

COMMITTEE OF THE WHOLE MAY 31, 2011

**TELECOMMUNICATION FACILITY SITING PROTOCOL
CITY OF VAUGHAN - FILE 15.88
WARDS 1-5**

Recommendation

The Acting Commissioner of Planning and Director of Development Planning recommend:

1. THAT Council provide direction with respect to the following options for obtaining stakeholder input in developing a new Telecommunication Facility Siting Protocol:
 - a) Option 1: THAT Council appoint a Telecommunication Facility Task Force comprised of key stakeholders, who will conduct a background review, identify, review and analyze issues, evaluate alternative strategies, and provide a Findings Report to support development of a City of Vaughan Telecommunication Facility Siting Protocol; or,
 - b) Option 2: THAT a Study Team led by the Development Planning Department and supported by other City staff will consult with key stakeholders, conduct a background review, identify, review and analyze issues, evaluate alternative strategies, and develop a City of Vaughan Telecommunication Facility Siting Protocol; and
 - c) THAT the Terms of Reference (Attachment #1 - associated with Option 1) or Work Plan (Attachment #2 - associated with Option 2), BE APPROVED, in a manner that is consistent with Council's approved option.
2. THAT Site Development Applications for new telecommunication facilities submitted prior to approval of a new City protocol be reviewed under the current City of Vaughan Protocol for Establishing Telecommunication Towers/Antenna Facilities.

Contribution to Sustainability

Consideration should be given to the following sustainable practices in developing a new Telecommunication Facility Siting Protocol:

- i) use of existing telecommunication and antenna infrastructure wherever possible, including modifying or replacing existing towers;
- ii) encouraging co-location of telecommunication facilities in industrial or commercial zones; and,
- iii) discouraging new telecommunication tower and antenna facilities from locating near sensitive land uses to be determined through the study.

Additional sustainable practices may be identified during the protocol review and stakeholder consultation.

Economic Impact

The Vaughan Development Planning Department or the Telecommunication Facility Task Force (if approved) should give consideration to the following economic issues in developing a new Telecommunication Facility Siting Protocol:

- i) promoting economic development and competitiveness through supporting effective telecommunication services that meet the needs of Vaughan residents and businesses; and
- ii) procedures for establishing telecommunication facilities on City-owned lands, which would provide a source of revenue for the City.

Should Council prefer that a Telecommunication Facility Task Force be established (Option 1), staff resources will be required to provide support to the Task Force and attend monthly meetings, as outlined in the Terms of Reference (Attachment #1). In addition, a budget will be required for advertising, copying, notice requirements, and consultation, as necessary.

Extensive staff resources (Option 2) will be required to carry out the Work Plan (Attachment #2) and develop a new Telecommunication Facility Siting Protocol, including one full-time staff member from the Development Planning Department.

Communications Plan

A Communications Plan should be developed by participants in either Option 1 or 2, depending on Council's approved option.

Purpose

This report outlines two options for obtaining stakeholder input in developing a new Telecommunication Facility Siting Protocol, in accordance with direction at the March 29, 2011 Committee of the Whole (Working Session), which was ratified by Vaughan Council on April 5, 2011. Stakeholders include, but are not limited to: members of the general public, ratepayer association representatives, telecommunication industry representatives, local experts in the field, the Region of York Medical Officer of Health, Members of Council, Industry Canada, and City staff.

The first option would establish a Telecommunication Facility Task Force (Attachment #1) to obtain input and provide a Findings Report to support development of the protocol. This option offers sustained dialogue amongst all parties, has experts involved throughout the process, and has the potential to reach a consensus.

The second option entails that a Study Team led by the Development Planning Department consults with key stakeholders in developing the new protocol (Attachment #2). As City staff are land use, not health experts, the Study Team must consult with experts in the field to address health issues.

Accordingly, the purpose of this report is to:

1. Obtain Council direction with respect to choosing one of the following options for undertaking a protocol review:
 - a) Option 1: establishment of a City of Vaughan Telecommunication Facility Task Force to provide a Findings Report which supports staff in development of a Telecommunication Facility Siting Protocol; or
 - b) Option 2: City staff develop a City of Vaughan Telecommunication Facility Siting Protocol in consultation with various stakeholders.
2. Approval of the Terms of Reference (Attachment #1) or the Work Plan (Attachment #2) to guide the process in either option as appropriate.

Background - Analysis and Options

Decision History

i) February 1, 2011 Committee of the Whole Meeting/February 15, 2011 Council Meeting

On February 1, 2011, four Site Development Applications for proposed telecommunication towers and accessory radio equipment were considered by the Committee of the Whole (Files DA.10.061, DA.10.070, DA.10.088 and DA.10.089). On February 15, 2011, Vaughan Council resolved the following for each application:

“That this matter be deferred to the Council meeting of May 3, 2011, to permit discussion with members of the telecommunications industry with cell towers in the City of Vaughan.”

ii) March 29, 2011 Committee of the Whole (Working Session)/April 5, 2011 Council Meeting

On March 29, 2011, the Committee of the Whole (Working Session) considered a presentation from Mr. Stephen D’Agostino of Thomson Rogers on behalf of his clients in the telecommunications industry (Rogers Wireless, Bell Mobility, and Telus Mobility) and presentations from the public. At that meeting, the following motion was tabled, which was ratified by Vaughan Council on April 5, 2011:

“That staff review the City of Vaughan’s Telecommunication Towers protocol taking into consideration the information received and provide options for obtaining further input from residents and experts in the fields when developing a new protocol.”

iii) May 3, 2011 Council Meeting

On May 3, 2011, Vaughan Council considered the four Site Development Applications (DA.10.061, DA.10.070, DA.10.088, and DA.10.089) noted earlier for new telecommunication towers, which were deferred from the February 15, 2011 Council Meeting. At the meeting, Council approved File DA.10.070 (City of Vaughan - Al Palladini Community Centre), and resolved the following for the other three applications, respectively:

“That consideration of this matter be deferred pending the review of the telecommunication tower protocol.”

Deputations and Communications

i) Vaughan Residents

Several Vaughan residents provided deputations and written communications at the Committee of the Whole and Council meetings outlined above. Issues centred on health concerns and siting policies, specifically:

- imposing stricter limits on radio frequency exposures than those provided by Health Canada’s Safety Code 6 (Attachment #4); for example, European guidelines and the City of Toronto’s Prudent Avoidance Policy;
- adopting the Precautionary Principle, which affirms that policy makers should exercise precaution in protecting members of the public from suspected health impacts;
- increasing awareness and education of health risks associated with electromagnetic radiation and radiofrequency exposure;

- limiting telecommunication facilities within 500 m of sensitive land uses such as residential areas, schools, daycares, community centres, institutional uses and seniors' residences;
- requiring public consultation within 500 m of any proposed telecommunication facility;
- installing shields and protective materials on telecommunication facilities;
- requiring proponents to be responsible for dismantling and maintaining telecommunication facilities;
- independent party monitoring of existing telecommunication facilities;
- making information available and accessible to the public;
- issues of federal jurisdiction; and
- cooperation among industry carriers, representatives from ratepayers/homeowners associations, community members and staff in developing a new telecommunications protocol.

ii) Industry Response

Stephen D'Agostino from Thomson Rogers, the solicitor for Rogers Wireless, TELUS Mobility and Bell Mobility, provided several communications in response to concerns raised by the public and Members of Council. In a presentation at the March 29 Committee of the Whole (Working Session), Stephen D'Agostino discussed the following issues:

- additional telecommunication facilities are required to meet the growing demand for data capacity and wireless service, which is compounded by new entrants in the industry;
- economic benefits of wireless communications;
- siting limitations;
- types of antenna installations, including stealth designs and camouflaged sites;
- emerging LTE (4G) technology, which typically requires less height than regular sites and needs to be located closer to users;
- the potential for using road allowances (e.g. street light poles) and municipally-owned lands to provide wireless coverage in residential areas while reducing visual impact;
- co-location in industrial and commercial areas;
- Industry Canada's exclusive federal jurisdiction of telecommunication facilities, which includes consultation with the local land-use authority;
- telecommunication facilities typically operate significantly below Safety Code 6 levels; and
- Health Canada, the World Health Organization, the American Cancer Society, and several Medical Officers of Health in Canada, do not believe that cell towers have significant health risks.

Jurisdiction

i) Industry Canada

Under the *Radiocommunication Act*, Industry Canada is the designated approval authority for all matters respecting telecommunication towers and antenna systems. As federal regulations supercede the Ontario *Building Code Act* and the *Planning Act*, telecommunication towers and antenna facilities are exempt from municipal zoning by-law requirements and site plan control. Industry Canada's protocol, *Radiocommunications and Broadcasting Antenna Systems* (CPC-2-0-03, effective January 1, 2008, Attachment #3) requires that proponents seeking to install or modify an antenna system adhere to the following broadly outlined process:

- i) Investigating sharing or using existing infrastructure before proposing new antenna-supporting structures.

- ii) Contacting the local land-use authority (LUA) to determine local requirements regarding antenna systems.
- iii) Undertaking public notification and addressing relevant concerns, whether by following LUA requirements or Industry Canada's default process, as is required and appropriate.
- iv) Satisfying Industry Canada's general and technical requirements, including: Health Canada guidelines as per Safety Code 6, radiofrequency immunity criteria, notification of nearby broadcasting stations, environmental considerations under the *Canadian Environmental Assessment Act*, and Transport Canada and NAV CANADA requirements regarding aeronautical safety.

ii) Region of York

On April 23, 2009, York Region adopted Industry Canada's protocol (CPC-2-0-03) outright to reduce redundancies and permit a more efficient and consistent approach for regulating telecommunication facilities, while providing an opportunity for local municipalities to determine individual procedures.

iii) City of Vaughan

For proposals subject to municipal review, the City of Vaughan has the authority to establish local requirements and procedures for establishing telecommunication facilities. Upon completion of consultation, the City is responsible for recommending final concurrence to Industry Canada within 120 days. Should the City not provide concurrence within this time period, proponents may file a dispute resolution with Industry Canada, who has legislative power to render a final decision.

Policy Context

While telecommunications facilities are federally regulated, several Provincial, Regional and Municipal policies speak to facility siting and planning.

i) Provincial Policy Statement

The Provincial Policy Statement states that telecommunication infrastructure must be integrated with growth planning, and accommodate projected needs through a coordinated, efficient and cost-effective approach (Section 6.1). Existing telecommunication infrastructure should be utilized prior to considering the development of new infrastructure, and facilities should be located in strategic areas to support effective emergency management services.

ii) Greenbelt Plan

The Greenbelt Plan permits existing, expanded or new telecommunication infrastructure approved under the *Environmental Assessment Act*, subject to specific policies (in Section 4.2). In general, planning, design and construction practices shall avoid and/or minimize any impacts to the landscape, particularly the Natural Heritage System. The Greenbelt Plan also encourages the use of existing infrastructure and coordination with different infrastructure services to maintain the rural character of the Greenbelt and support provincial growth initiatives.

iii) Oak Ridges Moraine Conservation Plan

The Oak Ridges Moraine Conservation Plan (ORMCP) does not permit applications for telecommunication facilities in the Natural Linkage Area and Natural Core Area, unless Sections 41(2) and 41(3), respectively, are satisfied. As per Section 41(2), new telecommunication infrastructure and upgrades to existing facilities are prohibited from locating on lands with key natural heritage or hydrologically sensitive features, unless Section 41(5) requirements are met. Finally, Section 41(6) states that service and utility trenches for telecommunication infrastructure must minimize disruption to natural groundwater flow.

iv) Region of York Official Plan

The York Region Official Plan identifies the importance of telecommunication services in sustaining a high standard of living. Such facilities must have regard for potential impacts on surrounding communities and the natural environment. Additional policies in Section 7.5 include:

- encouraging utility networks that can adapt to emerging technologies;
- working with corporations, commissions and government agencies to coordinate and integrate services, and minimize exposure to electromagnetic fields;
- requiring municipalities to engage with cellular service providers early in the process and integrate telecommunication facilities within new buildings;
- encouraging steel poles instead of lattice towers, when it is not feasible to integrate telecommunication facilities within buildings; and,
- permitting telecommunication infrastructure within the Greenbelt and Oak Ridges Moraine Plan areas, subject to the requirements of the *Environmental Assessment Act* and the respective provincial plans.

v) City of Vaughan Official Plan

OPA #604 (Oak Ridges Moraine Conformity Plan) outlines policies for siting telecommunication infrastructure in the Oak Ridges Moraine (Section 10.15). These policies are consistent with the ORMCP. Other City of Vaughan community plans, including OPA #600, do not have policies that address telecommunication towers and antenna facilities.

The City of Vaughan Official Plan 2010, which was adopted by Vaughan Council on September 7, 2010 and is subject to York Region approval, outlines several policies for telecommunications and data networks. Section 8.4.4.1 states that Council will encourage development of high-speed telecommunications and data networks throughout the City to contribute to economic competitiveness and support widespread access to such services. Additional policies in Sections 5.1.1.2 and 8.4 identify that:

- the City will support wired infrastructure within public rights-of-way, where appropriate;
- providers are encouraged to share infrastructure wherever possible, to minimize adverse impacts;
- site planning and design guidelines will be developed to address aspects such as: locating telecommunication infrastructure at the rear of lots, prohibiting towers from locating in parks, minimizing adverse impacts, supporting integration into buildings, engaging service providers early in the process, ensuring that infrastructure blends in with its surroundings, and camouflaging towers located in sensitive areas; and
- the City will support high quality, efficient and coordinated utilities, services and telecommunication infrastructure.

In accordance with the ORMCP, the City of Vaughan Official Plan 2010 has further policies for telecommunication infrastructure located within the Oak Ridges Moraine, as outlined in Sections 3.4.1.39 to 3.4.1.42 inclusive.

City of Toronto Prudent Avoidance Policy

The City of Toronto adopted a new Telecommunication Tower and Antenna Protocol on March 3, 4 and 5, 2008 (as amended on January 27 and 28, 2009), which requests that proponents provide estimates of radiofrequency levels for proposed telecommunication facilities. City Planning, in consultation with the Medical Officer of Health, screen this data against the City's Prudent Avoidance Policy on Siting Telecommunication Towers and Antennas (adopted on November 20, 2007). The City's Prudent Avoidance Policy adopts a precautionary approach and requests that radiofrequency waves from telecommunication towers and antennas be 100 times below Safety Code 6.

In response to Toronto's Prudent Avoidance Policy, Industry Canada has advised that Safety Code 6 is a federal standard which should not vary among local land-use authorities, and that Industry Canada will continue to approve proposals which comply with Safety Code 6. As radiofrequency waves are exclusively regulated by Health Canada, Toronto's Prudent Avoidance Policy is voluntary and cannot be legally enforced.

Current City of Vaughan Protocol

The City of Vaughan's current Protocol for Establishing Telecommunication Tower/Antenna Facilities, which was originally adopted by Vaughan Council on December 16, 2002 and subsequently amended on June 24, 2002 and June 23, 2003, has been utilized by the City to review applications for telecommunications facilities.

Development Planning Staff has prepared a telecommunication protocol comparison chart (Attachment #5) outlining the current City of Vaughan protocol in light of Industry Canada's procedures, which were updated on January 1, 2008. The chart also identifies opportunity areas for the new City of Vaughan protocol with respect to the following issues: use of existing infrastructure, exemptions, preliminary consultation, application process/requirements, site selection criteria, design guidelines, public consultation exemptions, public consultation/notification, community meetings, responding to public concerns, dispute resolution, concluding consultation, timeframes, fees, and additional requirements.

Surrounding Municipalities

Development Planning Staff has conducted a preliminary review of telecommunication protocols in other municipalities to gain input into their policies and procedures. The review focused on municipalities in the GTA. Most municipalities have elected to create local protocols based on the latest Industry Canada directive approved in January 2008.

A comparison chart of telecommunication protocols established by four of the neighbouring municipalities (Town of Richmond Hill, Town of Markham, City of Toronto and the City of Brampton) is provided in Attachment #6.

Protocol Development

Depending on Council's preferred option, either City staff will conduct consultation and proceed to develop the protocol; or a Task Force will be established to provide a Findings Report which will provide the primary input into staff's development of a new telecommunication protocol.

i) *Background Review*

Undertake a background review of Industry Canada requirements, applicable Provincial and Regional policies, the current City of Vaughan Protocol for Establishing Telecommunication Tower/Antenna Facilities, telecommunication protocols in other municipalities, and legal precedents. The background review will form the basis for developing the new Telecommunication Facility Siting Protocol.

ii) *Issue Identification, Review and Analysis*

Key issues to be addressed in the new protocol include: jurisdiction, co-location and use of existing infrastructure, supporting economic development and competitiveness, radiofrequency exposure and health concerns, exemptions from municipal review, preliminary consultation with the City, site selection criteria, urban design guidelines, procedures for locating telecommunication facilities on City-owned lands, application and review process, public consultation process, dispute resolution, and concluding consultation.

iii) *Protocol Objectives*

Development Planning Staff or the Task Force will develop appropriate objectives to guide development of the Telecommunication Facility Siting Protocol, based on analysis of constraints and opportunities, as well as, implementation tools.

iv) *Alternatives Evaluation and Protocol Preparation*

Upon completion of a background review, identification and analysis of issues, and development of protocol objectives, Development Planning Staff or the Task Force will evaluate a range of alternatives based on: economic ramifications, jurisdictional authority, health concerns, and possible staffing requirements. Stakeholders will work together to evaluate alternatives and develop the final telecommunications protocol through a consensus-based approach.

v) *Deliverables*

Develop a Telecommunication Facility Siting Protocol for consideration by Vaughan Council. The final protocol will be accompanied by a Findings Report discussing the background review, identification and analysis of key issues, development of protocol objectives, and assessment of alternatives.

vi) *Timing*

This report outlines two options for public consultation in developing the protocol, which could take approximately seven months (without a Task Force) or nine to twelve months (if a Task Force is appointed).

Current Applications for Telecommunication Facilities

The Development Planning Department has received several inquiries from telecommunication industry representatives concerned with how the City of Vaughan will process applications prior to development of the new telecommunication facility protocol.

Industry Canada's protocol states that the land-use authority consultation process will normally be completed within 120 days. If the City does not provide concurrence within 120 days, the proponent may file for dispute resolution with Industry Canada, who will make the final decision.

The Development Planning Department recommends that telecommunication facility proposals submitted prior to adopting the new protocol continue to be reviewed under the current City of Vaughan Protocol for Establishing Telecommunication Towers/Antenna Facilities. This is consistent with City procedures for development applications, and ensures that the City is involved in the consultation process for new telecommunication facilities, rather than delegating approval to Industry Canada.

Relationship to Vaughan Vision 2020/Strategic Plan

This report is consistent with the priorities set forth in Vaughan Vision 2020, particularly “Plan & Manage Growth & Economic Vitality”.

Regional Implications

The Telecommunication Facilities Siting Protocol is to be consistent with the York Region Official Plan. The Region’s Updated Telecommunication Tower Protocol adopted Industry Canada’s protocol (CPC-2-0-03) outright, and was approved by Regional Council on April 23, 2009.

Conclusion

The Vaughan Development Planning Department has reviewed the current City of Vaughan Protocol for Establishing Telecommunication Towers/Antenna Facilities in the context of Industry Canada’s requirements, and protocols in surrounding municipalities. In accordance with Council direction, this report outlines two options for obtaining stakeholder input in developing the new telecommunications protocol, as follows:

- a) Option 1: that Council appoint a Telecommunication Facility Task Force comprised of key stakeholders, who will conduct a background review, identify, review and analyze issues, evaluate alternative strategies, and provide a Findings Report to support development of a City of Vaughan Telecommunication Facility Siting Protocol; or,
- b) Option 2: that a Study Team led by the Development Planning Department and supported by other City staff will consult with key stakeholders, conduct a background review, identify, review and analyze issues, evaluate alternative strategies, and develop a City of Vaughan Telecommunication Facility Siting Protocol; and
- c) the Terms of Reference (Attachment #1 - associated with Option 1) or the Work Plan (Attachment #2 - associated with Option 2) be approved in a manner that is consistent with the approved option.

Given the 120 day timeframe for land-use authority consultation as well as current City practices, the Development Planning Department recommends that telecommunication facilities proposals submitted prior to approval of the new telecommunications protocol be reviewed under the current City of Vaughan Protocol for Establishing Telecommunication Towers/Antenna Facilities.

Attachments

1. Terms of Reference - Telecommunication Facility Siting Protocol Task Force
2. Work Plan (City Staff) - Telecommunication Facility Siting and Protocol Study
3. *Radiocommunication and Broadcasting Antenna Systems*, Industry Canada, Spectrum Management and Telecommunications, CPC-2-0-03, Issue 4, January 1, 2008
4. *Limits of Human Exposure to Radiofrequency Electromagnetic Energy in the Frequency Range from 3 kHz to 300 GHz: Safety Code 6*, Health Canada, 2009

5. Telecommunication Protocol Comparison Chart - Industry Canada & City of Vaughan Comparison Chart
6. Telecommunication Protocol Comparison Chart - Surrounding Municipalities

Report prepared by:

Erika Ivanic, Planner, ext. 8485

Mauro Peverini, Manager of Development Planning, ext. 8407

Respectfully submitted,

JOHN ZIPAY
Acting Commissioner of Planning

GRANT UYEVAMA
Director of Development Planning

/CM

**TERMS OF REFERENCE
TELECOMMUNICATION FACILITY SITING PROTOCOL TASK FORCE**

May 2011

1.0 MANDATE / TERM

The mandate of the Telecommunication Facility Task Force is to bring together various stakeholders to develop recommendations for siting telecommunication towers and antenna facilities in the City of Vaughan. Upon Council's appointment of the Task Force, members will have nine to twelve months to provide a Findings Report for consideration at a future Committee of the Whole meeting.

