

**Before the Federal Communications Commission
Washington, D.C. 20554**

In the Matters of:

**Updating the Commission's Rule for Over-the-Air)
Reception Devices) WT Docket No. 19-71**

To: Office of the Secretary
 Federal Communications Commission
 Washington, DC 20554

Reply Filed by: Catherine Kleiber
 N9387 Riverview Dr.
 Waterloo, WI 53594
 (920) 478-9696

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Dear FCC Commissioners,

The docket “Updating the Commission’s Rule for Over-the-Air Reception Devices - WT Docket No. 19-71” will endanger public health and the environment. It is making substantial changes to the rules governing transmitter placement and regulation practices without conducting a NEPA review. This is illegal.

There are more and more studies showing the radiation from wireless technology is carcinogenic. Among the experts calling for the classification of radiofrequency radiation to be changed from Group 2B (possibly carcinogenic) to Group 1 (carcinogenic) is Dr. Anthony Miller. **Dr. Miller was a senior epidemiologist at IARC at the time that RF radiation was classified as Group 2B and he says the evidence is now sufficient for the classification of RF radiation to be changed to Group 1 - carcinogenic.** Please watch this video of his presentation at a recent conference <https://www.youtube.com/watch?v=bgGJeOVEDQs>. The FCC should only support provision of broadband internet via wired methods, e.g. cable or fiber optic. Local authority over zoning should not be preempted to force installation of such a dangerous technology. The FCC should not be supporting 5G since it is an unsustainable and dangerous technology. It will do great harm to human health and the environment. The FCC should support maintaining the landline phone system so that everyone has access to safe telephone service.

Contrary to industry representations, **wireless technology is neither a sustainable nor environmentally-friendly technology** because wireless connectivity uses far more energy than wired connectivity. According to *Energy Consumption in Wired and Wireless Access Networks*, “**Wireless technologies will continue to consume at least 10 times more power than wired technologies** when providing comparable access rates and traffic volumes. PON [passive optical networks] will continue to be the most energy-efficient access technology.” (<http://people.eng.unimelb.edu.au/rtucker/publications/files/energy-wired-wireless.pdf>). A paper looking at the energy consumption of cloud computing states, “**Our energy calculations show that by 2015, wireless cloud will consume up to 43 TWh**, compared to only 9.2 TWh in 2012, an increase of 460%. This is an increase in carbon footprint from 6 megatonnes of CO2 in 2012 to up to 30 megatonnes of CO2 in 2015, **the equivalent of adding 4.9 million cars to the roads. Up to 90% of this consumption is attributable to wireless access network technologies**, data centres account for only 9%.” (<http://www.ceet.unimelb.edu.au/publications/ceet-white-paper-wireless-cloud.pdf>) It is clear from the discussion that wireless broadband access is unsustainable. The FCC ought to be focusing on providing quality wired broadband nationwide to protect health and the environment and promote sustainability.

There has been no NEPA review of the environmental and human health impacts of moving forward with 5G or the OTARD rule change. The FCC should not preempt local zoning authority to promote 5G without first studying the safety of 5G for humans and the environment. There is consensus within the scientific community that the existing FCC limits for wireless radiation do not protect the population from biological effects (www.EMFscientist.org)

At least three federal agencies have indicated that the FCC radiofrequency (RF) radiation limits with which wireless technology must comply are not protective of either human health or the environment during the chronic non-thermal exposures ubiquitously present today.

The U.S. National Toxicology Program recently released results showing that radiofrequency radiation (RFR) can indeed both break DNA and cause cancer. A replicated European study has found that RFR is also a cancer promoter (<https://ehtrust.org/clear-evidence-of-cancer-from-cell-phone-radiation-u-s-national-toxicology-program-releases-final-report-on-animal-study/>). Furthermore, the literature on RFR in the very high frequency bands required for 5G document DNA breakages, serious cellular resonance effects, and other detrimental metabolic effects (http://www.bioinitiative.org/report/wp-content/uploads/pdfs/sec15_2012_Evidence_Disruption_Modulation.pdf).

