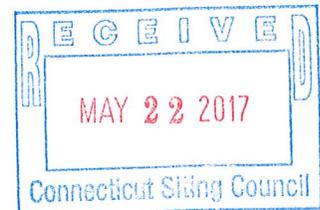


BRIDGET M. D'ANGELO
860.240.6015 DIRECT TELEPHONE
BDANGELO@MURTHALAW.COM

May 19, 2017



VIA ELECTRONIC MAIL AND FIRST CLASS MAIL

Attorney Melanie Bachman
Executive Director
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

ORIGINAL

Re: Docket No. 471 – Interrogatories to Application from Ms. Sorrentino

Dear Attorney Bachman:

Enclosed please find an original and fifteen copies of interrogatories directed to the Applicant in this Docket submitted on behalf of Ms. Patricia Sorrentino.

Based on the pre-hearing schedule, responses to the interrogatories are due on or before May 30, 2017.

Please feel free to contact the undersigned if you have any questions concerning this submission.

Thank you for your consideration.

Respectfully submitted,

By: 

Bridget M. D'Angelo
Attorney for Patricia Sorrentino

Enclosures

cc: Service List – Docket No. 471

STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL

IN RE: : DOCKET NO. 471
:
APPLICATION OF CELLCO PARTNERSHIP :
D/B/A VERIZON WIRELESS FOR A :
CERTIFICATE OF ENVIRONMENTAL :
COMPATIBILITY AND PUBLIC NEED FOR :
THE CONSTRUCTION, MAINTENANCE AND :
OPERATION OF A WIRELESS :
TELECOMMUNICATIONS FACILITY AT :
208 KIRK ROAD (a/k/a 1075 PARADISE :
AVENUE) IN HAMDEN, CONNECTICUT : MAY 19, 2017

DOCKET NO. 471 - PRE-HEARING INTERROGATORIES (SECOND SET)
DIRECTED TO CELLCO PARTNERSHIP D/B/A VERIZON WIRELESS FROM MS.
PATRICIA SORRENTINO

1. Reference Question 13 of Applicant's Responses to Patricia Sorrentino's Pre-Hearing Interrogatories (the "Interrogatories"). Please provide the information for the two alternative sites depicted in Schedule 1 of the Hamden 8 Search Area for the following:
 - a. The name of Applicant's representative who evaluated the alternative sites.
 - b. The dates on which the Applicant investigated the alternative sites to determine whether those areas are capable of supporting the Applicant's telecommunications antennas and related equipment at a location and elevation that satisfies its technical requirements.
 - c. Site evaluation documentation concerning each site's capability to support the Applicant's telecommunications antennas and related equipment at a location and elevation that satisfies its technical requirements.
 - d. Information regarding whether an increase to the existing utility poles will be necessary.
 - e. Information concerning whether the proposed utility facilities will be above ground or underground.
 - f. Reference Schedule 2 attached hereto (an aerial view of the Vignola property). Has the Applicant considered or discussed with the Lessor the possibility of locating the proposed tower in this location?

2. Reference Schedule 1. Regarding the two alternative site locations that were circulated to the Connecticut Siting Council staff and counsel for Ms. Sorrentino, please explain the viability of providing access to those sites from the private driveway at the end of Kirk Road rather than from Country Club Drive.
3. Reference Schedule 2. Based on the comments from the Town of Hamden, a State Legislator, and members of the public in the record and from the hearing on May 2, overwhelming opposition to tower access from Country Club Road is evident. Please answer the following questions:
 - a. Has the Applicant evaluated accessing the tower site from the private driveway at the end of Kirk Road?
 - b. Has the Applicant considered the ease and calculation of cost savings from utilization of the existing private driveway at the end of Kirk Road rather than initiating avoidable construction along Country Club Road?
 - c. Please discuss the feasibility of siting the tower adjacent to the private driveway at the end of Kirk Road, with a relatively lengthy existing access road, which, based on aerial observation as depicted in Schedule 2, would eliminate the need to construct an entirely new access road as was initially proposed along Country Club Drive.
4. Reference Question 13 of the Interrogatories. Please clarify the Applicant's response that alternative sites were investigated following the November 16, 2017 Public Information Meeting. Was this a typographical error?
5. Reference Tab 8 of the Executive Summary which states that Applicant's Hamden East facility consists of antennas on the roof of a building at 2313 Whitney Avenue in Hamden (a "small cell"). Please answer the following questions:
 - a. Has the Applicant evaluated the use of small cell facilities in Hamden as an alternative to the proposed Hamden 8 facility located in a densely populated residential neighborhood?
 - b. Where are the Applicant's small cell facilities currently located?
 - c. How many small cell facilities are currently deployed and cover the Hamden 8 site search area in which Ms. Patricia Sorrentino resides.
6. Reference Tab 6 and 7 of the Executive Summary. Please demonstrate small cells that would serve as an alternative in the area the Applicant indicates needs relief.
7. As noted in the site visit, the Applicant did not mark every tree. Of the twenty-nine trees that were identified, please clarify, for the record, whether the marked trees are the only major trees that will be removed. Please provide, for the

record, the approximate number of additional trees, bushes and shrubs that would require removal.

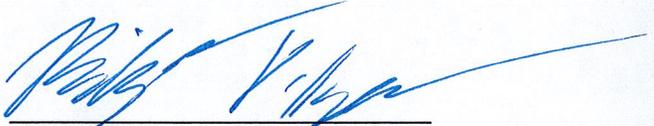
8. Reference the article attached hereto as Schedule 3. Please comment on why residents should not be concerned about the risks of the tower based on this article.
9. Reference Schedule 4, which establishes that tornados, while not regular occurrences, are not unknown to the greater Hamden area. Please provide evidence of the tower's structural safety including the safety of the following: (i) any attachments and appurtenances on the tower, as described in Tab 7 of the Executive Summary, which may become unhinged; (ii) the installed fencing and (iii) the fuel storage facility that will be placed on the site (all of which, based on the original application and Mr. Weinpahl's testimony, are 270 feet from the home of Ms. Sorrentino).
10. Application Tab 10 indicates consultation with the DEEP NDDDB Program. Has the Applicant received any correspondence to date?
11. Application page 16 indicates consultation with the State Historic Preservation Office. Has the Applicant received any correspondence to date?
12. Reference Question 10 of the Applicant's Responses to Connecticut Siting Council Pre-Hearing Questions. Please explain why the Applicant engaged in a "somewhat abbreviated site search effort" and how such attempt compares to the ordinary search effort undertaken by Applicant.
13. Please demonstrate that the proposed site and the two alternate sites on the lessor's property are not visible from Sleeping Giant State Park.

CERTIFICATION

This is to certify that on the 19 day of May the foregoing Cover Letter and Supplemental Pre-filed Testimony of Patricia Sorrentino was sent via United States mail, postage prepaid to the following parties of record:

Kenneth C. Baldwin, Esq.
Robinson & Cole LLP
280 Trumbull Street
Hartford, CT 06103-3597

Anthony Befera
Verizon Wireless
99 East River Drive
East Hartford, CT 06108



Bridget M. D'Angelo

SCHEDULE 1



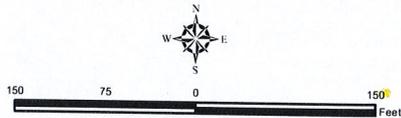
Legend

- Approximate Subject Property Boundary
- Proposed Facility Layout
- Alternate Site Location
- 2' Contour Line
- Approximate Parcel Boundary (CTDEEP GIS)

Alternate Sites

Proposed Wireless
 Telecommunications Facility
 Hamden 8 CT
 208 Kirk Road
 Hamden, Connecticut

Map Notes:
 Base Map Source: 2012 Aerial Photograph (CT ECO)
 Map Scale: 1 inch = 150 feet
 Map Date: May 2017



verizon



SCHEDULE 2

Google Maps Bear Path Rd



Imagery ©2017 Google, Map data ©2017 Google 20 ft

SCHEDULE 3



Radiation Hazards from Cell Phones/Cell Towers

Prof. Girish Kumar

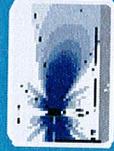
Electrical Engineering Department
IIT Bombay, Powai, Mumbai
(022) 2576 7436

gkumar@ee.iitb.ac.in

OUTLINE OF PRESENTATION



RF sources



Radiation Pattern of Cell tower
Antenna



EMF exposure Safety norms



Radiation measurements near cell
towers



Review Biological effects



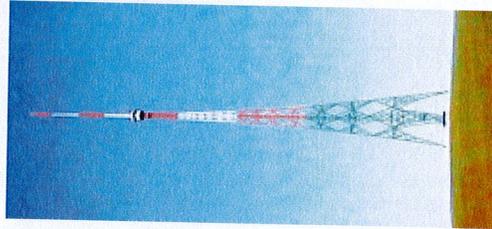
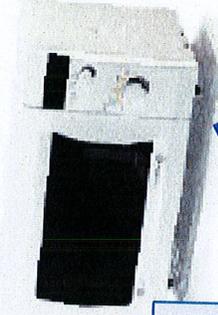
Case Studies