2.0 OBJECTIVES

The Task Force objectives are as follows:

- 1) To conduct a background review of Industry Canada requirements, applicable Provincial and Regional policies, the current City of Vaughan Protocol for Establishing Telecommunication Tower/Antenna Facilities, telecommunication protocols in other municipalities, and legal precedents;
- 2) To identify, review and analyze issues pertaining to the siting of telecommunication towers and antenna facilities, establish appropriate objectives, and evaluate alternative strategies in developing the new protocol, as discussed in Section 8.0 of this Terms of Reference;
- 3) To enable effective and transparent communication among members of the public, ratepayer association representatives, telecommunication industry representatives, the Region of York Medical Officer of Health, local experts in the field, Members of Council, Industry Canada, City Staff, and other stakeholders or agencies; and,
- 4) To make recommendations to Council addressing a Telecommunication Facility Siting Protocol, harmonized with Industry Canada, for siting telecommunication facilities within the City of Vaughan.

3.0 MEMBERSHIP

The Task Force will comprise a minimum of 5 members and a maximum of 12 members, including:

- up to 3 members of the general public
- up to 3 telecommunication industry representatives
- 1 Industry Canada representative or alternate (optional)
- 1 Health Canada representative or alternate (optional)
- Region of York Medical Officer of Health or alternate (optional)
- up to 3 Members of Council (optional)

Task Force members will be appointed by Council and any changes to membership will require Council approval. The opportunity to participate on the Task Force will be publicly advertised, and an appointment report will be brought forward to a future meeting.

City staff will be available to support the Task Force, as outlined in Section 4.5 of this Terms of Reference.

4.0 MEETING PROCEDURES

The City's Procedural By-law will govern proceedings for the Telecommunication Facility Task Force. The Chair and Vice-Chair shall be members of the general public and/or Members of Council.

4.1 Agendas and Reporting

Meeting agendas shall be filed and maintained in the Office of the City Clerk. After each meeting, the Task Force shall submit a report to the Committee of the Whole under the section titled "Other Items Considered by the Committee".

At the conclusion of its mandate, the Task Force shall submit a report with recommendations addressing a Telecommunication Facility Siting Protocol, and shall also contain the background review, identification and analysis of key issues, development of protocol objectives, assessment of alternatives, and other matters as deemed necessary (see Section 8.5).

4.2 Meetings

The Task Force will determine meeting dates at the first meeting, and meet on the schedule determined, or at the call of the Chair. The Task Force will meet monthly in a City-owned venue and all meetings will be open to members of the public.

4.3 Notice of Meetings

Meetings will be noted on the Schedule of Meetings calendar posted on the City's website.

4.4 Quorum

The majority of members, including the Chair, shall constitute quorum.

4.5 Staff Resources

The Director of Development Planning (or alternate - the Manager of Development Planning or Senior Planner) will be the staff coordinator for the Task Force. The Director of Development Planning (or alternate) will attend all meetings and request other City staff to attend or offer expertise, as required.

City staff will include, but not be limited to, representatives from the following departments/divisions on an as needed basis: Urban Design, Policy Planning, Building Standards, Engineering Services, Development/Transportation Engineering, Public Works, Parks Development, Recreation and Culture, Legal Services, Financial Services, and Corporate Communications. Staff will be available to provide support, educate, clarify and aid the Task Force in their deliberations, but will not do the work of the Task Force.

A Recording Secretary from the City Clerk's Office will also assist the Task Force by providing notification of cancelled meetings, preparing and circulating agendas and minutes at least one day prior to the meeting, attending meetings, recording minutes, and keeping attendance records.

4.6 Budget

A budget will be required for advertising, copying, notice requirements, and consultation, as necessary. At its first meeting, the Task Force shall prepare a budget for consideration by Council. A representative from the Financial Services Department will assist the Task Force in developing the budget.

4.7 Communications Plan

At its second meeting, the Task Force shall develop a Communications Plan for consultation with other stakeholders. A representative from the Corporate Communications Department will assist the Task Force in developing the Communications Plan.

4.8 Authority

The Task Force may not exercise decision-making powers, or commit expenditures save for those specifically delegated by Council. The Task Force may not direct staff to undertake activities without authority from Council.

4.9 Amendment/Expansion of Terms of Reference

Only Council can initiate any amendment and/or expansion of the Terms of Reference.

5.0 BACKGROUND

On March 29, 2011, the Committee of the Whole (Working Session) recommended:

- “1) That staff review the City of Vaughan’s Telecommunication Towers protocol taking into consideration the information received and provide options for obtaining further input from residents and experts in the fields when developing a new protocol.
- 2) That the presentation of Mr. Stephen J. D’Agostino, Thomson Rogers, Suite 3100, 390 Bay Street, Toronto, M5H 1W2 and Communication C9 presentation material entitled, “*Telecom Resources*” and “*Safety Code 6 and RF Exposure*”, dated March 29, 2011, be received;
- 3) That the following deputations and communications be received:
 1. Ms. Tina Catalano, 20 Dalmato Court, Woodbridge, L4L 8X7 and Communication C1 BioInitiative Report, C5 Information Package and C6 Information Package 2;
 2. Ms. Von Chaleunsouk-Marsden, Marsden Centre of Naturopathic Excellence, 2338 Major Mackenzie Drive, Maple, L6A 3Y7 and Communication C7 dated March 29, 2011;
 3. Ms. Susanne Maharaj, 7895 Kipling Avenue, Woodbridge, L4L 1Z7;
 4. Mr. Anand Maharaj, 7895 Kipling Avenue, Woodbridge, L4L 1Z7 and on behalf of Dr. Magda Havas and Communication C4 dated March 28, 2011;
 5. Mr. Mike Catalano, 20 Dalmato Court, Woodbridge, L4L 8X7;
 6. Mr. Eric Marsden, 113 Lockheed Avenue, Maple, L6A 1X5;
 7. Ms. Josie Fedele, West Woodbridge Homeowners Association Inc., 35 Albany Drive, Woodbridge, L4L 2X5; and

- 4) That the following communications be received:
1. C2 Ms. Maria Bonfini, dated March 27, 2011; and
 2. C3 Mr. Mario Bonfini, dated March 27, 2011.”

The recommendation of the Committee of the Whole (Working Session) was ratified at the April 5, 2011 Council meeting. In response, this Terms of Reference forms the basis for establishing a Task Force with the mandate of providing recommendations for siting telecommunication tower and antenna facilities within the City of Vaughan.

6.0 JURISDICTION

The Telecommunication Facility Task Force is responsible for updating and consolidating the existing City of Vaughan Protocol for Establishing Telecommunication Tower/Antenna Facilities (adopted on June 23, 2003) with respect to Industry Canada’s protocol, *Radiocommunication and Broadcasting Antenna Systems* (CPC-2-0-03, Issue 4, effective January 1, 2008). A brief overview of jurisdictional powers is provided below.

6.1 Industry Canada

Under the *Radiocommunication Act*, Industry Canada is the designated approval authority for all matters respecting telecommunication towers and antenna systems. As federal regulations supercede the Ontario *Building Code Act* and the *Planning Act*, telecommunication towers and antenna facilities are exempt from municipal zoning by-law requirements and site plan control. Industry Canada requires that proponents seeking to install or modify an antenna system adhere to the following broadly outlined process:

- 1) Investigating sharing or using existing infrastructure before proposing new antenna-supporting structures.
- 2) Contacting the local land-use authority (LUA) to determine local requirements regarding antenna systems.
- 3) Undertaking public notification and addressing relevant concerns, whether by following local LUA requirements or Industry Canada’s default process, as is required and appropriate.
- 4) Satisfying Industry Canada’s general and technical requirements, including: Health Canada guidelines as per Safety Code 6, radiofrequency immunity criteria, notification of nearby broadcasting stations, environmental considerations under the *Canadian Environmental Assessment Act*, and Transport Canada and NAV CANADA requirements regarding aeronautical safety.

6.2 Region of York

On April 23, 2009, York Region adopted Industry Canada’s protocol (CPC-2-0-03) outright to reduce redundancies and permit a more efficient and consistent approach for regulating telecommunication facilities, while providing an opportunity for local municipalities to determine individual procedures.

6.3 City of Vaughan

For proposals subject to municipal review, the City of Vaughan has the authority to establish local requirements and procedures for establishing telecommunication facilities. Upon completion of consultation, the City is responsible for recommending final concurrence to Industry Canada within 120 days. Should the City not provide concurrence within this time period, proponents may file a dispute resolution with Industry Canada, who has legislative power to render a final decision.

7.0 POLICY CONTEXT

While telecommunication facilities are federally regulated, several Provincial, Regional and City policies speak to tower and antenna siting, and must be addressed by the Task Force in developing recommendations for the new protocol.

7.1 Provincial Policy Statement

The Provincial Policy Statement states that telecommunication infrastructure must be integrated with growth planning, and accommodate projected needs through a coordinated, efficient and cost-effective approach (Section 6.1). Existing telecommunication infrastructure should be utilized prior to considering the development of new infrastructure, and facilities should be located in strategic areas to support effective emergency management services.

7.2 Greenbelt Plan

The Greenbelt Plan permits existing, expanded or new telecommunication infrastructure approved under the *Environmental Assessment Act*, subject to specific policies (in Section 4.2). In general, planning, design and construction practices shall avoid and/or minimize any impacts to the landscape, particularly the Natural Heritage System. The Greenbelt Plan also encourages the use of existing infrastructure and coordination with different infrastructure services to maintain the rural character of the Greenbelt and support provincial growth initiatives.

7.3 Oak Ridges Moraine Conservation Plan

The Oak Ridges Moraine Conservation Plan (ORMCP) does not permit applications for telecommunication facilities in the Natural Linkage Area and Natural Core Area, unless Sections 41(2) and 41(3), respectively, are satisfied. As per Section 41(2), new telecommunication infrastructure and upgrades to existing facilities are prohibited from locating on lands with key natural heritage or hydrologically sensitive features, unless Section 41(5) requirements are met. Finally, Section 41(6) states that service and utility trenches for telecommunication infrastructure must minimize disruption to natural groundwater flow.

7.4 Region of York Official Plan

The York Region Official Plan identifies the importance of telecommunication services in sustaining a high standard of living. Such facilities must have regard for potential impacts on surrounding communities and the natural environment. Additional policies in Section 7.5 include:

- encouraging utility networks that can adapt to emerging technologies;
- working with corporations, commissions and government agencies to coordinate and integrate services, and minimize exposure to electromagnetic fields;
- requiring municipalities to engage with cellular service providers early in the process and integrate telecommunication facilities within new buildings;

- encouraging steel poles instead of lattice towers, when it is not feasible to integrate telecommunication facilities within buildings; and,
- permitting telecommunication infrastructure within the Greenbelt and Oak Ridges Moraine Plan areas, subject to the requirements of the *Environmental Assessment Act* and the respective provincial plans.

7.5 City of Vaughan Official Plan

OPA #604 (Oak Ridges Moraine Conformity Plan) outlines policies for siting telecommunication infrastructure in the Oak Ridges Moraine (Section 10.15). These policies are consistent with the ORMCP. Other City of Vaughan community plans, including OPA #600, do not have policies that address telecommunication towers and antenna facilities.

The City of Vaughan Official Plan 2010, which was adopted by Vaughan Council on September 7, 2010 and is subject to York Region approval, outlines several policies for telecommunications and data networks. Section 8.4.4.1 states that Council will encourage development of high-speed telecommunications and data networks throughout the City to contribute to economic competitiveness and support widespread access to such services. Additional policies in Sections 5.1.1.2 and 8.4 identify that:

- the City will support wired infrastructure within public rights-of-way, where appropriate;
- providers are encouraged to share infrastructure wherever possible, to minimize adverse impacts;
- site planning and design guidelines will be developed to address aspects such as: locating telecommunication infrastructure at the rear of lots, prohibiting towers from locating in parks, minimizing adverse impacts, supporting integration into buildings, engaging service providers early in the process, ensuring that infrastructure blends in with its surroundings, and camouflaging towers located in sensitive areas; and
- the City will support high quality, efficient and coordinated utilities, services and telecommunication infrastructure.

In accordance with the ORMCP, the City of Vaughan Official Plan 2010 has further policies for telecommunication infrastructure located within the Oak Ridges Moraine, as outlined in Sections 3.4.1.39 to 3.4.1.42 inclusive.

8.0 FINDINGS REPORT IN SUPPORT OF PROTOCOL DEVELOPMENT

In preparing a Findings Report to support development of a new Telecommunication Facility Siting Protocol, the Task Force must follow the process outlined below and address each of the required components.

8.1 Background Review

The Task Force must conduct a background review of Industry Canada requirements, applicable Provincial and Regional policies, the current City of Vaughan Protocol for Establishing Telecommunication Tower/Antenna Facilities, telecommunication protocols in other municipalities, and legal precedents. The background review will form the basis for developing the new Telecommunication Facility Siting Protocol.

This Terms of Reference includes a review of jurisdictional issues and the local policy context, along with list of resources to assist the Task Force in conducting its analysis.

8.2 Issue Identification, Review and Analysis

Key issues that the Task Force must consider and reflect upon in their Findings Report include:

- 1) Jurisdiction: identifying which aspects are the exclusive jurisdiction of Industry Canada and which aspects the City has power to influence;
- 2) Co-location and use of existing infrastructure: where and when co-location should occur, possible incentives for co-locating, and notification of other industry carriers;
- 3) Economic issues: promoting economic development and competitiveness, and supporting effective telecommunication services that meet the needs of Vaughan residents and business;
- 4) Radiofrequency exposure, health concerns, and safety standards, including Health Canada's Safety Code 6, European guidelines, and the City of Toronto's Prudent Avoidance Policy;
- 5) Exemptions from municipal review: Industry Canada's exemptions, additional City of Vaughan exemptions, and potential courtesy notification requirements for proposals which are exempt from municipal review;
- 6) Preliminary consultation with the City: what is required, when it should occur and what process it should follow (e.g. the City has a Pre-Application Consultation process for submission of Site Development Applications);
- 7) Site selection criteria: appropriate distances from sensitive land uses, environmentally sensitive areas (i.e. Oak Ridges Moraine, Greenbelt and Natural Heritage Features), and anticipating future technologies such as LTE (4G) networks;
- 8) Urban design guidelines: minimizing visual impact through stealth design and camouflaging, issues of scale, landscaping requirements, heritage district guidelines, and signage opportunities;
- 9) Procedures for locating telecommunication facilities on City-owned lands or facilities, if determined appropriate;
- 10) Application process: fees, type and number of drawings required, site selection/justification report, application form, and method for tracking applications;
- 11) Public consultation process: exemptions from public consultation, public notification distances, timing and procedures (e.g. website notification), community meetings and/or open houses, and addressing public concerns;
- 12) City review process: procedures for reviewing proposals, timeline, and potential expedited process for proposals not subject to public consultation;
- 13) Dispute resolution process: resolving issues with the public, City or other key stakeholders; and,

- 14) Concluding consultation: potential agreement or undertaking between proponent and City, Building Permit requirements for antennas installed on buildings, and potential delegation of authority for granting/not granting municipal concurrence.

8.3 Protocol Objectives

The Task Force will develop appropriate objectives to guide development of the Telecommunication Facility Siting Protocol, based upon analysis of constraints and opportunities, as well as implementation tools.

8.4 Alternatives Evaluation and Protocol Preparation

Upon completion of a background review, identification and analysis of issues, the Task Force will evaluate a range of alternatives based on: economic ramifications, jurisdictional authority, and possible staffing requirements. The Task Force will evaluate the alternatives through a consensus-based approach. City staff will provide the Task Force with support on an as needed basis.

8.5 Deliverables/Timing

The Task Force will provide a Findings Report which supports development of a new Telecommunication Facility Siting Protocol for presentation to Vaughan Council within nine to twelve months of the Task Force being established. The Findings Report should discuss the background review, identification and analysis of key issues, development of protocol objectives, and assessment of alternatives.

9.0 RESOURCES

The following is a list of preliminary resources to be addressed by the Telecommunication Facility Task Force in completing their mandate. City staff will provide the Task Force with relevant excerpts from the documents.

9.1 Industry Canada

Radiocommunication and Broadcasting Antenna Systems. Spectrum Management and Telecommunications. Client Procedures Circular CPC-2-0-03. Issue 4, Effective June 1, 2008. Available at http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/h_sf01702.html.

Conditions of Licence for Mandatory Roaming and Antenna Tower and Site Sharing and to Prohibit Exclusive Site Arrangements. Spectrum Management and Telecommunications. Client Procedures Circular CPC-2-0-17. Issue 1, November 2008. Available at http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/h_sf01702.html.

Guide to Assist Land-use Authorities in Developing Antenna Siting Protocols. Spectrum Management and Telecommunications. Issue 1, January 2008. Available at http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/h_sf01702.html.

9.2 Province of Ontario

Provincial Policy Statement. Ministry of Municipal Affairs and Housing, 2005. Available at: <http://www.mah.gov.on.ca/Page215.aspx>.

Oak Ridges Moraine Conservation Plan. Ministry of Municipal Affairs and Housing, 2002. Available at: <http://www.mah.gov.on.ca/Page1707.aspx>.

Greenbelt Plan. Ministry of Municipal Affairs and Housing, 2005. Available at: <http://www.mah.gov.on.ca/Page189.aspx>.

9.3 York Region

Region of York Official Plan, December 2009. Approved by the Ministry of Municipal Affairs and Housing on September 7, 2010. Available at: <http://www.york.ca/Departments/Planning+and+Development/Growth+Management/default+Growth+Management.htm>.

York Region Updated Telecommunication Tower Protocol. Adopted by Regional Council on April 23, 2009. Available at: http://www.york.ca/Regional+Government/Agendas+Minutes+and+Reports/_2009/PEDC+rpt+4.htm.

9.4 City of Vaughan

City of Vaughan Official Plan 2010. Adopted by Vaughan Council on September 7, 2010 and subject to approval from York Region. Available at: <http://www.vaughantomorrow.ca/OPR/index.html>.

Procedural By-law 7-2011. Approved by Vaughan Council on January 25, 2011. Available at: http://www.vaughan.ca/vaughan/forms_docs/bylaws.cfm.

Protocol for Establishing Telecommunication Towers/Antenna Facilities. Approved by Vaughan Council June 23, 2003. Available from the City Clerk's Department and/or Development Planning Department.

Protocol for Establishing Telecommunication Towers/Antenna Facilities within the Regional Municipality of York. Approved by Vaughan Council on June 24, 2002 and December 16, 2002. Available from the City Clerk's Department and/or Development Planning Department.

**WORK PLAN (CITY STAFF)
TELECOMMUNICATION FACILITY SITING AND PROTOCOL STUDY**

May 2011

1.0 PURPOSE

The purpose of the Telecommunication Facility Siting and Protocol Study is to develop a siting protocol for telecommunication towers and antenna facilities in the City of Vaughan. The Development Planning Department will lead the Study Team, with assistance from (but not limited to) the following City departments/divisions: Urban Design, Policy Planning, Building Standards, Engineering Services, Development/Transportation Engineering, Public Works, Parks Development, Recreation and Culture, and Legal Services.

2.0 OBJECTIVES

The Study Team objectives are as follows:

- 1) To conduct a background review of Industry Canada requirements, applicable Provincial and Regional policies, the current City of Vaughan Protocol for Establishing Telecommunication Tower/Antenna Facilities, telecommunication protocols in other municipalities, and legal precedents;
- 2) To identify, review and analyze issues pertaining to the siting of telecommunication towers and antenna facilities, establish appropriate objectives, and evaluate alternative strategies in developing the new protocol, as discussed in Section 6.0 of this Work Plan;
- 3) To enable effective and transparent communication among members of the public, ratepayer association representatives, telecommunication industry representatives, the Region of York Medical Officer of Health, local experts in the field, Members of Council, Industry Canada, City staff, and other stakeholders or agencies; and,
- 4) To make recommendations to Council addressing a Telecommunication Facility Siting Protocol, harmonized with Industry Canada, for siting telecommunication facilities within the City of Vaughan.

3.0 BACKGROUND

On March 29, 2011, the Committee of the Whole (Working Session) recommended:

- “1) That staff review the City of Vaughan’s Telecommunication Towers protocol taking into consideration the information received and provide options for obtaining further input from residents and experts in the fields when developing a new protocol.
- 2) That the presentation of Mr. Stephen J. D’Agostino, Thomson Rogers, Suite 3100, 390 Bay Street, Toronto, M5H 1W2 and Communication C9 presentation

material entitled, “*Telecom Resources*” and “*Safety Code 6 and RF Exposure*”, dated March 29, 2011, be received;

- 3) That the following deputations and communications be received:
 1. Ms. Tina Catalano, 20 Dalmato Court, Woodbridge, L4L 8X7 and Communication C1 Biolnitiative Report, C5 Information Package and C6 Information Package 2;
 2. Ms. Von Chaleunsouk-Marsden, Marsden Centre of Naturopathic Excellence, 2338 Major Mackenzie Drive, Maple, L6A 3Y7 and Communication C7 dated March 29, 2011;
 3. Ms. Susanne Maharaj, 7895 Kipling Avenue, Woodbridge, L4L 1Z7;
 4. Mr. Anand Maharaj, 7895 Kipling Avenue, Woodbridge, L4L 1Z7 and on behalf of Dr. Magda Havas and Communication C4 dated March 28, 2011;
 5. Mr. Mike Catalano, 20 Dalmato Court, Woodbridge, L4L 8X7;
 6. Mr. Eric Marsden, 113 Lockheed Avenue, Maple, L6A 1X5;
 7. Ms. Josie Fedele, West Woodbridge Homeowners Association Inc., 35 Albany Drive, Woodbridge, L4L 2X5; and

- 4) That the following communications be received:
 1. C2 Ms. Maria Bonfini, dated March 27, 2011; and
 2. C3 Mr. Mario Bonfini, dated March 27, 2011.”

