Testimony in Favor of H5217 – The Rhode Island Clean Air Preservation Act of 2025

By Stephen Dahl, Diane Dr, Kingston RI

Good evening, esteemed Committee members.

My name is Stephen Dahl, and I am here to express my strong support for H5217, the Rhode Island Clean Air Preservation Act of 2025. My advocacy is rooted in personal experience with the adverse health effects of unregulated microwave radiation pollution. To be clear, my testimony is about a fundamental right to a safe and healthy environment, free from involuntary exposure to harmful pollutants.

In Rhode Island, there is currently no monitoring of microwave radiation pollution. Consequently, citizens like myself have taken it upon ourselves to document this pollution. Using a Safe and Sound Pro II meter, which detects microwave radiation pollution, I have documented high levels in various locations, including my home, areas around the University of Rhode Island, and notably near the water tower on Flagg Road. These documented levels far exceed what is required for five bars of service on a phone.

To illustrate, a full five-bar signal on a cellphone for a text or phone call requires just **0.002 µW/m² [microwatt per square**

**meter]**. The readings I have obtained surpass this by over **20.95 million times**, indicating an excessive, unnecessary and extreme level of microwave radiation pollution exposure.

As a result, I experience a range of debilitating symptoms, including arrhythmia, fatigue, headaches, cognitive impairment, muscle spasms, joint pain, insomnia, and memory loss. These are not abstract concerns; they are daily realities for me and many others in our community who may be unaware of the source of their ailments.

Consider this analogy: Imagine a shower in your home that cannot be turned off. Instead of a gentle stream, it delivers water at millions of times the necessary pressure, continuously, 24 hours a day. That would be bad enough but imagine that this is not clean water but contaminated sewage. The individual subjected to this would suffer severe health consequences, and the structure of the house would deteriorate over time.

This scenario mirrors our current situation with microwave radiation pollution. It is omnipresent, relentless, and unregulated. Its invisibility leads to widespread neglect, despite recognition by the telecommunications industry itself that microwave radiation constitutes an environmental pollutant. If this was any other form of contamination, stringent safeguards would be in place. Yet, due to its intangible nature, there is a glaring absence of monitoring, accountability, and protection for Rhode Island residents.

This issue is further compounded by the federal government's longstanding practice of rebranding and implementing environmental policies without adequate state-level oversight and control. For nearly 80 years, federal agencies have engaged in weather modification activities under various guises, often without informing or consulting the states affected. Rhode Island was among the first to raise objections to this overreach. Now, eight years later, 22 states have introduced legislation to prohibit such practices.

In a landmark decision, the U.S. Court of Appeals for the District of Columbia Circuit ruled that the Federal Communications Commission (FCC) failed to provide a reasoned explanation for its determination that its wireless radiation guidelines, established in 1996, adequately protect against all harmful effects of exposure. The court found that the FCC had **"completely failed"** to address the "substantive evidence of potential environmental harms" on the record, which included science showing serious impacts to birds, bees, trees, and plants.

H5217 is not merely an acknowledgment of microwave radiation pollution; it is a proactive step toward reclaiming our state's ability to protect itself from involuntary exposure to harmful pollution. I urge you to support this bill. The people of Rhode Island have a right to clean air and a safe environment.

## Radiofrequency Electromagnetic Microwave Radiation Exposures

We are constantly bombarded with pulsed, data-modulated, Radiofrequency Electromagnetic Microwave Radiation (RF-EMR) exposures due to the proliferation of cellular wireless, radio and television signals. The emergence of densified 4G/5G will exponentially increase these RF-EMR exposures, resulting in scientifically-established melatonin-suppression, immuno-suppression, immediate and direct neurological damages and acceleration of the growth of cancerous tumors. (In the table, below, **$\mu W/m^2$** is millionths of a Watt spread over a one-square-meter area and **x** is a multiplier)

| Power Output Scale | Consequences on Human Health (based on thousands of published studies) | $\mu W/m^2$ |
|---|---|---|
| **0.0005x** | EEG altered in humans, alters brain waves | 0.000001 |
| **1** | **FIVE BARS ON CELL PHONE** | 0.002 |
| **15,000x** | Sleep disorders, weakness, fatigue, pain | 30 |
| **50,000x** | Human sensation | 100 |
| **500,000x** | Decreased cell growth, humans | 1,000 |
| **600,000x** | Childhood leukemia | 1,200 |
| **1,250,000x** | Impaired motor function, reaction time, memory, attention | 2,500 |
| **3,750,000x** | Altered white blood cells, humans | 7,500 |
| **5,000,000x** | Headache, dizziness, fatigue, weakness, insomnia, humans | 10,000 |
| **15,000,000x** | Microwave hearing | 30,000 |
| **25,000,000x** | Leukemia, skin, melanoma, bladder cancer | 50,000 |
| **50,000,000x** | Impaired memory, visual reaction time, humans | 100,000 |
| **5,000,000,000x** | FCC Maximum Permissible RF-EMR Exposure Guidelines, General Pop. | 10,000,000 |

**Conclusion**: The measurements above explain why **close proximity** to the proposed million+ of microwave cell towers for the U.S. would be hazardous to the health of U.S. citizens. We need only **0.002 $\mu W/M^2$ (-85 dBm)** of RF microwave radiation for wireless telecommunications service. A locality can, therefore, set a ***maximum output limit*** from all frequencies/ antennas from Wireless Telecommunications Facilities (WTFs) in the pubic rights-of-way or in close proximity to where people live, sleep and heal at **0.1 Watt of Effective Radiated Power (ERP)** because that provides -85 dBm signal strength at a ½ -mile down the street, with five bars on a cell phone and the **capacity needed** for everyone to make a call.

***A typical WTF in the public rights-of-way outputs Effective Radiated Power at 1,500-7,500 watts ERP, which is between 15,000 and 75,000 times more power than is necessary to make "five-bar" cellular connections.***

Thank you.

Evaluate the pollution.

Start cleaning it up.

It's irresponsible to not be monitoring for this type of pollution.