The U.S. Department of Interior (DOI) stated, “*the electromagnetic radiation standards used by the Federal Communications Commission (FCC) continue to be based on thermal heating, a criterion now nearly 30 years out of date and inapplicable today,*” in reference to the current limits governing radiation utilized by wireless technology. The DOI letter discusses a number of studies showing that birds are harmed by low-level RF radiation associated with cell towers and other wireless technologies (http://www.ntia.doc.gov/files/ntia/us_doi_comments.pdf). **Furthermore, DOI required FirstNet to undergo a comprehensive NEPA review and planning program. Therefore, 5G and the OTARD rule changes, which will have similar widespread impacts, requires a NEPA review as well.**

The U.S. Environmental Protection Agency has stated, “The FCC's current exposure guidelines, as well as those of the Institute of Electrical and Electronics Engineers (IEEE) and the International Commission on Non-ionizing Radiation Protection, **are thermally based, and do not apply to chronic, nonthermal exposure situations.** They are believed to protect against injury that may be caused by acute exposures that result in tissue heating or electric shock and burn. The hazard level (for frequencies generally at or greater than 3 MHz) is based on a specific absorption dose-rate, SAR, associated with an effect that results from an increase in body temperature. The FCC's exposure guideline **is considered protective of effects arising from a thermal mechanism but not from all possible mechanisms.** Therefore, the generalization by many that the guidelines protect human beings from harm by any or all mechanisms is not justified.” (emphasis added) (http://www.emrpolicy.org/litigation/case_law/docs/noi_epa_response.pdf)

Non-industry funded studies have consistently found links between RF radiation and various negative biological effects (www.bioinitiative.org). They include serious neurological, cardiac, and metabolic effects, as well as DNA breakage which can lead to cancer and genetic defects (<http://www.mainecoalitiontostopsmartmeters.org/?p=1469>).

Studies, including the National Toxicology Program studies, have shown wireless to be a dangerous technology and 5G, according to former Chairman Wheeler's own comments, is an infrastructure intensive technology. So, invest in safe, wired infrastructure instead of spending a lot of money to saturate entire communities with hazardous radiation. The "cool" factor is not worth the peril.

It is time for the FCC to act in a precautionary way and stop promoting wireless, especially 5G. WiFi is already causing radiofrequency sickness in children and adults. The data suggests 5G is likely to be even more dangerous. No one should be forced to be exposed to a carcinogen when connectivity can be achieved in safer ways. The FCC should be completing the process of establishing meaningful biologically-based population protective RF safety limits instead of forcing people to be exposed to more RF radiation. An initial approach is outlined in the attached paper by Dr. Pall (<https://www.ncbi.nlm.nih.gov/pubmed/25879308>).

There are effects far beyond cancer. My family has had the misfortune to experience them firsthand. It has been a nightmare. Not only is the FCC abdicating its responsibilities by not establishing meaningful biologically protective RF safety limits before promoting further RF exposures, it is violating human rights. Please read "Wireless Technology Violates Human Rights," attached and at <http://www.electricalpollution.com/documents/WirelessViolatesHumanRights2016.pdf>. If you continue to expedite 5G, which will increase exposure to a carcinogen and pollutant with potent harmful biological activity, you will be violating human rights and the Nuremberg Code of Ethics.

The EUROPAEM [European Academy for Environmental Medicine] EMF Guideline 2016 for the prevention, diagnosis and treatment of EMF-related health problems and illnesses supports removing wireless technology from public spaces to protect public health and make them accessible to people who have already been injured by radiation from wireless technology. (<https://www.degruyter.com/view/j/reveh.ahead-of-print/reveh-2016-0011/reveh-2016-0011.xml?format=INT>) Studies have found that upwards of 5% of the population is aware of health effects, often disabling or even life-threatening, upon exposure to wireless technology. A blinded study looking at RF exposure from "dirty" electricity found that over 39% of the population experiences some symptoms from exposure.

