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Innovation, Science and Economic Development Canada
c/o Senior Director, Spectrum Licensing and Auction Operations
235 Queen Street, 6th Floor
Ottawa, Ontario
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Dear Sir or Madam:

Subject: My Comments on your document “Consultation on Releasing Millimetre Wave Spectrum to Support 5G”

I wish to submit the following comments in response to your document entitled “Consultation on Releasing Millimetre Wave Spectrum to Support 5G,” the Notice for which appeared in the *Canada Gazette*, Part I, on July 15, 2017, under notice reference number SLPB-001-17.

I was greatly dismayed to see that your consultation takes for granted that the millimetre wave spectrum should be released for use and that the fifth generation of wireless communication technology should be deployed here in Canada. It would appear that Innovation, Science and Economic Development Canada is unaware that radio-frequency radiation, which includes the millimetre portion of the spectrum, poses grave health risks to people, animals, and plants alike.

I hereby request that the Government of Canada impose a moratorium on the deployment of the fifth generation of wireless communication technology until a thorough investigation is conducted of its possible impact on health and the expected effects of the interaction between pulsed millimetre waves and the lower frequencies that currently saturate our environment. There should also be a clear assessment of exactly what infrastructure will be required in terms of its placement, aesthetics, and cost effectiveness.

With regard to the harmfulness of radio-frequency radiation, I base my statement above on the analysis of the available scientific literature relating to radio-frequency electromagnetic fields that was carried out by the World Health Organization’s International Agency for Research on Cancer (IARC) in May 2011. After due study and

consideration, IARC concluded that radio-frequency electromagnetic fields are possibly carcinogenic to humans (Group 2B), a classification that includes lead and DDT.¹

In the time since this assessment was made, IARC scientist and Swedish oncologist, Dr. Lennart Hardell, has stated, in a 2014 edition of the *Journal of Environmental Research and Public Health*, that “RF-EMF should be regarded as a human carcinogen requiring urgent revision of current exposure guidelines.” In addition, Dariusz Leszczynski, Adjunct Professor at the University of Helsinki, Finland, has suggested that, in the light of new research results, radio-frequency radiation could be re-classified as a Group 2A carcinogen, which is to say, that it *probably* causes cancer. Like Lennart Hardell, he believes that “current safety limits are insufficient to protect all users” of wireless devices, and Professor Leszczynski advocates a moratorium on the implementation of fifth generation technology.²

Many other scientists also believe that the safety limits set by governments, including that of Canada, on the levels of permissible electromagnetic radiation are far too lax. In May 2015, 190 scientists from 39 nations filed an International Appeal with the World Health Organization requesting that these limits be strengthened to provide protection from non-ionizing electromagnetic field exposure in order to better protect human and animal health.³

Ample scientific evidence exists of the adverse health effects from the radiation emitted by the third and fourth generations of wireless communication technology; however, very little is known about the possible health hazards related to the millimetre part of the electromagnetic spectrum.⁴ Neither Health Canada nor Innovation, Science and Economic Development Canada has presented any peer-reviewed, evidence-based scientific findings demonstrating that 5G technology is safe.⁵

What we do know about millimetre-wave (MMW) radiation is that it is absorbed mainly by the skin, the largest organ of the body, to a depth of one to two millimetres⁶ 7 8 9.

1 http://www.iarc.fr/en/media-centre/pr/2011/pdfs/pr208_E.pdf.

2 <https://betweenrockandhardplace.wordpress.com/2017/07/22/leszczynski-free-public-lecture-at-griffith-university-brisbane-australia/>.

3 The full text of the most recent version of the Appeal, including a list of the signatories, may be found at: <https://emfscientist.org/index.php/emf-scientist-appeal>.

4 http://c4st.org/wp-content/uploads/2017/04/original-references_of_over_200_scientific_studies_showing_potential_harm_at_levels_below_safety_code_6.pdf.

5 No analyses or evaluation of biological effects are presented in Safety Code 6 (2015), the Safety Code 6 (2015) Rationale, nor in the authorities that are referred to in these reports.