FCC Guideline is not protective. 27 volumes of evidence.

https://ehtrust.org/environmental-health-trust-et-al-v-fcc-key-documents/

Fact Sheet

EHT et al. v. FCC Factsheet EHTRUST.org

https://ehtrust.org/in-historic-decision-federal-court-finds-fcc-failed-to-explain-why-it-ignored-scientific-evidence-showing-harm-from-wireless-radiation

The state of New Hampshire studied microwave radiation and made 15 Recommendations, including Recommendation 5: "Signal strength measurements must be collected at all wireless facilities…" (See pages 11-12 of their report.)
https://gc.nh.gov/statstudcomm/committees/1474/reports/5G%20final%20report.pdf


Safe and Sound Pro II
Slight
Moderate
High
Extreme
High
Med
Low
Off
Hog Head Entrance


Safe and Sound Pro II

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On
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Max
Reset


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Moderate
High
Extreme
MAX
AVG
41,900 µW/m²
307 µW/m²
On
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122 µW/m2
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On
On
Off
High
Med
Low
LIVING
00 MHz - 8 GHz
CE


Safe and Sound Pro II


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Extreme
PEAK 106 µW/m2
MAX 227 µW/m2
AVG 3.83 µW/m2
On
On
Off
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Med
Low

Here are more photos for the testimony in favor of H5217.

All but two were taken the morning of Wednesday, Feb 5, 2025. I waited one minute after turning the Broadband meter on before taking photos.

The camera for those is one hour ahead. So if 10AM, should be 9AM.

0259 9:57:24AM, Peak 360, Max 360, Avg 14.5, High radiation/Red light indicated.

0258 9:57:16AM, Peak 35.0, Max 145, Avg 4.51, Medium radiation/yellow light.

0260 10:04:14AM, Berth Ave sewer/rain water pump at end of Berth Ave, a dead end street off of Diane Dr, next to college student duplexes. This is about 500 feet from my home, walking.

0262 10:04:40 Close up of meter and antenna for sewer water pump station. I was standing just outside its fence, at the end of the road.

0264 10:05:32AM Antenna and meter for Sewer water pump station, focus on Broadband meter. Peak 108, Max 227, Avg 3.83. Moderate/yellow.

0267 10:05:36AM Antenna and meter for sewer water pump station, focus on Broadband meter. Peak 122, Max 227, Avg 4.9. High radiation, red.

0272 10:05:50AM. Nice photo of meter and antenna, standing just outside of fence like the others.

0273 10:06:00AM Meter and antenna for sewer water pump station. Peak 114, Max 563, Avg 7.10. High radiation, red.

I wanted to show the difference with these next photos between how much radiation was in my home between last summer, before the new flat RF radiation panels were installed on the water tower at Flagg Rd near URI and after.

0281 10:46:50AM Acousticom2 Electrsmog Detector. This is a consumer version Broadband meter which is used by electromagnetically sensitive people to tell how much RF radiation is in an area and fits well into a pocket, making it more handy than the larger models. It uses the electrical measuring system of Volts/meter. It also gives readings in the 200MHz to 8GHz range, like the bigger meter. This one shows levels by my dining room window looking out. 0.1 to 0.3 V/m is in the orange to red (medium to high) radiation category. Compare this meter's reading to the camp readings further below.

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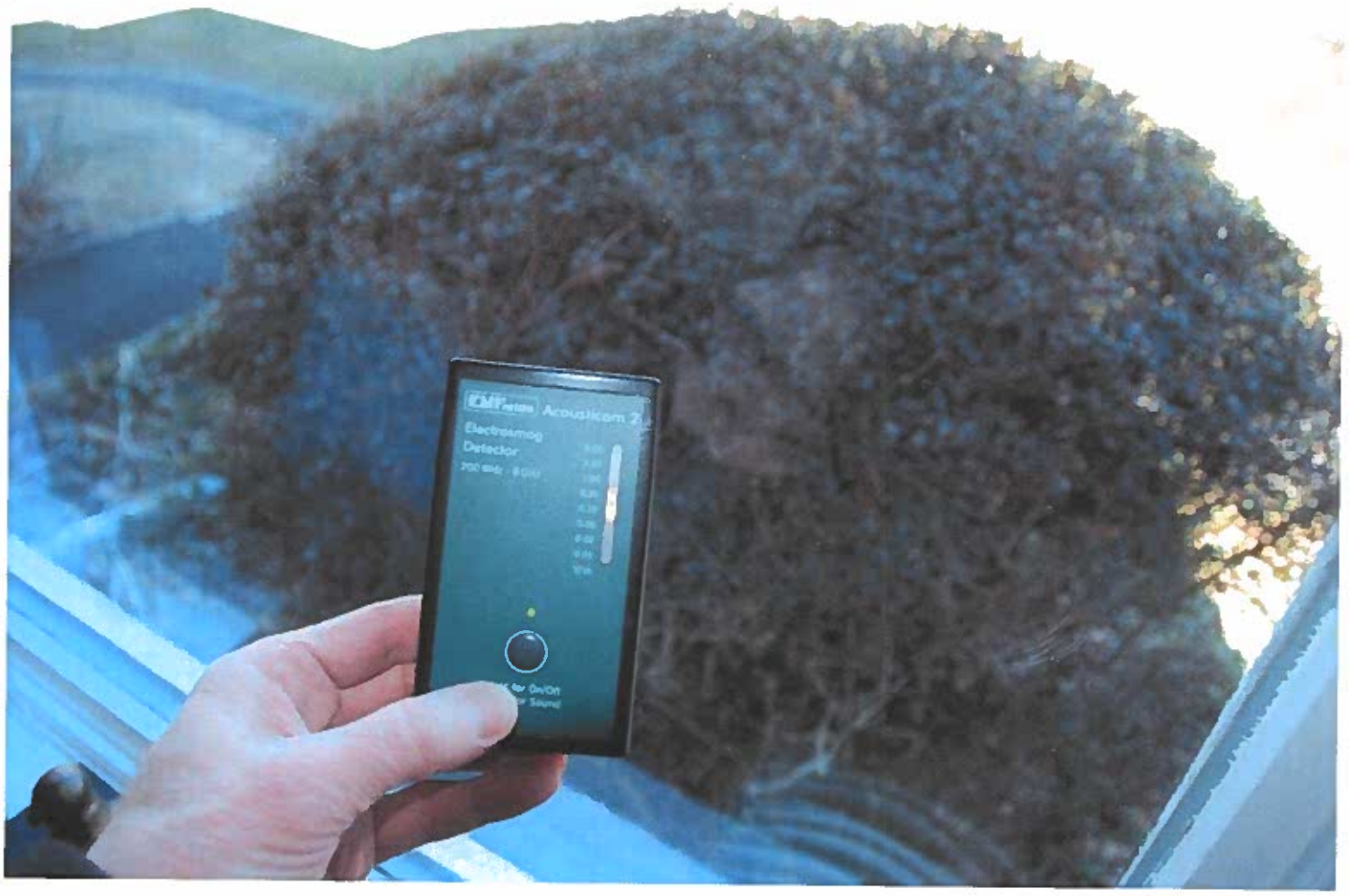
PEAK
MAX
AVG