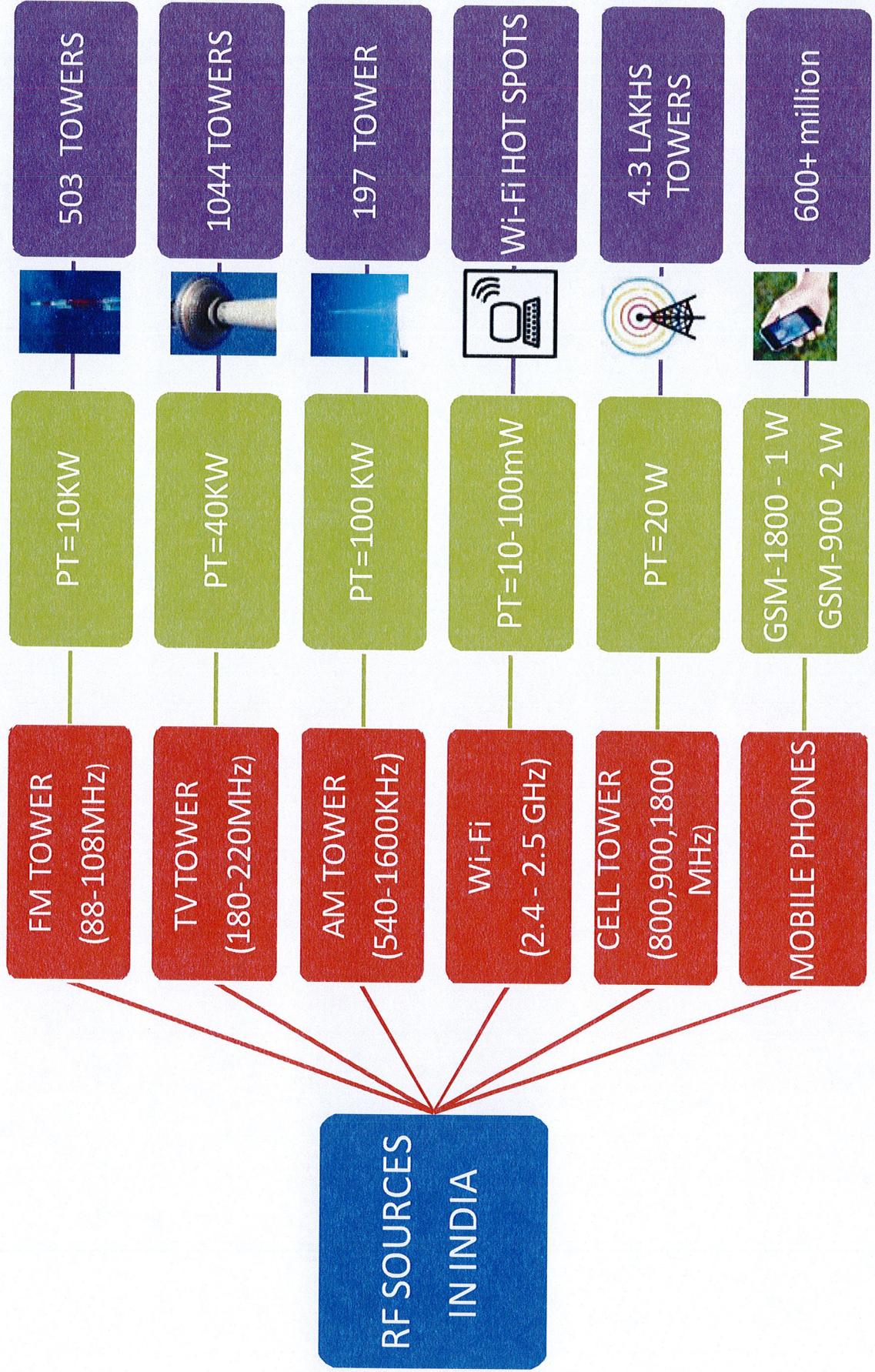
Electromagnetic Radiations

Radiation emitted from Cell Phones, Cell phone towers, Wi-Fi, TV and FM towers, microwave ovens, etc. are called Electromagnetic radiations (EMR).

EMR causes significant health hazards (biological effects) on human, animals, birds, plants and environment.



RF Sources



Microwave radiation effects are classified as:

- Thermal
- Non-thermal

The current exposure safety standards are mainly based on the thermal effects, which are inadequate.

Non-thermal effects are several times more harmful than thermal effects.

Microwave Heating Concept

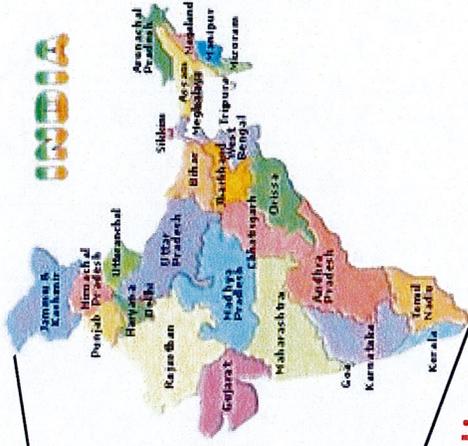
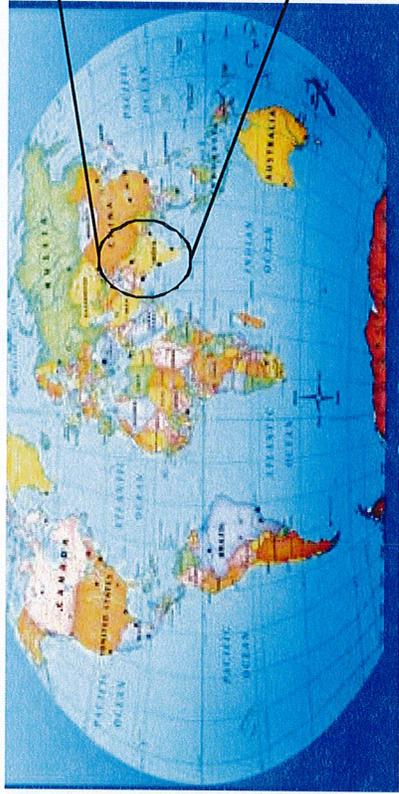
4.2 KW (4200 W) of microwave power raises temperature of 1 Litre of water by 1°C in 1 second.

In energy absorption term, 4.2 KW-sec microwave energy will increase the temperature of 1 Litre by 1°C .

For example, in a microwave oven, temperature of one cup of water increases from 30°C to 100°C in approx. 70 seconds with 500W of microwave power. With 1W power (same as output power of cell phones), temp. will increase by 1°C in 500 seconds.

Temp. of ear lobes increases by approx. 1°C when cell phone is used for approx. 20 minutes.

Cell Phone and Tower Statistics in India



Worldwide:

4.6 billion mobile subscriptions



Mobile subscriber base - 65crores.
Growing at 1.5 crore/month, highest in the world (TRAI, June 2010).

India:

Population - 1.15 billion



Mobile Towers - Nearly 4.5 lakhs to meet the communication demand.



6 minutes/day usage.

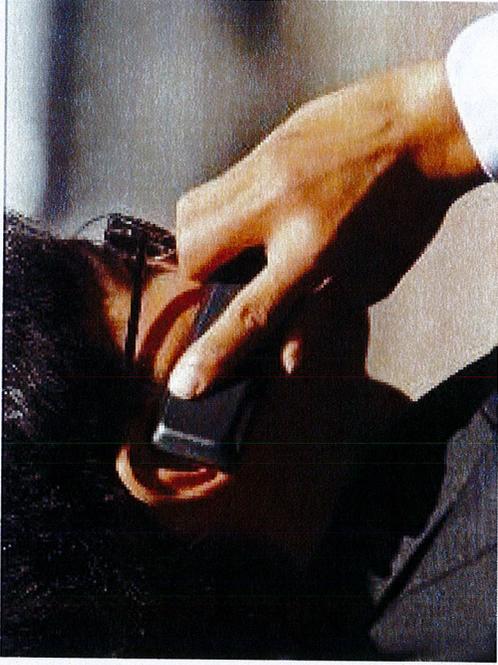
A Cell phone transmits
1 to 2 Watts of power

SAR (Specific absorption rate) - Rate at which radiation is absorbed by human body, measured in units of watts per kg (W/kg) of tissue.

In USA, SAR limit for cell phones is **1.6W/Kg** which is actually for **6 minutes**. It has a safety margin of 3 to 4, so a person should not use cell phone for more than **18 to 24 minutes per day**.

This information is not commonly known to people in India.

Cell phones and SAR values



Check SAR Values:
Search on Internet
SAR mobile phone

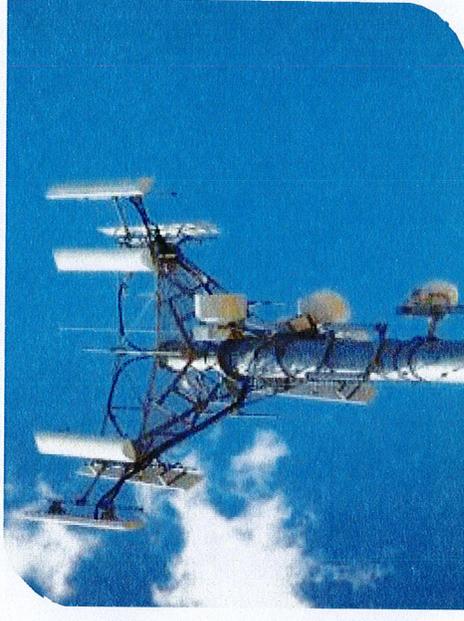
Manufacturer	Model	SAR Output (W/Kg)
Motorola	V195	1.6
Motorola	Rival	1.59
Sony Ericsson	Satio (Idou)	1.56
BlackBerry	Curve 8330	1.54
Nokia	E71x & X6	1.53
LG	Rumor	1.51
BlackBerry	Bold	1.51
Samsung	S3650 Corby	0.75
Samsung	SGH-G800	0.23
Samsung	Blue Earth	0.196

SAR is expressed in Watts per Kilogram
Current UK Standard = 1.0W/Kg
Current US Standard = 1.6W/Kg

San Francisco Govt. has made it mandatory for the industry to display SAR value for each phone. (USA Today 14 July, 2010)