6 <https://ehtrust.org/wp-content/uploads/Yuri-Feldman-and-Paul-Ben-Ishai-Abstract.pdf>.

7 https://www.researchgate.net/publication/51394628_Human_Skin_as_Arrays_of_Helical_Antennas_in_the_Millimeter_and_Submillimeter_Wave_Range.

The waves are also absorbed by the surface layers of the cornea. As explained by Joel M. Moskowitz on his web site, “since skin contains capillaries and nerve endings, MMW bio-effects may be transmitted through molecular mechanisms by the skin or through the nervous system.”¹⁰

We also know that millimetre-wave radiation is bio-active – that it has an effect on the human body. The Russians use low-intensity millimetre waves in the frequency range of 30 to 70 GHz as a therapy to reduce headaches, joint pain, and post-operative pain. The therapy is effective, but also has side effects, including fatigue, sleepiness, and paresthesia. The latter is an abnormal sensation of tingling or pricking, commonly referred to as “pins and needles.”¹¹ ¹² It must be noted that therapeutic applications are of short duration, as opposed to the long-term exposure characteristic of wireless radiation, and that the wave form used is continuous, not modulated or pulsed as they must be in order to carry information.

Based on cellular research that has been conducted, it is known that millimetre waves may alter the properties of cell membranes and affect the immune system. Other documented effects include: alterations of cell growth rate, UV light sensitivity, and biochemical and antibiotic resistivity in pathogenic bacteria,¹³ as well as arrhythmias, heart rate variability, altered gene expression, and cataracts.¹⁴

It has also been established that interactions between wireless radiation and chemical toxicants¹⁵ can increase the harm that would normally be done by either alone. For example, some toxic substances concentrate in the skin, and interactions with wireless radiation may be one explanation for the increasing incidence of skin cancers in areas of the body that are not exposed to the sun. It is logical to expect that the pulsed millimetre-wave energy of 5G would exacerbate any such interactions.

8 <http://aph.huji.ac.il/people/feldman/research.htm#Human%20Skin%20as%20Arrays%20of%20Helical%20>

9 <https://www.ncbi.nlm.nih.gov/pubmed/21297244>.

10 Joel M. Moskowitz, “5G Wireless Technology: Millimeter Wave Health Effects,” Monday, August 7, 2017, <http://www.saferemr.com/2017/08/5g-wireless-technology-millimeter-wave.html>.

11 <http://www.saferemr.com/2016/08/is-5g-cellular-technology-harmful-to.html>.

12 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1475937/>.

13 <http://www.saferemr.com/2017/08/5g-wireless-technology-millimeter-wave.html>.

14 <https://ehtrust.org/key-issues/cell-phoneswireless/5g-networks-iot-scientific-overview-human-health-risks/>.

15 Kostoff, R. N., and Lau, C. G. Y. (2013). Combined biological and health effects of electromagnetic fields and other agents in the published literature. *Technological Forecasting & Social Change*, 80(7), 1331–1349.

Further evidence of the bio-activity of millimetre waves is the fact that they are currently used in weapons. The Environmental Health Trust reports that, “. . . the U.S., Russian and Chinese defense agencies have been developing weapons that rely on the capability of this electromagnetic frequency range to induce unpleasant burning sensations on the skin as a form of crowd control.” Millimetre waves are used by the U.S. Army in crowd dispersal guns, formally called Active Denial Systems.¹⁶ Their mechanism of action appears to be the sweat glands in the skin, which may act as tiny antennae that receive sub-millimetre wavelength radiation, causing point heating and pain.¹⁷ Apparently, a person who is struck by the beam feels as if his body is on fire, producing a reflex reaction to flee.