The recommendation of the Committee of the Whole (Working Session) was ratified at the April 5, 2011 Council meeting. In response, this Work Plan forms the basis for establishing a Study Team with the mandate of developing a siting protocol for telecommunication tower and antenna facilities within the City of Vaughan.

4.0 JURISDICTION

The Study Team will update and consolidate the existing City of Vaughan Protocol for Establishing Telecommunication Tower/Antenna Facilities (adopted on June 23, 2003) with respect to Industry Canada’s protocol, *Radiocommunication and Broadcasting Antenna Systems* (CPC-2-0-03, Issue 4, effective January 1, 2008). A brief overview of jurisdictional powers is provided below.

4.1 Industry Canada

Under the *Radiocommunication Act*, Industry Canada is the designated approval authority for all matters respecting telecommunication towers and antenna systems. As federal regulations supercede the Ontario *Building Code Act* and the *Planning Act*, telecommunication towers and antenna facilities are exempt from municipal zoning by-law requirements and site plan control. Industry Canada requires that proponents seeking to install or modify an antenna system adhere to the following broadly outlined process:

- 1) Investigating sharing or using existing infrastructure before proposing new antenna-supporting structures.

- 2) Contacting the local land-use authority (LUA) to determine local requirements regarding antenna systems.

- 3) Undertaking public notification and addressing relevant concerns, whether by following local LUA requirements or Industry Canada's default process, as is required and appropriate.
- 4) Satisfying Industry Canada's general and technical requirements, including: Health Canada guidelines as per Safety Code 6, radiofrequency immunity criteria, notification of nearby broadcasting stations, environmental considerations under the *Canadian Environmental Assessment Act*, and Transport Canada and NAV CANADA requirements regarding aeronautical safety.

4.2 Region of York

On April 23, 2009, York Region adopted Industry Canada's protocol (CPC-2-0-03) outright to reduce redundancies and permit a more efficient and consistent approach for regulating telecommunication facilities, while providing an opportunity for local municipalities to determine individual procedures.

4.3 City of Vaughan

For proposals subject to municipal review, the City of Vaughan has the authority to establish local requirements and procedures for establishing telecommunication facilities. Upon completion of consultation, the City is responsible for recommending final concurrence to Industry Canada within 120 days. Should the City not provide concurrence within this time period, proponents may file a dispute resolution with Industry Canada, who has legislative power to render a final decision.

5.0 POLICY CONTEXT

While telecommunication facilities are federally regulated, several Provincial, Regional and City policies speak to tower and antenna siting, and must be addressed by staff in developing the new protocol.

5.1 Provincial Policy Statement

The Provincial Policy Statement states that telecommunication infrastructure must be integrated with growth planning, and accommodate projected needs through a coordinated, efficient and cost-effective approach (Section 6.1). Existing telecommunication infrastructure should be utilized prior to considering the development of new infrastructure, and facilities should be located in strategic areas to support effective emergency management services.

5.2 Greenbelt Plan

The Greenbelt Plan permits existing, expanded or new telecommunication infrastructure approved under the *Environmental Assessment Act*, subject to specific policies (in Section 4.2). In general, planning, design and construction practices shall avoid and/or minimize any impacts to the landscape, particularly the Natural Heritage System. The Greenbelt Plan also encourages the use of existing infrastructure and coordination with different infrastructure services to maintain the rural character of the Greenbelt and support provincial growth initiatives.

5.3 Oak Ridges Moraine Conservation Plan

The Oak Ridges Moraine Conservation Plan (ORMCP) does not permit applications for telecommunication facilities in the Natural Linkage Area and Natural Core Area, unless Sections 41(2) and 41(3), respectively, are satisfied. As per Section 41(2), new telecommunication infrastructure and upgrades to existing facilities are prohibited from locating on lands with key natural heritage or hydrologically sensitive features, unless Section 41(5) requirements are met. Finally, Section 41(6) states that service and utility trenches for telecommunication infrastructure must minimize disruption to natural groundwater flow.

5.4 Region of York Official Plan

The York Region Official Plan identifies the importance of telecommunication services in sustaining a high standard of living. Such facilities must have regard for potential impacts on surrounding communities and the natural environment. Additional policies in Section 7.5 include:

- encouraging utility networks that can adapt to emerging technologies;
- working with corporations, commissions and government agencies to coordinate and integrate services, and minimize exposure to electromagnetic fields;
- requiring municipalities to engage with cellular service providers early in the process and integrate telecommunication facilities within new buildings;
- encouraging steel poles instead of lattice towers, when it is not feasible to integrate telecommunication facilities within buildings; and,
- permitting telecommunication infrastructure within the Greenbelt and Oak Ridges Moraine Plan areas, subject to the requirements of the *Environmental Assessment Act* and the respective provincial plans.

5.5 City of Vaughan Official Plan

OPA #604 (Oak Ridges Moraine Conformity Plan) outlines policies for siting telecommunication infrastructure in the Oak Ridges Moraine (Section 10.15). These policies are consistent with the ORMCP. Other City of Vaughan community plans, including OPA #600, do not have policies that address telecommunication towers and antenna facilities.

The City of Vaughan Official Plan 2010, which was adopted by Vaughan Council on September 7, 2010 and is subject to York Region approval, outlines several policies for telecommunications and data networks. Section 8.4.4.1 states that Council will encourage development of high-speed telecommunications and data networks throughout the City to contribute to economic competitiveness and support widespread access to such services. Additional policies in Sections 5.1.1.2 and 8.4 identify that:

- the City will support wired infrastructure within public rights-of-way, where appropriate;
- providers are encouraged to share infrastructure wherever possible, to minimize adverse impacts;
- site planning and design guidelines will be developed to address aspects such as: locating telecommunication infrastructure at the rear of lots, prohibiting towers from locating in parks, minimizing adverse impacts, supporting integration into buildings, engaging service providers early in the process, ensuring that infrastructure blends in with its surroundings, and camouflaging towers located in sensitive areas; and
- the City will support high quality, efficient and coordinated utilities, services and telecommunication infrastructure.

In accordance with the ORMCP, the City of Vaughan Official Plan 2010 has further policies for telecommunication infrastructure located within the Oak Ridges Moraine, as outlined in Sections 3.4.1.39 to 3.4.1.42 inclusive.

6.0 PROTOCOL DEVELOPMENT

In developing the Telecommunication Facility Siting Protocol, the Study Team will follow the process outlined below and address each of the required components.

6.1 Background Review

Development Planning Staff will conduct a background review of Industry Canada requirements, applicable Provincial and Regional policies, the current City of Vaughan Protocol for Establishing Telecommunication Tower/Antenna Facilities, telecommunication protocols in other municipalities, and legal precedents. The background review will form the basis for developing the new Telecommunication Facility Siting Protocol. This Work Plan includes a review of jurisdictional issues and the local policy context.

6.2 Stakeholder Consultation and Communication

The Study Team will hold meetings at City Hall with different stakeholder groups, including, but not limited to: members of the public and ratepayer association representatives (specifically those who made deputations regarding the telecommunications protocol at recent Committee of the Whole and Council meetings), telecommunication industry representatives (representing all telecommunication carriers), the Region of York Medical Officer of Health, Industry Canada and/or Health Canada representatives, and Members of Council. Staff will also meet with additional stakeholders or agencies identified throughout the consultation process, and hold follow-up meetings with particular stakeholders, if necessary.

The Study Team will also hold a minimum of one public meeting (during the evening, in fall 2011) to receive input from the public on the Telecommunication Facility Siting Protocol.

Development Planning Staff will develop an agenda for each of the consultation meetings, which will address, at a minimum, each of the issues identified in Section 6.3 of this Work Plan, and will be specifically targeted to each stakeholder group. All members of the Study Team will be invited to attend the consultation meetings. Development Planning Staff will follow-up with each of the Study Team members regarding their specific area of expertise, as well outcomes from the consultation meetings.

6.3 Issue Identification, Review and Analysis

Key issues that staff will consider and incorporate into the new protocol include, but are not limited to:

- 1) Jurisdiction: identifying which aspects are the exclusive jurisdiction of Industry Canada and which aspects the City has power to influence;
- 2) Co-location and use of existing infrastructure: where and when co-location should occur, possible incentives for co-locating, and notification of other industry carriers;

- 3) Economic issues: promoting economic development and competitiveness, and supporting effective telecommunication services that meet the needs of Vaughan residents and business;
- 4) Radiofrequency exposure, health concerns, and safety standards, including Health Canada's Safety Code 6, European guidelines, and the City of Toronto's Prudent Avoidance Policy;
- 5) Exemptions from municipal review: Industry Canada's exemptions, additional City of Vaughan exemptions, and potential courtesy notification requirements for proposals which are exempt from municipal review;
- 6) Preliminary consultation with the City: what is required, when it should occur and what process it should follow (e.g. the City has a Pre-Application Consultation process for submission of Site Development Applications);
- 7) Site selection criteria: appropriate distances from sensitive land uses, environmentally sensitive areas (i.e. Oak Ridges Moraine, Greenbelt and Natural Heritage Features), and anticipating future technologies such as LTE (4G) networks;
- 8) Urban design guidelines: minimizing visual impact through stealth design and camouflaging, issues of scale, landscaping requirements, heritage district guidelines, and signage opportunities;
- 9) Procedures for locating telecommunication facilities on City-owned lands or facilities, if determined appropriate;
- 10) Application process: fees, type and number of drawings required, site selection/justification report, application form, and method for tracking applications;
- 11) Public consultation process: exemptions from public consultation, public notification distances, timing and procedures (e.g. website notification), community meetings and/or open houses, and addressing public concerns;
- 12) City review process: procedures for reviewing proposals, timeline, and potential expedited process for proposals not subject to public consultation;
- 13) Dispute resolution process: resolving issues with the public, City or other key stakeholders; and,
- 14) Concluding consultation: potential agreement or undertaking between proponent and City, Building Permit requirements for antennas installed on buildings, and potential delegation of authority for granting/not granting municipal concurrence.

6.4 Protocol Objectives

Staff will develop appropriate objectives to guide development of the Telecommunication Facility Siting Protocol, based upon analysis of constraints and opportunities, as well as implementation tools.

6.5 Alternatives Evaluation and Protocol Preparation

Upon completion of a background review, identification and analysis of issues, and development of protocol objectives, staff will evaluate a range of alternatives based on: economic ramifications, jurisdictional authority, and possible staffing requirements. The Development Planning Department will work closely with the Study Team and stakeholders to evaluate the alternatives and develop the final telecommunications protocol through a consensus-based approach.

6.6 Deliverables/Timing

Development Planning Staff will develop a Telecommunication Facility Siting Protocol for consideration by Vaughan Council within seven months. The final protocol will be accompanied by a findings report discussing the background review, identification and analysis of key issues, development of protocol objectives, and assessment of alternatives.



Industry
Canada

Industrie
Canada

ATTACHMENT 3

CPC-2-0-03

Issue 4

Released: June 2007

Effective: January 1, 2008

Spectrum Management and Telecommunications

Client Procedures Circular

Radiocommunication and Broadcasting Antenna Systems

(Formerly CPC-2-0-03 - Environmental Process, Radiofrequency Fields and
Land-Use Consultation)

Comments and suggestions may be directed to the following address:

Industry Canada
Radiocommunications and
Broadcasting Regulatory Branch
300 Slater Street
Ottawa, Ontario
K1A 0C8

Attention: DOSP

Via e-mail: spectrum_pubs@ic.gc.ca

All Spectrum Management and Telecommunications publications are available on the following website at: <http://strategis.gc.ca/spectrum>.

Contents

1.	Introduction	1
1.1	Mandate	1
1.2	Application	1
1.3	Process Overview	1
2.	Industry Canada Engagement	2
3.	Use of Existing Infrastructure (Sharing)	2
4.	Land-use Authority and Public Consultation	3
4.1	Land-use Authority Consultation	4
4.2	Industry Canada’s Default Public Consultation Process	5
4.3	Concluding Consultation	7
5.	Dispute Resolution Process	8
6.	Exclusions	9
7.	General Requirements	10
7.1	Radio Frequency Exposure Limits	10
7.2	Radio Frequency Immunity	10
7.3	Proximity of Proposed Structure to Broadcasting Undertakings	11
7.4	Canadian Environmental Assessment Act	11
7.5	Aeronautical Safety	13
	Appendix 1 - Consultation Flow Chart	14
	Appendix 2 - Industry Canada’s Default Public Consultation Process - Public Notification Package	15

1. Introduction

Radiocommunication and broadcasting services are important for all Canadians and are used daily by the public, safety and security organizations, government, wireless service providers, broadcasters, utilities and businesses. In order for radiocommunication and broadcasting services to work, antenna systems including masts, towers, and other supporting structures are required. There is a certain measure of flexibility in the placement of antenna systems which is constrained to some degree by: the need to achieve acceptable coverage for the service area; the availability of sites; technical limitations; and safety. In exercising its mandate, Industry Canada believes that it is important that antenna systems be deployed in a manner that considers the local surroundings.

1.1 Mandate

Section 5 of the *Radiocommunication Act* states that the Minister may, taking into account all matters the Minister considers relevant for ensuring the orderly development and efficient operation of radiocommunication in Canada, issue radio authorizations and approve each site on which radio apparatus, including antenna systems, may be located. Further, the Minister may approve the erection of all masts, towers and other antenna-supporting structures. Accordingly, proponents must follow the process outlined in this document when installing or modifying an antenna system. Also, the installation of an antenna system or the operation of a currently existing antenna system that is not in accordance with this process may result in its alteration or removal and other sanctions against the operator in accordance with the *Radiocommunication Act*.

1.2 Application

The requirements of this document apply to anyone (referred to in this document as the proponent) who is planning to install or modify an antenna system regardless of the type of installation or service. This includes, amongst others, Personal Communications Services (PCS) and cellular, fixed wireless, broadcasting, land-mobile, licence-exempt and amateur radio operators. As well, parts of this process contain obligations that apply to existing antenna system operators.

1.3 Process Overview

This document outlines the process that must be followed by proponents seeking to install or modify antenna systems. The broad elements of the process are as follows:

1. Investigating sharing or using existing infrastructure before proposing new antenna-supporting structures.
2. Contacting the land-use authority (LUA) to determine local requirements regarding antenna systems.
3. Undertaking public notification and addressing relevant concerns, whether by following local LUA requirements or Industry Canada's default process, as is required and appropriate.
4. Satisfying Industry Canada's general and technical requirements.

It is Industry Canada's expectation that steps (2) to (4) will normally be completed within *120 days*. Some proposals may be excluded from certain elements of the process (see Section 6). It is Industry Canada's expectation that all parties will carry out their roles and responsibilities in good faith and in a manner that respects the spirit of this document.

2. Industry Canada Engagement

There are a number of points in the processes outlined in this document where parties must contact Industry Canada to proceed. Further, anyone with any question regarding the process may contact the local Industry Canada office¹ for guidance. Based on a query by an interested party, Industry Canada may request parties to provide relevant records and/or may provide direction to one or more parties to undertake certain actions to help move the process forward.

3. Use of Existing Infrastructure (Sharing)

This section outlines the roles of proponents and owners/operators of existing antenna systems. In all cases, parties should retain records (such as analyses, correspondence and engineering reports) relating to this section.

Before building a new antenna-supporting structure, Industry Canada requires that proponents first explore the following options:

- consider sharing an existing antenna system, modifying or replacing a structure if necessary;
- locate, analyze and attempt to use any feasible existing infrastructure such as rooftops, water towers etc.

Proponents are not normally expected to build new antenna-supporting structures where it is feasible to locate their antenna on an existing structure, unless a new structure is preferred by land-use authorities.

Owners and operators of existing antenna systems are to respond to a request to share in a timely fashion and to negotiate in good faith to facilitate sharing where feasible. It is anticipated that 30 days is reasonable time for existing antenna system owners/operators to reply to a request by a proponent in writing with either:

- a proposed set of reasonable terms to govern the sharing of the antenna system; or
- a detailed explanation of why sharing is not possible.

¹ Please refer to Radiocommunication Information Circular 66 (RIC-66) for a list of addresses and telephone numbers for Industry Canada's regional and district offices. RIC-66 is available via the Internet at: <http://strategis.ic.gc.ca/epic/internet/insmt-gst.nsf/en/sf01742e.html>.

4. Land-use Authority and Public Consultation

Contacting the Land-use Authority

Proponents must always contact the applicable land-use authorities to determine the local consultation requirements unless their proposal falls within the exclusion criteria outlined in Section 6. If the land-use authority has designated an official to deal with antenna systems, then proponents are to engage the authority through that person. If not, proponents must submit their plans directly to the council, elected local official or executive. Proponents are expected to establish initial formal contact with the land-use authority in writing in order to mark the official commencement of the *120-day* consultation process.

Proponents should note that there may be more than one land-use authority with an interest in the proposal. Where no established agreement exists between such land-use authorities, proponents must, as a minimum, contact the land-use authority(ies) and/or neighbouring land-use authorities located within a radius of three times the tower height, measured from the tower base or the outside perimeter of the supporting structure, whichever is greater. As well, in cases where proponents are aware that a potential Aboriginal or treaty right or land claim may be affected by the proposed installation, they must contact Industry Canada in order to ensure that the requirements for consultation are met.

Following the Land-use Authority Process

Proponents must follow the land-use consultation process for the siting of antenna systems, established by the land-use authority, where one exists. In the event that a land-use authority's existing process has no public consultation requirement, proponents must then fulfill the public consultation requirements contained in Industry Canada's Default Public Consultation Process (see Section 4.2). Proponents are not required to follow this requirement if the LUA's established process explicitly excludes their type of proposal from consultation or it is excluded by Industry Canada's criteria. Where proponents believe the local consultation requirements are unreasonable, they may contact the local Industry Canada office in writing for guidance.

Broadcasting Undertakings

Applicants for broadcasting undertakings are subject to Canadian Radio-television and Telecommunications (CRTC) licensing processes in addition to Industry Canada requirements. Although Industry Canada encourages applicants to consult as early as practical in the application process, in some cases it may not be prudent for the applicants to initiate public and municipal/land-use consultation before receiving CRTC approval, as application denial by the CRTC would result in unnecessary work for all parties involved. Therefore, assuming that the proposal is not otherwise excluded, broadcasting applicants may opt to commence land-use consultation after having received CRTC approval. However, broadcasting applicants choosing this option are required, at the time of the CRTC application, to notify the land-use authority with a Letter of Intent outlining a commitment to conduct consultation after receiving CRTC approval. If the land-use authority raises concerns with the proposal as described in the Letter of Intent, applicants are encouraged to engage in discussions with the land-use authority regarding their concerns and attempt to resolve any issues. See Broadcasting Procedures and Rules, Part 1 (BPR-1), for further details.

4.1 Land-use Authority Consultation

Industry Canada believes that any concerns or suggestions expressed by land-use authorities are important elements to be considered by proponents regarding proposals to install, or make changes to, antenna systems. As part of their community planning processes, land-use authorities should facilitate the implementation of local radiocommunication services by establishing consultation processes for the siting of antenna systems.

Unless the proposal meets the exclusion criteria outlined in Section 6, proponents must consult with the local land-use authority(ies) on any proposed antenna system prior to any construction with the aim of:

- discussing site options;
- ensuring that local processes related to antenna systems are respected;
- addressing reasonable and relevant concerns (see Section 4.2) from both the land-use authority and the community they represent; and
- obtaining land-use authority concurrence in writing.

Land-use authorities are encouraged to establish reasonable, relevant, and predictable consultation processes² specific to antenna systems that consider such things as:

- the designation of suitable contacts or responsible officials;
- proposal submission requirements;
- public consultation;
- documentation of the concurrence process; and
- the establishment of milestones to ensure consultation process completion within *120 days*.

Where they have specific concerns regarding a proposed antenna system, land-use authorities are expected to discuss reasonable alternatives and/or mitigation measures with proponents.

Under their processes, land-use authorities may exclude from consultation any antenna system installation in addition to those identified by Industry Canada's own consultation exclusion criteria (Section 6). For example, an authority may wish to exclude from public consultation those installations located within industrial areas removed from residential areas, low visual impact installations, or certain types of structures located within residential areas.

² Industry Canada is available to assist land-use authorities in the development of local processes. In addition, land-use authorities may wish to consult Industry Canada's guide for the development of local consultation processes.

4.2 Industry Canada's Default Public Consultation Process

Proponents must follow Industry Canada's Default Public Consultation Process where the local land-use authority does not have an established and documented public consultation process applicable to antenna siting. Proponents are not required to follow Industry Canada's Default Public Consultation Process if the land-use authority's established process explicitly excludes their type of proposal from public consultation or it is excluded by Industry Canada's criteria (see Section 6). Industry Canada's default process has three steps whereby the proponent:

1. provides written notification to the public, the land-use authority and Industry Canada of the proposed antenna system installation or modification (i.e. *public notification*);
2. engages the public and the land-use authority in order to address relevant questions, comments and concerns regarding the proposal (i.e. *responding to the public*); and
3. provides an opportunity to the public and the land-use authority to formally respond in writing to the proponent regarding measures taken to address reasonable and relevant concerns (i.e. *public reply comment*).