Safe and Sound Pro II
Broadband RF Meter
Slight
Moderate
High
Extreme
7.10 μW/m²
High
Med
Low
Off


Acoustic
Electrosmog
Detector


Safe and Sound Pro II


EMFields Acousticom 2
Electrosmog
Detector
200 MHz - 8 GHz
Hold for On/Off

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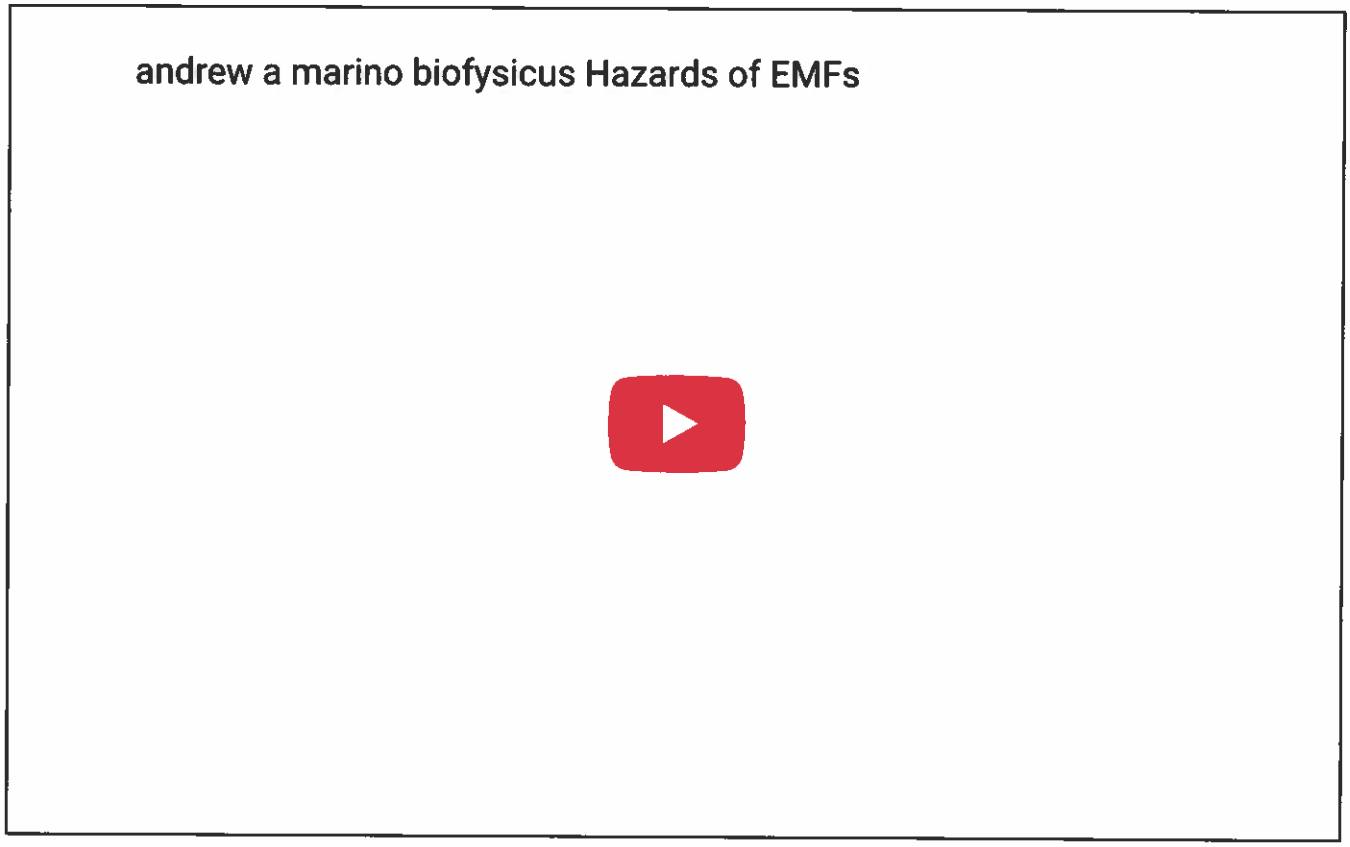
# SCIENTISTS FOR WIRED TECHNOLOGY

Advocacy based on Scientists' research of the hazards of pulsed, data-modulated, Radiofrequency Microwave Radiation

## Radiofrequency Microwave Radiation Exposure Guidelines

**Dr. Andrew A. Marino on the Hazards of EMFs and RF Microwave Radiation**




**Are SAR measurements useful in your research?**
**More here**

*Marino:*

> *In connection with understanding mobile phone fields, none whatsoever. I think they're meaningless with regard to that application.*

**Why are SAR measurements meaningless?**

*Dr. Marino:*

> *Several reasons. First you need to understand where SAR came from. I was there when SAR was invented. Richard Phillips, Don Justesen, Saul Michaelson, Herman Schwann, these were men who created SAR, whose mind gave rise to it. And the reason they did was because they were interested in developing microwave ovens and in understanding how to cook meat. And it's useful for understanding how to cook meat. But it has no application whatsoever, that I have ever seen suggested or advanced, for understanding mobile phones.* ***SAR works for dead muscle. It has just no applicability in my opinion for live brain****.*