While the Canadian government chooses to obfuscate and deny the evidence of the harmfulness of wireless technology, the insurance industry does not. As you may already be aware, the insurance industry refuses to insure telecommunications companies against claims made by current and past employees for damage to their health due to their employment. A legal complaint made by The Maine Coalition to Stop “Smart” Meters in 2013 against The Maine Public Utilities Commission outlines the insurance industry’s position with regard to the risks of insuring telecommunications companies. Among other things, the complaint makes it clear that the costs of future claims made by employees whose health has been harmed by their workplace exposure to radio-frequency radiation will probably have to be borne entirely by the employer.¹⁸

Aside from the alarming health concerns raised by the prospect of air waves saturated with millimetre-wave frequencies, there is the fact that our existing form of wireless communication is rapidly becoming obsolete. According to my research, far safer and more secure methods of communication are being developed that will soon be ready for testing. An example is the recent report of Chinese experiments using satellite-based quantum communication, which would be unhackable.¹⁹

For this reason, it would be irresponsible for the Government of Canada to encourage the telecommunications industry to install the costly and elaborate infrastructure that 5G technology will require. To open the millimetre-wave spectrum at this time would, in all probability, serve to reduce Canada’s eventual competitiveness in the field and discourage the adoption of new, innovative technologies because, having committed itself to 5G technology, the Canadian telecommunications industry might prefer to wait until its investment had been amortized.

16 “5G Frequencies Are Used in Weapons” at <https://ehtrust.org/key-issues/cell-phoneswireless/5g-networks-iot-scientific-overview-human-health-risks/>.

17 https://www.researchgate.net/publication/51394628_Human_Skin_as_Arrays_of_Helical_Antennas_in_the_Millimeter_and_Submillimeter_Wave_Range.

18 <http://www.mainecoalitiontostopsmartmeters.org/wp-content/uploads/2013/04/EV9-Insurability-Liability-Corrected-4-8-13-PUC-464.pdf>.

19 “China Focus: China’s satellite sends unbreakable cipher from space,” August 15, 2017, http://news.xinhuanet.com/english/2017-08/10/c_136514705.htm.

Because millimetre-wave frequencies travel only short distances and propagate poorly through solid materials, 5G technology requires an unobstructed, preferably line-of-sight, path between transmitters and receivers. As a result, it is estimated that antennae would have to be installed every two to ten buildings apart in residential areas. Furthermore, the necessary power supplies are not small, being about the size of a household refrigerator.²⁰ 5G infrastructure would be intrusive and unsightly, its rays penetrating into the very heart of our homes, invading our privacy and sickening everything in their path.

The adoption of 5G technology would also have a major impact on the seldom-acknowledged problem of the voracious electricity consumption of wireless communication technology. With its faster speeds and enhanced capability, 5G would vastly increase the amount of electricity used in accessing the Internet. I refer you to a most illuminating article called “The Real Amount of Energy Used to Power the Internet” by Jane Anne Morris.²¹ As a signatory to the Paris Agreement, the Government of Canada has undertaken the duty of reducing the energy consumption of the nation. The Government would fail miserably in this duty if it allowed 5G technology to be adopted because of both its costly and wasteful infrastructure and its enormous energy requirements.

The reason that the matter of 5G technology is of such concern to me is that I am electrosensitive, a condition for which I have received a formal medical diagnosis. In order to minimize my exposure to radio-frequency radiation, and to the dirty electricity produced by all digital devices, I do not own a mobile phone, and never have; nor do I own a microwave oven, Wi-Fi router (I connect to the Internet using the telephone line), cordless telephone, I-Pad or I-Pod, laptop computer, or any other wireless device. My computer consists of a tower that is connected by extension cords to my mouse, screen, and keyboard in order to distance it from me. This arrangement is only partially effective, so I still feel very nervous when I use it.

Also, I have no television or television service of any kind, no CD player, amplifiers, or speakers, and I must restrict the time that I listen to the radio to half an hour a day. In addition, I can no longer use my telephone answering machine, and it was necessary to have the electronic thermostat that controlled my furnace changed to an analog one so that I could sleep at night. I have a sign on my entrance door that says “No cell phones allowed”; when I am inadvertently subjected to a radiating mobile phone, I suffer ferocious insomnia that night.