Public Notification

1. Proponents must ensure that the local public, the land-use authority and Industry Canada are notified of the proposed antenna system. As a minimum, proponents must provide a notification package (see Appendix 2) to the local public (including nearby residences, community gathering areas, public institutions, schools, etc.), neighbouring land-use authorities, businesses, and property owners, etc. located within a radius of three times the tower height, measured from the tower base or the outside perimeter of the supporting structure, whichever is greater. For the purpose of this requirement, the outside perimeter begins at the furthest point of the supporting mechanism, be it the outermost guy line, building edge, face of the self-supporting tower, etc.
2. It is the proponent's responsibility to ensure that the notification provides at least **30 days** for written public comment.
3. In addition to the minimum notification distance noted above, in areas of seasonal residence, the proponent, in consultation with the land-use authority, is responsible for determining the best manner to notify such residents to ensure their engagement.
4. In addition to the public notification requirements noted above, proponents of antenna-supporting structures that are proposed to be 30 metres or more in height must place a notice in a local community newspaper circulating in the proposed area.³

³ The notice must be synchronized with the distribution of the public notification package. It must be legible and placed in the public notice section of the newspaper. The notice must include: a description of the proposed installation; its location and street address; proponent contact information and mailing address; and an invitation to provide public comments to the proponent within **30 days** of the notice. In areas without a local newspaper, other effective means of public notification must be implemented. Proponents may contact the local Industry Canada office for guidance.

Responding to the Public

Proponents are to address all reasonable and relevant concerns, make all reasonable efforts to resolve them in a mutually acceptable manner and must keep a record of all associated communications. If the local public or land-use authority raises a question, comment or concern relating to the antenna system as a result of the public notification process, then the proponent is required to:

1. respond to the party in writing within **14 days** acknowledging receipt of the question, comment or concern and keep a record of the communication;
2. address in writing all reasonable and relevant concerns within **60 days** of receipt or explain why the question, comment or concern is not, in the view of the proponent, reasonable or relevant; and
3. in the written communication referred to in the preceding point, clearly indicate that the party has **21 days** from the date of the correspondence to reply to the proponent's response. The proponent must provide a copy of all public reply comments to the local Industry Canada office.

Responding to reasonable and relevant concerns may include contacting a party by telephone, engaging in a community meeting or having an informal, personal discussion. Between steps 1 and 2 above, the proponent is expected to engage the public in a manner it deems most appropriate. Therefore, the letter at step 2 above may be a record of how the proponent and the other party addressed the concern at hand.

Public Reply Comments

As indicated in step 3 above, the proponent must clearly indicate that the party has **21 days** from the date of the correspondence to reply to the response. The proponent must also keep a record of all correspondence/discussions that occurred within the **21-day** public reply comment period. This includes records of any agreements that may have been reached and/or any concerns that remain outstanding.

The factors that will determine whether a concern is reasonable or relevant according to this process will vary but will generally be considered if they relate to the requirements of this document and to the particular amenities or important characteristics of the area surrounding the proposed antenna system. Examples of concerns that proponents are to address may include:

- Why is the use of an existing antenna system or structure not possible?
- Why is an alternate site not possible?
- What is the proponent doing to ensure that the antenna system is not accessible to the general public?
- How is the proponent trying to integrate the antenna into the local surroundings?
- What options are available to satisfy aeronautical obstruction marking requirements at this site?
- What are the steps the proponent took to ensure compliance with the general requirements of this document including the *Canadian Environmental Assessment Act* (CEAA), Safety Code 6, etc.?

Concerns that are not relevant include:

- disputes with members of the public relating to the proponent's service, but unrelated to antenna installations;
- potential effects that a proposed antenna system will have on property values or municipal taxes;
- questions whether the *Radiocommunication Act*, this document, Safety Code 6, locally established by-laws, other legislation, procedures or processes are valid or should be reformed in some inanner.

4.3 Concluding Consultation

The proponent may only commence installation/modification of an antenna system after the consultation process has been completed by the land-use authority, or Industry Canada confirms concurrence with the consultation portion of this process, and after all other requirements under this process have been met. Consultation responsibilities will normally be considered complete when the proponent has:

1. concluded consultation requirements (Section 4.1) with the land-use authority;
2. carried out public consultation either through the process established by the land-use authority or the Industry Canada's Default Public Consultation Process where required; and
3. addressed all reasonable and relevant concerns.

Concluding Land-use Authority Consultation

Industry Canada expects that land-use consultation will be completed within *120 days* from the proponent's initial formal contact with the local land-use authority. Where unavoidable delays may be encountered, the land-use authority is expected to indicate when the proponent can expect a response to the proposal. If the authority is not responsive, the proponent may contact Industry Canada. Depending on individual circumstances, Industry Canada may support additional time or consider the land-use authority consultation process concluded.

Depending on the land-use authority's own process, conclusion of local consultation may include such steps as obtaining final concurrence for the proposal via the relevant committee, a letter or report acknowledging that the relevant municipal process or other requirements have been satisfied, or other valid indication, such as the minutes of a town council meeting indicating LUA approval. Compliance with informal city staff procedures, or grants of approval strictly related to zoning, construction, etc. will not normally be sufficient.

Industry Canada recognizes that approvals for construction (e.g. building permits) are used by some land-use authorities as evidence of consultation being concluded. Proponents should note that Industry Canada does not consider the fact a permit was issued as confirmation of concurrence, as different land-use authorities have different approaches. As such, Industry Canada will only consider such approvals as valid when the proponent can demonstrate that the LUA's process was followed and that the LUA's preferred method of concluding LUA consultation is through such an approval.

Concluding Industry Canada's Default Public Consultation Process

Industry Canada's Default Public Consultation Process will be considered concluded when the proponent has either:

- received no written questions, comments or concerns to the formal notification within the *30-day* public comment period; or
- if written questions, comments or concerns were received, the proponent has addressed and resolved all reasonable and relevant concerns and the public has not provided further comment within the *21-day* reply comment period.

In the case where the public responds within the *21-day* reply comment period, the proponent has the option of making further attempts to address the concern on its own, or can request Industry Canada engagement. If a request for engagement is made at this stage, Industry Canada will review the relevant material, request any further information it deems pertinent from any party and may then decide that:

- the proponent has met the consultation requirements of this process and that Industry Canada concurs that installation or modification may proceed; or
- the parties should participate in further attempts to mitigate or resolve any outstanding concern.

5. Dispute Resolution Process

The dispute resolution process is a formal process intended to bring about the timely resolution where the parties have reached an impasse.

Upon receipt of a written request, from a stakeholder other than the general public, asking for Departmental intervention concerning a reasonable and relevant concern, the Department may request that all involved parties provide and share all relevant information. The Department may also gather or obtain other relevant information and request that parties provide any further submissions if applicable. The Department will, based on the information provided, either:

- make a final decision on the issue(s) in question, and advise the parties of its decision; or
- suggest the parties enter into an alternate dispute resolution process in order to come to a final decision. Should the parties be unable to reach a mutually agreeable solution, either party may request that the Department make a final decision.

Upon resolution of the issue under dispute, the proponent is to continue with the process contained within this document as required.

6. Exclusions

For the following types of installations, proponents are excluded from the requirement to consult with the LUA and the public, but must still fulfill the General Requirements outlined in Section 7:

- maintenance of existing radio apparatus including the antenna system, transmission line, mast, tower or other antenna-supporting structure;
- addition or modification of an antenna system (including improving the structural integrity of its integral mast to facilitate sharing), the transmission line, antenna-supporting structure or other radio apparatus to existing infrastructure, a building, water tower, etc. provided the addition or modification does not result in an overall height increase above the existing structure of 25% of the original structure's height;
- maintenance of an antenna system's painting or lighting in order to comply with Transport Canada's requirements;
- installation, for a limited duration (typically not more than 3 months), of an antenna system that is used for a special event, or one that is used to support local, provincial, territorial or national emergency operations during the emergency, and is removed within 3 months after the emergency or special event; and
- new antenna systems, including masts, towers or other antenna-supporting structure, with a height of less than 15 metres above ground level.

Individual circumstances vary with each antenna system installation and modification, and the exclusion criteria above should be applied in consideration of local circumstances. Consequently, it may be prudent for the proponents to consult the LUA and the public even though the proposal meets an exclusion noted above. Therefore, when applying the criteria for exclusion, proponents should consider such things as:

- the antenna system's physical dimensions, including the antenna, mast, and tower, compared to the local surroundings;
- the location of the proposed antenna system on the property and its proximity to neighbouring residents;
- the likelihood of an area being a community-sensitive location; and
- Transport Canada marking and lighting requirements for the proposed structure.

Proponents who are not certain if their proposed structure is excluded, or whether consultation may still be prudent, are advised to contact the land-use authority and/or Industry Canada for guidance.

7. General Requirements

In addition to roles and responsibilities for site sharing, land-use consultation and public consultation, proponents must also fulfill other important obligations including: compliance with Health Canada's Safety Code 6 guideline for the protection of the general public; compliance with radio frequency immunity criteria; notification of nearby broadcasting stations; environmental considerations; and Transport Canada/NAV CANADA aeronautical safety responsibilities.

7.1 Radio Frequency Exposure Limits

Health Canada has established safety guidelines for exposure to radio frequency fields, in its Safety Code 6 publication, entitled: *Limits of Human Exposure to Radiofrequency Electromagnetic fields in the Frequency Range from 3 kHz to 300 GHz*.⁴ While the responsibility for developing Safety Code 6 rests with Health Canada, Industry Canada has adopted this guideline for the purpose of protecting the general public. Current biomedical studies in Canada and other countries indicate that there is no scientific or medical evidence that a person will experience adverse health effects from exposure to radio frequency fields, provided that the installation complies with Safety Code 6.

It is the responsibility of proponents and operators of installations to ensure that all radiocommunication and broadcasting installations comply with Safety Code 6 at all times, including the consideration of combined effects of nearby installations within the local radio environment.

For all proponents following Industry Canada's Default Public Consultation Process, the proponent's notification package must provide a written attestation that there will be compliance with Safety Code 6 for the protection of the general public, including consideration of nearby radiocommunication systems. The notification package must also indicate any Safety Code 6 related signage and access control mechanisms that may be used.

Compliance with Safety Code 6 is an ongoing obligation. At any time, antenna system operators may be required, as directed by Industry Canada, to demonstrate compliance with Safety Code 6 by (i) providing detailed calculations, and/or (ii) conducting site surveys and, where necessary, by implementing corrective measures. Proponents and operators of existing antenna systems must retain copies of all information related to Safety Code 6 compliance such as analyses and measurements.

7.2 Radio Frequency Immunity

All radiocommunication and broadcasting proponents and existing spectrum users are to ensure that their installations are designed and operated in accordance with Industry Canada's immunity criteria as outlined in EMCAB-2⁵ in order to minimize the malfunctioning of electronic equipment in the local surroundings. Broadcasting proponents and existing undertakings should refer to Broadcasting

⁴ Safety Code 6 can be found on Health Canada's website at: http://www.hc-sc.gc.ca/ewh-smmt/pubs/radiation/99ehd-dhm237/index_e.html.

⁵ For more information see EMCAB-2, entitled: *Criteria for Resolution of Immunity Complaints Involving Fundamental Emissions of Radiocommunications Transmitters* available on Industry Canada's Spectrum Management and Telecommunications website at: www.strategis.ic.gc.ca/epic/internet/insmt-gst.nsf/en/sf01005e.html.

Procedures and Rules - Part 1, *General Rules* (BPR-1) for additional information and requirements⁶ on this matter.

Proponents are advised to consider the potential effect that their proposal may have on nearby electronic equipment. In this way, they will be better prepared to respond to any questions that may arise during the public and land-use consultation processes, or after the system has been installed.

Land-use authorities should be prepared to advise proponents and owners of broadcasting undertakings of plans for the expansion or development of nearby residential and/or industrial areas. Such expansion or development generally results in the introduction of more electronic equipment in the area and therefore an increased potential for electronic equipment to malfunction. By keeping broadcasters aware of planned developments and changes to adjacent land-use, they will be better able to work with the community. Equally, land-use authorities have a responsibility to ensure that those moving into these areas, whether prospective residents or industry, are aware of the potential for their electronic equipment to malfunction when located in proximity to an existing broadcasting installation. For example, the LUA could ensure that clear notification be provided to future prospective purchasers.

7.3 Proximity of Proposed Structure to Broadcasting Undertakings

Where the proposal would result in a structure that exceeds 30 metres above ground level, the proponent is to notify operators of AM, FM and TV undertakings within 2 kilometres, due to the potential impact the physical structure may have on these broadcasting undertakings. Metallic structures close to an AM directional antenna array may change the antenna pattern of the AM broadcasting undertaking. These proposed structures can also reflect nearby FM and TV signals, causing 'ghosting' interference to FM/TV receivers used by the general public.

7.4 Canadian Environmental Assessment Act

Industry Canada requires that the installation and modification of antenna systems be done in a manner that complies with appropriate environmental legislation. This includes the CEAA and local environmental assessment requirements where required by the CEAA.

Proponents will ensure that the environmental assessment process is applied as early as is practical in the planning stages. This will enable proponents and other stakeholders to consider environmental factors in any decisions that may be made. As part of their environmental assessment, proponents are to give due consideration to potential environmental impacts including cumulative effects.

Proponents are advised to view the current CEAA exclusion list⁷ to see if their proposed installation meets the requirements to be excluded from assessment under the CEAA.

⁶ BPR-1 - Part I: General Rules can be found on the Spectrum Management and Telecommunications website at: <http://strategis.ic.gc.ca/epic/internet/insmt-gst.nsf/en/sf01326e.html>.

⁷ The CEAA exclusion list can be found at <http://laws.justice.gc.ca/en/C-15.2/SOR-94-639/index.html>.

If not excluded, the proponent must first notify the local Industry Canada office which will direct the proponent on how to proceed with an environmental assessment. At this point, the proponent must not proceed with any construction related to the proposal.

Where the proposal requires assessment under the CEAA, the proponent must either:

- abandon the proposal; or
- participate in the environmental assessment process as established under the CEAA.

Should the environmental assessment identify that there is the potential for an adverse environmental effect, the proponent will be required to describe the effect and propose mitigation measures. Through an environmental assessment, careful consideration may be given to potential adverse environmental effects during the planning stages. This makes it possible to introduce measures which permit the project to proceed while protecting the environment.

Should any significant adverse environmental effect become apparent at any time during the installation, all construction must be stopped, regardless of whether the installation was excluded from environmental assessment.

For all proponents following Industry Canada's Default Public Consultation Process, the proponent's notification package must provide written confirmation of the project's status under the *Canadian Environmental Assessment Act*.

In those situations where an environmental assessment is required, Industry Canada will post a notification of the commencement of the assessment on the Canadian Environmental Assessment Registry website.⁸ This will help to ensure that all interested parties, including the general public, are aware of an assessment from the outset. The notification will include the name, location and a summary description of the project, and identify the project proponent(s) and federal department(s) directly involved in the assessment. Other pertinent documents will be placed on the Internet site as the assessment proceeds, including all public notices, decisions and information about follow-up programs. Should mitigation measures be identified further to the assessment, Industry Canada will ensure that the project does not proceed unless these measures are adequately addressed.

In addition, proponents are responsible to ensure that antenna systems are installed and operated in a manner that respects the local environment and complies with other statutory requirements such as the *Canadian Environmental Protection Act*, the *Migratory Birds Convention Act* and the *Species at Risk Act*, where applicable.

⁸ The Canadian Environmental Assessment Registry website can be found at: http://www.ceaa-acee.gc.ca/050/index_e.cfm.

7.5 Aeronautical Safety

Proponents must ensure their proposals for any antenna system are first reviewed by Transport Canada and NAV CANADA.

Transport Canada will perform an assessment of the proposal with respect to the potential hazard to air navigation and will notify proponents of any painting and/or lighting requirements for the antenna system. NAV CANADA will comment on whether the proposal has an impact on the provision of their national air navigation system, facilities and other services located off-airport.

As required, the proponent must:

1. submit an Aeronautical Obstruction Clearance form to Transport Canada;
2. submit a Land-use Proposal Submission form to NAV CANADA;
3. include Transport Canada marking requirements in the public notification package;
4. install and maintain the antenna system in a manner that is not a hazard to aeronautical safety; and
5. retain all correspondence.

For those antenna systems subject to Industry Canada's Default Public Consultation Process, the proponent will inform the community of any marking requirements. Where options are possible, proponents are expected to work with the local community and Transport Canada to implement the best and safest marking options. Proponents should be aware that Transport Canada does not advise Industry Canada of marking requirements for proposed structures. Proponents are reminded that the addition of, or modification to, obstruction markings may result in community concern and so any change is to be done in consultation with the local public, land-use authority and/or Transport Canada, as appropriate.

References and Details

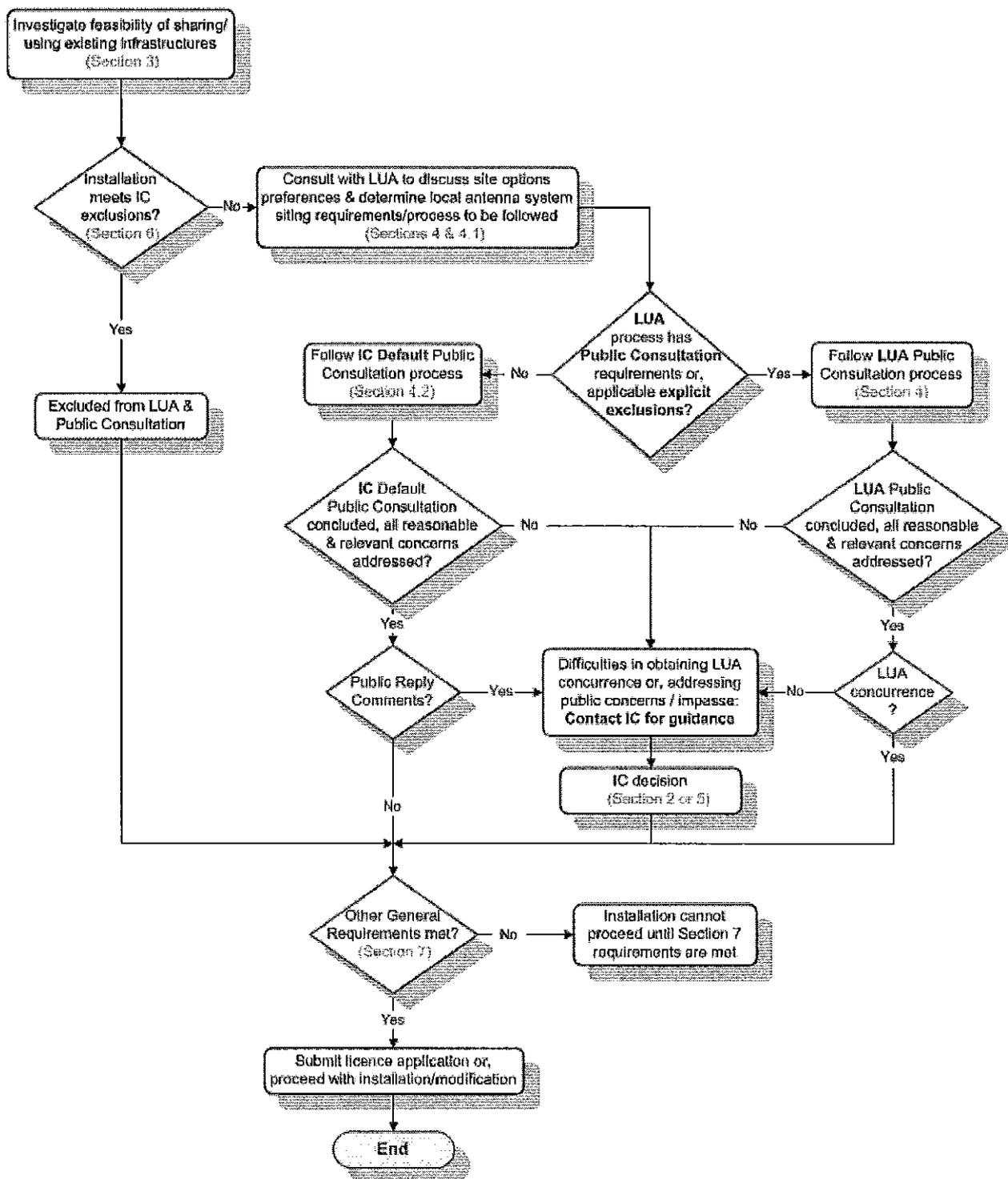
Aeronautical Obstruction Clearance forms are available from any Transport Canada Aviation Group Office. Both the Aeronautical Obstruction Clearance form (#26-0427) and a list of Transport Canada Aviation Group regional offices are available on the Transport Canada website.⁹ Completed forms are to be submitted directly to the nearest Transport Canada Aviation Group office. (Refer to Canadian Aviation Regulations, Standard 621.19, Standards Obstruction Markings).

Land-use Proposal Submission forms are available from NAV CANADA¹⁰ and completed forms are to be sent to the appropriate NAV CANADA General Manager Airport Operations (GMAO) office, East or West.