**Why are SAR measurements not applicable to the live brain?**

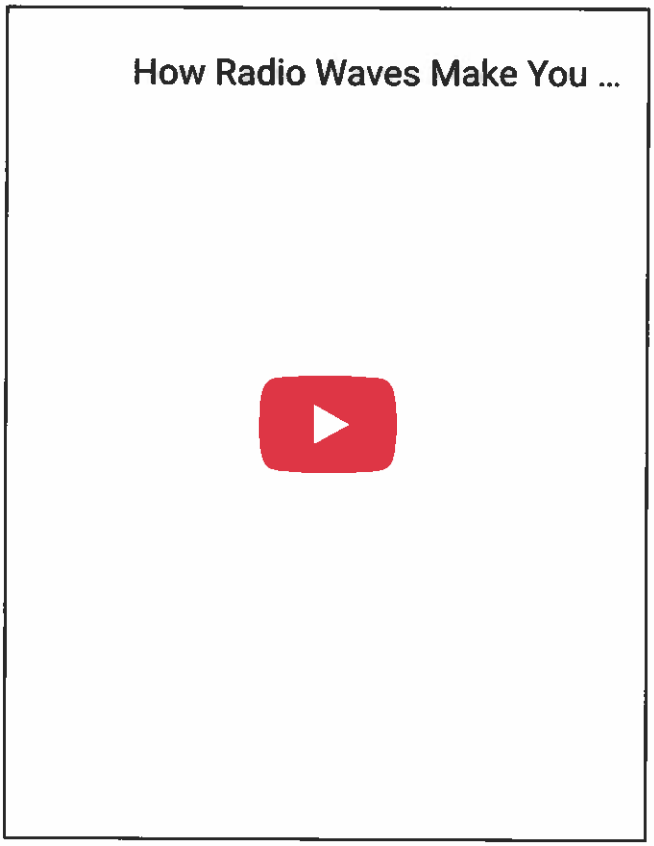
*Dr. Marino:*

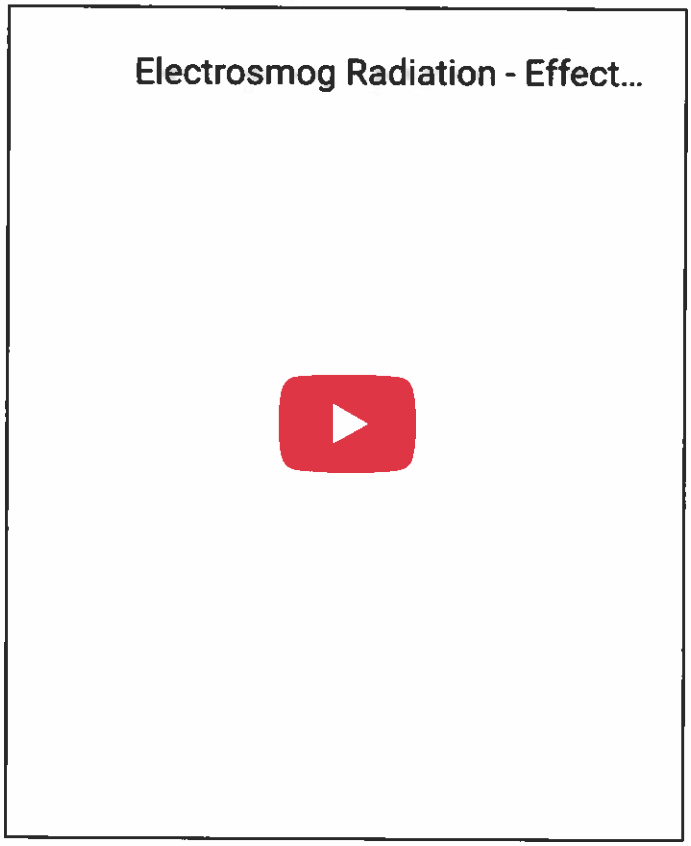
> ***Because the health hazards associated with mobile phone fields have nothing to do with heat****. So it makes no sense to say, "I have a really great way of measuring heat" when the measurement of heat is irrelevant to understanding health hazards. Any measurement that you make that has no connection with what you're interested in is just a waste of time.* ***SAR can produce a lot of data and when the calculations of SAR are done they can produce beautiful pictures but the pictures are arbitrary and the measurements are meaningless. It's quite clear that that's the case.***

## Prof. Trevor Marshall, PhD States the Truth: "The brain is not acting as a mass being heated, the brain is acting as a radio receiver."

**Dr. Trevor Marshall: How Radio Waves Make You Sicker**

**Dr. Trevor Marshall: Electrosmog Radiation – Effects**

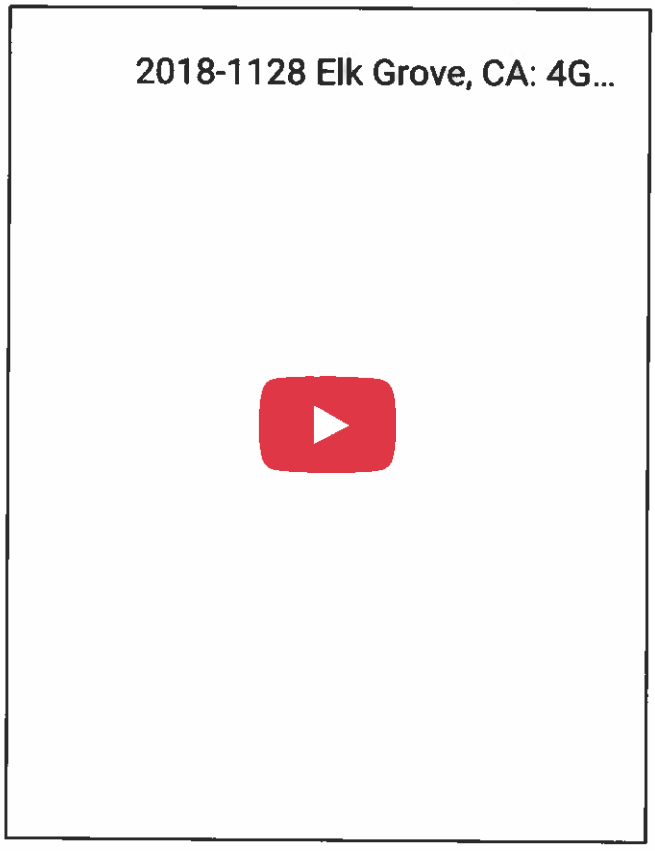



## Windheim Proves That The Emperor Has No Clothes

**Nov 28, 2018: William F. Hammett, Professional Electrical Engineer Spreads Industry Propaganda on Nov 28, 2018 in Elk Grove, CA (39:04 to 43:50)**

