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**United States District Court**  
**District of Oregon**  
**Portland Division**

**AHM**, by and through  
her Guardian *ad litem* and father,  
David Mark Morrison, and  
**David Mark Morrison**, individually,

v.

**Portland Public Schools,**  
Defendant.

Civil Action No. 3:11-cv-00739-MO

**Amended Declaration of  
Barrie Trower**

I, Barrie Trower, under penalty of perjury pursuant to 28 U.S.C. § 1746, hereby make the following declaration in support of a preliminary and permanent injunction enjoining Portland Public Schools' use of WI-FI:

## Background

1. I trained at the Government (Ministry of Defense) microwave warfare establishment(s) early in the 1960s covering all aspects of microwave (MW) radiation technology, uses and health dangers. Later works included underwater bomb-disposal, which incorporated MW technology.
2. In the late 1960's and 1970's a part of my task was to extract confidential (hitherto secret) information from master criminals, terrorists, and spies. This included Cold War MW technology.
3. My first degree is in Physics with a specialization in microwaves. My second degree is a research degree. I have a teaching diploma in human physiology. Before retiring, I taught advanced physics and mathematics at South Dartmoor College.
4. I am Scientific Advisor to the Radiation Research Trust and the H.E.S.E. (Human Ecological Social Economical) Project.
5. I am the author of both Tetra Reports for the Police Federation of England and Wales and the Public and Commercial Service Union.
6. In April 2010, I gave a speech for the King of Botswana. [http://www.magdahavas.com/wordpress/wp-content/uploads/2010/08/Barrie\\_Trower\\_SA.pdf](http://www.magdahavas.com/wordpress/wp-content/uploads/2010/08/Barrie_Trower_SA.pdf). I hereby adopt and incorporate by reference my opinions and findings therein.
7. My work is done entirely free of charge and I have never accepted money from any person or organization in the years I have been doing this research. I consider myself absolutely independent.
8. I reserve the right to amend to add new studies as they may become available through the time of trial.

## Origins

9. To my knowledge, 'microwave' or 'radiowave sickness' was first reported in August 1932 with the symptoms of severe tiredness, fatigue, fitful sleep, headaches, intolerability and high susceptibility to infection. Hecht, K *et al.*, *Overloading of Towns and Cities with Radio*

*Transmitters (Cellular Transmitter): A hazard for the human health and a disturbance of ecoethics*, International Research Centre of Healthy Ecological Technology (IRCHET), Berlin-Germany, at ¶ 3 (2007). These symptoms were reported to be from athermal (which are sometimes also called subthermal or microthermal) effects.

10. By 1971, the US Naval Medical Research Institute (NMRI) referenced 2300 research articles listing in excess of 120 impairments and illnesses attributed to radiofrequency and microwave radiation. *Biography of Reported Biological Phenomena (Effect) and Clinical Manifestations Attributed to Microwave and Radio-Frequency Radiation*, Research Report. MF12.524.015-0004B, Report No. 2. NMRI, National Naval Medical Centre (1971). Under the Freedom of Information Act, extracts from published US Defence Intelligence Agency (DIA) Documents confirmed the NMRI research and stated: 'If the more advanced nations of the West are strict in enforcement of stringent exposure standards, there could be unfavourable effects on industrial output and military functions,' in order to protect industrial profit and military function, and to avoid litigation from military employees. It was suggested that governments in the West chose a safety level compatible to industrial output and military function. The governments that adopted the thermal level only denied and still to this day deny any adverse effect from subthermal levels. DIA Documents: DST - 1810S - 076-76, ST-c5-01-169-72, DST-1810S-074-76 (1972-1983).

11. In 1975, after an extensive study, the United States DIA warned all of its personnel of the risk from low-level microwaves including illnesses ranging from microwave sickness (flu like symptoms, depression, suicidal tendencies) to cancers and leukaemia. *Biological effects of electromagnetic radiation (radiowaves and microwaves) – Eurasian Communist Countries*, Defence Intelligence Agency: DST-1810S-074-76, March (1976).

12. During the Cold War, the Russian Embassy microwaved the United States Embassy in Moscow with low-level microwaves for many years from across the road; why and how is outside the scope of this Declaration. After changes of staff for serious neurologic impairments, miscarriages, multiple cancers / leukaemias and other illnesses to both male and female employees and their children, the late John R. Goldsmith, M.D., was invited to investigate this matter. His investigative report on this incident showed that continuous, long-term low-level microwaves were responsible for those illnesses. Goldsmith, J. R., *Radiofrequency Epidemiology, Environmental Health Perspectives*, Vol 105, at 1585, Supp 6, Table 8, Dec (1997). Dr. Goldsmith held 11 Professorships and was the World Health Organization (WHO) representative for Europe. Interestingly, the power of the microwaves used by the Russians in some cases was less than the power used by modern-day transmitters, with the average ranging  $<0.02 - 0.05 \mu\text{W}/\text{cm}^2$  and the maximum ranging  $5 - 18 \mu\text{W}/\text{cm}^2$ . Goldsworthy JR. Epidemiological evidence of radiofrequency radiation (microwave) effects on health in military, broadcasting, and occupational studies, *Intl J Occ and Env Health*, 1:47-57, 1995. [http://www.radiationresearch.org/goldsworthy\\_bio\\_weak\\_em\\_07.pdf](http://www.radiationresearch.org/goldsworthy_bio_weak_em_07.pdf). Dr. Goldsmith's warning on health and fertility: <http://omega.twoday.net/stories/1755556/>.

13. Debriefing spies during The Cold War extended my military education into the full diversity of stealth microwave warfare and communication systems. In so doing, I learned a list of approximately 30 pulse frequencies that could induce some 50 physical and mental ailments by entrainment.