⁹ The Transport Canada website can be found at: <http://www.tc.gc.ca>.

¹⁰ Search keywords "Land-use Proposal" on the NAV CANADA website at: <http://www.navcanada.ca>.

Appendix 1 - Consultation Flow Chart



Appendix 2 - Industry Canada's Default Public Consultation Process - Public Notification Package (See Section 4.2)

The proponent must ensure that at least **30 days** are provided for public comment. Notification must provide all information on how to submit comments to the proponent in writing. The proponent must also provide a copy of the notification package to the land-use authority and the local Industry Canada office at the same time as the package is provided to the public.

Notification must include, but need not be limited to:

- (1) the proposed antenna system's purpose, the reasons why existing antenna systems or other infrastructure cannot be used, a list of other structures that were considered unsuitable and future sharing possibilities for the proposal;
- (2) the proposed location within the community, the geographic co-ordinates and the specific property or rooftop;
- (3) an attestation¹ that the general public will be protected in compliance with Health Canada's Safety Code 6 including combined effects within the local radio environment at all times;
- (4) identification of areas accessible to the general public and the access/demarcation measures to control public access;
- (5) the project's status under the *Canadian Environmental Assessment Act*²;
- (6) a description of the proposed antenna system including its height and dimensions, a description of any antenna that may be mounted on the supporting structure and simulated images of the proposal;
- (7) Transport Canada's aeronautical obstruction marking requirements (whether painting, lighting or both) if available; if not available, the proponent's expectation of Transport Canada's requirements together with an undertaking to provide Transport Canada's requirements once they become available;
- (8) an attestation that the installation will respect good engineering practices including structural adequacy;
- (9) reference to any applicable local land-use requirements such as local processes, protocols, etc.;

¹ Example: I, (*name of individual or representative of company*) attest that the radio installation described in this notification package will be installed and operated on an ongoing basis so as to comply with Health Canada's Safety Code 6, as may be amended from time to time, for the protection of the general public including any combined effects of nearby installations within the local radio environment.

² Example: I, (*name of individual or representative of company*) attest that the radio antenna system described in this notification package is excluded from environmental assessment under the *Canadian Environmental Assessment Act*.

- (10) notice that general information relating to antenna systems is available on Industry Canada's Spectrum Management and Telecommunications website (<http://strategis.ic.gc.ca/antenna>);
- (11) contact information for the proponent, land-use authorities and the local Industry Canada office;
and
- (12) closing date for submission of written public comments (not less than **30 days** from receipt of notification).



Health
Canada

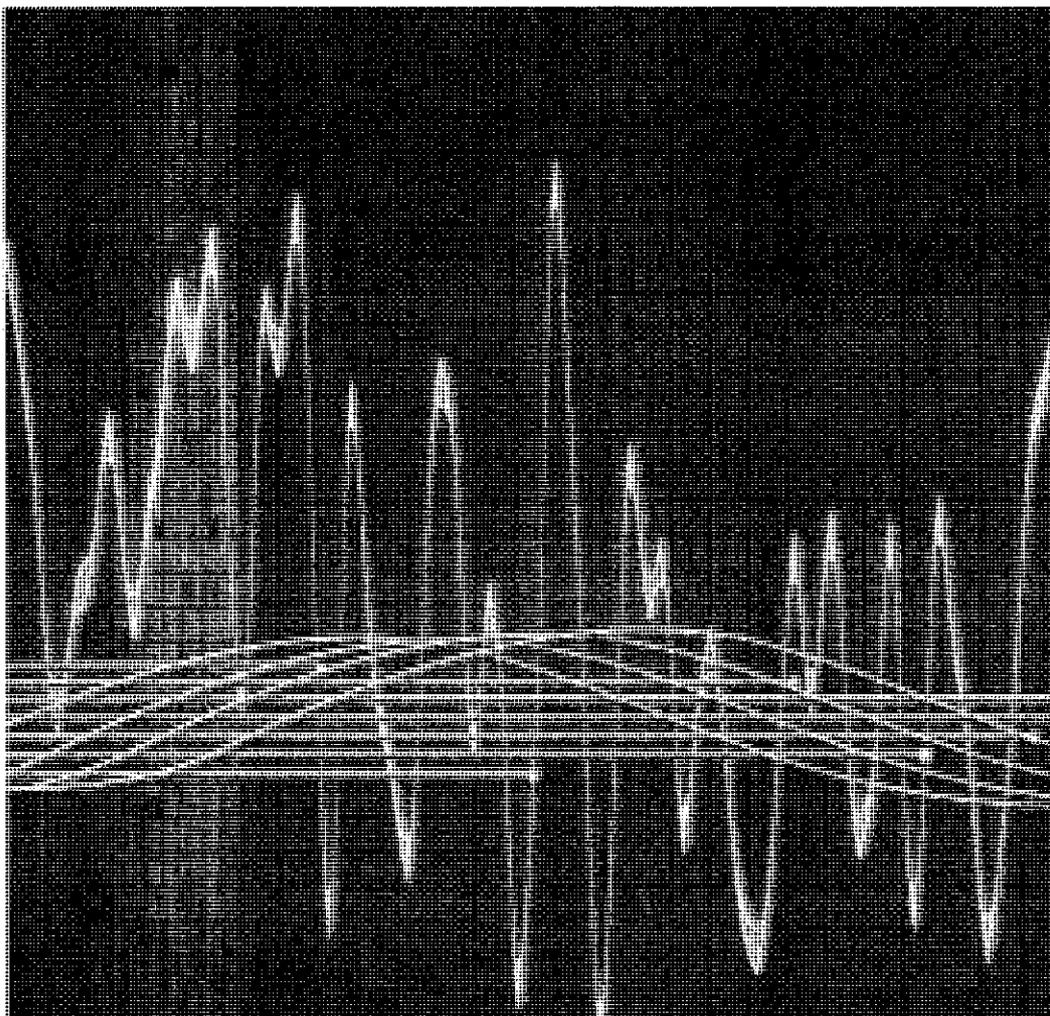
Santé
Canada

*Your health and
safety... our priority.*

*Votre santé et votre
sécurité... notre priorité.*

Limits of Human Exposure to Radiofrequency Electromagnetic Energy in the Frequency Range from 3 kHz to 300 GHz

Safety Code 6 (2009)



Canada

Errata

Section 2.3, page 19

“For frequencies between 3 kHz and 100 kHz, the averaging time for induced and contact currents shall be 1 second (Section 2.1.2). For frequencies greater than 100 kHz and up to 15 000 MHz, time averaging provisions in this code take into account that the basic restrictions are designed to limit temperature increases in tissues. Temperature increases in living tissue due to RF energy absorption follow a well-defined pattern with a time constant of approximately 6 minutes (thermal time constant), where ~~67%~~ **63%** of the steady state temperature increase occurs within 6 min. Time averaging permits exposures to be greater than the limits outlined in Sections 2.1 and 2.2 over short periods of time, provided that the total absorbed energy in any 6 min period does not exceed the energy absorbed from a constant (time invariant) exposure at the limits outlined in Sections 2.1 and 2.2. Since time averaging is based on absorbed energy considerations, the electric and magnetic field intensities shall be squared before time averaging is applied, while the power density and SAR are applied directly.”

Limits of Human Exposure to Radiofrequency Electromagnetic Energy in the Frequency Range from 3 kHz to 300 GHz

Consumer and Clinical Radiation Protection Bureau
Environmental and Radiation Health Sciences Directorate
Healthy Environments and Consumer Safety Branch
Health Canada

Safety Code 6 (2009)

Health Canada is the federal department responsible for helping the people of Canada maintain and improve their health. We assess the safety of drugs and many consumer products, help improve the safety of food, and provide information to Canadians to help them make healthy decisions. We provide health services to First Nations people and to Inuit communities. We work with the provinces to ensure our health care system serves the needs of Canadians.

Published by authority of the Minister of Health.

Limits of human exposure to radiofrequency electromagnetic energy in the frequency range from 3 kHz to 300 GHz is available on the Internet at the following address:

www.hc-sc.gc.ca/ewh-semt/pubs/radiation/index-eng.php

Également disponible en français sous le titre :

Limites d'exposition humaine à l'énergie électromagnétique radioélectrique dans la gamme de fréquences de 3 kHz à 300 GHz

This publication can be made available on request on diskette, large print, audio-cassette and braille.

For further information or to obtain additional copies, please contact:

Publications

Health Canada

Ottawa, Ontario K1A 0K9

Tel.: (613) 954-5995

Fax: (613) 941-5366

E-Mail: info@hc-sc.gc.ca

© Her Majesty the Queen in Right of Canada, represented by the Minister of Health, 2009

All rights reserved. No part of this information (publication or product) may be reproduced or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, or stored in a retrieval system, without prior written permission of the Minister of Public Works and Government Services Canada, Ottawa, Ontario K1A 0S5 or copyright.droitdauteur@pwgsc.gc.ca.

HC Pub.: 091029

Cat.: H128-1/09-591E

ISBN: 978-1-100-13802-2

Preface

This document is one of a series of safety codes prepared by the Consumer and Clinical Radiation Protection Bureau, Health Canada. These safety codes specify the requirements for the safe use of, or exposure to, radiation emitting devices. This revision replaces the previous version of Safety Code 6 (99-EHD-237) published in 1999.

The purpose of this code is to establish safety limits for human exposure to radiofrequency (RF) electromagnetic energy in the frequency range from 3 kHz to 300 GHz. The safety limits in this code apply to all individuals working at, or visiting, federally regulated sites. These guidelines may also be adopted by the provinces, industry or other interested parties. The Department of National Defence shall conform to the requirements of this safety code, except in such cases where it considers such compliance to have a detrimental effect on its activities in support of training and operations of the Canadian Forces. This code has been adopted as the scientific basis for the equipment certification specifications outlined in Industry Canada's regulatory compliance documents⁽¹⁻³⁾, that govern the use of wireless devices in Canada, such as cell phones, cell towers (base stations) and broadcast antennae. Safety Code 6 does not apply to the deliberate exposure for treatment of patients by, or under the direction of, medical practitioners. Safety Code 6 is not intended for use as a product performance specification document, as the limits in this safety code are for controlling human exposure and are independent of the source of RF energy.

In a field where technology is advancing rapidly and where unexpected and unique problems may occur, this code cannot cover all possible situations. Consequently, the specifications in this code may require interpretation under special circumstances. This interpretation should be done in consultation with scientific staff at the Consumer and Clinical Radiation Protection Bureau, Health Canada.

The safety limits in this code are based on an ongoing review of published scientific studies on the health impacts of radiofrequency electromagnetic energy. This code is periodically revised to reflect new knowledge in the scientific literature and the exposure limits may be modified, if deemed necessary.

Table of Contents

1. Introduction	7
1.1 Purposes of the Code	8
2. Maximum Exposure Limits	9
2.1 Basic Restrictions	11
2.1.1 Specific Absorption Rate (SAR) Limits	11
2.1.2 Induced and Contact Current Limits	12
2.2 Electric and Magnetic Field Strength Limits	15
2.2.1 Peak Field Strength Limit for Pulsed Fields	18
2.3 Time Averaging	19
2.4 Spatial Averaging	21
Definitions	22
References	24
Appendix I – Maximum Exposure Limits for RF energy	27

1. Introduction

Electromagnetic radiation is emitted by many natural and man-made sources and is a fundamental aspect of our lives. We are warmed by electromagnetic radiation emitted from the sun and our eyes can detect the visible light portion of the electromagnetic spectrum. Radiofrequency (RF) energy is a portion of the electromagnetic spectrum with frequencies ranging from 3 kHz to 300 GHz, below that of visible light and above that of extremely low frequency (ELF) electromagnetic energy. RF energy is produced by many man-made sources including cellular (mobile) phones and base stations, television and radio broadcasting facilities, radar, medical equipment, microwave ovens, RF induction heaters as well as a diverse assortment of other electronic devices within our living and working environments.

It has long been recognized that sufficiently intense RF energy can cause heating of materials with finite conductivity, including biological tissues. A number of well established biological effects and adverse health effects from acute exposure to intense RF energy have been documented⁽⁴⁻⁹⁾. For the most part, these effects relate to localized heating or stimulation of excitable tissue from intense RF energy exposure. The specific biological responses to RF energy are generally related to the rate of energy absorbed. The rate and distribution of RF energy absorption depends strongly on the frequency, intensity and orientation of the incident fields as well as the body size and its constitutive properties (dielectric constant and conductivity). At frequencies between 100 kHz and 6 GHz, RF energy absorption is commonly described in terms of the specific absorption rate (SAR), which is a measure of the rate of energy deposition per unit mass of body tissue and is usually expressed in units of watts per kilogram (W/kg). Based on a large amount of historical knowledge, national and international exposure limits have been established to protect the general public against adverse effects associated with acute RF energy exposures⁽⁸⁻⁹⁾.

The exposure limits specified in Safety Code 6 have been established based upon a thorough evaluation of the scientific literature related to the thermal and possible non-thermal effects of RF energy on biological systems. Health Canada scientists consider all peer-reviewed scientific studies, on an ongoing basis, and employ a weight-of-evidence approach when evaluating the possible health risks of RF energy. This approach takes into account both the quantity of studies on a particular endpoint (whether adverse or no effect), but more importantly, the quality of those studies. Poorly conducted studies (e.g. incomplete dosimetry or inadequate control samples) receive relatively little weight, while properly conducted studies (e.g. all controls included, appropriate statistics, complete dosimetry) receive more weight. The exposure limits in Safety Code 6 are based upon the lowest exposure level at which scientifically-established human health hazards occur. Safety factors have been incorporated into these limits to add an additional level of protection for the general public and personnel working near RF sources. The scientific approach used to establish the exposure limits in Safety Code 6 is comparable to that employed by other science-based international standards bodies⁽⁸⁻¹²⁾. As such, the basic restrictions in Safety Code 6 are similar to those adopted by most other nations, since all recognized standard-setting bodies use the same scientific data. It must be stressed that Safety Code 6 is based upon scientifically-established health hazards and should be distinguished from some municipal and/or national guidelines that are based on socio-political considerations.

In the following sections, the maximum exposure levels for persons in both controlled and uncontrolled environments are specified. These levels shall not be exceeded.

1.1 Purposes of the Code

The purposes of this code are to:

- (a) specify maximum levels of human exposure to RF energy at frequencies between 3 kHz and 300 GHz, to prevent adverse human health effects;
- (b) specify maximum allowable RF contact and induced body currents to prevent the physical perception of internal currents resulting from RF energy in uncontrolled environments, and to prevent RF shock or burns to personnel in controlled environments;
- (c) provide guidance for evaluating RF exposure levels, to ensure that personnel in controlled and uncontrolled environments are not exposed at levels greater than the limits specified in this code.

2. Maximum Exposure Limits

The scientific literature with respect to possible biological effects of RF energy has been monitored by Health Canada scientists on an ongoing basis since the last version of Safety Code 6 was published in 1999. During this time, a significant number of new studies have evaluated the potential for acute and chronic RF energy exposures to elicit possible effects on a wide range of biological endpoints including: human cancers (epidemiology); rodent lifetime mortality; tumor initiation, promotion and co-promotion; mutagenicity and DNA damage; EEG activity; memory, behaviour and cognitive functions; gene and protein expression; cardiovascular function; immune response; reproductive outcomes; and perceived electromagnetic hypersensitivity (EHS) among others. Numerous authoritative reviews have summarized this literature^(13–30).

Despite the advent of thousands of additional research studies on RF energy and health, the predominant adverse health effects associated with RF energy exposures in the frequency range from 3 kHz to 300 GHz still relate to the occurrence of tissue heating and excitable tissue stimulation from short-term (acute) exposures. At present, there is no scientific basis for the premise of chronic and/or cumulative health risks from RF energy at levels below the limits outlined in Safety Code 6. Proposed effects from RF energy exposures in the frequency range between 100 kHz and 300 GHz, at levels below the threshold to produce thermal effects, have been reviewed. At present, these effects have not been scientifically established, nor are their implications for human health sufficiently well understood. Additionally, a lack of evidence of causality, biological plausibility and reproducibility greatly weaken the support for the hypothesis for such effects. Thus, these proposed outcomes do not provide a credible foundation for making science-based recommendations for limiting human exposures to low-intensity RF energy.

For frequencies from 3 to 100 kHz, the predominant health effect to be avoided is the unintentional stimulation of excitable tissues, since the threshold for electrostimulation in this frequency range will typically be lower than that for the onset of thermal effects. Experimental studies have demonstrated that exogenous electric and magnetic field exposures can induce *in situ* electric fields and currents within biological tissue that can lead to nerve and muscle depolarization^(5, 8–9, 31–32). Limits for maximum external electric and magnetic field strengths have been established in Safety Code 6 to avoid *in situ* electric field strengths greater than that of the minimum excitation threshold for excitable tissues.

For frequencies from 100 kHz to 300 GHz, tissue heating is the predominant health effect to be avoided. Other proposed non-thermal effects have not been conclusively documented to occur at levels below the threshold where thermal effects arise. Studies in animals, including non-human primates, have consistently demonstrated a threshold effect for the occurrence of behavioural changes and alterations in core-body temperature of ~ 1.0 °C, at a whole-body average SAR of ~ 4 W/kg^(7–9). This forms the scientific basis for the whole-body average SAR limits in Safety Code 6. To ensure that thermal effects are avoided, a safety factor of 10 has been incorporated for exposures in controlled environments, resulting in a whole-body-averaged SAR limit of 0.4 W/kg. A safety margin of 50 has been incorporated for exposures in uncontrolled environments to protect the general public, resulting in a whole-body average SAR limit of 0.08 W/kg.

Peak (spatial-average) SAR limits have also been established in Safety Code 6 to avoid excessive thermal effects (hot-spots) in localized human tissues. The peak SAR limits reflect the highly non-homogenous nature of typical RF energy exposures and the differing thermoregulatory properties of various body tissues. The peak SAR limits pertain to discrete tissue volumes (1 or 10 g), where thermoregulation can efficiently dissipate heat and avoid changes ($>1^{\circ}\text{C}$) in core body temperature. As such, the peak SAR limits for exposures in controlled environments are 20 W/kg for the limbs and 8 W/kg for the head, neck and trunk. For exposures in uncontrolled environments, the peak SAR limits are 4.0 W/kg for the limbs and 1.6 W/kg for the head, neck and trunk. There are also limits in Safety Code 6 for the avoidance of painful shocks or burns from contact currents.

The basic restrictions which shall not be exceeded are given in terms of the currents in the body, either by induction or contact with energized metallic objects, or in terms of the rate at which RF electromagnetic energy is absorbed in the body (i.e. SAR). In practice, direct measurements of SAR are only feasible under laboratory conditions. Therefore, recommended maximum exposure levels in terms of unperturbed electric and magnetic field strength as well as power density are given in addition to the SAR limits. These maximum field intensities are at levels that ensure that the SAR or induced body current will be no greater than that of the basic restrictions. Additional factors such as temporal variations in intensity and spatial distribution of the exposure fields are accounted for by provisions for time and spatial averaging. Exposure to RF energy in excess of the limits given in this safety code, when time and spatially-averaged, may cause adverse health effects.

For the purpose of this code, controlled environments are defined as those where all of the following conditions are satisfied:

- (a) the RF field intensities in the controlled area have been adequately characterized by means of measurements, calculations or modeling (such as with the use of FDTD [finite difference time domain] software),
- (b) the exposure is incurred by persons who are aware of the potential for RF exposure and are cognizant of the intensity of the RF energy in their environment and,
- (c) the exposure is incurred by persons who are aware of the potential health risks associated with RF energy exposures and whom can control their risk using mitigation strategies.

All situations that do not meet the specifications above are considered to be uncontrolled environments. Uncontrolled environments are defined as areas where either insufficient assessment of RF energy has been conducted or where persons who are allowed access to these areas have not received proper RF awareness training and have no means to assess or, if required, mitigate their exposure to RF energy.

To determine whether the maximum exposure levels are exceeded, full consideration shall be given to such factors as:

- (a) nature of exposure environment (controlled or uncontrolled);
- (b) duration of exposure and/or time-averaging (including ON/OFF times of the RF source, direction of the beam, duty factors, sweep times, etc...);

- (c) spatial characteristics of exposure (i.e. whole body or parts thereof);
- (d) uniformity of the exposure field (i.e. spatial averaging).

In certain circumstances, higher exposure levels may be permitted for short durations. If this is the case, the field strengths and power densities should be averaged over any one tenth-hour period (0.1 h or 6 min). Graphs are provided in Appendix I for easy identification of maximum exposure levels at various frequencies.

SI units are used throughout this document unless specified otherwise.

2.1 Basic Restrictions

2.1.1 Specific Absorption Rate (SAR) Limits

The specific absorption rate (SAR) is a measure of the rate at which electromagnetic energy is absorbed in the body. At frequencies between 100 kHz and 6 GHz, SAR limits take precedence over field strength and power density limits and shall not be exceeded.

The SAR should be determined for situations where exposures occur at a distance of 0.2 m or less from the source. In cases where SAR determination is feasible, the values in Table 1 shall not be exceeded. For conditions where SAR determination is impractical, field strength or power density measurements shall be carried out and the limits outlined in Section 2.2 shall be respected.

Table 1. SAR Exposure Limits for Controlled and Uncontrolled Environments.