**Nov 28, 2018: Eric Windheim, Certified Electromagnetic Radiation Specialist Tells the Truth on Nov 28, 2018 in Elk Grove, CA (3:02:23 to 3:07:40)**





## Biologically-Based RF Microwave Radiation Exposure Guidelines

BioInitiative, 2019: "A scientific benchmark of 30 μW/m$^2$ for lowest observed effect level for RF microwave radiation is based on mobile phone base station-level studies. Applying a ten-fold reduction to compensate for the lack of long-term exposure (to provide a safety buffer for chronic exposure) or for children as a sensitive subpopulation yields a **3 to 6 μW/m$^2$** RF Microwave Radiation exposure guideline"

Similar scientifically-based RF Microwave Radiation Exposure Guidelines are published by the International Institute for Building-Biology & Ecology:

| No Hazard | Slight Hazard | Severe Hazard | Extreme Hazard |
|---|---|---|---|
| < 0.1 $\mu W/m^2$ | **0.1 $\mu W/m^2$ to 10 $\mu W/m^2$** | 10 $\mu W/m^2$ to 1,000 $\mu W/m^2$ | > 1,000 $\mu W/m^2$ |

- **$\mu W/m^2$** = millionths of a Watt per square meter (a measurement of power flux density)
- **Power flux density** (PFD) = the amount of electrical power that flows through a unit area: expressed as microWatts (µW) per square meter ($m^2$).
- PFD measures only the **rate of electrical power**, **NOT** the total electrical power delivered over time, which requires the rate to be multiplied by the time of exposure and then requires reporting the results in a **more relevant unit:** µW-seconds/$m^2$ or µJoules/$m^2$
- Average $\mu W/m^2$ readings, as specified by the FCC, **significantly under-report** the levels of pulsed, data-modulated, RF microwave radiation exposures for two reasons —
- **Peak RF microwave radiation** exposures meter **100x–1000x higher** than average RF microwave radiation for data-carrying, modulated, high-crest signals like Wi-Fi, 4G/LTE and 5G because of the duty cycle, inherent in these RF signals. Inexplicably, the FCC RF microwave radiation exposure guidelines *only consider average* RF microwave radiation exposures, which is a significant error because living organisms' biology reacts to the sharp changes of RF microwave radiation from zero to peak levels and back again. This is more fully explained here: Palo Alto Whitewashes RF Microwave Radiation Exposure Hazards
- The FCC RF microwave radiation exposure guidelines **consider neither the time of exposure nor the total electrical power delivered over time**, which is *utter nonsense* and scientifically unsound. This is more fully explained here: RF Microwave Radiation Counter.

## Signal Strength RF Microwave Radiation Exposure Guidelines

**dBm** (decibel-milliwatts) is an abbreviation for the power ratio in decibels (dB) of the measured power referenced to one milliwatt (1 mW = 1/1,000 of a Watt). It is used in radio, microwave and fiber-optic communication networks as a convenient measure of absolute power because of its capability to *express both very large and very small values in a short form.* The following data is based on that published in the Cornet ED-85X Manual; the meter's antenna is centered at 2,450 MHz and can meter RF Microwave Radiation from 700 MHz to 6,000 MHz.

| dBm | Power Density | Comparison | See Case **No. 18-1051**, *Mozilla v FCC* |
|---|---|---|---|
| **0 dBm** | 580,000 $\mu W/m^2$ | **322,000,000x higher** | Land of . . . |
| -5 dBm | 180,000 $\mu W/m^2$ | **100,000,000x higher** | |
| -10 dBm | 58,000 $\mu W/m^2$ | | **Land of Capacity** (No 1996-TCA Preemption) |
| **-15 dBm** | 18,000 $\mu W/m^2$ | **10,000,000x higher** | |
| -20 dBm | 5,800 $\mu W/m^2$ | | |
| **-25 dBm** | 1,800 $\mu W/m^2$ | **1,000,000x higher** | |
| -30 dBm | 580 $\mu W/m^2$ | | |
| **-35 dBm** | 180 $\mu W/m^2$ | **100,000x higher** | |
| -40 dBm | 58 $\mu W/m^2$ | | |
| **-45 dBm** | 18 $\mu W/m^2$ | **10,000x higher** | |
| -50 dBm | 5.8 $\mu W/m^2$ | | |
| **-55 dBm** | 1.8 $\mu W/m^2$ | **1,000x higher** | |

| dBm | Power Density | Comparison | See Case **No. 18-1051**, *Mozilla v FCC* |
|---|---|---|---|
| -60 dBm | 0.58 μW/m² | | |
| **-65 dBm** | 0.18 μW/m² | **100x higher** | |
| -70 dBm | .058 μW/m² | | |
| **-75 dBm** | .018 μW/m² | **10x higher** | |
| -80 dBm | .0058 μW/m² | | |
| **-85 dBm** | 0.0018 μW/m² | **5 Bars on a cell phone** | |
| -90 dBm | 0.00058 μW/m² | | |
| **-95 dBm** | 0.00018 μW/m² | **1/10 lower** | |
| -100 dBm | 0.000058 μW/m² | | |
| **-105 dBm** | 0.000018 μW/m² | **1/100 lower** | |
| -110 dBm | 0.0000058 μW/m² | | |
| **-115 dBm** | 0.0000018 μW/m² | **1/1,000 lower** | |
| -120 dBm | 0.00000058 μW/m² | | |
| **-125 dBm** | 0.00000018 μW/m² | **1/10,000 lower** | |

**Land of Coverage**

(1996-TCA Premption)

**Conclusion: 0.002 μW/m² (-85 dBm)** is all the RF microwave radiation that is needed for strong cellular service in a residential neighborhood. A locality can set a maximum power output limit from all frequencies/antennas from a WTF in the public rights-of-way at **0.1 Watt of Effective Radiated Power (ERP)** because that provides -85 dBm signal strength at a ½-mile down the street, with five bars on a cell phone and everyone can make a call.