14. As soon as ordinary MW transmitters became commonplace, residents started to complain of neurologic impairments, illnesses and later of cancer clusters. Independent researcher Sue Webster took data from just 19 transmitters and found approx 92 cancers (breast, thyroid, bowel, leukaemia), where the average age of those affected was roughly only 39. Health

Dangers from Wireless Laptops, Sue Webster was quoted in Canceractive's ICON magazine in January 2003 article, <http://www.canceractive.com/shop/product.php?productid=16157&cat=255&page=1>.

15. Microwave sickness was well documented by 1997, when over 100 further research documents pertaining to it were referenced. Grant, L., *Microwave Sickness*, Electrical Sensitivity News, Vol 1 No 6, Vol 2 Nos 1-4 (1997).

16. Portland Public Schools are transmitting electromagnetic, specifically MW, frequencies at low exposure levels compared to thermal levels. However, these exposure levels are very high compared to natural background levels at the frequencies deployed: 2.45 GHz and 5 GHz frequency, which means between 2.45 and 5 billion cycles per second. When I realized that power densities and frequencies similar to those used as weapons during the Cold War were being used as WI-FI in schools, I decided to come out of retirement and travel around the world free of charge and explain exactly what the problem is going to be in the future.

17. HAARP – High Frequency Active Auroral Research Program – was originally researched by Sister Dr. Rosalie Bertell, who investigated its electromagnetic interference to our atmosphere. HAARP reflects electromagnetic waves off the ionosphere and can influence any part of the air or land on this Planet. This has the potential to cause physiologic and neurologic effects on humans, animals and plants.

18. The paradox of course is how microwave radiation can be used as a weapon to cause impairment, illness and death and at the same time be used as a communications instrument. Therefore, WI-FI cannot be safe for the schoolchildren and teachers exposed to it. Also, there still exists an ongoing stealth microwave warfare industry, continuing from the 1950's.

## Technology

19. The International Commission for Non-Ionizing Radiation (ICNIRP) classifies microwaves as electromagnetic waves from 300 MHz to 300 GHz. ICNIRP Guidelines, Guidelines for Limiting Exposure to Time-Varying Electric, Magnetic, and Electromagnetic Fields (Up to 300 GHz), Health Physics April 1998, Vol 74, No 4, 522, [www.icnirp.de/documents/emfgdl.pdf](http://www.icnirp.de/documents/emfgdl.pdf). Therefore, everything discussed in this report is in the microwave 'band.'

20. Microwaves react very differently in our water-based bodies than do radio waves. The term 'Radio Frequency' is often used to describe MW-based communications systems. It is important that the term 'Radio Frequency' is not associated solely with Radio Waves, but rather primarily with Microwaves. Microwaves are the preferred medium for communication, over radiowaves, due to their *superior penetrative properties*. Penetration occurs in living tissues in particular, with more absorption due to water content; and microwaves will also penetrate most dwellings and other buildings.

21. What is all this really about? Imagine the field around a magnet and imagine ordinary everyday static electricity. If you put the force field from the magnet with the force field from the static electricity, you make a wave. This is called an electromagnetic wave. There are lots of different types of electromagnetic waves, but they are all made of the same two things, magnetic and static fields. The main difference between these waves is their wavelength or the length of the wave, hence the number of waves that can be produced per second, i.e. the frequency. All electromagnetic waves are included in a table called the electromagnetic spectrum.

22. At one end of this electromagnetic spectrum you have the very shortest lengths, namely cosmic, gamma rays and x-rays, and at the other end of the spectrum you have the very long ways, namely TV and radio. Physicists sometimes take the radiofrequency spectrum further yet, all the way to extreme low frequency (ELF), such as the electrical power frequency. All

waves have the same basic properties: they can be reflected, diffracted, and they all travel at the same speed, which is the speed of light. For interest, if you were one wave of light you would be able to travel around the world nearly seven times every second; that is the speed of light. The electromagnetic spectrum is ordered; starting with the shortest wave end you have cosmic and gamma rays, x-rays, ultra-violet, visible light, infra-red, microwaves, TV and radio being the longest, in that order. The ultra-violet and higher frequencies are known as ionizing waves; and they are damaging to the body. Longer than ultraviolet and visible light is the radiofrequency side of the spectrum, which is also damaging. The microwaves deployed for the WI-FI system are on this radiofrequency side of the electromagnetic spectrum. I will be discussing microwaves and health herein.

#### **Adverse Health Effects**

23. There is a plethora of extensive, well-researched documents from around the world highlighting impairments and illnesses caused by MW radiation. These papers (in their thousands) discuss adverse health outcomes caused by low-level (below thermal) microwaves as: arrhythmia, heart attack, cell death, diseases of the blood, interference to bone marrow, brain tumours, DNA damage, altered calcium level in cells, reduction in night-time melatonin, suppression of the immune system, arthritis, rheumatism, skin problems, lymphatic diseases, vaginal discharge, vascular system disease, tinnitus, leukaemia, childhood cancer, sleep problems, mental problems involving depression, irritability, memory loss, difficulty in concentrating, headache, dizziness and fatigue, suicidal tendencies, miscarriage and infertility.

24. Some have asserted that such symptoms and illnesses are psychogenic. For example, when a neighbourhood sees the erection of a transmitter, subsequent health problems are often attributed to that transmitter. Psychologically the mast is deemed to have caused the illnesses. However, an argument against this is the many cases where disguised, stealth, or concealed transmitters have been erected without local knowledge and similar illnesses still occur.

Moreover, when similar conditions arise in animals near new transmitters, and in laboratory trials under controlled circumstances, the animals do not have such a psychologic component, yet still respond similarly in the ways that humans do.

25. Advancement in microwave technology since the Cold War necessitated concurrent experimentation. Thousands of research studies exist concerning ill effects from low-level, below thermal irradiation levels, involving almost every organ in the body. Possibly the most comprehensive explanation for this phenomenon is written by Dr. A. Goldsworthy of Imperial College London: *The biological effects of weak electromagnetic fields* (2007), <http://tinyurl.com/2nfujj>; also: [a.goldsworthy@imperial.ac.uk](mailto:a.goldsworthy@imperial.ac.uk).