I am restricted by my electromagnetic sensitivity in many other ways as well, such as not being able to shop in stores that offer Wi-Fi service and not being able to travel by intercity bus, train, or airplane. As a result of my efforts to avoid exposure, I function

²⁰ <https://ehtrust.org/key-issues/cell-phoneswireless/5g-networks-iot-scientific-overview-human-health-risks/>.

²¹ <http://www.electronicsilentspring.com/real-amount-energy-power-internet/>.

better, but I remain in poor health. I am unable to work and my limited financial means make it difficult for me to find suitable housing. The prospect of being irradiated twenty-four hours a day by 5G transmitters that might be located just outside my house is terrifying to me. The world would become an even more hostile place than it is now.

The problems faced by me and other electrosensitives are beginning to receive institutional attention in that both the Canadian Human Rights Commission and the *Commission des droits de la personne et des droits de la jeunesse Québec* recognize it as a disability.²² In addition, the House of Commons Standing Committee on Health has studied the larger issue of the safety of man-made radio-frequency radiation. In June 2015, the Committee issued a report entitled “Radiofrequency Electromagnetic Radiation and the Health of Canadians.” The report makes 12 recommendations, four of which specifically address electrosensitivity, which the Committee regards as a serious health problem.²³

Although electrosensitivity is recognized as a disability, it is not, in fact, an illness. People who suffer from electrosensitivity have lost their tolerance to electromagnetic fields for various reasons, such as over-exposure to them or other types of environmental poisoning. Many people are electrosensitive without knowing it, and may even be under a doctor’s care for their health problems, but to no avail since most physicians are unaware of, or refuse to acknowledge, the existence of electrosensitivity. On several occasions, my doctor has referred to me as the canary in the coal mine.

A major reason why the Government of Canada has, so far, refused to acknowledge the lethality of radio-frequency radiation is that the Government finds itself in a major conflict of interest between its role of custodian, and lessor, of the electromagnetic spectrum – with the substantial income that is generated – and the Government’s avowed duty to protect and enhance the health of Canadians.

To this profound and irresolvable conflict of interest must be added the pressure that is continually being brought to bear upon the Government by the powerful and morally bankrupt telecommunications industry. I say morally bankrupt because, for the most part, Canada’s newspapers, radio stations and television networks are owned by the same companies that sell wireless devices and offer wireless services. Consequently, complete media silence reigns with regard to the systematic poison that is radio-frequency communication. Even the tobacco industry, in its heyday, could not prevent information on the harm caused by smoking from being published.

Canada should learn from past public health disasters. The Government’s record protecting Canadians in a timely manner is shameful – the delays regarding the banning

²² For additional information, I invite you to consult the following web sites: <http://www.chrc-cdp.gc.ca/index.html> (Canadian Human Rights Commission) and <http://www.cdpcj.qc.ca/en/droits-de-la-personne/vos-droits/Pages/des.aspx> (*Commission des droits de la personne et des droits de la jeunesse Québec*, English).

²³ <http://www.parl.gc.ca/housepublications/publication.aspx?DocId=8041315>.

of asbestos, our past failure to vigorously discourage cigarette smoking, the ongoing use of bisphenol-A (BPA), the thalidomide tragedy, and the urea formaldehyde insulation debacle are all sorry examples. Authoritative scientific evidence exists now demonstrating that exposure to the radio-frequency emissions of wireless devices is a serious health hazard that is sickening millions of Canadians.

For all of the above reasons, and others that I have not been able to enumerate, I request once again that Innovation, Science and Economic Development Canada place a moratorium on releasing the millimetre wave spectrum to support the implementation of the fifth generation of wireless technology. The people of Canada are being subjected to far too much electromagnetic radiation from innumerable sources as it is.

I also request, as stated earlier, that an unbiased investigation be conducted by qualified scientists who have no connection whatsoever to the communications industry of the possible health impact of allowing the fifth generation of wireless communication to be implemented. The investigation should include an assessment of the possible interactions between pulsed millimetre waves and the lower frequencies that are currently in use. Furthermore, there should also be a clear analysis of exactly what infrastructure will be required in terms of its placement, aesthetics, and cost effectiveness.

Sincerely,

Sharon Blanchard

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