Condition	SAR Limit (W/kg)	
	Controlled Environment	Uncontrolled Environment
The SAR averaged over the whole body mass.	0.4	0.08
The spatial peak SAR for the head, neck and trunk, averaged over any one gram (g) of tissue*.	8	1.6
The spatial peak SAR in the limbs as averaged over any 10 g of tissue*.	20	4

* Defined as a tissue volume in the shape of a cube. A 10 g mass of tissue represents a volume of approximately 10 cm³, while 1 g of tissue represents a volume of approximately 1 cm³.

Note: Although not a requirement of the code, it is suggested that whenever possible, the organ-averaged SAR for the eye should not exceed 0.4 W/kg in the controlled environment and 0.2 W/kg in the uncontrolled environment.

2.1.2 Induced and Contact Current Limits

Limits for induced and contact currents are intended to reduce the potential for RF shock or burns as follows:

(a) For free standing individuals (standing upright, no contact with metallic objects), current induced in the human body by electromagnetic energy in the frequency bands listed in Column 1 of Tables 2 and 3, shall not exceed the values specified in Column 2 of:

(i) Table 2 for Controlled Environments.

(ii) Table 3 for Uncontrolled Environments.

An evaluation for compliance with the limits of induced currents should be made with an appropriate instrument. Measurements should be made with a person or a human equivalent antenna standing upright.

Note: Induced current through both feet can be measured by using a clamp-on current probe or a low profile platform consisting of two parallel conductive plates isolated from each other and one located above the other. If the latter is used, the platform should be placed on the surface where the person stands, and a person or a human equivalent antenna is placed on the upper plate of the platform. A voltage drop on a low-inductance resistor connected between the plates provides a measure of the induced current.

(b) No object, with which an individual may come into contact by hand grip, shall be energized by electromagnetic energy in the frequency bands listed in Column 1 of Tables 2 and 3, to such an extent that the maximum current flow through a human body, exiting through the feet, exceeds the values specified in Column 3 of:

(i) Table 2 for Controlled Environments.

(ii) Table 3 for Uncontrolled Environments.

Note 1: For any conducting metallic object that a person may come into contact with, that is located near a high-intensity RF field, contact currents shall be measured using an instrument consisting of an electrical circuit having the impedance of the human body.

Note 2: In controlled environments, the maximum permitted currents may be perceptible (such as a tingling or warming sensation), but are not sufficient to cause any pain or damage such as burns.

(c) Where the electromagnetic energy consists of a number of frequencies in the same or different frequency bands shown in Column 1 of Tables 2 and 3, the ratio of the square of the measured current in each frequency to the square of the limit at that given frequency shown in Column 2 or 3 (depending on whether it is induced or contact current) shall be determined and the sum of all ratios thus obtained for all frequencies shall not exceed unity, when time averaged. The limit, as applied to multiple frequencies, can be expressed as:

$$\sum_{f=3 \text{ kHz}}^{110 \text{ MHz}} r_f \leq 1 \quad (2.1)$$

where f is the frequency for which measurements were taken and r_f is the ratio of the square of the measured current in each frequency to the square of the limit at that given frequency, expressed as:

$$r_f = \left[\frac{\text{Measured Time-Averaged Value of Current at } f}{\text{Current Limit at } f} \right]^2 \quad (2.2)$$

Table 2. Induced and Contact Current Limits for Controlled Environments.

1 Frequency (MHz)	2 Rms Induced Current (mA) Through		3 Rms Contact Current (mA) Hand Grip and Through Each Foot	4 Averaging Time
	Both Feet	Each Foot		
0.003 - 0.1	2000 f	1000 f	1000 f	1 s
0.1 - 110	200	100	100	6 min

Notes: 1. Frequency, f , is in MHz.

2. The above limits may not adequately protect against startle reactions and burns caused by transient spark discharges for intermittent contact with energized objects.

Table 3. Induced and Contact Current Limits for Uncontrolled Environments.

1 Frequency (MHz)	2 Rms Induced Current (mA) Through		3 Rms Contact Current (mA) Hand Grip and Through Each Foot	4 Averaging Time
	Both Feet	Each Foot		
0.003 - 0.1	900 <i>f</i>	450 <i>f</i>	450 <i>f</i>	1 s
0.1 - 110	90	45	45	6 min

Notes: 1. Frequency, *f*, is in MHz.

2. The above limits may not adequately protect against startle reactions and burns caused by transient spark discharges for intermittent contact with energized objects.

(d) For frequencies between 3 kHz and 100 kHz, the averaging time to be applied to the induced and contact current measurements shall be 1 second. For frequencies between 100 kHz and 110 MHz, time averaging shall be applied to the square of the induced and contact currents and shall be consistent with the averaging time in Tables 5 and 6, provided that the time-averaged square of the current in any 6 min (or 0.1 h) period does not exceed the limit given in the following relation:

$$I_{av}^2 = I_{lm}^2 \frac{6}{T_{exp}} \quad (2.3)$$

where I_{av} is the maximum allowable time-averaged current for exposure times less than 6 min, I_{lm} is the current limit through each foot (100 mA for controlled environment and 45 mA for uncontrolled environment) as specified in Tables 2 and 3, and T_{exp} is the exposure time in minutes during any 6 min period. Shown in Table 4 are the higher values of I_{av} that may be allowed for exposure times less than 6 min.

Table 4. Time-Averaged Induced and Contact Current Limits for Different Exposure Times for the Frequency Band 0.1-110 MHz, Applicable to Controlled and Uncontrolled Environments.

Exposure Time (min)	Time-Averaged Induced/Contact Current (rms) through Each Foot (mA)	
	Controlled Environment	Uncontrolled Environment
≥ 6	100	45
5	110	49
4	123	55
3	141	64
2	173	78
1	245	110
0.5	346	155
< 0.5	350	155

Note: The above limits may not adequately protect against startle reactions and burns caused by transient spark discharges for intermittent contact with energized objects.

2.2 Electric and Magnetic Field Strength Limits

In the far-field zone, electric field strength, magnetic field strength and power density are interrelated by simple mathematical expressions, where any one of these parameters defines the remaining two. In the near-field zone, both the unperturbed electric and magnetic field strengths shall be measured, since there is no simple relationship between these two quantities. Instrumentation for the measurement of magnetic fields at certain frequencies may not be commercially available. In this case, the electric field strength shall be measured and used for assessing compliance with the basic restrictions in this code.

Individuals should not be exposed to electromagnetic energy in a frequency band listed in Column 1 of Tables 5 and 6, if:

- (a) the electric or magnetic field strengths exceed the values, when averaged spatially and over time, specified in Column 2 or 3 of:
 - (i) Table 5 for Controlled Environment.
 - (ii) Table 6 for Uncontrolled Environment.
- (b) the power density exceeds the values, when averaged spatially and over time, specified in Column 4 of:
 - (i) Table 5 for Controlled Environment.
 - (ii) Table 6 for Uncontrolled Environment.

Spatial averaging is to be carried out over an area equivalent to the vertical cross-section of the human body (Section 2.4). A time-averaging period of 6 min should be employed for frequencies up to 15 000 MHz. For frequencies above 15 000 MHz, the averaging time to be used, in minutes, shall be:

$$\text{Averaging Time} = 616\,000 / f^{1.2}$$

where f is the frequency in MHz.

Where the electromagnetic energy consists of a number of frequencies in the same or different frequency bands shown in Column 1 of Tables 5 and 6, then the ratio of the measured value at each frequency to the limit at that given frequency shown in Column 2, 3, or 4 shall be determined and the sum of all ratios thus obtained for all frequencies shall not exceed unity, when averaged spatially and over time. For field strength measurements, the measured values and the limits shall be squared before determining the ratios. The limit, as applied to multiple frequencies, can be expressed as:

$$\sum_{f=3\text{ kHz}}^{300\text{ GHz}} R_f \leq 1 \quad (2.4)$$

where f is the frequency for which measurements were taken and R_f is the ratio of the measured value at each frequency to the exposure limit at that given frequency, and where the electric or magnetic field strength is measured,

$$R_f = \left[\frac{\text{Measured Value of Field Strength at } f}{\text{Exposure Limit of Field Strength at } f} \right]^2 \quad (2.5)$$

or where the power density is measured,

$$R_f = \frac{\text{Measured Value of Power Density at } f}{\text{Exposure Limit of Power Density at } f} \quad (2.6)$$

Table 5. Exposure Limits for Controlled Environments.

1 Frequency (MHz)	2 Electric Field Strength; rms (V/m)	3 Magnetic Field Strength; rms (A/m)	4 Power Density (W/m ²)	5 Averaging Time (min)
0.003 - 1	600	4.9		6
1 - 10	600/ <i>f</i>	4.9/ <i>f</i>		6
10 - 30	60	4.9/ <i>f</i>		6
30 - 300	60	0.163	10*	6
300 - 1 500	3.54 <i>f</i> ^{0.5}	0.0094 <i>f</i> ^{0.5}	<i>f</i> /30	6
1 500 - 15 000	137	0.364	50	6
15 000 - 150 000	137	0.364	50	616 000 / <i>f</i> ^{1.2}
150 000 - 300 000	0.354 <i>f</i> ^{0.5}	9.4 x 10 ⁻⁴ <i>f</i> ^{0.5}	3.33 x 10 ⁻⁴ <i>f</i>	616 000 / <i>f</i> ^{1.2}

* Power density limit is applicable at frequencies greater than 100 MHz.

Notes: 1. Frequency, *f*, is in MHz.

2. A power density of 10 W/m² is equivalent to 1 mW/cm².

3. A magnetic field strength of 1 A/m corresponds to 1.257 microtesla (μT)
or 12.57 milligauss (mG).

Table 6. Exposure Limits for Uncontrolled Environments.

1 Frequency (MHz)	2 Electric Field Strength; rms (V/m)	3 Magnetic Field Strength; rms (A/m)	4 Power Density (W/m ²)	5 Averaging Time (min)
0.003 - 1	280	2.19		6
1 - 10	280/ <i>f</i>	2.19/ <i>f</i>		6
10 - 30	28	2.19/ <i>f</i>		6
30 - 300	28	0.073	2*	6
300 - 1 500	1.585 <i>f</i> ^{0.5}	0.0042 <i>f</i> ^{0.5}	<i>f</i> /150	6
1 500 - 15 000	61.4	0.163	10	6
15 000 - 150 000	61.4	0.163	10	616 000 / <i>f</i> ^{1.2}
150 000 - 300 000	0.158 <i>f</i> ^{0.5}	4.21 x 10 ⁻⁴ <i>f</i> ^{0.5}	6.67 x 10 ⁻⁵ <i>f</i>	616 000 / <i>f</i> ^{1.2}

* Power density limit is applicable at frequencies greater than 100 MHz.

Notes: 1. Frequency, *f*, is in MHz.

2. A power density of 10 W/m² is equivalent to 1 mW/cm².

3. A magnetic field strength of 1 A/m corresponds to 1.257 microtesla (μT) or 12.57 milligauss (mG).

2.2.1 Peak Field Strength Limit for Pulsed Fields

While the average power density of pulsed waves shall be within the limits specified in Tables 5 and 6, the peak value of the instantaneous electric field strength (temporal peak) in the frequency range of 0.1 to 300 000 MHz shall not exceed 100 kV/m.

For exposures to pulsed RF fields in the range of 0.1 to 300 000 MHz, peak pulse power densities are limited by the use of time averaging and the limit on peak electric field, with one exception: the total incident energy density during any one-tenth second period within the averaging time shall not exceed one-fifth of the total energy density permitted during the entire averaging time for a continuous field⁽⁹⁾.

This can be expressed as:

$$\sum^{0.1s} W_p T \leq \frac{W_a T_a}{5} \quad (2.7)$$

where,

W_p = peak RF power density, in W/m²

W_a = power density limit as specified in column 4 of Table 5 or 6, in W/m²

T = pulse duration, in seconds

T_a = averaging time as specified in column 5 of Table 5 or 6, in seconds.

A maximum of five pulses with pulse durations less than 100 ms is permitted during any period equal to the averaging time. If there are more than five pulses during the averaging time, or if the pulse duration is greater than 100 ms, normal time averaging calculations apply.

2.3 Time Averaging

For frequencies between 3 kHz and 100 kHz, the averaging time for induced and contact currents shall be 1 second (Section 2.1.2). For frequencies greater than 100 kHz and up to 15 000 MHz, time averaging provisions in this code take into account that the basic restrictions are designed to limit temperature increases in tissues. Temperature increases in living tissue due to RF energy absorption follow a well-defined pattern with a time constant of approximately 6 minutes (thermal time constant), where 63% of the steady state temperature increase occurs within 6 min. Time averaging permits exposures to be greater than the limits outlined in Sections 2.1 and 2.2 over short periods of time, provided that the total absorbed energy in any 6 min period does not exceed the energy absorbed from a constant (time invariant) exposure at the limits outlined in Sections 2.1 and 2.2. Since time averaging is based on absorbed energy considerations, the electric and magnetic field intensities shall be squared before time averaging is applied, while the power density and SAR are applied directly.

In situations where the exposure intensity varies significantly with time within a period of 6 min, time-averaged values must be calculated from multiple measurements, otherwise a single measurement is sufficient. Some instruments have time averaging capabilities; however, if this feature is not available, time averaged values over 6 min can be obtained by using the following formulae:

- (a) To obtain the time-averaged rms electric (E) or magnetic (H) field strength, use the applicable formula:

$$E = \left[\frac{1}{6} \sum_{i=1}^n E_i^2 \Delta t_i \right]^{0.5} \quad (2.8)$$

or

$$H = \left[\frac{1}{6} \sum_{i=1}^n H_i^2 \Delta t_i \right]^{0.5} \quad (2.9)$$

where E_i and H_i are the sampled rms electric and magnetic field strengths, respectively, which are considered to be constant in the i^{th} time period, Δt_i is the time duration, in minutes, of the i^{th} time period and n is the number of time periods within 6 min.

(b) To obtain the time-averaged power density W , use the formula:

$$W = \frac{1}{6} \sum_{i=1}^n W_i \Delta t_i \quad (2.10)$$

where W_i is the sampled power density in the i^{th} time period.

(c) To obtain the time averaged SAR, use the formula:

$$SAR = \frac{1}{6} \sum_{i=1}^n (SAR)_i \Delta t_i \quad (2.11)$$

where $(SAR)_i$ is the sampled SAR in the i^{th} time period.

Note 1: In all of the previous formulae, the following relationship shall be satisfied:

$$\sum_{i=1}^n \Delta t_i = 6 \text{ min} \quad (2.12)$$

Note 2: For pulsed fields, E_i and H_i are rms values, and W_i is the value averaged over the time interval Δt_i . If peak values are measured, the rms or average values shall be calculated.

2.4 Spatial Averaging

Spatial averaging takes into account that the maximum exposure limits for electric and magnetic field strengths and power density are derived from the basic restrictions for whole body averaged SAR (Section 2.1). The whole body averaged SAR will be equal to or less than the value in Table 1 for exposure to a uniform plane wave of intensity given in Table 5 or 6, respectively, for polarization along the body axis and for all human body sizes. It is important to note that the limits in Tables 5 and 6 represent the worst case coupling of absorbed power for all human body sizes at all frequencies. In most realistic situations, the exposure field is not uniform and therefore the field strength or power density should be spatially averaged before being compared to the maximum exposure limit.

Measurements to determine conformity with the limits specified in Section 2.2 shall be performed with field sensors (probes) placed at least 0.2 m away from any object or person. To determine the spatially averaged value, local values (including the maximum value) shall be measured over the projected surface area (flat plane), equivalent to the head and trunk region of persons (adults or children) who would occupy the area of the incident fields. It is advisable that the measurement points are uniformly spaced within the sampling area. Local values should be measured in nine or more points. Where the field is reasonably uniform (within 20%), a measurement in one location representative of the space that is occupied by a person is sufficient. Otherwise, the spatially averaged values shall be calculated from the following formulae:

$$E = \left[\frac{1}{n} \sum_{i=1}^n E_i^2 \right]^{0.5} \quad (2.13)$$

$$H = \left[\frac{1}{n} \sum_{i=1}^n H_i^2 \right]^{0.5} \quad (2.14)$$

$$W = \frac{1}{n} \sum_{i=1}^n W_i \quad (2.15)$$

where n is the number of locations, E_i , H_i and W_i are the electric field strength, the magnetic field strength and the power density, respectively, measured in the i^{th} location.

Definitions

antenna – A device for radiating or receiving radiofrequency (RF) energy.

basic restriction – Dosimetric limit directly related to established health effects that incorporate safety factors and are expressed in terms of internal body currents or specific absorption rate (100 kHz to 6 GHz).

contact current – Current flowing between an energized, isolated, conductive (metal) object and ground, through the human body.

continuous wave (CW) – Successive oscillations which are identical under steady-state conditions (an unmodulated electromagnetic wave).

controlled environment – A condition or area where exposure is incurred by persons who are aware of the potential for RF exposure and are cognizant of the intensity of the RF fields in their environment, where exposures are incurred by persons who are aware of the potential health risks associated with RF exposure and whom can control their risk using mitigation strategies.

electric field – The region surrounding an electric charge, in which the magnitude and direction of the force on a hypothetical test charge is defined at any point.

electromagnetic radiation – The propagation of time-varying electric and magnetic fields through space at the velocity of light.

extremities – Limbs of the body, including upper arms and thighs.

far-field zone – The space beyond an imaginary boundary around an antenna. The boundary marks the beginning where the angular field distribution is essentially independent of the distance from the antenna. In this zone, the field has a predominantly plane-wave character.

field strength – The magnitude of the electric or magnetic field, normally a root-mean-square (rms) value.

frequency – The number of sinusoidal cycles made by electromagnetic waves in one second; usually expressed in units of hertz (Hz).

general public – Individuals of all ages, body sizes and varying health status, some of whom may qualify for the conditions defined for the controlled environment in certain situations.

induced current – Current induced in a human body exposed to RF fields.

magnetic field – A region of space surrounding a moving charge (e.g. in a conductor) being defined at any point by the force that would be experienced by another hypothetical moving charge. A magnetic field exerts a force on charged particles only if they are in motion, and charged particles produce magnetic fields only when they are in motion.

near-field zone – A volume of space generally close to an antenna or other radiating structure, in which the electric and magnetic fields do not have a substantially plane-wave character, but vary considerably from point to point.

non-thermal effects – Biological effects ascribed to exposure to low-level electromagnetic fields, at levels below the threshold to induce thermally-related biological effects.

power density – The rate of flow of electromagnetic energy per unit surface area usually expressed in W/m^2 or mW/cm^2 or $\mu W/cm^2$.

radiofrequency (RF) – A frequency or rate of oscillation within the range of about 3 kHz to 300 GHz.

radiation (electromagnetic) – The emission or transfer of energy through space in the form of electromagnetic waves.

RF device – A device which generates and/or utilizes RF energy.

rms – root mean square. Mathematically, it is the square root of the average of the square of the instantaneous field or current taken throughout one period.

safety – The absence of detrimental health effects from RF exposures.

SI – An acronym of *Système international d'unités* (International System of Units).

specific absorption rate (SAR) – The rate of RF energy absorbed in tissue per unit mass. Quantitatively, it is the time derivative (rate) of the incremental energy (dW) absorbed by an incremental mass (dm) contained in a volume element (dV) of given mass density (ρ).

$$SAR = \frac{d}{dt} \left[\frac{dW}{dm} \right] = \frac{d}{dt} \left[\frac{dW}{\rho dV} \right]$$

SAR is expressed in units of watts per kilogram (W/kg). Also,

$$SAR = \frac{\sigma E^2}{\rho}$$

where σ is the tissue conductivity (S/m), E is the rms electric field strength induced in the tissue (V/m) and ρ is the mass density (kg/m^3).

thermal effects – Biological effects resulting from heating of the whole body or a localized region, where a sufficient temperature increase has occurred that results in a physiologically significant effect.

uncontrolled environment – A condition or area where exposures are incurred by persons that do not meet the criteria defined for the controlled environment.

wavelength – The distance travelled by a propagating wave in one cycle of oscillation.