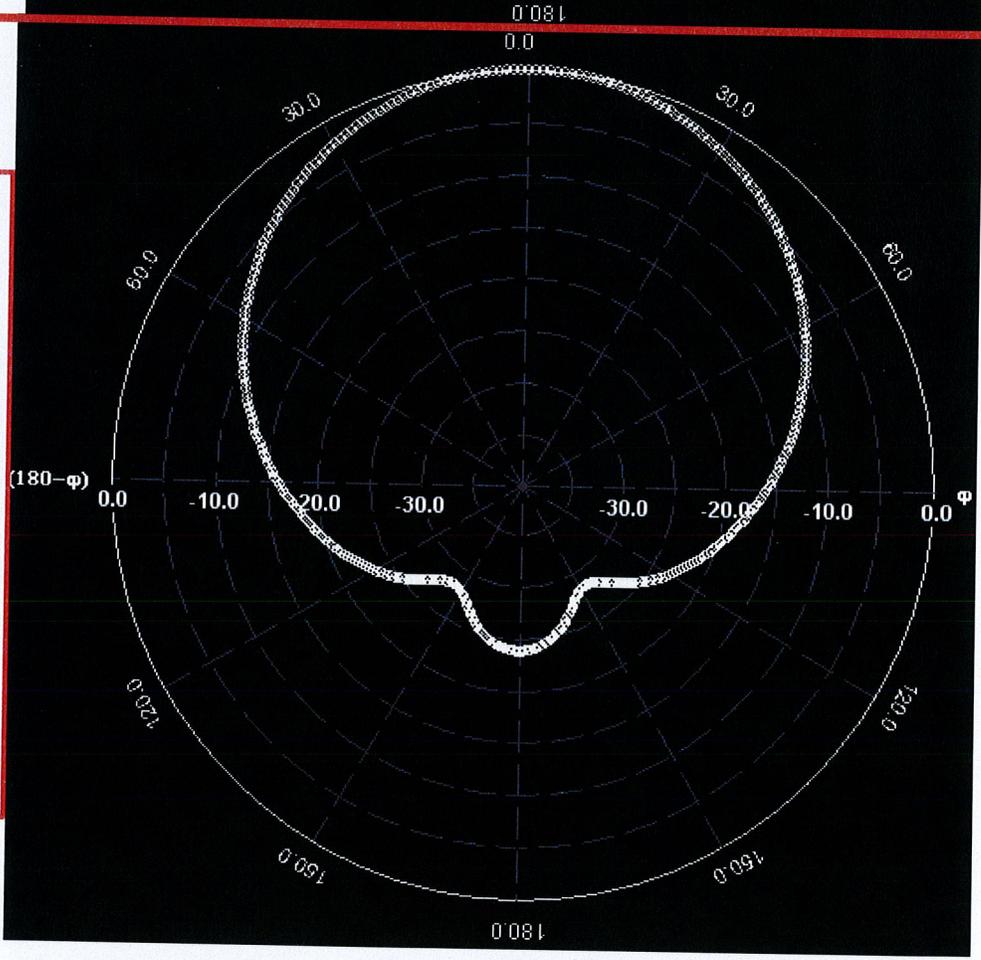
Antennas on Cell tower transmit in the frequency range of:

- 869 - 890 MHz (CDMA)
- 935 - 960 MHz (GSM900)
- 1805 - 1880 MHz (GSM1800)
- 2110 - 2170 MHz (3G)*

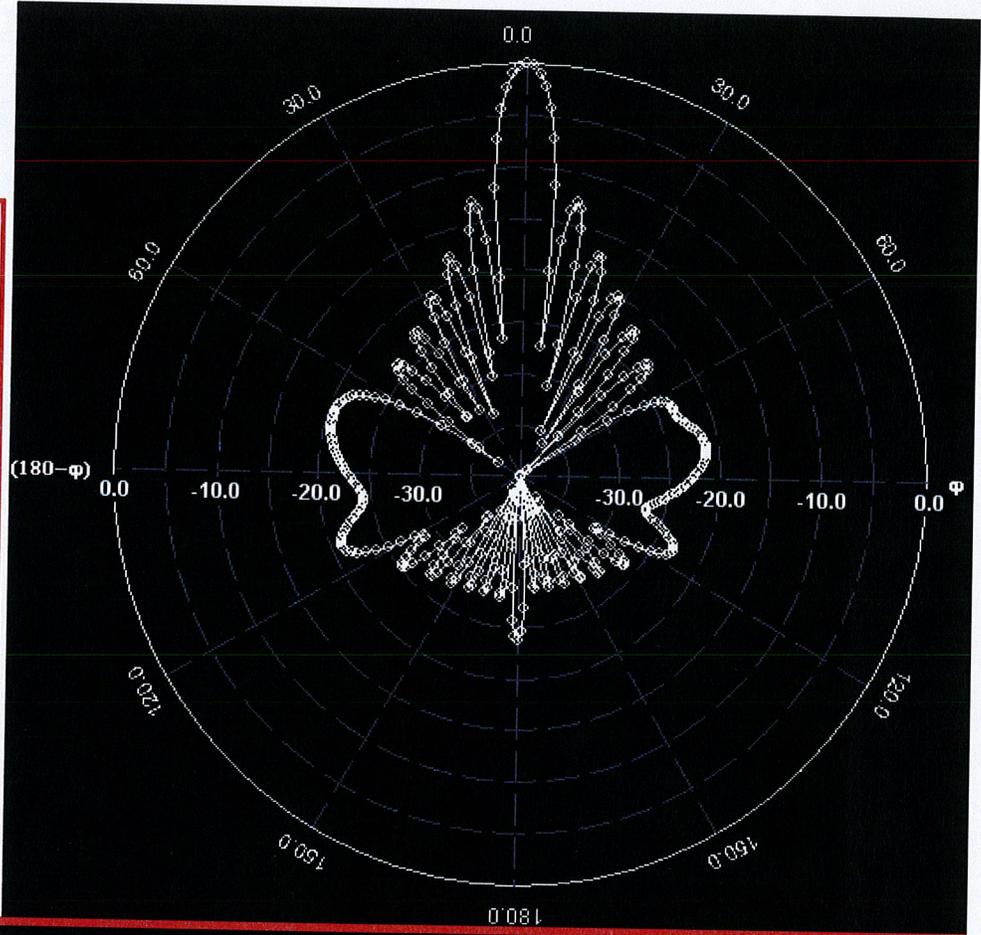


Radiation Pattern of Antenna

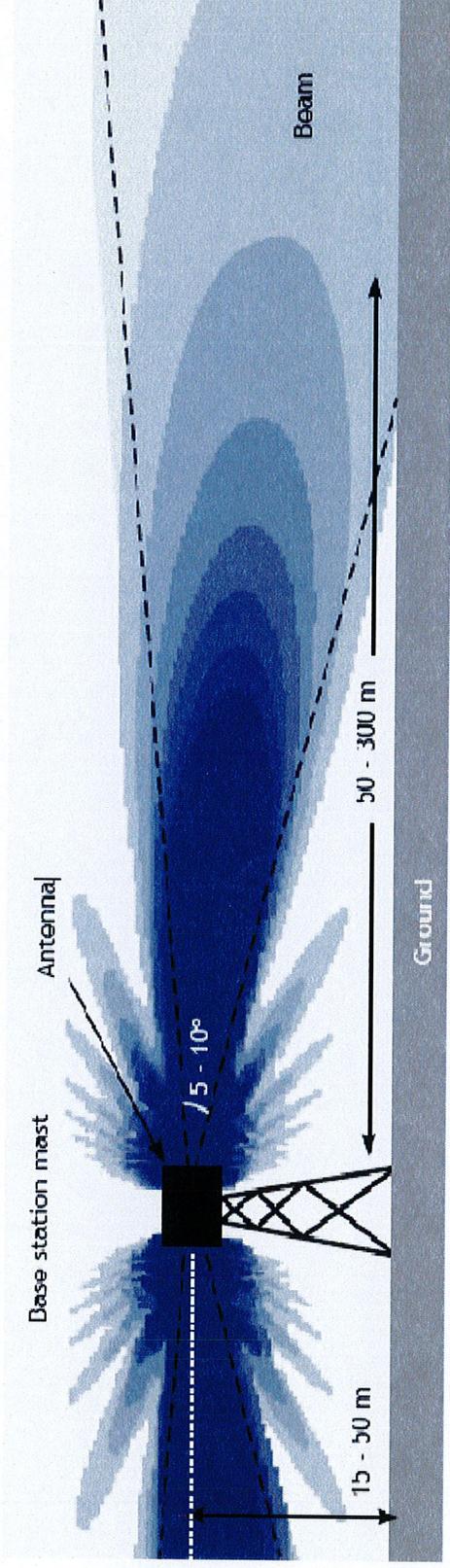
Horizontal plane



Vertical plane



Radiation Pattern of a Cell Tower Antenna



Propagation of "main beam" from antenna mounted on a tower or roof top

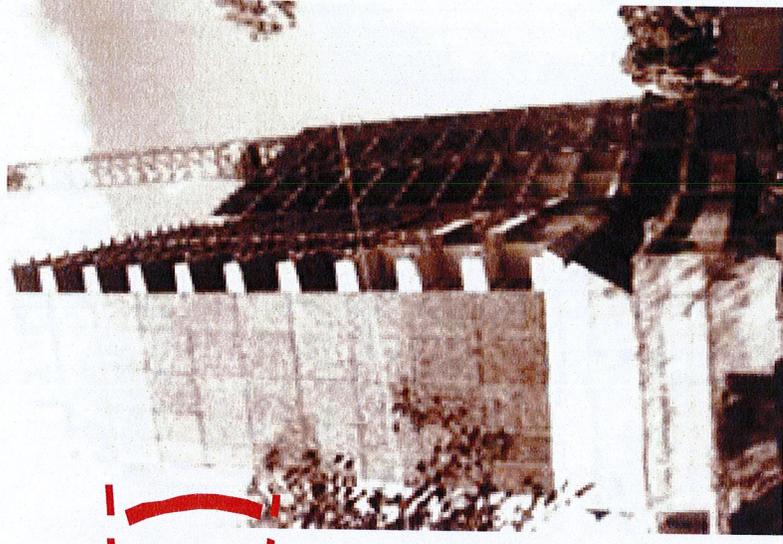
People living within 50 to 300 meter radius are in the high radiation zone (dark blue) and are more prone to ill-effects of electromagnetic radiation

CASE STUDY

Usha Kiran Building, Worli, Mumbai



The cell phone towers installed on the Vijay Apartments terrace at Carmichael Road **pic/Bipin Kokate**



Usha Kiran Building

Four cancer cases in 3 consecutive floors (6th, 7th and 8th) directly facing and at similar height as the mobile phone towers of four telecom companies placed on the roof of opposite building.

Power Density Calculations

Power density P_d at a distance R is given by

$$P_d = \left(\frac{P_t \times G_t}{4\pi R^2} \right)$$

Watt/m²

P_t = Transmitter power in Watts

G_t = Gain of transmitting antenna

R = Distance from the antenna in meters

Power Density at distance R from cell tower

For $P_t = 20 \text{ W}$, $G_t = 17 \text{ dB} = 50$

Distance R (m)	P_d (W/m ²)	P_d ($\mu\text{W}/\text{m}^2$)
1	79.6	79,600,000
3	8.84	8,840,000
5	3.18	3,180,000
10	0.796	796,000
50	0.0318	31,800
100	0.008	7,960
500	0.000318	318

The above values are for a **single carrier and a single operator**. For multiple carriers and **multiple operators** on the same roof top or tower, then the above values will **increase manifold**.