26. Before I go further, I wish to comment on the telecommunication industry's own research. In February 2007, I was invited to give a short presentation concerning low-level microwave irradiation and cancer at London's Great Ormond Street Hospital for Children. One of the other speakers present was Dr. George Carlo. Sharing the same hotel afforded me the opportunity to engage in several conversations with Dr. Carlo during the two days we were in London. Dr. Carlo explained how he was commissioned by the mobile industry to conduct research on its products. His study ([www.health/concerns.org](http://www.health/concerns.org)) involved 200 research doctors and 15 epidemiological studies (1993-1999), at a cost of 28.5 million US dollars. 'Our data showed *increased risk to children*, concerning tumours, genetic damage and other problems,' explained Dr Carlo. He continued, 'my results were suppressed by the telecommunications industry.'

27. Further discussion of industry influence is warranted as The University of Berne, Switzerland, published a data synthesis of 59 research studies involving ill health from low-level MW irradiation. The Department of Social and Preventive Medicine concluded: 'Studies funded exclusively by industry reported the largest number of outcomes, but were least likely to report a



statistically significant result. The interpretation of results \* \* \* should take sponsorship into account.' Huss, A. *et al.*, Source of Funding and Results of Studies of Health effects of Mobile Phone Use: Systematic Review of experimental Studies, (2006), University of Berne, Finkenhubelweg II, Switzerland (egger@ispm.unibe.ch).

28. Moreover, the 'Journal of Industrial Medicine' published the fact that industrial affiliation was being concealed by research scientists, suggesting that biases from conflicting interests in risk assessments cannot be evaluated properly. Hardell, L., *et al.*, *Secret Ties to Industry and Conflicting Interests in Cancer Research*, American Journal of Industrial Medicine, at 1, May (2006), [Wiley-Liss Inc.]; www.interscience.wiley.com; Dept of Oncology, University Hospital, Orebro University, Sweden. Examples of these problems from Sweden, the United Kingdom and the United States are presented.

29. Notwithstanding industry's attempts to influence research, even their own studies continued to find adverse health effects. One example is a worldwide epidemiological study (commissioned by T-Mobile, on its own product) that concluded, 'On the cellular level, a *multitude of studies* found the type of damage from high frequency electromagnetic fields which is important for cancer initiation and cancer promotion.' Mobile Telecommunications and Health, ECOLOG Institute, Sec 7, April (2000) (mailbox@ecolog-institut.de). This document also describes DNA damage on the same page.

30. The US Environmental Protection Agency (EPA) recommended that electromagnetic radiation (which includes WI-FI radiation) be classified as a 'probable human carcinogen.' United States Environmental Protection Agency, Evaluation of the Potential Carcinogenicity of Electromagnetic Fields, External Review Draft, No. EPA1600/6-901005B, October 1990. With many new studies since 1990, there is certainty that microwave radiation in particular is carcinogenic.

31. Following a spate of illnesses in their practices, on October 9, 2002, a group of doctors produced the Freiburger Appeal. <http://omega.twoday.net/stories/555926/>, scroll down for cluster listing. Initially signed by 270 medical consultants, scientists, GPs, MPs and physicians, it now has many thousands of signatories worldwide. It is a warning to decision-makers concerning illnesses from low-level microwaves. This appeal lists 13 severe, chronic illnesses and various disorders involving: behaviour, blood, heart, cancers, migraines, tinnitus, susceptibility to infections and sleeplessness, all of them ascribed to 'pulsed microwaves from mobile communications technology.' *Interdisziplinäre Gesellschaft für Umweltmedizin e. V.* <http://www.e-smog nrw.de/news/skandal/wewelsburg/HESEProject!FreiburgerAppell/LivelistenderunterschriftensammlungfuerdenFreiburgerAppellArztelists.htm>.

32. During September 2002 at the University of Vienna, 19 of the world's top scientists met to discuss electromagnetic waves. This was known as the Catania Resolution. They stated 'we take exception to arguments suggesting that weak, low-intensity EMF cannot interact with tissue. There are plausible mechanistic explanations for EMF-induced effects that occur below present ICNRP guidelines and exposure recommendations by the EU.'

33. An international study of schools near cell towers or with a cell tower on school premises published a list of impairments and illnesses amongst staff and students, finding with large numbers of cancer clusters and other illnesses. There were 47 cancer clusters. *Schools and Cell Tower Antennas*, 2003, <http://members.aol.com/gotemf/emf/schools.htm>; [www.omega.twoday.net/stories/55592](http://www.omega.twoday.net/stories/55592).

34. Another report, *School References (school and cell tower antennas)* from 138 schools, dated November 2003, lists miscarriages, brain tumours, cancers, breast cancers and teachers ill within this report. One single school had transmitters on its roof in the Saint-Cyr-l'Ecole quarter of France, where eight cases of cancer were confirmed amongst children in the district.

35. The Stewart Report 2004 asks that anecdotal evidence be taken seriously in the absence of long-term epidemiological studies, regarding illnesses around the area of mobile phone transmitters. Such anecdotal evidence produced July 2002 refers to 92 cases of cancer around just 19 mobile phone transmitters. Other illnesses in the same paper refer to breast cancers, thyroid, bowel and blood problems. Now, of course, there are many epidemiological studies, and they are consistent in showing such illnesses and other harmful effects.

36. In 2007, an international group of scientists studied 2000 peer-reviewed and published research papers. They recommended an acceptable level of radiation of not more than  $0.6 \text{ V/m} = \sim 1 \mu\text{W/cm}^2$  outdoors, and  $0.2 \text{ V/m} = \sim 0.1 \mu\text{W/cm}^2$  indoors, based on the interaction between low-level microwaves and the cellular processes. This became known as the Bioinitiative Level, which has since been lowered by a factor of 10, to  $0.01 \mu\text{W/cm}^2$ .