Recent scientific publications look specifically at causality, such as M.L. Pall in "*Microwave Frequency Electromagnetic Fields (EMFs) Produce Widespread Neuropsychiatric Effects Including Depression*" (J Chem Neuroanat. 2015 Aug 20; <http://www.sciencedirect.com/science/article/pii/S0891061815000599>). It discusses the causal relationship between exposure to radiation from wireless technology and neuropsychiatric effects. Mechanisms of action are also discussed. It is likely the rampant proliferation of wireless radiation (to which 5G would add greatly) is an important factor behind the marked increase in mass killings due to the detrimental psychiatric effects it can have. Many of the perpetrators were technology addicts and thus highly exposed to RF radiation. Prudence and caution would dictate a halt to the proliferation of wireless technology.

A review by Yakymenko, et al., 2015, *Oxidative Mechanisms of Biological Activity of Low-intensity Radiofrequency Radiation* finds in 93 of 100 reviewed studies a wide pathogenic potential of the induced Reactive Oxygen Species (ROS) and their involvement in cell signaling pathways which explains a range of biological/health effects of low intensity RF radiation, including both cancer and non-cancer pathologies. Their concluding analysis demonstrates low-intensity RF radiation is an impressive oxidative agent for living cells with a high pathogenic potential and that the oxidative stress induced by RF radiation exposure should be recognized as one of the primary mechanisms of the biological activity of this kind of radiation (<http://www.mainecoalitiontostopsmartmeters.org/wp-content/uploads/2015/07/Yakymenko-et-al-2015.pdf>).

A recent paper "*Wireless communication technologies: New study findings confirm risks of nonionizing radiation*" by Hensinger and Wilke (<http://bit.ly/2qX22CY>) discusses the numerous health effects of RF, including the fact that multiple studies now confirm its carcinogenicity. The paper also discusses mechanisms by which RF has these effects. It is imperative that the FCC stop promoting wireless technology until biologically-based population-protective RF safety limits are established. Research supports the need for a moratorium on promotion of wireless technology until biologically-based population-protective RF safety limits are established. At a minimum, the seriousness of the health threat requires the FCC to halt all dockets and proceedings that would further preempt local control in an attempt to force a such a dangerous technology on communities, including the proposed OTARD rule changes.

Not only is the radiation utilized by wireless technology dangerous to people, it is dangerous to the environment. Therefore, the need for a NEPA review is triggered.

FCC must complete a NEPA review and EIS prior to implementing 5G

The potential environmental and human health hazards from 5G necessitates a comprehensive NEPA review [*Envtl. Def. Fund v. Tenn. Valley Auth.*, 468 F.2d 1164, 1174 (6th Cir. 1972)] and, specifically, a formal Environmental Impact Statement (EIS). The EIS should include a full review of environmental effects, as well as human health and safety. The FCC has an obligation to evaluate whether “*services or capabilities are essential to public health, safety, or in the public interest*” (H.R. Report No. 104-204, p. 94) and so must protect the public from possible harm caused by radiofrequency radiation.

The FCC is not entitled to essentially disregard comments that do not provide global cost-benefit analysis (*Scenic Hudson v. Federal Power Commission*). The Commission has an affirmative duty to inquire into and consider all relevant facts. The FCC must use government resources to perform the relevant analysis. The FCC should request the EPA use its National Risk Management Research Laboratory resources and experts to conduct all cost analyses necessary.

This proposal also triggers the need for a Memoranda of Understanding (MOU) with U.S. Fish and Wildlife Service under Executive Order 13186 concerning effects on migratory birds.

RF radiation kills and damages trees

Trees are being killed and damaged across the U.S. and world-wide even without full-scale implementation of 5G. RF radiation is being implicated as the cause. Several studies show the very serious effects that RF radiation has on the health of trees. Trees are essential to the welfare of the global environment and the continuation of the human race. Decimation of the Amazon rainforest by direct human actions has been oft-cited as endangering the global environment. The FCC should not be moving forward with implementing a technology, 5G wireless technology, that will hasten the RF-caused death of our urban and rural forests. Please read the following papers to see the toll RF is already taking on trees. We cannot afford additional forest die-off. Large mature trees are being seriously damaged and killed. This damage will take 50 years or more to repair.