Power Density for multiple carriers and operators

For $P_t = 20 \text{ W}$, $G_t = 17 \text{ dB} = 50$

No. of carriers = 5, No. of operators = 3

Distance R (m)	P_d (W/m ²)	P_d ($\mu\text{W}/\text{m}^2$)
1	1194.0	1194,000,000
3	126.0	126,000,000
5	47.7	47,700,000
10	11.94	11,940,000
50	0.477	477,000
100	0.1194	119,400
500	0.00477	4,770

For 5 carriers and 3 operators on the same roof top or tower, the radiation level is extremely high.

International Exposure Standards and Guidelines

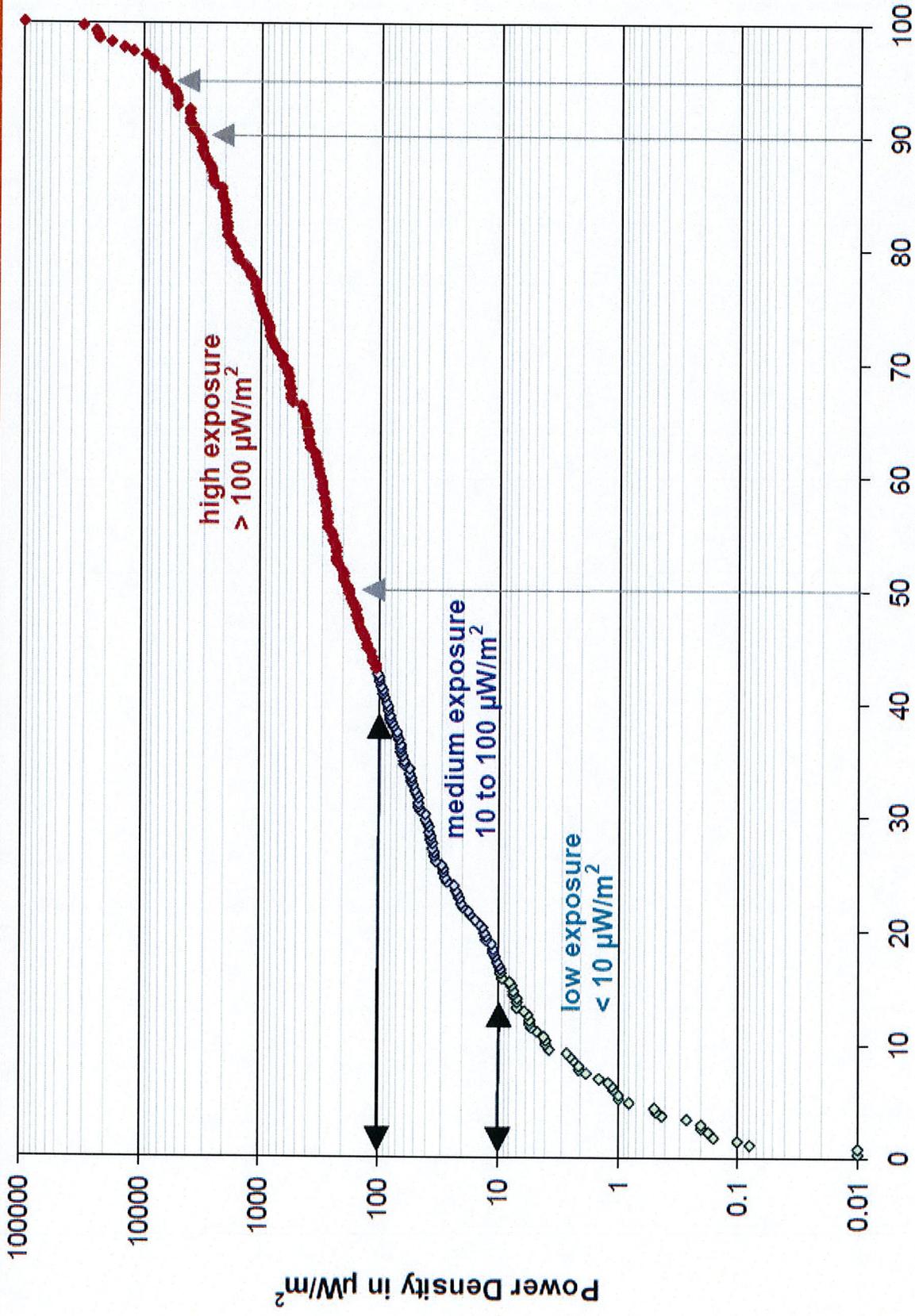
International Exposure limits for RF fields (1800MHz)

9.2 W/m²	ICNIRP and EU recommendation 1998 – Adopted in India
3 W/m ²	Exposure limit in Canada (Safety Code 6, 1997)
2 W/m ²	Exposure limit in Australia
1.2 W/m ²	Belgium (ex Wallonia)
0.5 W/m ²	Exposure Limit in Auckland, New Zealand
0.24 W/m ²	Exposure limit in CSSR, Belgium, Luxembourg
0.1 W/m ²	Exposure limit in Poland, China, Italy , Paris
0.095 W/m ²	Exposure limit in Switzerl, Italy in areas with duration > 4hours
0.09 W/m ²	ECOLOG 1998 (Germany) <i>Precaution recommendation only</i>
0.025 W/m ²	Exposure limit in Italy in sensitive areas
0.02 W/m²	Exposure limit in Russia (since 1970), Bulgaria, Hungary
0.001 W/m ²	"Precautionary limit" in Austria, Salzburg City only
0.0009 W/m ²	<i>BUND 1997 (Germany) Precaution recommendation only</i>
0.00001 W/m²	New South Wales, Australia

Table from Haumann Thomas, et al, Germany

Comparison of Standard Threshold Values and Recommendations (electromagnetic fields, non ionizing radiation)	Total Power Density
Standards, GSM1800/GSM1900/UMTS/DECT (e.g.)	
FCC/ANSI – USA	10,000,000 $\mu\text{W}/\text{m}^2$
Germany, England, Finland and Japan	10,000,000 $\mu\text{W}/\text{m}^2$
Belgium	1,200,000 $\mu\text{W}/\text{m}^2$
Switzerland and Italy	90,000 $\mu\text{W}/\text{m}^2$
Recommendations / References (e.g.)	
Ecolog Study, Germany (ECOLOG 2000)	10,000 $\mu\text{W}/\text{m}^2$
Cellular tower radiation – significant exposure level, 95 th percentile (this study)	6,300 $\mu\text{W}/\text{m}^2$
Salzburg, Austria (RESOLUTION 2000)	1,000 $\mu\text{W}/\text{m}^2$
Cellular tower radiation – median level, 50 th percentile (this study)	200 $\mu\text{W}/\text{m}^2$
High exposure, Oeko-Test (OEKOTEST 2001)	100 $\mu\text{W}/\text{m}^2$
EU Parliament (STOA 2001)	100 $\mu\text{W}/\text{m}^2$
Cellular tower radiation – background level, 20 th percentile (this study)	10 $\mu\text{W}/\text{m}^2$
Low exposure, Oeko-Test (OEKO TEST 2001)	10 $\mu\text{W}/\text{m}^2$
Nighttime exposure, Baubiology Standard (SBM 2000)	0.1 $\mu\text{W}/\text{m}^2$
Successful communication with GSM mobile phone, system coverage requirements	0.001 $\mu\text{W}/\text{m}^2$
Natural cosmic microwave radiation (MAES 2000)	0.000001 $\mu\text{W}/\text{m}^2$

GSM cell tower power density levels – percentiles



Percentiles (Haumann T. et al, Germany)

Other Standards and Guidelines

- BioInitiative Report 2007 - **1000 $\mu\text{W}/\text{m}^2$** for outdoor, cumulative RF exposure
- Building Biology Institute, Germany, provided following guidelines for exposure:
 - a. $< 0.1 \mu\text{W}/\text{m}^2$ ($0.00001 \mu\text{W}/\text{cm}^2$) - no concern
 - b. $0.1 - 10 \mu\text{W}/\text{m}^2$ (0.00001 to $0.001 \mu\text{W}/\text{cm}^2$) - slight concern
 - c. $10 - 1000 \mu\text{W}/\text{m}^2$ (0.001 to $0.1 \mu\text{W}/\text{cm}^2$) - severe concern
 - d. $> 1000 \mu\text{W}/\text{m}^2$ ($> 0.1 \mu\text{W}/\text{cm}^2$) - extreme concern
- **We recommend safe power limit up to $50 \mu\text{W}/\text{m}^2$ with upper limit as $100 \mu\text{W}/\text{m}^2$.**

INDIA adopts ICNIRP Guidelines

India adopts ICNIRP guideline for Power density (P_d)

= Frequency / 200, frequency is in MHz.

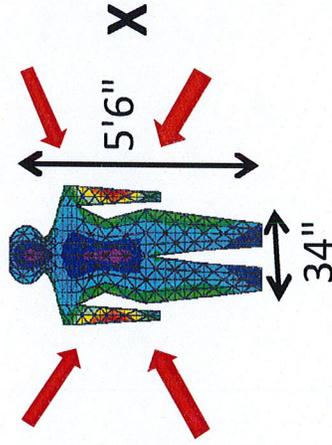
For GSM900 (935-960 MHz), $P_d = 4.7\text{W}/\text{m}^2$ and
GSM1800 (1810-1880 MHz), $P_d = 9.2\text{W}/\text{m}^2$.

ICNIRP has considered only thermal effects of radiation and has given following disclosure:

ICNIRP is only intended to protect the public against short term gross heating effects and NOT against 'biological' effects such as cancer and genetic damage from long term low level microwave exposure from mobile phones, masts and many other wireless devices. - <http://www.icnirp.de/documents/emfgdl.pdf>

Power Absorbed by Human Body

How much microwave power will be absorbed by human body if exposed to the so called safe radiation level adopted in India, which is $f/200$, where f is in MHz?



Area = 1.43 m²

ICNIRP Guideline –
At 940 MHz, Power density (P_d) is 4.7W/m²

Power received (P_r) by human body will be
 $[P_r = P_d \times \text{Area}] = 6.75$
Watts in one sec.



