

To: Clearwater County Commissioners

The Scientific Evidence To Support Restrictions on Cell Towers Near Homes and Schools

November 30, 2023

Dear Clearwater County Commissioners:

Today, we are writing to advise you of the scientific grounds for enacting strong school policy to mitigate exposures to the non-ionizing electromagnetic field emissions from cell towers. Wireless radio frequency (RF) electromagnetic (EMF) radiation and magnetic field/extremely low-frequency electromagnetic fields (ELF-EMF) are a relatively new and rapidly increasing environmental exposure. Significant sources include cell towers, cell boosters and 5G/4G networks.

We recommend wired and corded communications networks to connect homes and businesses to the internet instead of more cell tower networks.

Extensive published scientific evidence indicates that radiofrequency radiation at levels compliant with federal government limits can cause [cancer](#), [increased oxidative stress](#), [genetic damage](#), structural and functional changes of the [reproductive system](#), [memory deficits](#), [behavioral problems](#), and [neurological impacts](#). We consider radiofrequency radiation (RFR) to be a human carcinogen based on the [current body](#) of evidence. Many of these effects could be irreversible with grave consequences for our children's future.

In addition, research on impacts to wildlife has found numerous adverse effects ([Levitt et al 2022](#), [Cucurachi et al 2013](#), [Sivani et al 2012](#), [Balmori, 2015](#), [Balmori 2021](#)). A just published [systematic review and metaanalysis of studies](#) on the biological effects to insects of non-ionizing electromagnetic fields, including cell tower and Wi-Fi radiation, was published in the journal *Reviews on Environmental Health* finding the "vast majority of studies found effects, generally harmful ones" with toxic effects such as impacts to reproduction and immune health occurring at legally allowed exposure levels.

A landmark three part 2021 research review on effects to wildlife published in *Reviews on Environmental Health* by U.S experts including former U.S. Fish and Wildlife senior biologist Albert Manville states current science should trigger urgent regulatory action citing more than 1,200 scientific references which found adverse biological effects to wildlife from even very low intensities of non ionizing radiation with findings of impacts to orientation and migration, reproduction, mating, nest, den building and survivorship ([Levitt et al., 2021a](#), [Levitt et al., 2021b](#), [Levitt et al., 2021c](#)).

The [U.S. Department of the Interior sent a letter](#) in 2014¹ reviewing several research studies showing harm to birds and concluding that "The electromagnetic radiation standards used by the Federal

¹ Washington DC, Veenendaal ME. [Department of Interior Letter](#). United States Department of the Interior OFFICE OF THE SECRETARY.

Communications Commission (FCC) continue to be based on thermal heating, a criterion now nearly 30 years out of date and inapplicable today.”

We recommend policies to reduce exposure to RF, especially for schools, neighborhoods and ecologically sensitive areas. We note that schools are now taking measures to reduce cell tower radiation from nearby cell towers. As an example, the Desert Sage High School in central Tucson, a public charter school has [installed shielding along the wall facing the cell tower](#) to reduce the cell tower radiation exposures in the classroom.

On August 13, 2021, the United States Court of Appeals for the District of Columbia Circuit [ruled in our case](#) against the FCC that the decision by the Federal Communications Commission (FCC) not to update its 1996 safety limits for human exposure to wireless radiation (which includes cell tower emissions) was “arbitrary and capricious.” One of the most important aspects of the court decision was that the court found the FCC did not adequately explain why it ignored scientific evidence on impacts from long term wireless radiation exposure, especially in regards to children, who the American Academy of Pediatrics states are more vulnerable to wireless radiation. The court ordered the FCC to examine the record evidence regarding long term exposure to children. So far, the FCC has not responded. Thus, this landmark [ruling](#) highlights how no federal health agency has reviewed the full body of current research to ensure current safety standards are protective.

As an example of the research indicating federal regulations are inadequate to protect health, refer to a publication titled [“Evidence for a health risk by RF on humans living around mobile phone base stations: From radiofrequency sickness to cancer](#) by Balmori (2022). This publication reviewed the existing scientific literature on cell tower radiation and found associations with radiofrequency sickness, cancer and changes in biochemical parameters. We have attached this study for your review.

A review paper by [Pearce 2020](#) titled [“Limiting liability with positioning to minimize negative health effects of cellular phone towers”](#) reviewed the “large and growing body of evidence that human exposure to RFR from cellular phone base stations causes negative health effects.” The authors recommend restricting antennas near homes and within 500 meters of schools and hospitals to protect companies from future liability.

Studies on people living near cell antennas have found increases in molecular markers in the blood that predict cancer. [Zothansjama et al. 2017](#) evaluated effects in the human blood of individuals living near mobile phone base stations (for study purposes, they chose a distance of 80 meters) compared with healthy controls living more than 300 meters from a base station. The study measured higher RFR levels in the homes of people living in homes within 80 meters from the cell antennas (documenting the impact of increased RFR radiation from the antenna installations) and found statistically significant differences in their blood. The group living closer to the antennas had statistically significant higher frequency of micronuclei and a rise in lipid peroxidation in their blood; these changes are considered biomarkers predictive of cancer.

Please note the following scientific publications regarding cell towers and cell phone radiation:

- In 2011, radiofrequency radiation was [classified](#) as a Class 2B possible carcinogen by the World Health Organization’s International Agency for Research on Cancer. Between then and now, the published peer-reviewed scientific evidence has significantly increased. Now, many scientists are of the opinion that the weight of current peer-reviewed evidence supports the conclusion that

radiofrequency radiation should be regarded as a human carcinogen ([Hardell and Carlberg 2017](#), [Peleg et al, 2018](#), [Miller et al 2018](#)).