- **0.002 µW/m² is 5 billion (5,000,000,000) times lower** than the scientifically-unsound, FCC RF microwave radiation maximum public exposure guideline of 10,000,000 µW/m².
- **0.002 µW/m² is still 2 billion (2,000,000,000) times higher** than the PicoWatt (0.000000000001 Watt) electrical rates of power that human cell membranes use in regulating many key biological functions.

The simple math, above, clearly explains why Close Proximity Microwave Radiation Antennas (CPMRA) are hazardous and should not be allowed in public rights-of-way in residential zones.

**Typical Signal Strengths**

| SIGNAL STRENGTH | EXCELLENT | GOOD | FAIR | POOR | DEAD ZONE |
|---|---|---|---|---|---|
| 3G/1x | -70dBm | -71 to -85dBm | -86 to -100dBm | -101 to -109dBm | -110dBm |
| 4G LTE | -90dBm | -91 to -105dBm | -106 to -110dBm | -111 to -119dBm | -120dBm |

RF-EMR-Exposures-v5 **Download**

**From BioInitiative RF Color Charts**

**Radiofrequency Electromagnetic Microwave Radiation Exposures**

We are constantly bombarded with pulsed, data-modulated, Radio-frequency Electromagnetic Microwave Radiation (RF-EMR) exposures due to the proliferation of cellular, wireless, radio and television signals. The emergence of densified 4G/5G will exponentially increase these RF-EMR exposures, resulting in scientifically established melatonin suppression, immune-suppression, immediate and direct neurological damages and acceleration of the growth of cancerous tumors. (In the table, below: **µW/m²** is millionths of a Watt spread over a one-square-meter area and **n** is a multiplier)

| Power Output Scale | Consequences on Human Health (based on thousands of published studies) | µW/m² |
|---|---|---|
| 0.0005n | EEG altered in humans, alters brain waves | 0.000001 |
| 1 | **FIVE BARS ON CELL PHONE** | 0.002 |
| 15,000n | Sleep disorders, weakness, fatigue, pain | 10 |
| 50,000n | Human sensation | 100 |
| 500,000n | Decreased cell growth, humans | 1,000 |
| 600,000n | Childhood leukemia | 1,200 |
| 1,250,000n | Impaired motor function, reaction time, memory, attention | 2,500 |
| 3,750,000n | Altered white blood cells, humans | 7,500 |
| 5,000,000n | Headache, dizziness, fatigue, weakness, insomnia, humans | 10,000 |
| 15,000,000n | Microwave hearing | 30,000 |
| 25,000,000n | Leukemia, skin, melanoma, bladder cancer | 50,000 |
| 50,000,000n | Impaired memory, visual reaction time, humans | 100,000 |
| 5,000,000,000n | FCC Maximum Permissible RF EMR Exposure Guidelines, General Pop | 10,000,000 |

**Conclusion** The measurements above explain why **close proximity** to the proposed millions of microwave cell towers for the U.S. would be hazardous to the health of U.S. citizens. We need only **0.002 µW/m²** (**-85 dBm**) of RF microwave radiation for wireless telecommunications where a locality can, therefore, set a ***maximum output limit*** from all frequencies/ antennas from Wireless Telecommunications Facilities (WTF's) in the public rights-of-way or in close proximity to where people live, sleep and heal at **0.1 Watt of Effective Radiated Power (ERP)** because that provides -85 dBm signal strength at a ½ mile down the street, with five bars on a cell phone and the **capacity needed** for everyone to make a call.

***A typical WTF in the public rights-of-way outputs Effective Radiated Power at 1,500-7,500 watts ERP, which is between 15,000 and 75,000 times more power than is necessary to make "five-bar" cellular connections.***

# CELL PHONE FREQUENCIES BY PROVIDER

| USA | 3G | 4G LTE |
|---|---|---|
| verizon wireless | 850/1900 MHz (CDMA) | 700 MHz. Band 13<br>1900 MHz. Band 2<br>1700/2100 MHz. Band 4 |
| Sprint | 800/1900 MHz (CDMA) | 800 MHz. Band 26<br>1900 MHz. Band 25 |
| at&t | 850/1900 MHz (GSM) | 700 MHz. Band 17<br>850 MHz. Band 4<br>1700/2100 MHz. Band 4<br>1900 MHz. Band 2 |
| T-Mobile | 1700/2100 MHz (AWS)<br>1900 MHz | 700 MHz. Band 12<br>1900 MHz. Band 2<br>1700/2100 MHz. Band 4 |
| boost mobile | 800/1900 MHz (CDMA) | 800 MHz. Band 26<br>1900 MHz. Band 25 |
| metroPCS | 1700/2100 MHz (GSM) | 700 MHz. Band 12<br>1700/2100 MHz. Band 4 |

**47 CFR 2.1091 – Radiofrequency radiation exposure evaluation: mobile devices.**

## § 2.1091

(d) The limits to be used for evaluation are specified in §1.1310 of this chapter. All unlicensed personal communications service (PCS) devices and unlicensed NII devices shall be subject to the limits for general population/uncontrolled exposure.

(1) For purposes of analyzing mobile transmitting devices under the occupational/controlled criteria specified in § 1.1310 of this chapter, **time-averaging provisions of the guidelines may be used in conjunction with typical maximum duty factors to determine maximum likely exposure levels**.