- Radiofrequency radiation injures trees around mobile phone base stations https://www.researchgate.net/publication/306435017_Radiofrequency_radiation_injures_trees_around_mobile_phone_base_stations
- Adverse Influence of Radio Frequency Background on Trembling Aspen Seedlings: Preliminary Observations <https://www.hindawi.com/journals/ijfr/2010/836278/>
- Tree damage in the vicinity of mobile phone base stations <http://kompetenzinitiative.net/KIT/wp-content/uploads/2016/06/Tree-damages-in-the-vicinity-of-mobile-phone-base-stations.pdf>
- The trees make it easy to recognize the effects of RF-EMF. Examples of tree damage: <http://kompetenzinitiative.net/KIT/wp-content/uploads/2016/09/Trees-in-Bamberg-and-Hallstadt-Dokumentation-2006-2016.pdf>

- Electromagnetic Fields Act Similarly in Plants as in Animals: Probably Activation of Calcium Channels via Their Voltage Sensor: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3780531/>

The damage to trees is not theoretical. We are seeing it on our farm now. We have seen it in the city for years, but now we are seeing it in the country as well, on a widespread basis.



July 24, 2016
Note thinness in tree on right and bare spot developing between trees



August 9, 2016
Damage progressing quickly



September 12, 2016
More leaves lost. No sign of healthy fall leaf color so fall is not the cause.



October 10, 2016
Still no fall color, but leaf loss nearly complete in righthand tree.

As you can see the damage to trees is progressing quickly to death. Balimori discusses the fact that "*White and black poplars (Populus sp.) and willows (Salix sp.) are more sensitive. There may be a special sensitivity of this family exists or it could be due to their ecological characteristics forcing them to live near water, and thus electric conductivity.*"

Certainly the trees that are worst off in our area are in the willow and poplar families and they are growing in areas that are wet, but I have seen trees of all types exhibiting damage.



July 24, 2016
These trees began exhibiting damage similar to the trees above in 2015. Most of them greened up in the spring 2016, then had the leaves die and drop. Two still retain leaves low down. Others are completely dead.



May 26, 2017 - Tree on right now totally dead less that a year after damage first began to

Please think of the future. We cannot live without a healthy tree population. We rely on them for the very oxygen we breathe. **No technology is worth endangering something as essential as our source of oxygen.**

Please halt the rollout of 5G and stop seeking to preempt local zoning authority.



September 18, 2016
Notice uneven leaf drop, unhealthy green, and absence of fall color. Characteristic of RF damage



Close-up of leaves from one of the cottonwoods above. Notice necrotic lesions and off color characteristic of RF leaf damage. No normal fall color present, despite on-going leaf drop.



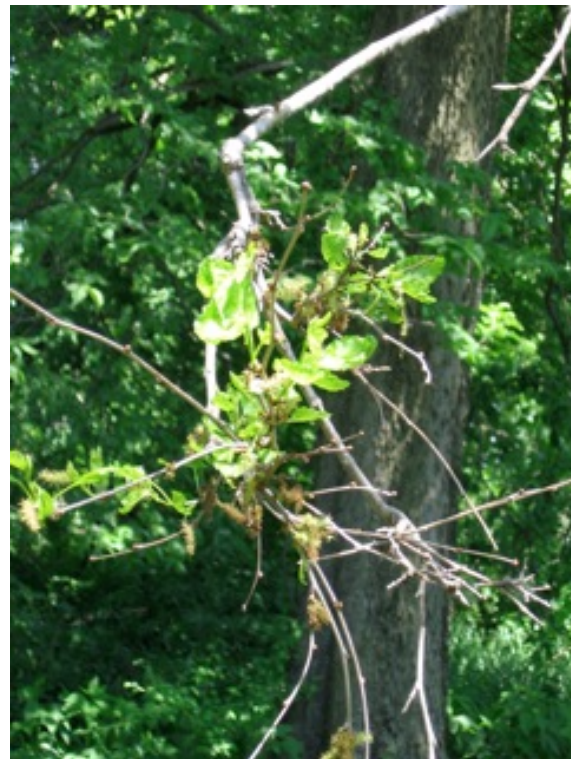
Note the small damaged leaves across the top of the maple below. Trees of all different species around our yard are demonstrating this damage. Also mentioned in the aforementioned papers. We have no transmitters so all RF from outside sources.





This male mulberry tree is characteristic of the male mulberries in our area. It shows pronounced damage with dead branch ends, poor overly yellow color, sparse leaves. These photos were taken on May 31, 2017. The situation continues to worsen.