37. A project called EU-Reflex or European Union Risk Evaluation of Potential Environmental Hazards from Low Frequency Electromagnetic Field Exposure using sensitive in Vitro Methods shows that cells exposed to cell phone radiation exhibit chromosomal damage well below the exposure guidelines of the WHO.

38. The following studies: Naila, Hutter, Santini, Oberfeld, Bamberg, Wolf, etc. all show increased neurologic impairments and/or cancers and/or other illnesses from low-level microwave irradiation. A good summary of these studies, with details, can be found on the Radiation Research Trust's website: [www.radiationresearch.org](http://www.radiationresearch.org).

39. The International Association of Fire Fighters opposes the use of fire stations as transmitter sites, because of the health problems of its members. International Association of Fire Fighters, [www.iaff.org/safe/content/celltower/celltowerfinal.htm](http://www.iaff.org/safe/content/celltower/celltowerfinal.htm).

40. The world-renowned Irish Doctors' Association listed 70 research papers showing the dangers from low-level microwaves. Dr. Santini listed 20 similar studies; the

EM Radiation Research Trust listed 9 studies; Dr. Blackwell listed 6 similar studies in his report, and finally 4 international universities completed the Spanish Study, which verified all of these known illnesses. The authors of the Spanish study (The Microwave Syndrome-Further Aspects of a Spanish Study, 2004) recommended a level 10 million times below ICNIRP guidelines (discussed below), or  $0.1 \mu\text{W}/\text{cm}^2$ . Dr. Gerd Oberfeld, one of the authors of the study, is the Director of the Public Health Office in Salzburg, Austria, which lowered its precautionary value for indoor exposures to GSM frequencies to comply with the recommendation made by the study. See: <http://www.ideaireland.org/emresearch.htm>; Santini paper (2006): [http://next-up.org/pdf/Roger\\_SANTINI\\_Scientific\\_arguments\\_to\\_prove\\_application\\_of\\_precaution\\_principle\\_mobil\\_phone.pdf](http://next-up.org/pdf/Roger_SANTINI_Scientific_arguments_to_prove_application_of_precaution_principle_mobil_phone.pdf), Dr. Grahame - Six studies showing ill effect: <http://www.starweave.com/masts/>; The Microwave Syndrome Further Aspects of a Spanish Study: [http://www.hese-project.org/hese-uk/en/papers/navarro\\_n%20045%20\\_p353%20-%20p358\\_.pdf](http://www.hese-project.org/hese-uk/en/papers/navarro_n%20045%20_p353%20-%20p358_.pdf).

41. Listing and referencing all such epidemiological studies would be too extensive and repetitive for this article; suffice to say, by 2006, it was reported that 80 percent of the extant epidemiological studies on the WHO database list symptoms from microwave sickness, including up to fourfold increase in cancers from low-level microwaves. Guilmot, Jean-luc, *WHO EMF Database*, Watch - Understand - Act 26, Sept (2006), [www.001be.cx](http://www.001be.cx). I was curious to investigate the remaining 20 percent that showed no symptoms. However, this had already been looked at by Swiss scientists who said 'the interpretation of results \* \* \* should take sponsorship into account.' By that time, Michael Meacher, Minister for the Environment 1997-2003 (United Kingdom), had published a report blaming some universities for accepting lucrative contracts in reporting favourable results from scientific research. In the same month, United States Congressman Henry Waxman published a similar report in *Scientific American* stating that science was being corrupted by industry. <http://www.next-up.org/pdf/Ope>

nLetterWHODrvanDeventer.pdf; Swiss Study on funding sources; <http://www.ehponline.org/docs/2006/9149/abstract.html>; Michael Meacher quote, <http://www.epolitix.com/EN/MPWebsites/Michael+Meacher/c8afdecc-b15e-41ad-b9cf-25354790d2dc.htm>, also published in The Times, May (2004); Henry Waxman in The Scientific American, <http://www.sciam.com/article.cfm?articleID=0000FF81-A7DD-1084-A73E83414B7F0000> (May 2004).

42. In April 2011, the Russian National Committee on Non-Ionizing Radiation Protection (RNCNIRP) found:

Preventing childhood and juvenile diseases from exposure to EMF sources is of paramount social and economic importance. \* \* \* This problem has been already recognized by the international community: in May 2011, the World Health Organization (WHO) will be organizing the Second International Conference: 'Non-ionizing Radiation and Children's Health' dedicated to health protection of children exposed to EMF sources of various frequency ranges. It is the WHO's opinion that a 'child is more vulnerable to environmental factors.' \* \* \*

Human brain and the nervous system tissues directly perceive EMF and react irrespective of its intensity, and in certain cases it depends on EMF modulation. \* \* \* Analysis of scientific peer-reviewed national and international publications as well as analysis of actual population exposure to EMF have allowed the RNCNIRP to formulate 10 postulates. \* \* \* (*Note: here and following, 'EMF' includes RF/MW radiation.*)

1. For the first time in human evolution, the brain is daily exposed to modulated EMF at all developmental stages.

2. Absorption of EMF in a child's brain is greater than in adult phone users; larger brain areas including those responsible for intellectual development are exposed in a child's brain.

3. A child's brain is undergoing development \* \* \*

8. Better safety criteria for children and teenagers are required *in the nearest term*. Features of the developing organism should be taken into account, as well as the significance of bioelectric process for human life and activities, present and future conditions of EMF, prospects of technological and technical development should be addressed in a document of legal status. (*Italics added.*) RNCNIRP, *Electromagnetic Fields From Mobile Phones: Health Effects on Children and Teenagers*, (*Italics added*) April 2011, [www.scribd.com/doc/55420788/Electromagnetic-Fields-from-Mobile-Phones-Health-Effect-on-Children-and-Teenagers](http://www.scribd.com/doc/55420788/Electromagnetic-Fields-from-Mobile-Phones-Health-Effect-on-Children-and-Teenagers).