Microwave oven: 700 to 1000 W.
With say 60% efficiency, microwave power output is say 500 W.

In one day, microwave energy absorbed will be $[6.75 \text{ Watts} \times 60 \times 60 \times 24 \text{ sec}] = \underline{583.2 \text{ KW-sec.}}$

This implies that human body can be safely kept in a microwave oven for 1166 secs = **19 minutes per day**

Power Received by an Antenna

Power Received P_r by an antenna at a distance R is given by:

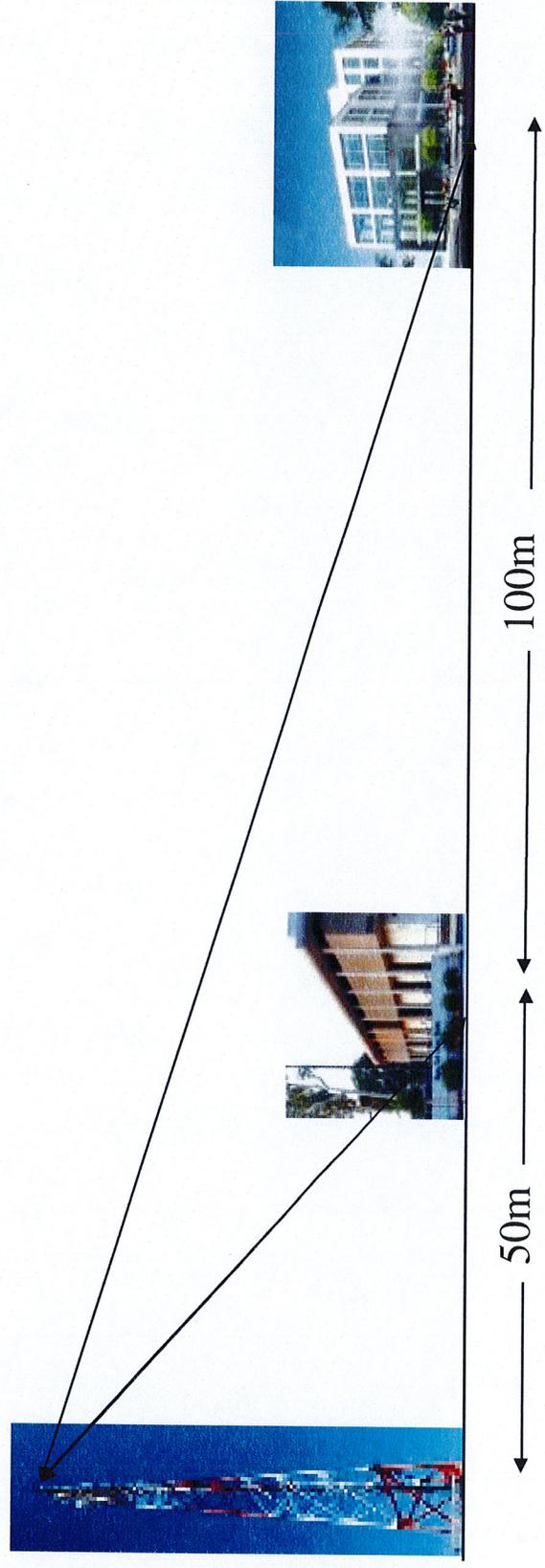
$$P_r = \frac{P_t \times G_t \times Area}{4\pi R^2} = P_t \times G_t \times G_r \times \left(\frac{\lambda}{4\pi R} \right)^2$$

- For a transmitter power, $P_t = 20 \text{ W}$
- Transmitting antenna gain, $G_t = 17.0 \text{ dB} = 50$
- Receiving monopole antenna gain, $G_r = 2 \text{ dB} = 1.6$
- Received power at $R = 50 \text{ m}$ is:
- At 940 MHz, $P_r = 0.413 \text{ mW} = -3.8 \text{ dBm}$
- At 1840 MHz, $P_r = 0.108 \text{ mW} = -9.7 \text{ dBm}$

Power density is equal to $31.8 \text{ mW/m}^2 = 31,800 \text{ } \mu\text{W/m}^2$.

EXPERIMENT: Radiation level measurements near several Cell Tower sites

Broadband monopole antenna of gain = 2 dB was used to measure radiated power from cell towers (CDMA, GSM900 and GSM1800)



-20 to -30 dBm

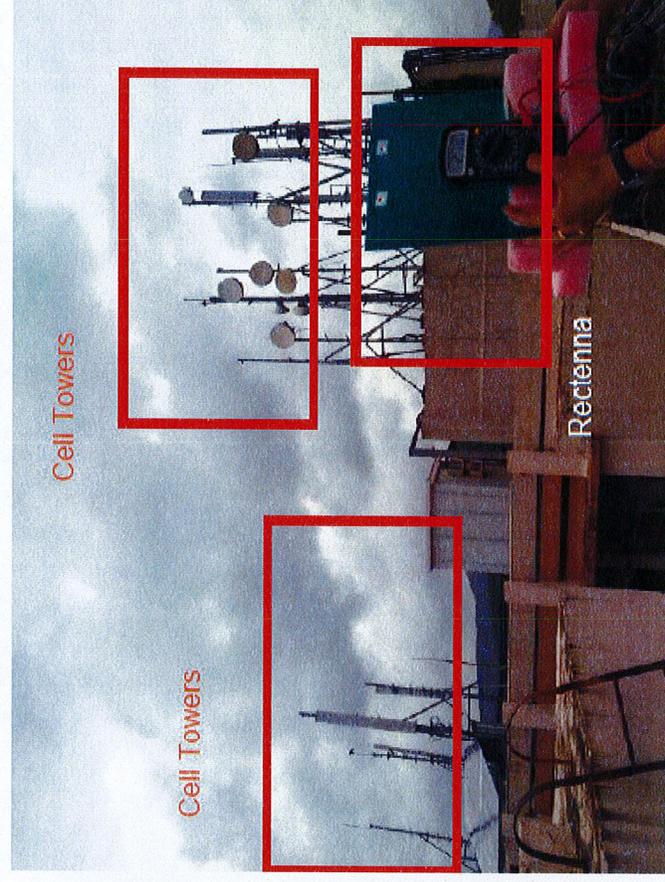
-30 to -50 dBm

**Measured Power (in dBm)
For each frequency bands**

- Measured power is less than theoretically calculated power as the concrete wall provides some attenuation and also these buildings were not directly in the direction of maximum radiation of transmitting antenna.

- A mobile phone requires -80 to -100 dBm power for its proper operation. Thus power level at 50m is 50 to 60 dBm (100,000 to 1,000,000 times) more than required by mobile phone.

Pictures of Measurement at IIT Bombay



50m from cell tower (IIT-B)

10m from cell tower (IIT-B)

Power level measured using a hand-held radiation monitor was :
-6dBm and 5dBm (max. limit of instrument) at 50m and 10m,
respectively.

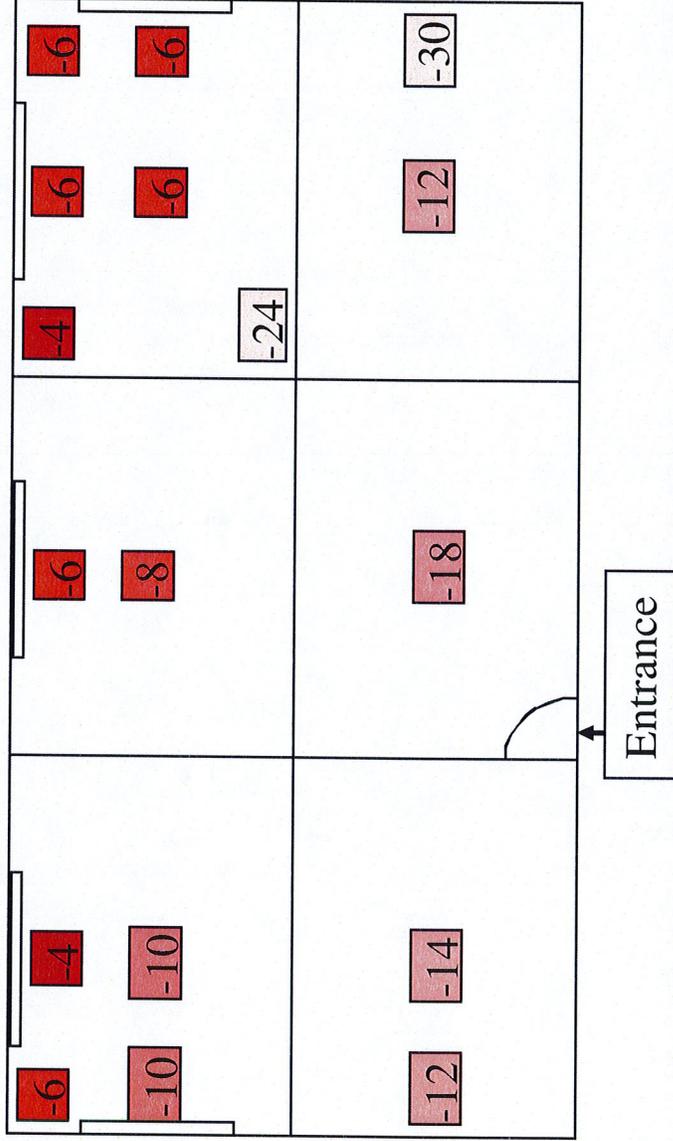
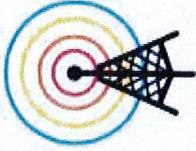
Radiation Measurement at various locations

Cumulative Readings including following:

CDMA ,GSM 900 ,GSM 1800 ,Bluetooth, Wireless LAN (0.8-4GHz)