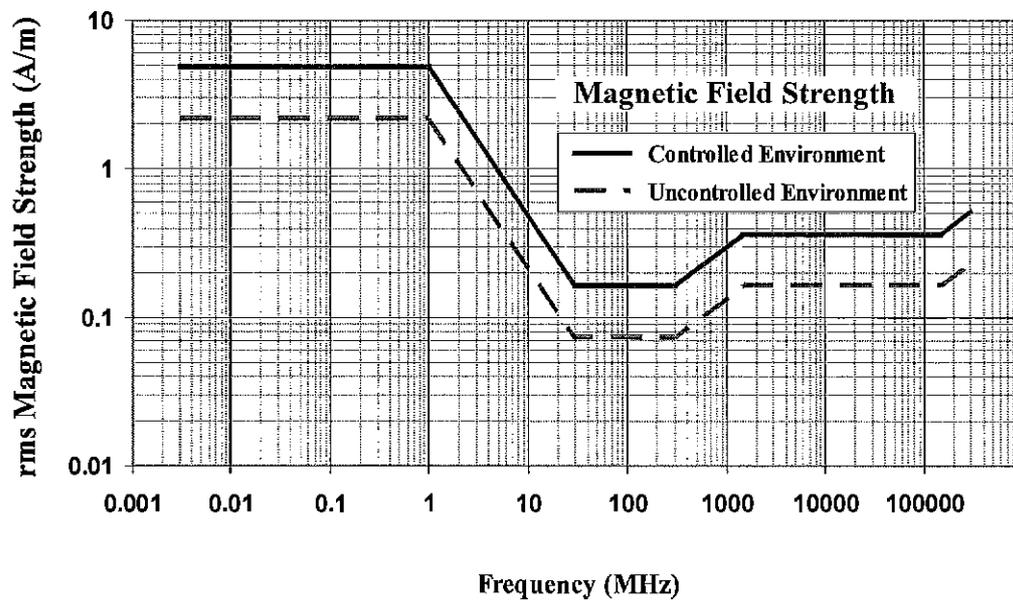
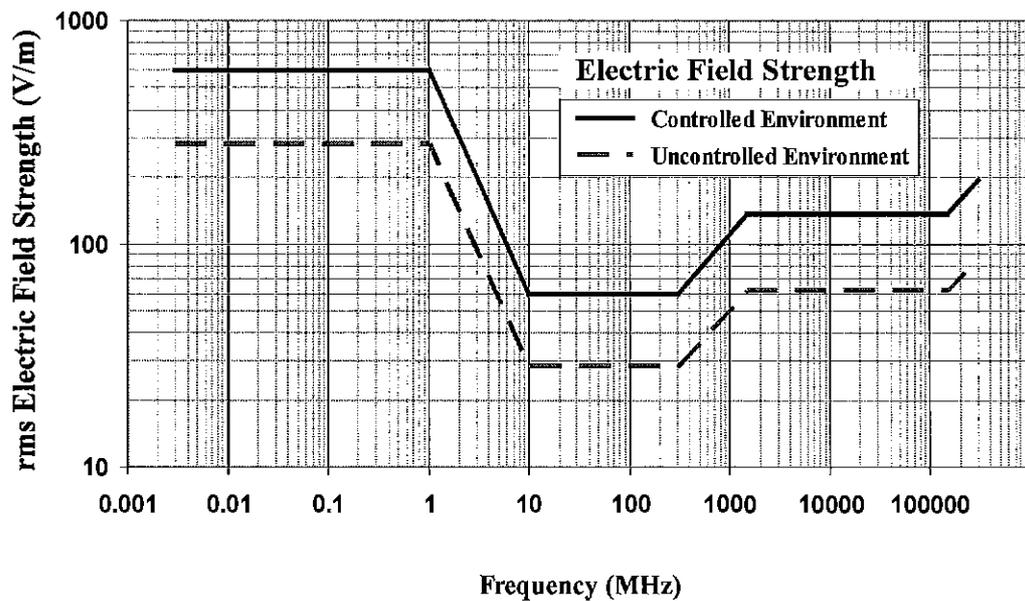
References

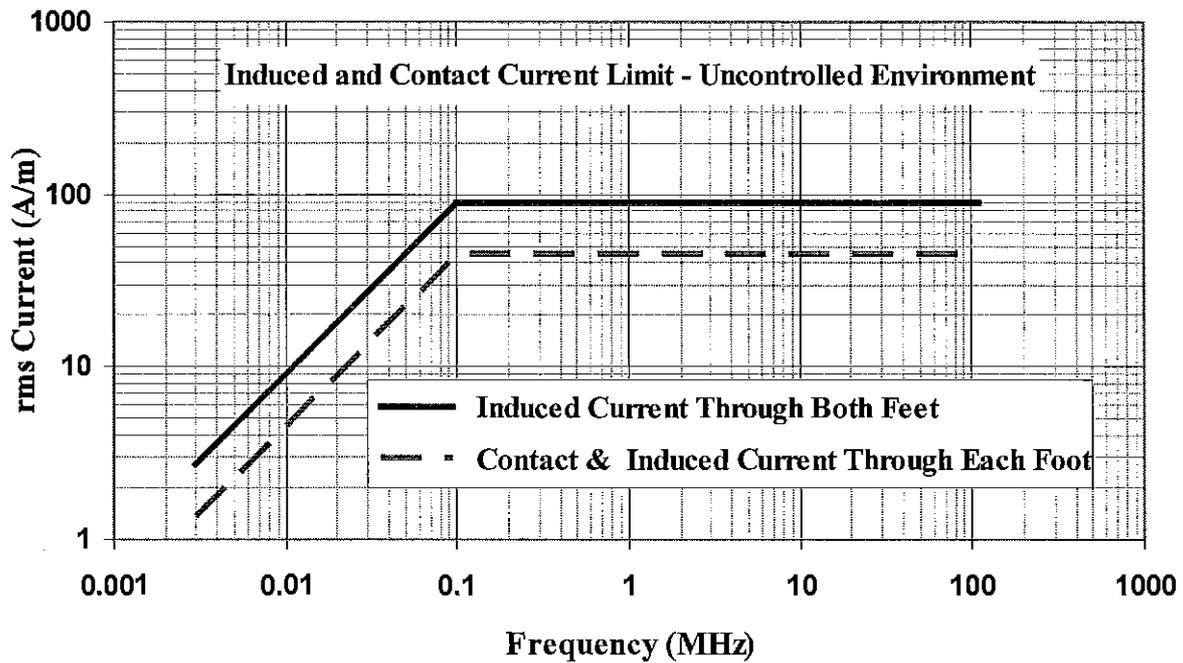
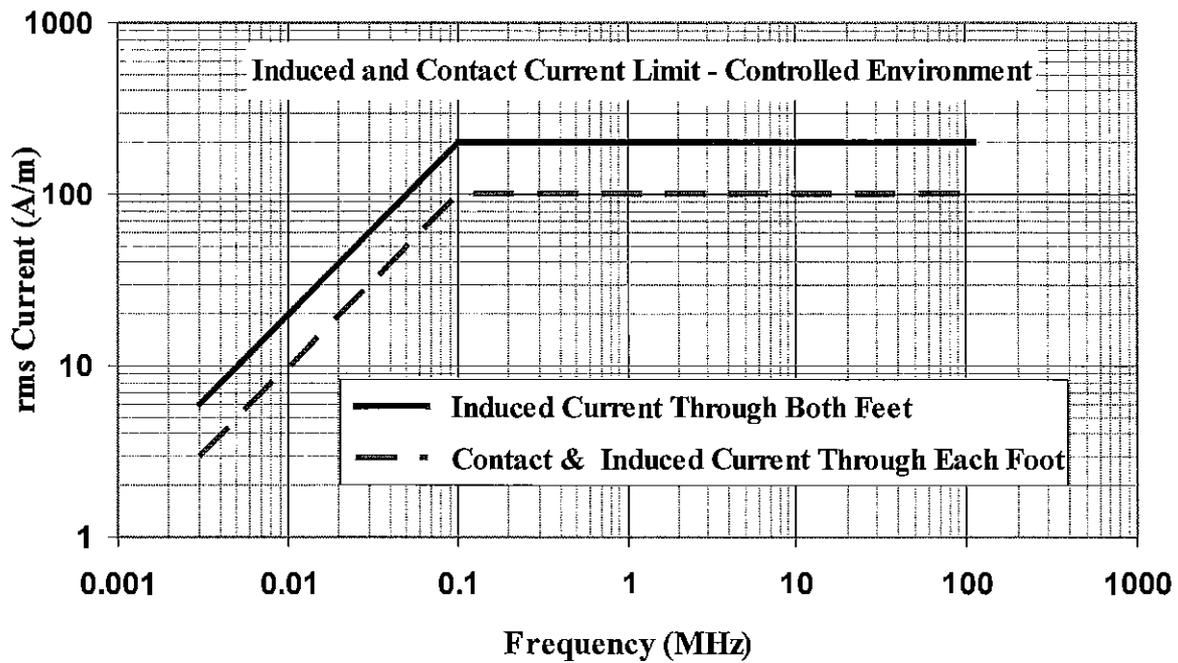
1. General Requirements and Information for the Certification of Radiocommunication Equipment (RSS–Gen), Spectrum Management and Telecommunications, Industry Canada, 2007.
2. Radio Frequency Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands) (RSS–I02), Spectrum Management and Telecommunications, Industry Canada, 2005.
3. Radiocommunication and Broadcasting Antenna Systems, Issue 4, Client Procedures Circular (CPC–2–0–03), Spectrum Management and Telecommunications, Industry Canada, 2008.
4. Extremely Low Frequency Fields, Environmental Health Criteria 238, World Health Organization, Geneva, Switzerland, 2007.
5. Electromagnetic Fields (300 Hz to 300 GHz), Environmental Health Criteria 137, World Health Organization, Geneva, Switzerland, 1993.
6. Vecchia P. Exposure of humans to electromagnetic fields. Standards and Regulations. *Ann. Ist. Super Sanita.* 43:260–267, 2007.
7. D’Andrea JA, Ziriak JM, Adair ER. Radio frequency electromagnetic fields: mild hyperthermia and safety standards. *Prog. Brain Res.* 162:107–135, 2007.
8. International Commission on Non-Ionizing Radiation Protection. Guidelines for limiting exposure to time-varying electric, magnetic, and electromagnetic fields (up to 300 GHz). *Health Phys.* 74:494–522, 1998.
9. International Committee on Electromagnetic Safety. IEEE Standard for Safety Levels with respect to human exposure to radiofrequency electromagnetic fields, 3 kHz to 300 GHz. New York: Institute of Electrical and Electronic Engineers; IEEE Standard C95.1–2005.
10. Framework for developing health-based EMF standards, World Health Organization, Geneva, Switzerland, 2006.
11. International Commission on Non-Ionizing Radiation Protection (ICNIRP) Statement: General Approach to protection against non-ionizing radiation. *Health Phys.* 82:540–548, 2002.
12. Roy CR, Martin LJ. A comparison of important international and national standards for limiting exposure to EMF including the scientific rationale. *Health Phys.* 92:635–641, 2007.
13. SCENIHR (Scientific Committee on emerging and Newly Identified Health Risks). Possible Effects of Electromagnetic Fields (EMF) on Human Health, Health and Consumer Protection – Directorate General, European Commission, 2007.
14. Lahkola A, Auvinen A, Raitanen J, Schoemaker MJ, Christensen HC, Feychting M, Johansen C, Klæboe L, Lönn S, Swerdlow AJ, Tynes T, Salminen T. Mobile phone use and risk of glioma in 5 North European countries. *Int. J. Cancer.* 120:1769–1775, 2007.
15. Lahkola A, Salminen T, Raitanen J, Heinävaara S, Schoemaker MJ, Christensen HC, Feychting M, Johansen C, Klæboe L, Lönn S, Swerdlow AJ, Tynes T, Auvinen A. Meningioma and mobile phone use—a collaborative case-control study in five North European countries. *Int. J. Epidemiol.* 37:1304–1313, 2008.

16. Kan P, Simonsen SE, Lyon JL, Kestle JR. Cellular phone use and brain tumor: a meta-analysis. *J. Neurooncol.* 86:71–78, 2008.
17. Krewski D, Glickman BW, Habash RW, Habbick B, Lotz WG, Mandeville R, Prato FS, Salem T, Weaver DF. Recent advances in research on radiofrequency fields and health: 2001-2003. *J. Toxicol. Environ. Health B Crit. Rev.* 10:287–318, 2007.
18. Valberg PA, van Deventer TE, Repacholi MH. Workgroup report: base stations and wireless networks-radiofrequency (RF) exposures and health consequences. *Environ. Health Perspect.* 115:416–424, 2007.
19. Moulder JE, Foster KR, Erdreich LS, McNamee JP. Mobile phones, mobile phone base stations and cancer: a review. *Int. J. Radiat. Biol.* 81:189–203, 2005.
20. Verschaeve L. Genetic damage in subjects exposed to radiofrequency radiation. *Mutat. Res.* 681:259–270, 2009.
21. Cook CM, Saucier DM, Thomas AW, Prato FS. Exposure to ELF magnetic and ELF-modulated radiofrequency fields: the time course of physiological and cognitive effects observed in recent studies (2001–2005). *Bioelectromagnetics.* 27:613–627, 2006.
22. D’Andrea JA, Chou CK, Johnston SA, Adair ER. Microwave effects on the nervous system. *Bioelectromagnetics. Suppl.* 6:S107–147, 2003.
23. D’Andrea JA, Adair ER, de Lorge JO. Behavioural and cognitive effects of microwave exposure. *Bioelectromagnetics. Suppl.* 6:S39–62, 2003.
24. McNamee JP and Bellier PV, “Cytogenetic and Carcinogenetic Effects of Exposure to Radiofrequency Radiation” In: “Chromosomal Alterations: Methods, Results and Importance in Human Health. Obe, Günter; Vijayalaxmi (Eds.) 2007, XXIV, 515 p.” Springer-Verlag, Heidelberg, Germany (ISBN:9783540714132).
25. Jauchem JR. Effects of low-level radio-frequency (3kHz to 300GHz) energy on human cardiovascular, reproductive, immune, and other systems: a review of the recent literature. *Int. J. Hyg. Environ. Health.* 211:1–29, 2008.
26. Rubin GJ, Das Munshi J, Wessely S. Electromagnetic hypersensitivity: a systematic review of provocation studies. *Psychosom. Med.* 67:224–232, 2005.
27. Rössli M. Radiofrequency electromagnetic field exposure and non-specific symptoms of ill health: a systematic review. *Environ. Res.* 107:277–287, 2008.
28. Chauhan V, McNamee JP. Radiofrequency emissions and gene/protein expression: A review. *Radiat. Res.* 172:265-287, 2009.
29. Habash RWY, Byus CV, Elwood JM, Krewski D, Lotz WG, McBride ML, McNamee JP, Prato FS. Recent Advances in Research on Radiofrequency fields and Health: 2004–2007. *J. Toxicol. Environ. Health B Crit. Rev.* 12:250-288, 2009.
30. Exposure to high frequency electromagnetic fields, biological effects and health consequences (100 kHz–300 GHz) – Review of the Scientific Evidence and Health Consequences. Munich: International Commission on Non-Ionizing Radiation Protection; 2009. ISBN 978–3–934994–10–2.

31. Reilly JP. *Applied Bioelectricity: from electrical stimulation to electropathology*, New York, Springer, 1998.
32. IEEE Standard C95.6-2002, *IEEE Standard for Safety Levels with respect to human exposure to electromagnetic fields, 0–3 kHz*. New York, Institute of Electrical and Electronic Engineers, 2002.

Appendix I – Maximum Exposure Limits for RF energy





ATTACHMENT 5

TELECOMMUNICATION PROTOCOL COMPARISON CHART - INDUSTRY CANADA & CITY OF VAUGHAN

	Protocol Requirements	Industry Canada (January 1, 2008)	Existing City of Vaughan Protocol (June 23, 2003)	Opportunities for new City of Vaughan Protocol
a.	Use of Existing Infrastructure	<ul style="list-style-type: none"> Proponents must consider sharing an existing antenna system, modifying or replacing an existing structure if necessary, and attempt to use existing infrastructure such as rooftops, water towers, etc. Proponents expected to utilize existing infrastructure prior to proposing a new structure, unless LUA prefers a new structure. 	<ul style="list-style-type: none"> Encourages use of existing structures wherever possible. 	<ul style="list-style-type: none"> Where and when co-location should occur. Possible incentives for co-locating. Justification requirements as to why co-location is not possible. Notification of other industry carriers.
b.	Exemptions	<ul style="list-style-type: none"> Maintenance of existing structures. Addition or modification of existing structures, up to 25% of original structure's height. Maintenance of an antenna system's painting or lighting to comply with Transport Canada's requirements. Installation of antenna system for special events or emergency operations (up to 3 months). New antenna systems, including masts, towers or other antenna-supporting structure, up to 15 m in height. Proponents encouraged to consult with LUA and public even if structure is exempt. 	<ul style="list-style-type: none"> Co-locating antennas on existing structures. Modification or replacement towers where the proposed height does not exceed the existing height by more than 10%, and where the proposed tower is within the development envelope. Towers on any building where the tower height does not exceed 25% of the building height or 16.6 m, whichever is greater, and a building permit is required. Hydro towers as a co-location situation, if facility is at least 100 m away from residential areas. Modifications or replacements of existing towers in industrial areas, 	<ul style="list-style-type: none"> Opportunity to harmonize new protocol with Industry Canada exemption requirements. Protocol may identify additional exclusion criteria.

	Protocol Requirements	Industry Canada (January 1, 2008)	Existing City of Vaughan Protocol (June 23, 2003)	Opportunities for new City of Vaughan Protocol
			which are at least 100 m away from residential areas.	
c.	Preliminary Consultation with Land Use Authority (LUA)	<ul style="list-style-type: none"> Unless proposal is exempt, proponents must consult with LUA to discuss site options, local processes, address reasonable and relevant concerns¹ and obtain land-use concurrence in writing. 	<ul style="list-style-type: none"> Staff provides information package detailing consultation process, documents, fees, drawings to be submitted, and a list of agencies to be consulted. Members of Council must receive at least 2 weeks prior notice of any proposed modifications to existing structures. 	<ul style="list-style-type: none"> Preliminary consultation requirements: when and what process it should follow.
d.	Application Process / Requirements	<ul style="list-style-type: none"> Investigate sharing or use of existing infrastructure. Contact LUA to determine local requirements. Undertake LUA public consultation process. Satisfy Industry Canada's general and technical requirements. Submit licence application. 	<ul style="list-style-type: none"> Processed similar to a Site Development Application. Supporting information package required. 	<ul style="list-style-type: none"> Protocol must determine application process for telecommunication facilities, submission requirements, supporting information such as a site selection/justification report, and a method for tracking applications.
e.	Site Selection Criteria	<ul style="list-style-type: none"> Determined by LUA. 	<ul style="list-style-type: none"> Maximize distances from residential areas, public and institutional facilities such as schools, hospitals, community centres, day care centres and seniors' residences. Avoid natural features, vegetation, hazard lands. 	<ul style="list-style-type: none"> Appropriate distances from sensitive land uses and environmentally sensitive areas. Anticipating future technologies such as LTE (4G) networks.

	Protocol Requirements	Industry Canada (January 1, 2008)	Existing City of Vaughan Protocol (June 23, 2003)	Opportunities for new City of Vaughan Protocol
			<ul style="list-style-type: none"> • Avoid areas of topographical prominence, where possible. • Compatibility with adjacent uses. • Access. 	
f.	Design Guidelines	<ul style="list-style-type: none"> • Determined by LUA. 	<ul style="list-style-type: none"> • Flagpole cell towers and other desirable forms preferred. • Minimize visual impact. • Avoid disturbance to natural features. • Type, colouring and design to be consistent with surrounding area. • Landscaping to be provided where appropriate. 	<ul style="list-style-type: none"> • Guidelines should be developed to address stealth design and camouflaging, scale, landscaping, Heritage District guidelines and signage opportunities.
g.	Public Consultation Exemptions	<ul style="list-style-type: none"> • All proposals subject to Industry Canada approval require public consultation, unless stipulated otherwise by the LUA. 	<ul style="list-style-type: none"> • Proposals already exempt from municipal approval. • Towers less than 16.6 m in height. • Towers within industrial and commercial zones, located a minimum of 100 m away from residential areas. 	<ul style="list-style-type: none"> • Opportunity to harmonize new protocol with Industry Canada exemptions. • May identify additional public consultation exemptions.
h.	Public Consultation / Notification	<ul style="list-style-type: none"> • Default public consultation process for LUAs without an established process. • Proponent must provide notification package to public, neighbouring LUAs, business and property owners within a radius of 3 times the 	<ul style="list-style-type: none"> • Proponent responsible for notification and public consultation. • Notice sent by regular mail to owners within 120 m or 3 times the tower height, whichever is greater, within urban areas. • Notice provided within 250 m in rural 	<ul style="list-style-type: none"> • Public notification distances, timing and procedures (e.g. website notification).

	Protocol Requirements	Industry Canada (January 1, 2008)	Existing City of Vaughan Protocol (June 23, 2003)	Opportunities for new City of Vaughan Protocol
		tower height. <ul style="list-style-type: none"> • 30 days for public comment. • In areas of seasonable residence, proponent and LUA determine consultation process. • For structures over 30 m in height, proponents must place a notice in the local community newspaper. 	areas, and to area ratepayers associations. <ul style="list-style-type: none"> • Notice to Council, Commissioner/ Director of Planning, City Clerk, Ward Councillor, and municipalities within 500 m of proposed facility. • Notice may be given to a condominium corporation instead of assessed owners. • Notice shall be post-dated at least 20 days prior to meeting. 	
i.	Community Meeting	<ul style="list-style-type: none"> • Not required in default consultation process. • Determined by LUA. 	<ul style="list-style-type: none"> • Proponent must provide colour photograph of property with a superimposed image of tower. • Proponent to provide City with attendees' contact information and meeting minutes. 	<ul style="list-style-type: none"> • Protocol must determine community meeting and/or open house requirements.
j.	Responding to Public	<ul style="list-style-type: none"> • Proponent must respond to public comments within 14 days, and address all reasonable and relevant concerns¹ in writing within 60 days. • Proponent must indicate in writing that public has 21 days to respond. • Proponent keeps records of all correspondence and provides copy to Industry Canada. 	<ul style="list-style-type: none"> • Proponents required to follow-up with the public and provide copies of correspondence to City. 	<ul style="list-style-type: none"> • Protocol may establish requirements/timeline for responding to public concerns.