43. On May 6, 2011, the European Parliament was presented with a report recommending that wireless networks and mobile phones be totally banned from schools on health grounds. Council of Europe, *The potential dangers of electromagnetic fields and their effect on the environment*, Parliamentary Assembly, Committee on the Environment, Agriculture and Local and Regional Affairs, [assembly.coe.int/documents/workingdocs/doc11/edoc12608.pdf](http://assembly.coe.int/documents/workingdocs/doc11/edoc12608.pdf). This document notes that young people are most susceptible. *Id* at 2. The Assembly recommends that we take all reasonable measures to reduce exposure to electromagnetic fields on 'as low as reasonably achievable' (ALARA) (*Id.*) The Parliamentary Assembly asked education and health authorities to develop information campaigns 'aimed at teachers, parents and children to alert them to the specific risks of early, ill-considered and prolonged use of mobiles and other devices emitting microwaves.' *Id* at 3. The Assembly also asked that Governments '*ban all mobile phones, DECT phones or WI-FI or WLAN systems from classrooms and schools*, as advocated by some regional authorities, medical associations and civil society organizations.' (Italics added) *Id.*

44. In conclusion, *even so-called 'low' levels of microwave radiation are very serious!* Emphasis supplied. It is impossible to MW-irradiate the body without an effect. Low-level MW radiation is as dangerous or even more dangerous than high-level radiation.

45. I reserve the reserve the right to amend to add new relevant studies as they may arise and pending analysis, additional testing, and recently received voluminous discovery.

#### **Current Regulations and Thermal Heating**

46. The guidelines set by ICNIRP and the National Radiological Protection Board (NRPB), and which are followed by the United States' FCC, are amongst the least protective in the world. Being thermally based – no account whatsoever is given to the effect of the electric and magnetic of the wave interacting with the physiology of the body – it is very unlikely, if not impossible, for any person to receive warming of the body with exposure exceeding the guidelines, if this person

is not sitting right on top of the transmitter. Guidelines in units of microwatts per cm<sup>2</sup>, the maximum level for 1,800 MHz transmitters, 1,000 of these units. By contrast, Russia and China have a total maximum of 10 of these units,  $\mu\text{W}/\text{cm}^2$ , Toronto has a maximum of 6  $\mu\text{W}/\text{cm}^2$  and in Salzburg, the limit is 0.1  $\mu\text{W}/\text{cm}^2$ . The June 2000 International Conference at Salzburg, consisting of 19 of the world's top scientists in this field, set the level at 0.1 units.

47. The EU Parliament on September 4, 2008, by 522 votes to 16, stated that the 'ICNIRP guidelines were obsolete and out of date.' Mast Action UK - Legal Services (2010).

48. By way of example, Russia has recommended the banning of children under 16 from using cell phones when possible.

49. As a result of research that documents the harmful effects of MW radiation on fetuses, the British government warned in the cell phone handbook under 'safety,' that pregnant women should not have a cell phone near the abdomen, children under 16 should avoid carrying phones near their abdomen, like boys in their trouser pockets, and children should text rather than phone. The handbook recommends that if they do phone, they use hands-free, so the phone is away from the head; that, if one is going to make a long call, one should use a landline telephone; and that the phone should never be closer than 0.98 inch from the body. The government advice for children is 'essential calls only' to avoid exposure to MW radiation. See Statz, P., *The Cell Phone Handbook: Everything You Wanted to Know About Wireless Telephony (But Didn't Know Whom or What to Ask)* (1999) <http://www.amazon.com/Cell-Phone-Handbook-Everything-Telephony/dp/1890154121>.

50. These international bodies', NRPB's and ICNIRP's, guidelines are based purely on thermal effects. Looking at scientific papers, most of the rest of the world disagrees with this assessment. Dr. Cletus Kanavy, Chief of the Biological Effects Group of the Phillips Laboratory's Electromagnetic Effects Division at Kirkfield Air Force Base in New Mexico, says there is a 'Large amount of data, both animal, experimental and human clinical to support the existence of

chronic, non-thermal effects \* \* \* these include behavioural, neural, fetal, blood, metabolic, endocrine and immune problems.'

51. Professor Adey, a Fellow of the US American Academy of Scientists and a distinguished visitor of the Royal Society of Medicine said of his own research, in parallel with similar studies in Russia in the early 1980s, that they showed that radio frequency and microwave radiation affected enzyme systems that regulate growth and the division of white blood cells.

52. Clearly there are experts worldwide, both in military-intelligence and from Universities, from the long before Cold War to the present, who have shown that microwave radiation below thermal effects can impinge on human and other living organisms' physiologic functions.

#### **Pulse and Modulation**

53. Carrier waves may be used to carry information (video or audio data) that can be superimposed on them by modulation.

54. Sometimes academic arguments arise where the word 'pulsing' is not used and a word like 'modulated' substituted. Theoretically, there can be very little difference between a modulated wave and a pulsed wave.

55. Scientists argue over what constitutes a modulation or pulse. A modulation is a superimposition of data upon a carrier wave; modulations are usually connected with an infinitesimally thin thread of 'energy.' A pulse has no such attachment to the following pulse. A reader may wonder why this distinction is relevant. Scientists specializing in this field blame pulsed microwaves for various biological reactions within our cellular structures, which may then cause illness and impairment.

56. Further arguments suggest that there is no biological difference between a frequency modulated transmission or pulse when it comes to resonance with our cyclotronic and circadian rhythms.



57. Transmissions may be directional or isotropic (equal in all directions), may be analogue (with continuously variable quantity e.g. spatial position) or digital (sometimes called 'frequency-modulated'). However, all transmissions are electromagnetically propagated. In the world of nuclear and atomic physics, electronic switches can make tens of millions of decisions a second; and all transmissions travel at the speed of light.