Location	Reading in dBm	Readings in W/m ²	Readings in microW/m ²
Delhi-Gurgaon Highway - near Toll (3 towers)	0	0.121	121000
Vashi Bridge - after Railway Station	-4	0.0481	48100
Resident 1, 4 th Fl: Sergean House Lady w/cancer	-6	0.0304	30400
Resident 2, Opposite roof, Rane Society, Powai	-10	0.012	12000
Near Hub mall, Goregaon	-10	0.012	12000
Gandhi Nagar Over railway bridge-near building	-12	0.00763	7630
Ustav Chowk, Kharghar	-12	0.00763	7630
Vikroli - before Godrej	-14	0.00481	4810
Govandi- Residential towers - near Indian Oil	-14	0.00481	4810
Belapur Flyover, near RBI- CIDCO	-16	0.00304	3040
Vashi Highway – near Turbhe	-18	0.00192	1920
Nerul Bridge	-20	0.00121	1210
Vivero pre School (opposite powai lake)	-22	0.000763	763
Powai police station	-22	0.000763	763
Rajeev Gandhi nagar	-26	0.000304	304
On road near Evita (Hiranandani Building)	-28	0.000192	192
D-Mart,Hiranandani, Powai	-34	0.0000481	48.1
IIT Bombay School of Management - Entrance	-46	0.00000304	3.04

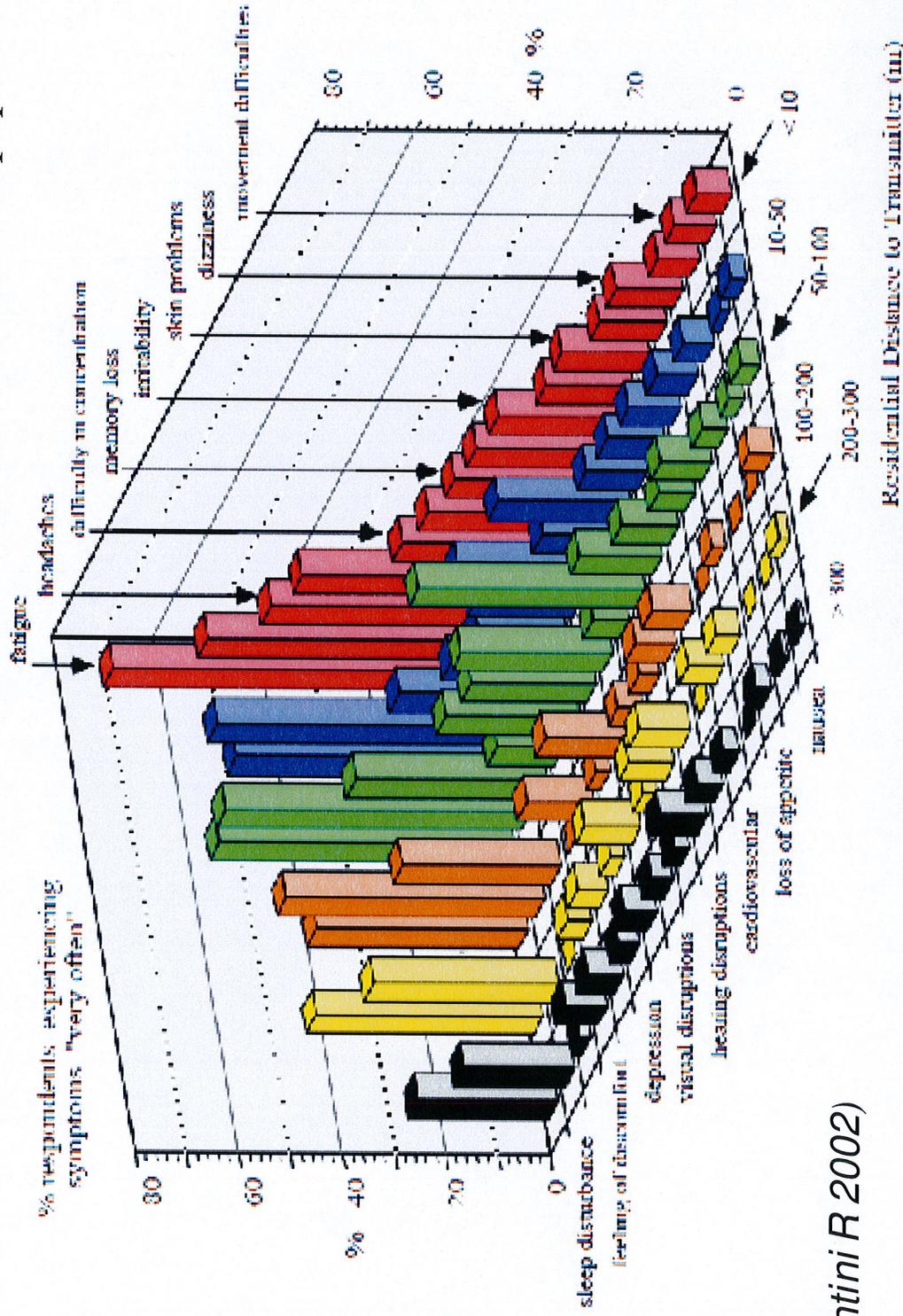
CASE STUDY:



SERGEANT HOUSE Residence (4th Floor) - Lady has been diagnosed with cancer - Cell phone towers few 10 meters away close to window in main beam. Measured Power levels using Radiation Monitor (in the room layout above) are given in dBm, which are very high.

Epidemiological studies-Cell Phone Antennas: Human Exposure

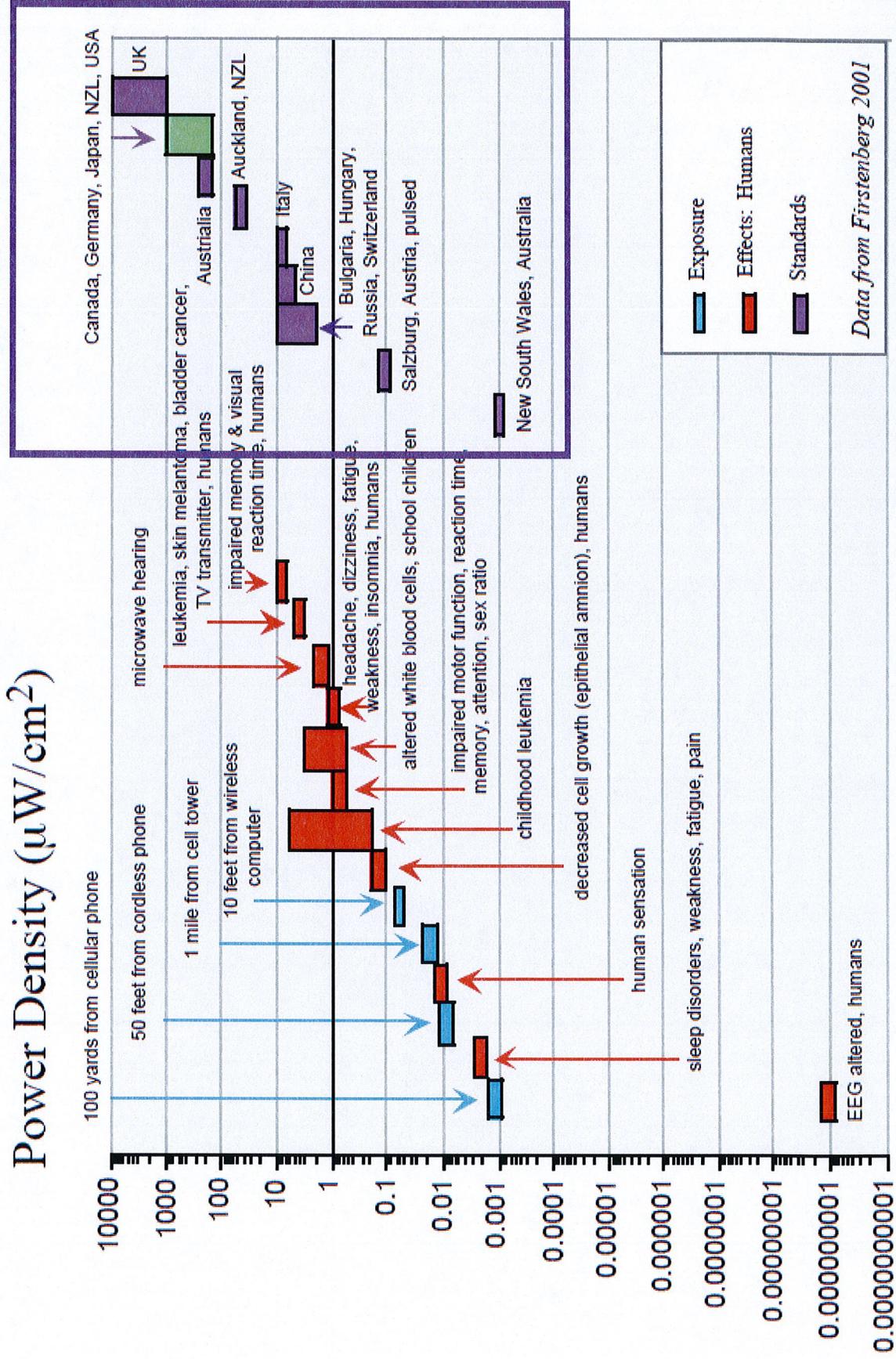
Studies in Spain, the Netherlands, Israel, Germany, Egypt and Austria all document adverse health effects below the FCC guideline. Based on symptoms experiences: Cellular phone base stations should not be sited closer than 300 m to populations.