	Protocol Requirements	Industry Canada (January 1, 2008)	Existing City of Vaughan Protocol (June 23, 2003)	Opportunities for new City of Vaughan Protocol
k.	Dispute Resolution	<ul style="list-style-type: none"> When parties have reached an impasse, the proponent or stakeholder (other than the general public) may file for dispute resolution. Industry Canada will make a final decision, or suggest an alternate dispute resolution process. 	<ul style="list-style-type: none"> No dispute resolution process in place. Proponent's responsibility to resolve issues. 	<ul style="list-style-type: none"> Process for resolving issues with the public, City or other key stakeholders.
l.	Concluding Consultation	<ul style="list-style-type: none"> Proponent must conclude LUA consultation requirements, carry out public consultation, and address all reasonable and relevant concerns.¹ 	<ul style="list-style-type: none"> Agreement, undertaking or letter of commitment may be required to address removal of structures upon expiration of lease; posting of securities; and a commitment to accommodate other providers on site, where feasible. Protocol does not address completion of LUA consultation process. 	<ul style="list-style-type: none"> Must establish potential agreement or undertaking, Building Permit requirements for antennas installed on buildings, obtaining final concurrence, and potential delegation of authority for granting final concurrence.
m.	Timeframe	<ul style="list-style-type: none"> 120-day consultation process, which commences with written request to LUA. 	<ul style="list-style-type: none"> City will endeavour to complete circulation and make view known within 60 days. Complete review and approval process within 120 days. 	<ul style="list-style-type: none"> Establish milestones for completing process within 120 days. Potential expedited process for proposals exempt from public consultation.
n.	Fees	<ul style="list-style-type: none"> Licencing and other fees stipulated by Industry Canada. 	<ul style="list-style-type: none"> Site Development Application fees as per the City's Tariff of Fees By- 	<ul style="list-style-type: none"> Protocol must determine fees.

	Protocol Requirements	Industry Canada (January 1, 2008)	Existing City of Vaughan Protocol (June 23, 2003)	Opportunities for new City of Vaughan Protocol
		<ul style="list-style-type: none"> Other fees determined by LUA. 	<ul style="list-style-type: none"> law for Planning Applications. Additional fees may apply from other approval authorities (e.g. York Region & TRCA). 	
o.	Additional Requirements	<ul style="list-style-type: none"> Proponent must comply with Health Canada's Safety Code 6, radio frequency immunity criteria, the <i>Canadian Environmental Assessment Act</i>, and Transport Canada/NAV CANADA aeronautical safety responsibilities. Proponent must notify nearby broadcasting stations. 	<ul style="list-style-type: none"> No additional requirements. 	<ul style="list-style-type: none"> Protocol may incorporate additional requirements, such as procedures for locating telecommunication facilities on City-owned lands, and attestation from the proponent that the proposal complies with Safety Code 6.

¹ According to Industry Canada, reasonable and relevant concerns include:

- Why is the use of an existing antenna system or structure not possible?
- Why is an alternate site not possible?
- What is the proponent doing to ensure that the antenna system is not accessible to the general public?
- How is the proponent trying to integrate the antenna into the local surroundings?
- What options are available to satisfy aeronautical obstruction marking requirements at this site?
- What are the steps the proponent took to ensure compliance with Industry Canada requirements of this document including the *Canadian Environmental Assessment Act* (CEAA), Safety Code 6, etc.?

Concerns that are not relevant include:

- Disputes with the public related to the proponent's service, but unrelated to antenna installations
- Potential effects that a proposed antenna system will have on property values or municipal taxes;
- Questions whether the *Radiocommunication Act*, this document, Safety Code 6, locally established by-laws, other legislation, procedures or processes are valid or should be reformed in some manner.

ATTACHMENT 6

TELECOMMUNICATION PROTOCOL COMPARISON CHART – SURROUNDING MUNICIPALITIES

	Protocol Requirements	Town of RICHMOND HILL (January 2011)	Town of MARKHAM (June 2009)	City of TORONTO (January 28, 2009)	City of BRAMPTON (February 16, 2011)
a.	Use of Existing Infrastructure	<ul style="list-style-type: none"> For new antenna structures, proponents must justify why existing infrastructure cannot be used, a list of other structures considered unsuitable, and future sharing opportunities. 	<ul style="list-style-type: none"> Encouraged to co-locate on existing telecommunications towers, such as water towers, rooftops, existing towers, etc. Minimize total number of existing and proposed towers in area. For new towers, proponent must make effort to co-locate or accommodate additional users. 	<ul style="list-style-type: none"> Proponents expected to co-locate on existing towers. Proponents to work co-operatively with other industry providers in reaching co-location agreements. Proponents for new towers required to submit a Site Selection / Justification Report. Exclusivity agreements which limit access from other proponents are unacceptable. 	<ul style="list-style-type: none"> New towers to be constructed on an as-needed basis. Proponent must demonstrate that existing towers or structures cannot be utilized. Proponent must send a letter to all other industry providers requesting confirmation whether other carriers are interested in co-locating; copies of correspondence to be provided to City.
c.	Preliminary Consultation with LUA	<ul style="list-style-type: none"> Required prior to formal submission, unless proponent makes preliminary contact with Town via a covering letter with Notification Package and fees. 	<ul style="list-style-type: none"> Required between proponents and staff. Staff to provide details regarding location, preliminary comments, process, public consultation, submission requirements, fees, agencies to be consulted, and location of Town owned land or 	<ul style="list-style-type: none"> Required to determine if a building permit is required; determine emission levels in compliance with Safety Code 6; and, if applicable, explore preferred site locations and siting, design & co-location. 	<ul style="list-style-type: none"> Required to address land use compatibility, sensitive visual areas and vistas, existing and proposed land uses, and any other potential impacts. Pre-Consultation Application package required, including associated plan,

	Protocol Requirements	Town of RICHMOND HILL (January 2011)	Town of MARKHAM (June 2009)	City of TORONTO (January 28, 2009)	City of BRAMPTON (February 16, 2011)
			facilities that may be a suitable site.		background materials and fees.
d.	Application Process / Requirements	<ul style="list-style-type: none"> • Notification Package required with submission (Appendix 2 of Industry Canada's default consultation process). • Additional information may be required. • Town advises proponent if application is deemed complete. • Town staff coordinates and distributes all written comments to proponent, and relays responses back to public. • Town prepares land-use comments to proponent, and Industry Canada. 	<ul style="list-style-type: none"> • Site Plan process. • Supporting information package required. • Town staff to provide guidance regarding public consultation, format for the community information session notice, mailing list of parties to be notified, an appropriate location for session, and make recommendation to Development Services Committee. 	<ul style="list-style-type: none"> • Telecommunication Tower Review Application with required drawings and information, including Site Selection / Justification Report. • Application circulated to affected City Divisions and agencies, adjacent municipalities within 120 m of site, and Local Ward Councillor. 	<ul style="list-style-type: none"> • Site plan application required, including detailed plans showing the location, design, grading/drainage, and landscaping buffer. • City circulates application to affected internal and external agencies, including abutting municipalities within 500 m. • All installations of antennas on existing structures subject to City's expedited Site Plan Approval process.
e.	Site Selection Criteria	<ul style="list-style-type: none"> • New antenna systems encouraged to locate in a manner that respects natural features, landscapes and significant sight-lines in the Town. • Desirable distances from 	<ul style="list-style-type: none"> • Maximize distance from residential zones. • Minimize any negative visual impacts. • Avoid significant natural features, including hazard lands. • Avoid areas of 	<ul style="list-style-type: none"> • The following options to be considered (in order): co-location on existing facilities; new location on existing facilities; industrial areas 120 m from residential areas; monopoles with co- 	<ul style="list-style-type: none"> • New towers encouraged to locate on existing structures such as high-rise buildings, church steeples, hydro towers, and existing telecom towers. • Monopole structure

	Protocol Requirements	Town of RICHMOND HILL (January 2011)	Town of MARKHAM (June 2009)	City of TORONTO (January 28, 2009)	City of BRAMPTON (February 16, 2011)
		residential and institutional uses whenever technically possible and feasible.	<p>topographical prominence.</p> <ul style="list-style-type: none"> • Ensure that access requirements are sensitively integrated. • Avoid new towers in Heritage Conservation Districts and Heritage Conservation Study Areas. 	<p>location capability; and disguised installations.</p> <ul style="list-style-type: none"> • Minimize total number of tower sites required. • Maximize distance (at least 120 m) from residential areas, centres, and heritage buildings and sites. • Avoid parks and open spaces, sites of topographical prominence, sites that would obscure public views or vistas. • Compatibility with adjacent uses. • Access. 	<p>encouraged.</p> <ul style="list-style-type: none"> • Towers shall not be located at prominent vistas, adjacent to residential developments, or frontages of major roads and highways. • Minimum setback of tower to a road ROW shall be the tower height (except for towers that mimic streetlights or other street furniture). • Minimum setback to a residential property shall be twice the tower height.
f.	Design Guidelines	<ul style="list-style-type: none"> • No specific design guidelines outlined in protocol. • Proponents typically required to submit Context Plan, Tree Inventory and Tree Preservation Plan/Report, Site Plan, Exterior Lighting Plan and Landscape Plan. 	<ul style="list-style-type: none"> • Type, size, location, height, width, configuration and colour or proposed tower shall blend in with area, where permitted by Transport Canada and/or NAV Canada. • Landscaping or a lump sum cash payment in lieu of landscaping may be required. • Design should fit into and 	<ul style="list-style-type: none"> • Towers outside of residential areas and centres to accommodate at least two other users. • Architectural style must be compatible with neighbourhood. • Monopoles to be used within residential areas and centres. • Towers encouraged to be setback from property lines a distance equal to 	<ul style="list-style-type: none"> • Tower style shall be compatible with surrounding neighbourhood. • Lattice type structures only permitted at rear yards of industrial sites. • Slim monopole design, with antennas that are flush-mounted. • Tower colour shall reduce visual impact; non-reflective white or

	Protocol Requirements	Town of RICHMOND HILL (January 2011)	Town of MARKHAM (June 2009)	City of TORONTO (January 28, 2009)	City of BRAMPTON (February 16, 2011)
			<p>be compatible with immediate context.</p> <ul style="list-style-type: none"> • Design should mimic other features in area context (e.g. clock towers, flag poles, church steeples). • No signs not directly related to equipment, or other on-site land uses permitted unless it complies with Town's sign by-law. • Proponent encouraged to relocate tower to a more suitable location as one becomes available (if feasible). • Small plaque to be based at tower base identifying owner/operator and a contact number. 	<p>tower height.</p> <ul style="list-style-type: none"> • One parking space at each tower site with access from a public ROW. • Decrease size and visibility of towers. • Lighting prohibited unless required by Navigation Canada. • Towers may accommodate only telecommunication antennas; no other signage permitted. • Where equipment shelters are on building roofs, min. 3 m setback to roof edge, with a max. 4 m height. • Where towers are on building roofs, max. 5 m in height from roof-level and min. 5 m setback from roof edge. 	<p>light grey colour shall be provided.</p> <ul style="list-style-type: none"> • Ground level to be landscaped. • Visual impact of equipment shelters to be mitigated through colour, decorative fencing, screening, and/or landscaping. • Towers shall be designed to allow co-occupancy. • Other than a plaque to identify carrier(s), no advertisements permitted.
g.	Public Consultation Exemptions	<ul style="list-style-type: none"> • Roof-top antenna systems, utility/street-light poles with attached antenna systems and ground-based antenna systems less than 15 m 	<ul style="list-style-type: none"> • Telecommunication towers on Town owned lands and/or facilities (internal municipal review required). • All proposals exempt 	<ul style="list-style-type: none"> • New towers 120 m away from residential areas and centres. • Replacement of and/or modification to existing towers 120 m away from 	<ul style="list-style-type: none"> • Not addressed in protocol.

	Protocol Requirements	Town of RICHMOND HILL (January 2011)	Town of MARKHAM (June 2009)	City of TORONTO (January 28, 2009)	City of BRAMPTON (February 16, 2011)
		<p>in height.</p> <ul style="list-style-type: none"> • Portable or temporary “on-the-ground” antenna systems provided that the proponent enters into an agreement with the Town. 	<p>from municipal review.</p> <ul style="list-style-type: none"> • New antenna systems less than 15 m high. • Towers within industrial, institutional and commercial zoned areas, where tower is located at least 120 m or 3 times the tower height away from residential zones. 	<p>residential areas and centres, provided that height increase does not exceed 25% of originally approved height, and tower is located within originally approved building envelope.</p> <ul style="list-style-type: none"> • All proposals exempt from municipal review. • City requires information regarding exempt proposals. 	
h.	Public Consultation/ Notification	<ul style="list-style-type: none"> • Proponent notifies landowners and municipalities within a radius of 4 times the tower height in urban areas, and 8 times the tower height in rural areas. • Notice provided to Town Clerk and local Industry Canada office. • Notice must occur 30 days prior to meeting. • Public notice sign required on lands. • Written comments from the public sent directly to the Town. 	<ul style="list-style-type: none"> • Proponent to give notice by regular mail to all property owners and adjacent municipalities within a 120 m radius or 3 times the tower height. • Notice by regular mail to area ratepayer associations. • For a tower 45 m or more in height, proponent places notice in local community paper. • Notice may be given to a condominium corporation, rather than all owners. • Notice to Chairman of 	<ul style="list-style-type: none"> • Notice required for owners and tenants within 120 m of proposed facility or 3 times the proposed tower height, and 25 m of a proposed antenna. • Notification area may be expanded after consultation with Local Ward Councillor. • Notice to Local Ward Councillor, Director of Community Planning and Industry Canada. • Notice to be sent by regular mail 30 days prior to meeting. 	<ul style="list-style-type: none"> • Proponent must provide information package to notify owners within a radius of 3 times the tower height. • 30 days for public comment. • Proponent provides City with affidavit regarding public notification.

	Protocol Requirements	Town of RICHMOND HILL (January 2011)	Town of MARKHAM (June 2009)	City of TORONTO (January 28, 2009)	City of BRAMPTON (February 16, 2011)
		<ul style="list-style-type: none"> • Town comments on proposal submission and public comments. • Written public comments to proponent must occur within 30-60 days from mailing of notice. • Proponent must respond to Town within 14 days to acknowledge receipt. 	<p>Development Services Committee, Ward Councillor, Director of Planning and Town Clerk.</p>	<ul style="list-style-type: none"> • Proponent to provide City Planning with a copy of mailing list and affidavit that notice has been given. 	
i.	Community Meeting/ Information Session	<ul style="list-style-type: none"> • Meeting to be open and accessible to public. • Convened and moderated by proponent. • Speakers allotted 3-5 minutes speaking time. • Meeting must occur within 30-40 days from mailing of notice. • Proponent displays 4 colour photographs with a superimposed image of proposed structure. • Proponent provides Town with contact information for all attendees. • Proponent to provide written and verbal notice that Town is a commenting agency 	<ul style="list-style-type: none"> • Proponent responsible for organizing and holding a community information session. • Proponent to distribute comment cards at session, and prepare a record of attendees. 	<ul style="list-style-type: none"> • Proponent responsible for organizing and chairing community meeting. • Proponent must provide visual display: 24" x 36" colour photograph of property with superimposed image of tower. • Industry Canada will be requested to attend meetings for complex or sensitive applications. • Proponent will provide City with a record containing list of attendees and contact info, minutes, and copies of letters. 	<ul style="list-style-type: none"> • Not required.

	Protocol Requirements	Town of RICHMOND HILL (January 2011)	Town of MARKHAM (June 2009)	City of TORONTO (January 28, 2009)	City of BRAMPTON (February 16, 2011)
		only, and all decisions are to be made by Industry Canada.			
j.	Responding to Public	<ul style="list-style-type: none"> Proponent shall respond to Town in writing within 60 days of receiving comments from Town and public. Proponent must address all reasonable and relevant concerns from community meeting. Town will respond to a written response from proponent within 21 days and advise when Council will ratify their position. 	<ul style="list-style-type: none"> Copies of records and follow-up correspondence to be provided to City. 	<ul style="list-style-type: none"> Copies of follow-up correspondence to be provided to City. 	<ul style="list-style-type: none"> Proponents must respond to concerns within 14 days to acknowledge receipt, and address all reasonable and relevant concerns within 60 days. Proponent must indicate in any response letters that the party has 21 days to respond. Copies of correspondence to be provided to City.
k.	Dispute Resolution	<ul style="list-style-type: none"> Any impasses will be declared by Council via ratification of their official position. Industry Canada will make final decision or suggest and implement alternative methods. 	<ul style="list-style-type: none"> Not specifically outlined in protocol. 	<ul style="list-style-type: none"> City will provide proponent with comments from Departments/Agencies. If revisions agreed to, proponent encouraged to resubmit drawings and documents. 	<ul style="list-style-type: none"> City will inform Industry Canada if there are irresolvable concerns. Industry Canada to provide final decision.

	Protocol Requirements	Town of RICHMONDHILL (January 2011)	Town of MARKHAM (June 2009)	City of TORONTO (January 28, 2009)	City of BRAMPTON (February 16, 2011)
I.	Concluding Consultation	<ul style="list-style-type: none"> • Staff will provide comments to both proponent and to Industry Canada. • Council will ratify final comments as the official Town position. • Agreement may be required to ensure removal of antenna systems that have been deactivated and left unused or abandoned for two years, and/or for the posting of securities of fencing, screening and landscaping; and the commitment to accommodate other providers on site where feasible. 	<ul style="list-style-type: none"> • May be required to enter into an undertaking, which includes: the location and design of tower; in the case of a lease between Town and proponent, the removal of all structures upon expiration of lease; landscaping provisions; compliance with Industry Canada's CPC-2-0-17. • For tower proposals exempt from public consultation, Director of Planning provides concurrence. • Where public consultation is required, proponent seeks approval from Development Services Committee. • If Committee approves proposal, proponent must submit 15 copies of site plan and elevations to Director of Planning for final approval. • Final concurrence given by Director of Planning. 	<ul style="list-style-type: none"> • Agreement may be required to address removal of tower if deactivated or unused for 2 years; securities for construction of fencing, screening and landscaping; and commitment to accommodate other providers on site. • Letter to proponent and Industry Canada stating whether the local land-use consultation has been completed. • Recommendation regarding concurrence or non-concurrence with City requirements. • Copy of letter provided to all interested parties and Local Ward Councillor. 	<ul style="list-style-type: none"> • May be required to address posting of securities for landscaping and engineering purposes. • If proposal deemed acceptable, City issues municipal concurrence (site plan approval).

	Protocol Requirements	Town of RICHMONDHILL (January 2011)	Town of MARKHAM (June 2009)	City of TORONTO (January 28, 2009)	City of BRAMPTON (February 16, 2011)
m.	Timeframe	<ul style="list-style-type: none"> • Town will endeavour to expedite public consultation period within 60-120 days. • In the case of unavoidable delays beyond 120 days, Town shall communicate delays to proponent and Industry Canada indicating anticipated completion date. 	<ul style="list-style-type: none"> • Where no public consultation is required, Town shall attempt to finalize application within 2 weeks. • Town will endeavour to complete circulation and make its views known within 60 days. • Entire process shall not exceed 120 days. 	<ul style="list-style-type: none"> • 60 day expedited consultation process. • Up to 120 days for proposals that require public consultation. • City to communicate with proponent regarding unavoidable delays beyond 120 days. 	<ul style="list-style-type: none"> • 60 days for City to provide comments to proponent. • 120 days to complete consultation process (from date site plan application is submitted).
n.	Fees	<ul style="list-style-type: none"> • \$1500.00 application fee. 	<ul style="list-style-type: none"> • Site plan fees. • Other fees may be required from other approval authorities (e.g. TRCA, York Region). 	<ul style="list-style-type: none"> • Application fee. • Other fees may apply (e.g. curb cuts, tree removal etc.). • Public consultation costs borne by Applicant. 	<ul style="list-style-type: none"> • Site plan fees.
o.	Building Permit	<ul style="list-style-type: none"> • Building permit required when antenna system is located on the roof of an existing building; for construction of or alteration to buildings with antenna systems; and/or for design and construction of a ground- 	<ul style="list-style-type: none"> • Building permit may be required; no further details addressed. 	<ul style="list-style-type: none"> • Building permit required for construction of or material alteration to buildings associated with a telecommunication antenna or tower. 	<ul style="list-style-type: none"> • Building permit may be required; no further details addressed.

	Protocol Requirements	Town of RICHMONDHILL (January 2011)	Town of MARKHAM (June 2009)	City of TORONTO (January 28, 2009)	City of BRAMPTON (February 16, 2011)
		based antenna system structure.			
p.	Use of Public Facilities/Land	<ul style="list-style-type: none"> Not addressed in protocol. 	<ul style="list-style-type: none"> Proponents to consider use of Town owned lands and/or facilities where technically feasible, and of a location and design acceptable to Town. Lease agreement must be executed and provisions acceptable to Town Solicitor. 	<ul style="list-style-type: none"> Agencies, Boards and Commissions, and City Divisions should not lease space for towers without consultation with local Ward Councillor and authorization from City Council. 	<ul style="list-style-type: none"> Separate requirements for City-owned properties, including: preliminary consultation to be held with Manager of Realty Services Division, Planning Department to comment on proposal, and additional guidelines.
q.	Additional Requirements	<ul style="list-style-type: none"> Attestation that the general public will be protected in compliance with Health Canada's Safety Code 6 including combined effects within the local radio environment at all times. Compliance with <i>Canadian Environmental Assessment Act</i>. Transport Canada's aeronautical obstruction marking requirements. Attestation that the 	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> Prudent Avoidance Policy (voluntary) requests that radiofrequency waves for towers and antennas to be 100 times below Safety Code 6. 	<ul style="list-style-type: none"> None.

	Protocol Requirements	Town of RICHMONDHILL (January 2011)	Town of MARKHAM (June 2009)	City of TORONTO (January 28, 2009)	City of BRAMPTON (February 16, 2011)
		installation will respect good engineering practices including structural adequacy.			