(2) Time-averaging provisions may not be used in determining typical exposure levels for devices intended for use by consumers in general population/uncontrolled environments as defined in § 1.1310 of this chapter. However, **"source-based" time-averaging based on an inherent property or duty-cycle of a device is allowed. An example of this is the determination of exposure from a device that uses digital technology such as a time-division multiple-access (TDMA) scheme for transmission of a signal. In general, maximum average power levels must be used to determine compliance.**

## FCC RF-EMR Exposure Guideline Differences Among 4G/5G Wavelengths/Frequencies

| Year | Organization | Wavelengths | Frequencies | Velocity | Power Density | Description |
|---|---|---|---|---|---|---|
| | | **(inches)** | **(MHz)** | **(mph)** | **(μW/m²)** | |
| 1996 | FCC | 22.6 | 600 | 671,000,000 | 4,000,000 | MPE for general population/uncontrolled exposure (time-averaged) |
| 1996 | FCC | 19.4 | 700 | 671,000,000 | 4,666,667 | MPE for general population/uncontrolled exposure (time-averaged) |

| Year | Organization | Wavelengths | Frequencies | Velocity | Power Density | Description |
|---|---|---|---|---|---|---|
| 1996 | FCC | 17.0 | 800 | 671,000,000 | 5,333,333 | MPE for general population/uncontrolled exposure (time-averaged) |
| 1996 | FCC | 15.1 | 900 | 671,000,000 | 6,000,000 | MPE for general population/uncontrolled exposure (time-averaged) |
| 1996 | FCC | 13.5 | 1,000 | 671,000,000 | 6,666,667 | MPE for general population/uncontrolled exposure (time-averaged) |
| 1996 | FCC | 12.3 | 1,100 | 671,000,000 | 7,333,333 | MPE for general population/uncontrolled exposure (time-averaged) |
| 1996 | FCC | 11.3 | 1,200 | 671,000,000 | 8,000,000 | MPE for general population/uncontrolled exposure (time-averaged) |
| 1996 | FCC | 10.4 | 1,300 | 671,000,000 | 8,666,667 | MPE for general population/uncontrolled exposure (time-averaged) |
| 1996 | FCC | 9.6 | 1,400 | 671,000,000 | 9,333,333 | MPE for general population/uncontrolled exposure (time-averaged) |
| 1996 | FCC | 9.0 | 1,500 | 671,000,000 | 10,000,000 | MPE for general population/uncontrolled exposure (time-averaged) |
| 1996 | **FCC** | **8.5 to 0.1** | **1,600 to 100,000** | 671,000,000 | **10,000,000** | **MPE for general population/uncontrolled exposure (time-averaged)** |

| Year | Organization | Wavelengths | Frequencies | Velocity | Power Density | Description |
|---|---|---|---|---|---|---|
| 2012 | BioIntiative | 22.6 to 9.0 | 600 to 1,500 | 671,000,000 | 3 to 6 | MPE for general population to pulsed, data-modulated RF microwave radation (peak) |
| 2012 | **BioIntiative** | **8.5 to 0.1** | **1,600 to 100,000** | 671,000,000 | **3 to 6** | **MPE for general population to pulsed, data-modulated RF microwave radation (peak)** |

## Legend

- **FCC** = Federal Communications Commission
- **MHz** = MegaHertz or thousands of times per second
- **mph** = miles per hour
- **MPE** = Maximum Public Exposure
- **$\mu W/m^2$** = a **rate of exposure** for an unlimited amount of time (**not total exposure in a set period of time**) in millionths of a Watt (or microWatts) spread over a square meter

## Sources:

- 47 CFR 1.1310 – Radiofrequency Microwave Radiation Exposure Limits https://www.law.cornell.edu/cfr/text/47/1.1310
- FCC OET Bulletin 65 — FCC Guidelines for Human Exposure to Radiofrequency Microwave Radiation https://transition.fcc.gov/bureaus/oet/info/documents/bulletins/oet65/oet65.pdf
- BioIntiative Guidelines for Human Exposure to Radiofrequency Microwave Radiation http://www.bioinitiative.org/rf-color-charts
- Actual Field Radiofrequency Microwave Radiation Exposure Measurements, that compare Peak RMR and Average RMR http://responsibleipad.com/urgent.html
- Actual Field Radiofrequency Microwave Radiation Exposure Measurements, that compare Peak RMR and Average RMR http://responsibleipad.com/truth.html#truth

## FCC Guidelines for Human Exposure to Radiofrequency Microwave Radiation ('RMR') Reported as Average RMR

| Frequency range (MHz) | Electric field strength (V/m) | Magnetic field strength (A/m) | Average Power density ($\mu W/m^2$) | Averaging time (minutes) |
|---|---|---|---|---|
| 0.30-1.34 | 614 | 1.63 | (1,000,000,000)* | 30 |
| 1.34-30.00 | 824/f | 2.19/f | (1,800,000,000/$f^2$)* | 30 |
| 1.3 | | | 1,000,000,000 | 30 |
| 1.5 | | | 800,000,000 | 30 |
| 3.0 | | | 200,000,000 | 30 |
| 10.0 | | | 18,000,000 | 30 |
| 15.0 | | | 8,000,000 | 30 |
| 25.0 | | | 2,880,000 | 30 |
| 30-300 | 27.5 | 0.073 | 2,000,000 | 30 |
| 300-1,500 | | | (f/1500)*10 million | 30 |
| 600 | | | 4,000,000 | 30 |
| 700 | | | 4,670,000 | 30 |
| 800 | | | 5,330,000 | 30 |
| 900 | | | 6,000,000 | 30 |
| 1,000 | | | 6,670,000 | 30 |
| 1,250 | | | 8,330,000 | 30 |
| 1,500-100,000 | | | 10,000,000 | 30 |

*Plane-wave equivalent power density; f = frequency in MHz;

## FCC Guidelines for Human Exposure to Radiofrequency Microwave Radiation Translated to Peak RMR, which is at least 10x to 100x higher than Average RMR

| Frequency range (MHz) | Electric field strength (V/m) | Magnetic field strength (A/m) | Average Power density ($\mu W/m^2$) | Averaging time (minutes) |
|---|---|---|---|---|
| 0.30-1.34 | | | (1,000,000,000) x 100* | 30 |
| 1.34-30.00 | | | (1,800,000,000/$f^2$) x 100* | 30 |
| 1.3 | | | 100,000,000,000 | 30 |
| 1.5 | | | 80,000,000,000 | 30 |
| 3.0 | | | 20,000,000,000 | 30 |
| 10.0 | | | 1,800,000,000 | 30 |
| 15.0 | | | 800,000,000 | 30 |
| 25.0 | | | 288,000,000 | 30 |
| 30-300 | | | 200,000,000 | 30 |
| 300-1,500 | | | (f/1500)* 1 billion | 30 |
| 600 | | | 400,000,000 | 30 |
| 700 | | | 467,000,000 | 30 |
| 800 | | | 533,000,000 | 30 |
| 900 | | | 600,000,000 | 30 |
| 1,000 | | | 667,000,000 | 30 |
| 1,250 | | | 833,000,000 | 30 |
| 1,500-100,000 | | | 1,000,000,000 | 30 |