58. Transmissions can be increased by possibly up to 40 percent, with side lobe technology. Vector mathematics can demonstrate whether any of these transmissions are incident upon another transmitted wave, such as a low-frequency radio wave, as there can be a piggy-back effect (constructive interference).

59. The Health Council of the Netherlands Radio Frequency Radiation Committee says in its 200 page 1997 report, concerning frequencies of 300 Hz to 300 GHz: 'The experimental data indicate that the effects of EM fields occur at lower power densities when the object is exposed to pulsed electromagnetic fields.' In other words, you will get impairments and illnesses quicker if the microwaves are pulsed. Health Council of the Netherlands: Radiofrequency Radiation Committee, *Radiofrequente elektromagnetische velden (300 Hz – 300 GHz)*, at 134 (1997).

60. Professor Salford at Lund University in Sweden has shown in his work in the year 2000 that pulsing can alter the permeability of the blood/brain barrier in rats. This would reasonably occur in human brains as well, and could have profound effects on brain function.

61. The Freiburger Appeal (2002), as previous mentioned, says, 'One can no longer evade these pulsed microwaves. They heighten the risk of already present chemical/physical influences, stress the body's immune system and can bring the body's still functioning regulatory mechanisms to a halt. Pregnant women, children, adolescents, elderly and sick people are especially at risk.'

62. Assimilating knowledge from the Cold War and other sources, I accumulated a plethora of data describing how pulsed / modulated microwaves interfere with our cellular biochemistry.

Believing the communications industry to be spiralling out of control with its new innovations, I published my list on the Internet in the hope that the industry and policymakers would take note. (*The Communications Industry is in the position where it is spiralling out of any person's ability to control it*, An open letter from Barrie Trower (undated); <http://omega.twoday.net/search?qBarry+Trower>; <http://www.mastsanti ty.org>),

### **Transduction**

63. I will try to summarise the thousand or so research papers written over the last 20 or so years and explain or summarise what happens when the electric and magnetic part of the wave goes into our bodies. We, being water-based animals, act like aerials to these waves. As the waves penetrate our bodies, an electric current is generated inside our bodies, which is how aerials work. Waves come in and electricity is generated. The electricity generated in our bodies, like all electric currents, goes to ground through our bodies; and like all electric currents, it takes the path of least resistance. Unfortunately, the path of least resistance through our bodies, although only representing 10 percent of our pathways, carries 90 percent of our traffic rather like the M1 motorway. The traffic in our bodies, namely hormones, antibodies and neurotransmitters, know where they are going because they also carry an electric charge. The hormones, antibodies and neurotransmitters know where to 'get off' the pathway, because there is a corresponding opposite charge at the site of delivery – rather like the positive and negative ends of a battery. The problem is, if you have an electric current passing through the body it can change this charge, either on the hormones, antibodies or neurotransmitters, or at the site of delivery.

64. A similar effect is that the destination for some of these hormones, neurotransmitters, and antibodies is a surface of a cell where chemicals will pass through a membrane into a cell. If you think of a cell in our body, be it a brain cell, bone cell, etc., as having a positive and negative charge on the outside and the inside similar to a battery the difference in these charges will draw

the chemical into the cell or draw poisonous substances out of the cell. If the charge is changed on the outside of the cell, then necessary chemicals may not go in or poisonous chemicals may not go out.

### Children

65. WI-FI in a classroom is more powerful energy than having a cell tower 300m away. It makes no sense to have WI-FI in the class, especially where cell masts are disallowed.

66. My position as scientific advisor requires that I read and translate papers from all around the world, and, I have never, ever, no matter which country I lecture in, which paper I have read, I have never seen a single scientist brave enough to submit for peer review a safety level of microwave radiation for a child or embryo. There is not one that exists. Last year I lectured in six countries. When I'm in a country I challenge on TV the industry and the government to produce a scientist who will come on air with me and cite a safe level for children. In 12 years, no one has ever come forward.

67. Children act like antennas and absorb more radiation than adults because they are smaller, and their very dimensions approximate the deployment's wavelength. See example of humans acting as antennae: Cohn G, Morris D, Patel S, Tan D, *Your Noise is My Command: Sensing Gestures Using the Body as an Antennae*, [http://research.microsoft.com/en-us/um/redmond/groups/cue/publications/chi2011\\_rfgestures\\_cohn.pdf](http://research.microsoft.com/en-us/um/redmond/groups/cue/publications/chi2011_rfgestures_cohn.pdf):

A basic receiving antenna can be thought of as an apparatus that converts electromagnetic waves into electrical current \* \* \* It turns out that the human body is also a very effective antenna over a broad frequency range. As an electrical conductor, when exposed to electromagnetic fields, it behaves as an antenna with a frequency resonance determined by various factors including height, posture, etc.

68. Children are not merely small adults. They are physiologically and neurologically immature; their systems have not yet formed. Microwave radiation alters the blood-brain barrier

so that toxins leak into the brain. This can cause neurologic and psychologic amongst many other problems more easily in children. A child's immune system, which fights off infection, takes 18 years to develop. Additionally, 122 layers of protein – myelin – insulate the electrically generated signals used by the nervous system to control muscles and organs. These layers of protein take 22 years to develop. MW radiation has been shown to affect protein synthesis. This could lead to muscular dystrophy-like symptoms in later life.

69. I have always predicted that any school that allows itself to be 'bathed' in microwaves from whatever source will see its sicknesses rise and behaviour fall. I have received many phone calls to confirm this. In all of the schools I have visited around the world with WI-FI, every one has reported the same symptoms in students: fatigue, headaches, nausea, chest pain, vision problems. I argue that one could experience from microwave radiation psychologic problems, with increase in aggression and other bad behaviour, as well as reduced immune symptoms, leading to more and longer colds and coughs, depression, anxiety, bad behaviour and suicidal tendencies from sleep deprivation and finally – leukaemia.