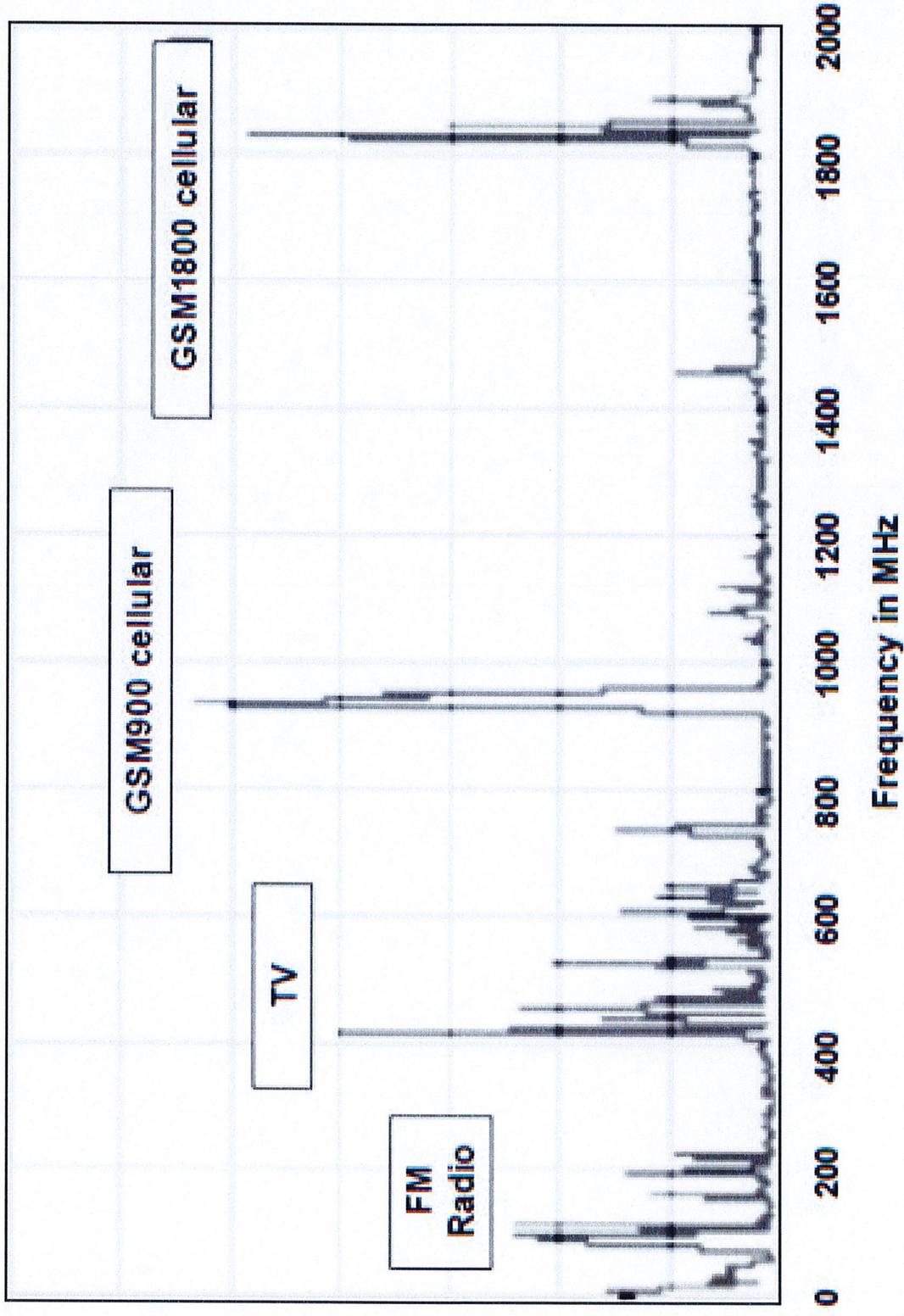
(Santini R 2002)

Serious health concerns regarding current Safety Guidelines

Guidelines for various countries



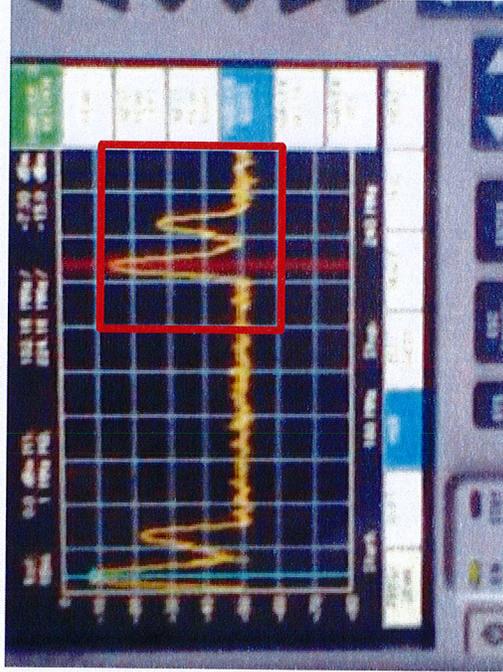
RF Spectrum near cell tower



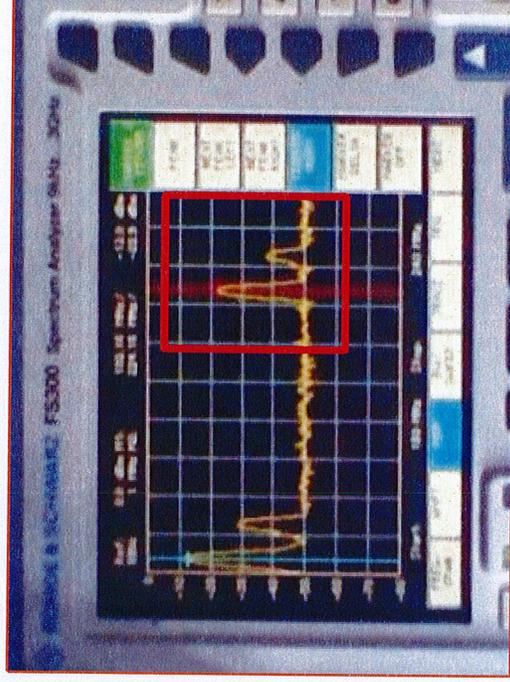
TV Tower Radiated Power Density at Different Height at a distance of 800 m

H(m)	R (m)	Power density (mW/cm ²)
230	803	0.00147
200	806	0.00145
150	814	0.00139
100	825	0.00132
50	838	0.00124
0	854	0.00115

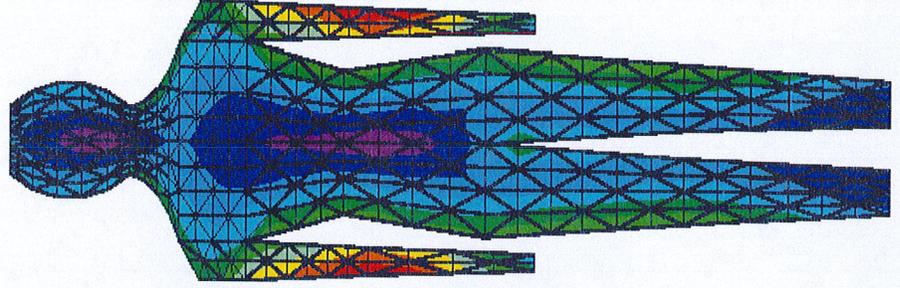
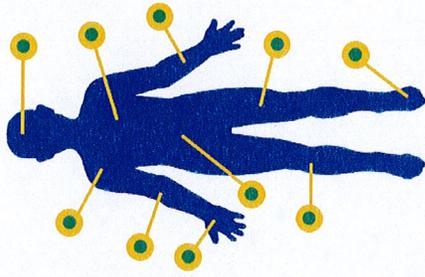
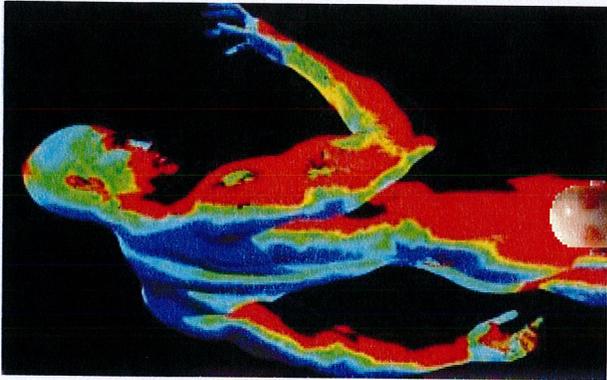
TV Tower radiation measurement with shield



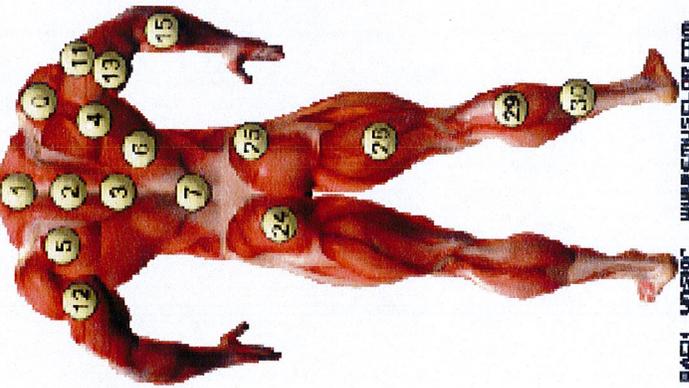
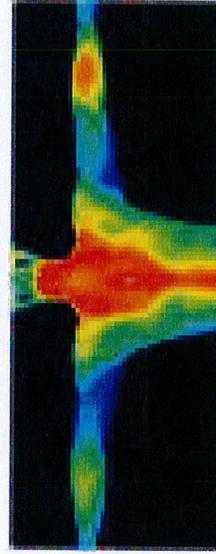
Without shield



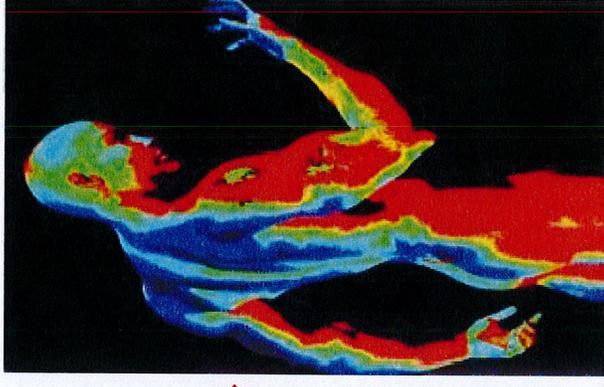
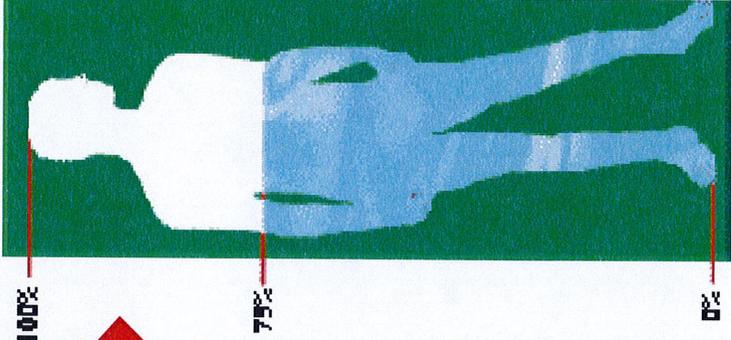
With shield



BIOLOGICAL EFFECTS



BIOLOGICAL EFFECTS



Multiple Resonances - localized heating - This results in boils, drying up the fluids around eyes, brain, joints, heart, abdomen, etc - leg/foot pain, muscle and joint pain.