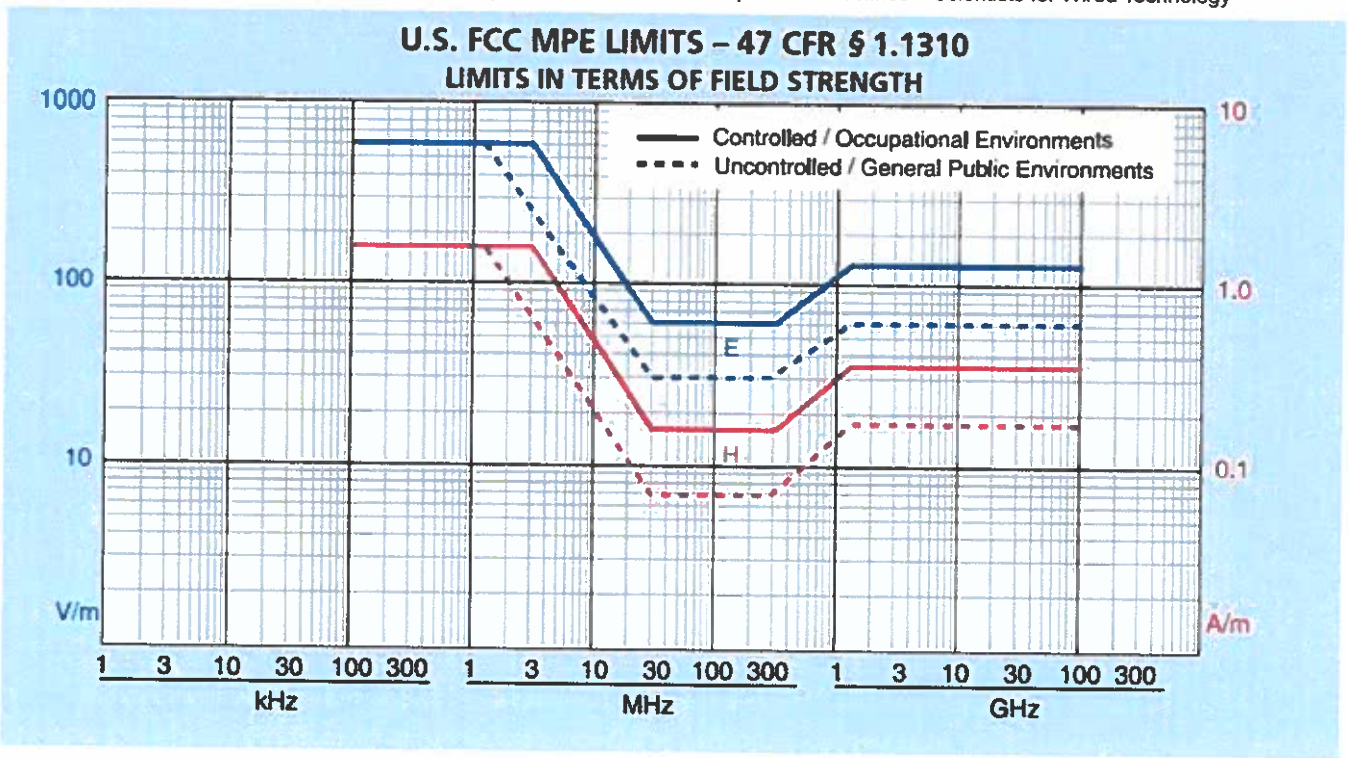
*Plane-wave equivalent power density; f = frequency in MHz; 1 $\mu W/m^2$ average RFR = 100 $\mu W/m^2$ peak RFR

## BioIntiative Guidelines for Human Exposure to Radiofrequency Microwave Radiation Reported as Peak RMR

| Frequency range (MHz) | Electric field strength (V/m) | Magnetic field strength (A/m) | Power density ($\mu W/m^2$) | Averaging time (minutes) |
|---|---|---|---|---|
| 0.30-1.34 | | | 5* | N/A |

| Frequency range (MHz) | Electric field strength (V/m) | Magnetic field strength (A/m) | Power density ($\mu W/m^2$) | Averaging time (minutes) |
|---|---|---|---|---|
| 1.34-30.00 | | | 5 | N/A |
| 1.3 | | | 5 | N/A |
| 1.5 | | | 5 | N/A |
| 3.0 | | | 5 | N/A |
| 10.0 | | | 5 | N/A |
| 15.0 | | | 5 | N/A |
| 25.0 | | | 5 | N/A |
| 30-300 | | | 5 | N/A |
| 300-1,500 | | | 5 | N/A |
| 600 | | | 5 | N/A |
| 700 | | | 5 | N/A |
| 800 | | | 5 | N/A |
| 900 | | | 5 | N/A |
| 1,000 | | | 5 | N/A |
| 1,250 | | | 5 | N/A |
| 1,500-100,000 | | | 5 | N/A |

*Recommendation is 3 to 6 $\mu W/m^2$; mid-point is 4.5 $\mu W/m^2$, which rounds up to **5 $\mu W/m^2$**; f = frequency in MHz;




Link to the 1986 National Commission on Radiation Protection document (NCRP Report No. 86, Biological Effects and Exposure Criteria for Radiofrequency Electromagnetic Fields), NCRP-86.pdf, used by the FCC to set its pulsed, data-modulated, Radio-frequency Electromagnetic Microwave Radiation (RF-EMR) exposure guideline discussed negative health consequences at many different power levels of RF-EMR exposures — at power levels high enough to heat living tissue and at power levels much, much lower than that.