- The U.S. National Toxicology Program \$25 million animal study on long-term exposure to radiofrequency radiation found [DNA Damage](#), [heart damage](#), increased [brain tumors](#), and [increased heart tumors](#) deemed “clear evidence of cancer.” Researchers with the renowned Ramazzini Institute in Italy then published [findings](#) that lab animals exposed to levels of RFR comparable to cell tower base stations’ networks developed the same types of cancers as the [US National Toxicology Program](#) found in its large-scale animal study.
- An Australian [study](#) looked at RFR levels to which kindergarten children were exposed, depending on how close their school was to base stations/cell towers. Researchers equipped the children with RFR measuring devices. Researchers found that kindergartens located nearby base stations/cell towers (closer than 300 meters or approximately 330 yards) had total exposure to radiofrequency radiation (RFR or RF-EMF) more than 3 times higher than children at schools where base stations were further away than 300 meters.
- A review by [Yakymenko 2015](#) found that in 93 out of 100 studies, RFR exposure caused oxidative stress. Many well-known carcinogens (such as asbestos and arsenic) are understood to induce oxidative stress. [Schuermann et al., 2021](#) again confirmed non-ionizing radiation has oxidative effects in the majority of animal and cell studies.
- The International Association of Firefighters has officially opposed cell towers on their stations since 2004 after a study [found](#) neurological damage in firefighters with antennas on their fire station. In 2017, when 5G “small cells” were coming to California via a 5G streamlining bill (SB 649), firefighter organizations came out in strong opposition to the bill and requested that towers not be installed on firehouses. They were successful and SB649 was [amended](#) to [exempt](#) their stations from the deployment due to their health concerns.
- A study by [Meo et al., 2019](#) of students in schools near cell towers found their higher RF exposure was associated with impacts on motor skills, memory, and attention. Examples of other health issues associated with cell towers in research studies include [neuropsychiatric problems](#), diabetes, [headaches](#), [sleep problems](#), and [genetic damage](#). Such research continues to accumulate after the 2010 landmark [review study](#) on 56 studies that reported biological effects found at very low intensities of wireless radiation, including impacts on reproduction, permeability of the blood-brain barrier, behavior, cellular changes and metabolic changes, and increases in cancer risk ([Lai and Levitt 2010](#)).
- The [International EMF Scientist Appeal](#) was submitted to the United Nations urging immediate protective policy action in light of the scientific evidence that has found adverse biological effects from electromagnetic radiation, including radiofrequency radiation, and, as of July 2023, this Appeal is signed by 259 scientists from 44 nations; these are scientists who have published peer-reviewed articles about electromagnetic fields. They state, “numerous recent scientific publications have shown that EMF affects living organisms at levels well below most international and national guidelines. Effects include increased cancer risk, cellular stress, increase in harmful free radicals, genetic damages, structural and functional changes of the reproductive system, learning and memory deficits, neurological disorders, and negative impacts on general well-being.”

- The European Parliament Study Service “[Health Impact of 5G](#)” report concludes that the electromagnetic field emission frequencies of 450 to 6,000 MHz “are probably carcinogenic for humans, in particular related to gliomas and acoustic neuromas” and in regards to reproductive developmental effects “these frequencies clearly affect male fertility and possibly female fertility too. They may have possible adverse effects on the development of embryos, fetuses and newborns.”

The exposure limits of the U.S. are outdated and do not protect the health of the public, especially not the health of children and staff exposed every school day. This is why the [New Hampshire State Commission on 5G](#) and [Santa Clara Medical Association](#) recommend restricting cell towers near schools.

Please note that in several countries, governments have set policies to protect children, pregnant women and medically fragile persons by classifying areas with homes, hospitals and schools as “sensitive areas.” These countries reduce exposure in “sensitive” areas and have strict oversight and compliance measures in place.

Our position is that children require special protections from radiofrequency radiation and their exposures should be reduced to as low as possible. Teachers and staff should work in a healthy environment. We strongly recommend mitigating RFR exposure at schools.

EHT has been joined by other experts and organizations in writing to you and offering expertise to support the development of protective measures. Please see the attached resources with additional documentation. We are available to meet and present more about how to reduce and mitigate RF risks and answer any questions.

Thank you for your consideration and action on this important issue.

Signatories

Devra Davis, PhD, MPH
President and Founder, Environmental Health Trust

Anthony B. Miller, MD
Professor Emeritus at the Dalla Lana School of Public Health, University of Toronto
Senior Advisor to Environmental Health Trust

Theodora Scarato, MSW
Executive Director, Environmental Health Trust

David O. Carpenter, MD
Director, Institute for Health and the Environment
A Collaborating Center of the World Health Organization
University at Albany, New York

Alfonso Balmori, BSc, Biologist
Master in Environmental Education, Independent researcher

Kent Chamberlin, PhD
Professor & Chair Emeritus
Department of Electrical & Computer Engineering
University of New Hampshire

Paul Héroux, PhD
Professor of Toxicology and Health Effects of Electromagnetism
McGill University Medicine
Department of Surgery, McGill University Health Centre

Meg Sears, PhD
Chair, Prevent Cancer Now
Senior Research Associate, Ottawa Hospital Research Associate

Frank Clegg
CEO, Canadians for Safe Technology

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