This tree began to exhibit pronounced symptoms of RF problems by the end of the summer in 2016. The leaves were small off-color and no properly formed on the branch ends. It has had multiple sprouts at the ends of the branches for a couple years, but it still looked green and healthy overall. Obviously, the sprouts suggest it has been stressed for a couple of years. It is not exposed to road exhaust. It is in the countryside, not near a major highway.



The male mulberry at left (center) is a different mulberry tree. You can see how poorly leafed it is compared to the elm and hackberry trees it is next to. Leaves on our lovely locust tree are now sparse and branches are dying. Other locusts in the area are a very yellow green, not a healthy deep green color. Many other trees around the area are also showing damage or dying from damage that appears to be RF radiation induced.

Lilac showing marked one sided damage. Signal appears to be coming from a WiFi tower on a hill about a mile away.



**Green lilac nearly touching green side of affected lilac. The bases are only 8 ft apart.
0.6 microwatts/m² max
no audible or visible spikes in over 5 minutes**



**Green side of lilac
2.8 microwatts/m² max
only periodic audible or visible spikes**



**Bare side of lilac
83.5 microwatts/m² max
audible and visible spikes every 9 seconds**



39 microwatts/m² max
Bare spot pointing S/SW
Line of sight to cell tower
6 miles away

10 microwatts/m² max
Measured near bottom of
bare spot which points N



2.8 microwatts/m² max
In first whorl where still has needles

Please read the following reports which demonstrate that wireless technology is causing serious harm to wildlife:

- “The Report on Possible Impacts of Communication Towers on Wildlife Including Birds and Bees” commissioned on 30th August 2010 by the Ministry of Environment and Forest, Government of India http://www.moef.nic.in/downloads/public-information/final_mobile_towers_report.pdf
- “Impacts of radio-frequency electromagnetic field (RF-EMF) from cell phone towers and wireless devices on biosystem and ecosystem – a review” http://www.biolmedonline.com/Articles/Vol4_4_2012/Vol4_4_202-216_BM-8.pdf
- Balmori, A. “Electromagnetic pollution from phone masts. Effects on wildlife,” Pathophysiology (2009), doi:10.1016/j.pathophys.2009.01.007 <http://www.ncbi.nlm.nih.gov/pubmed/19264463>

Numerous foreign countries have taken precautionary action (<http://ehtrust.org/policy/international-policy-actions-on-wireless/>). Brussels, Belgium (<http://www.brusselstimes.com/brussels/14753/radiation-concerns-halt-brussels-5g-for-now>) and the Canton of Geneva, Switzerland (<https://www.telecompaper.com/news/canton-of-geneva-prohibits-construction-of-5g-antennae--1288622>) have placed a moratorium on 5G due to the health hazard posed by the high radiation levels emitted. Numerous scientists are calling for a moratorium on 5G globally due to the health and environmental hazard it poses (<http://www.5gappeal.eu/the-5g-appeal/>). The Italian court has ordered the Italian government to begin a public health campaign to make residents aware that cell and cordless phones are a health hazard (<https://microwavenews.com/short-takes-archive/italian-decision-precaution>). France has recalled thirteen models of cell phone for violating their exposure limits by up to three times when held against the body, in pockets, bras, socks, or directly against the head, as everyone does (<https://ehtrust.org/new-study-cell-phones-exceed-safety-limits-when-phones-touch-the-body/>).

Why does the FCC persist in trying to force a dangerous technology on the United States? Why have you not taken action to protect us?

The FCC is supposed to be protecting the health of all Americans and should not be complicit in forcing exposure to a dangerous technology.

Don't unleash a dangerous environmental pollutant on your friends, family, and, indeed, the whole country. Protect your family, friends, and the country - halt implementation of 5G and halt all proceedings and dockets to preempt local zoning to expedite 5G, including this OTARD rule change docket. Halt attempts to dismantle wired communications systems, including the copper wire phone system. Help bring wired broadband to everyone by placing a tariff on the use of wireless and use the proceeds to fund dedicated wired broadband internet. Be on the right side of history.

Sincerely,

Catherine Kleiber