70. The effects of microwaves will continue long after the children are exposed at school. A study has been carried out on children using an ordinary microwave transmitter, a cell phone. What it found was that after just two minutes' use of a cell phone, the children had their natural brain waves disrupted for up to two hours thereafter. This is called long-term potentiation, and it can last up to six weeks.

71. Research suggests children and women (females have more complex hormone-based systems to be disrupted than males) exhibit more vulnerability to illnesses from MW irradiation than do adult males.

72. The problem with young girls is that microwave irradiation has been shown to damage the genetic structure in their ovaries. Girls are born with all of the eggs they need in their ovaries at

birth. They are immature eggs, hence susceptible to damage during growth. *Microwaves are genotoxic* (experiments can be linked to children showing low-level mobile telephony radiation disrupts the biochemistry of follicle cells in a mammalian egg chamber), hence the microwaves irradiation could affect the genetic structure within the eggs. The problem here is that the mitochondrial DNA, the genes inside the ovaries, is irreparable.<sup>(1)(2)(3)</sup> If you have a little girl in whom there is damage through this mechanism to the genetic structure in one of her eggs, and she has a daughter, that daughter will carry that genetic problem. It is irreparable. And her daughter in turn will carry that genetic problem, because it is irreparable. And every female *forever*, in that line, will carry that problem in perpetuity, because it is irreparable. Attached as Addendum 'A' is a diagram further explaining this process.

73. I believe the most important research I have read is from Dr. Goldsworthy, *The biological effects of weak electromagnetic fields* (2007), <http://tinyurl.com/2nfuj>; also, [a.goldsworthy@imperial.ac.uk](mailto:a.goldsworthy@imperial.ac.uk). Dr. Goldsworthy not only shows the mechanism by which microwaves disrupt cells, but also predicts that a genetically damaged sperm and egg can lead to mutant offspring. If you think of children with these transmitters near their laps, the question must be, 'Why do this for the sake of a piece of cable and a plug, which could replace WI-FI with no loss of performance, and in fact improved performance?'

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<sup>1</sup> Acharya, PVN; The Effect of Ionizing Radiation on the Formation of Age-Related Oligo Deoxyribo Nucleo Phospheryl Peptides in Mammalian Cells; 10th International Congress of Gerontology, Jerusalem. Abstract No. 1; January 1975. Work done while employed by Dept. of Pathology, University of Wisconsin, Madison.

<sup>2</sup> Acharya, PVN; Implications of The Action of Low-Level Ionizing Radiation on the Inducement of Irreparable DNA Damage Leading to Mammalian Aging and Chemical Carcinogenesis.; 10th International Congress of Biochemistry, Hamburg, Germany. Abstract No. 01-1-079; July 1976. Work done while employed by Dept. of Pathology, University of Wisconsin, Madison.

<sup>3</sup> Acharya, PV Narasimh; Irreparable DNA-Damage by Industrial Pollutants in Pre-mature Aging, Chemical Carcinogenesis and Cardiac Hypertrophy: Experiments and Theory; 1st International Meeting of Heads of Clinical Biochemistry Laboratories, Jerusalem, Israel. April 1977. Work conducted at Industrial Safety Institute and Behavioral Cybernetics Laboratory, University of Wisconsin, Madison.

74. This represents permanent, low-level microwave damage, and it also involves the induction of chronic nitrosative and oxidative stress.

Warnke, [http://www.hese-project.org/de/emf/WissenschaftForschung/Warnke\\_Dr.%20rer.%20nat\\_Ulrich/20050219\\_VortragDrWarnke.pdf](http://www.hese-project.org/de/emf/WissenschaftForschung/Warnke_Dr.%20rer.%20nat_Ulrich/20050219_VortragDrWarnke.pdf) (2005) (in German, English translation in progress). It is known that chronic nitrosative/oxidative stress damages the mitochondria, the 'powerhouses' of each cell in the body. Mitochondropathy is at the root of many of today's chronic illnesses, such as MS, Alzheimers, Parkinsons, Fibromyalgia Diabetes, Artherosclerosis and Obesity. Kuklinski, [http://www.kpu-berlin.de/For\\_Neu\\_Kuklinski\\_1\\_en.html](http://www.kpu-berlin.de/For_Neu_Kuklinski_1_en.html) (2004). Even more disturbingly, when chronic nitrosative and oxidative stress is present, irreversible mitochondrial DNA damage will occur sooner or later (see also Kuklinski, [http://www.kpu-berlin.de/For\\_Neu\\_Kuklinski\\_1\\_en.html](http://www.kpu-berlin.de/For_Neu_Kuklinski_1_en.html) (2004)). The mitochondrial DNA is ten times more susceptible to nitrosative / oxidative stress than is the DNA in the cell nucleus. Whilst regular cell DNA has built-in repair mechanisms, mitochondrial DNA is irreparable, due to its low histone protein content. The mitochondropathy is therefore irreversibly transmitted to the children by the maternal egg cell, causing cumulative irreparable damage to future generations.

75. There is no known safe level of MW irradiation for an embryo, a fetus, a child or a pregnant woman.

#### **Electro-hyper-sensitivity**

76. The World Health Organization (WHO) recognizes and describes electro-hyper-sensitivity. Electro-hyper-sensitivity can be compared to a food allergy that exposes the person to great harm on each occasion that the food is absorbed. If a food received this much adverse publicity from research all over the world, it would be immediately taken off the shelf.

77. In Sweden, it is published that 3.15 percent of its population is medically recognized and registered as being handicapped from electro-hyper-sensitivity. This number is comparable in California and it is believed to be similar in Australia. The Irish Doctors' Association believes this figure may actually be as high as 15 percent.

