor who has already submitted a proposal may submit a further proposal at any time up to the official closing time. The last proposal received shall supersede and invalidate all proposals previously submitted by that contractor as it applies to this request for proposals.

WITHDRAWAL OF PROPOSAL

The Contractor may request in writing the opportunity to withdraw a proposal in advance of the closing date. The package will be returned unopened.

Any agreement by London Hydro to allow this withdrawal will prohibit the Contractor from working as a subcontractor for the preferred Contractor.

WHIMS

Material Safety Data Sheets must accompany all shipments to conform with Hazardous Products Act, Hazardous Materials Information Review Act, and Occupational Health & Safety Act.

DISCOUNTS

Please advise what discounts are available for quantity volumes or early payment. Specifically, what discounts are offered for payment within 10 days of receipt of invoice.

6.6 INDEMNIFICATION

The contractor accepts full responsibility for the work described in these bid specifications; and indemnifies London Hydro, its Board of Directors and the Owner (The City of London), its servants or agents, from any actions which may result from the violation of all applicable regulations or statutes. Without limiting the generality of this provision, this shall include violations of applicable regulations and statutes involving health and safety and environmental protection.

RELEASE OF INFORMATION

Respondents to this Request for Proposal are advised that information obtained from respondents would be communicated to the public and the respondents in the following manner and form:

- A public opening of the proposals will take place at the time and location indicated in the attached proposal cover letter. All respondents and the general public may attend this public opening of the respondents' submissions. At such opening, information communicated will be limited to the names of the participating respondents. No other information will be provided to the public at that time. Evaluation and awarding of the contract will not take place at the public opening.

- After the proposals have been evaluated, a recommendation to award the contract may be presented to London Hydro's Executive or the Board of Directors for approval. The information presented will consist of the respondent's names, the bid amounts and the recommendation to award the contract.

- After the evaluation and awarding of the contract, all unsuccessful respondents will be advised in writing that the contract was not awarded to them.

- Further requests for information from those respondents who have submitted pricing for this Proposal must be received in writing to the attention of the Purchasing Coordinator. Facsimile will be acceptable if signed and the originating facsimile is identified and consistent with the party requesting the information. Electronic E-mail requests will also be accepted. Information provided would be limited to the names of the respondents, the name of the successful bidder and the range of the prices received from the respondents.

Municipal Freedom of Information and Protection of Privacy Act (MFIPPA) – PERSONAL INFORMATION PROTECTION

While performing its services for London Hydro, the Contractor may come into contact with personal information regarding London Hydro's customers, employees or other parties. Such personal information is subject to the requirements of privacy legislation and London Hydro's privacy policy.

The Contractor may not use or disclose such personal information in any way except pursuant to London Hydro's instructions or to the extent necessary to perform its services for London Hydro. The Contractor must use security measures adequate to the sensitivity of the personal information to prevent the unauthorized use and disclosure of personal information both to and by third parties and to and by the employees of the Contractor who have no need to view personal information for the performance of the Contractor's services for London Hydro.

The Contractor must promptly notify London Hydro of any requests for disclosure of personal information by any party and of any accidental or unauthorized access to such information. If the Contractor subcontracts any part of its obligations hereunder it must obtain contractual obligations similar to this letter from the subcontractor.

CONFLICT OF INTEREST AND COLLUSION

The following shall be part of proposal response:

I/We declare that no person, firm, or corporation, other than the one whose signature, or the signature of whose proper officers and seal are attached below, has any interest in this bid. I/We further declare that this bid is made without any connection, knowledge, or comparison of figures; or arrangement with any other company, firm or person making a bid for the same, and is in all respects fair and without collusion. I/We declare that no employee(s) of London Hydro is, or will become interested, directly or indirectly as a contracting party or otherwise in the supplies, work or business to which it relates or any portion of the revenues or profits thereof, or in any of the monies to be derived there from. I/We further declare that the several matters and representations stated in said bid are in all respects true.

Please complete the following information:

Company Name: _____

Business License #: _____

GST #: _____

Authorized Signature: _____

Name (Printed): _____

Date: _____

RE: ENGINEERING PROPOSALS WITH PERFORMANCE BONDS & HOLDBACKS:

HOLD BACK RELEASE

The Contractor is advised that forty-five days after the date of Substantial Completion, the Contractor, on production of WSIB Clearance Certificate and a sworn statement (CCDC Form 9A – 2001 Statutory Declaration) that all accounts for labour, subcontracts, products, construction machinery and equipment, and other indebtedness incorporated in the work that London Hydro may in any way be held responsible for have been fully paid, London Hydro shall issue a certificate for payment of the hold back amount. London Hydro shall retain amounts properly retained as a holdback or as identified in dispute.

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