#### **Experimentation**

78. In 2008, the European Parliament wrote to its 27 countries urging them to ignore WHO guidelines and set exposure limits at lower levels. Ries, *European Parliament 2004-2009 Commission on the Environment. Public Health and Food Safety, 2008/2211/INI* (translation by www.nexyt-up.org) Editor: Frederique Ries (2008). In response, the WHO (which only began studying microwave radiation effects on children in 2009) stated it will not comment on microwave radiation effects on people until 2015, when it will be able to establish effects on human beings. Their researchers are watching people to see how many will become sick. We are being experimented upon.

#### **The Cumulative Dose**

79. Professors Sosskind, Provsnitz, Lai, and Cherry and a Russian International Medical Commission have all warned about the cumulative effect of these microwaves. See, *Effects of chronic microwave irradiation on mice*, S Prausnitz & C Susskind, 1962.

80. Professor Sosskind and Provsnitz write, 'An accumulated cellular level damage mechanism is not necessarily related to the intensity but can relate to total dose.' This is not surprising; a property of electromagnetic radiation exposure is that the effects are cumulative. By way of example, if we go out on a cloudy day we can still get sunburned, it just takes longer.

81. In the report *Mobile telephones, their base stations and health*, from the French Health General Directorate, January (2001), they warn of the cumulative exposure over the lifetime of a child. This body concluded with an interesting sentence stating, 'Biological

effects occur at energy levels that do not cause any rise in local temperature.’ As it may be argued that biological effects may not be hazardous, *the responsibility for this decision concerning children should lay with the parents*, guardians or those in loco-parentis and not the school.

82. Based upon a review of the Mount Tabor School WI-FI Floor Plan, schoolchildren will be exposed to as much as 30-40 hours per week of constant, digitally encoded pulsed WI-FI signals from each wireless device in the child’s vicinity, in addition to the infrastructure, making the cumulative exposure over a child’s lifetime successively higher.

83. When reviewing this case, it occurred to me to compare the relative cumulative dose of WI-FI in the classrooms with a commonly known device that emits the same frequencies. That device is a microwave oven. Both WI-FI and microwave ovens operate at a frequency of ~2.4 GHz. An average WI-FI transmitter operates on 0.2 J/s [0.2 Watts] power. Therefore, if using only 20 computer/laptop transmitters in a classroom, there is a combined 4 J/s [4 Watts]. A typical microwave oven (output) is 800 J/s [800 Watts] (magnetron input equals 1,200 J/s [1,200 Watts]). A classroom equals 4 J/s [4 Watts]; a microwave oven 800 J/s [800 Watts]. A ratio of 1:200. Thus, if WI-FI is used in morning and afternoon sessions, and if 200 seconds in a classroom (at 4 J/s [4 Watts]) equals 1 second inside a microwave oven (at 800 J/s [800 Watts]), then over a school day a child or adult receives the equivalent of 2 minutes in a microwave oven, 10 minutes per week.<sup>4</sup>

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<sup>4</sup> It should be noted these calculations will vary according to the following factors:

- i. There can be approximately 13 mathematical variations to wave formulae;
- ii. The  $1/d^2$  rule will apply to distance;
- iii. The wall transmitter and main transmitter are not included/calculated;
- iv. Constructive interference patterns are not calculated;
- v. WI-FI sets and transmitters in nearby classrooms are not included/calculated; and
- vi. Reflective materials are unknown: i.e. wall insulation.

To understand fully the actual exposures, a reading will be taken in a classroom with 20 or more fully operational



84. As a final word about cumulative dose, it must be stressed that a long-low exposure can be more dangerous than a short-high exposure. By way of example, as I wrote in my published paper (co-written with Scientist Andrea Klein), *Wireless Laptops and Their Transmitters Using Microwaves in Schools*, <http://www.mastsanity.org/wifi/17/154-wireless-laptops-and-their-transmitters-using-microwaves-in-schools-a-report-by-barrie-trower.html>, Permanent low-level microwave exposure can induce chronic nitrosative/oxidative stress; hence damage to mitochondrial DNA.

### Conclusion

85. There is a simple solution, use a cable and a plug or fibre optic cable to deliver the Internet.

86. With all of this evidence pointing to physical, mental and long-term disorders even long into the future (including cancers and mutant newborns), is this honestly worth the risk to our next generations for the sake of just a few metres of wire and a plug. As shown, the dangers of low-level, below-thermal microwaves, have been known to governments for >50 years. I was educated in microwave technology by the Military (United Kingdom) in the early 1960's, and even then we were instructed of these dangers. Nothing has changed to suddenly make microwaves safe.

87. The evidence for adverse effects of low-level microwave irradiation is currently strong and grows stronger with each new study. Using a cabled Internet system does not increase exposure.

88. I ask you, if a drink were reported in the 1950's to cause cancer and other ill effects, and if countless reports and epidemiologic and toxicologic studies and expert associations since showed these reports to be correct, would you give this to your children to drink, knowing they have their whole lives ahead of them? So what is the difference? It is simple. This product, pulse-modulated microwave radiation from WI-FI, is backed and financed by the most powerful computers and WI-FI transmission devices next to other classrooms (below, above, adjacent, etc.) with 20 or more fully operational transmission devices in each of those rooms.

industry on the planet. This is an industry that apparently does not have to prove its product is safe (unlike a drug company). Incredibly, the public is rather told to prove it is not! Thence take this industry to court with your list of impairments, illnesses, cancers, leukaemias, early deaths, etc.

89. Within the relevant scientific community, it is generally accepted that that many bioeffects and adverse health effects occur at far lower levels of radio wave and MW exposure where no measurable heating occurs; some effects are shown to occur at several hundred thousand times below the existing public guidelines.

90. In my opinion, Portland Public Schools' use of WI-FI is causing and will continue to cause AHM, other students, and school staff and faculty adverse health effects, and should be discontinued immediately.

Dated this 21<sup>st</sup> day of December 2011.

*/s/ Barrie Trower*

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BARRIE TROWER