Most common complaints:

Cognitive functions -Concentration, memory, behavior, etc

Epidemiological studies - Sleep disruption, Headache,

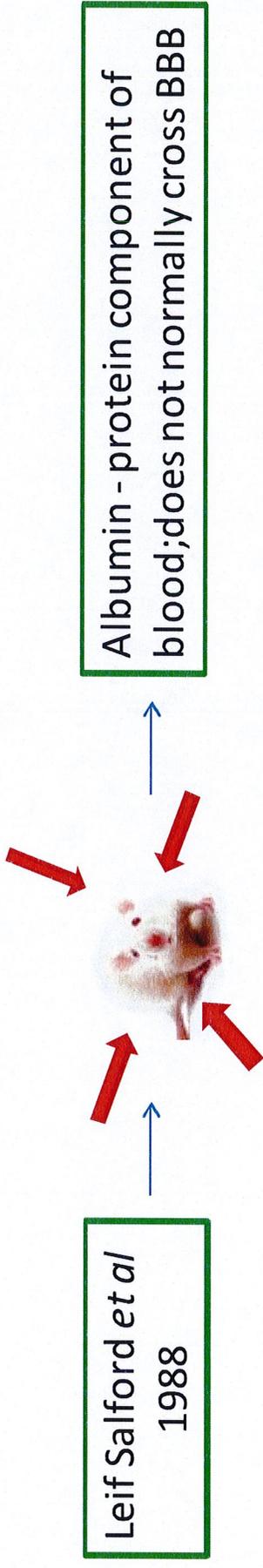
Depression, discomfort, irritability, nausea, dizziness, appetite loss, muscle spasms, numbness, tingling, altered reflexes

Subjects reported buzzing in the head, palpitations of the heart, light-headedness, heat, visual disorders, cardiovascular problems, respiratory problems, nervousness, agitation. More severe reactions include seizures, paralysis, psychosis and stroke.



All these are related to changes in the electrical activity of the brain

Blood Brain Barrier -selectively lets nutrients pass through from the blood to the brain, but keeps toxic substances out.

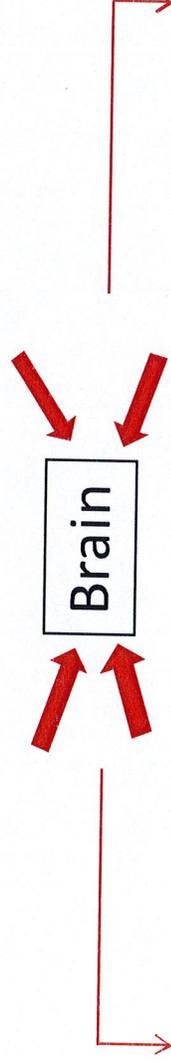
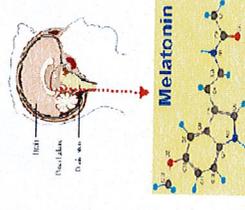


- Albumin in brain tissue - Damaged blood vessels & lost brain protection
- Neuron - Grouped & shrunken with loss of internal cell structures.

NOTE: BBB in is the same in a rat and a human being.

Alzheimer's, Motor neuron, Parkinson's disease

- 4 times incidence of Alzheimer's disease (*Hakansson et al 2003*)
- 3 times amyotrophic lateral sclerosis (ALS) (*Savitz et al 1998*)



Cells concerning learning, memory, movement damaged (Protects from brain damage)

(*Salford et al 2003*)

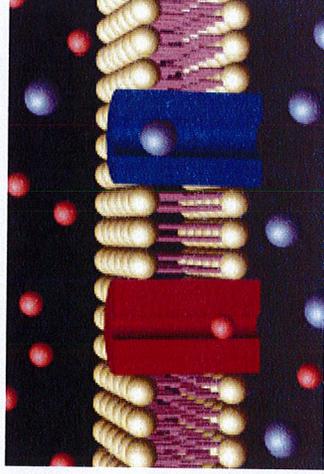
(*Burch 1999a, Wood et al 1998*)

Alzheimer's, Parkinson's disease

DNA Damage



1. Ca²⁺ release:



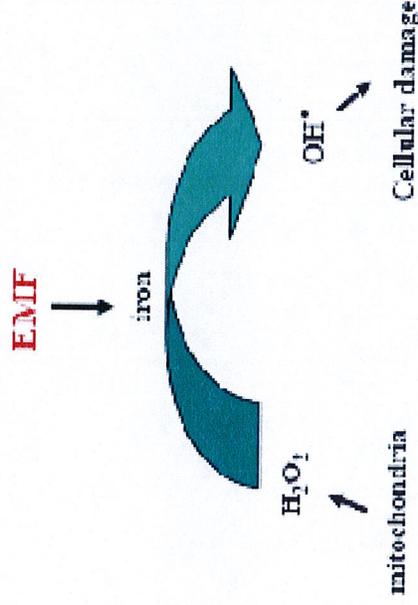
- ☐ ELF release Ca²⁺ bound to membranes
- ☐ Loss of Ca²⁺ causes leaks in the membranes of lysosomes releasing DNAase that causes DNA damage.

2. Interfere with natural processes:

- ☐ DNA replication & repair -altering molecular conformation
- ☐ This could result in chromosome aberrations, micronuclei formation & increased DNA fragmentation

3) Free radical formation inside cells:

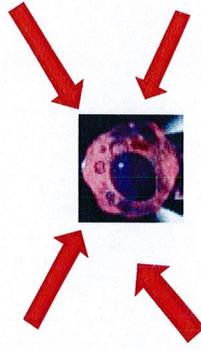
- ❑ ↑ free radical activity in cells from EMF via Fenton rxn.
- ❑ Free radicals kill cells by damaging macromolecules, such as DNA, protein and membrane.



THE FENTON REACTION

When Damage to DNA > Rate of DNA repaired, there is the possibility of retaining mutations and initiating cancer

Effect on HSP



Normal Cell
(Human/Animal)

Over-expression of (HSPs)
Inhibit natural programmed cell death (apoptosis)

cells that should have 'committed suicide' *continue to live.*



Normal Cell



Cancer Cell

Consistent with the 2-3-fold \uparrow in incidence of a rare forms of cancer

Sleep Disorders



Use of mobile phones before bed disturbs Stage 4 sleep, the stage important for full recuperation of brain and body.

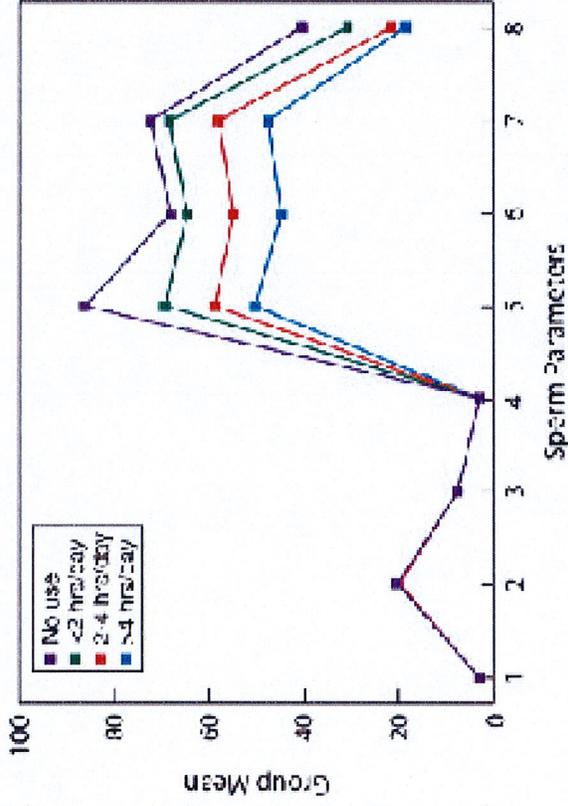
Irreversible infertility

Continuous exposure



30% sperm decrease in intensive mobile users, in addition to damage of sperms

Sperm parameter profile for cell phone use groups. The x-axis lists eight sperm parameters: 1 = volume; 2 = liquefaction time; 3 = pH; 4 = viscosity; 5 = sperm count; 6 = motility; 7 = viability; and 8 = percent normal morphology. The y-axis depicts the mean value of the corresponding sperm parameters for each cell phone use group.

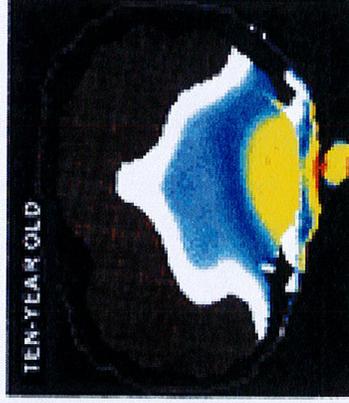


Agarwal. Cell phone usage and male infertility. Fertil Steril 2008.

Risk to Children

Children are more vulnerable as:

- Skulls are smaller & thinner - ↑'s radiation absorption
- ↑rate of Cell division - more susceptible to genetic damage
- Myelin sheath not developed - Electrical brain-wave activity



RF penetration in the skull of an adult (25%), 10 year (50%) and a 5 year old (75%).



Fetus & Mother -RF can pass placental barrier
& continuously react with the developing
embryo and increasing cells

Effect on Skin

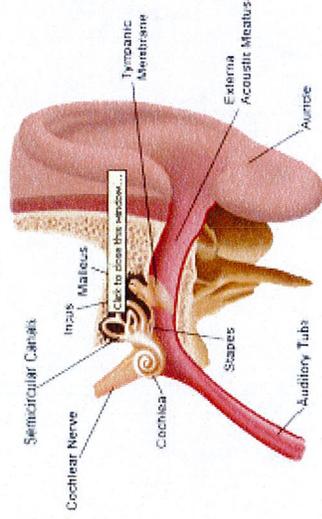


- ✓ Rashes /sores – redness of skin
- ✓ crawling, biting and stinging sensations
- ✓ granules, threads or black speck-like materials on or beneath the skin.

- Alters protein expression in endothelial cell lines and affect skin structure,(↑ed *transtyretin* protein conc.)
- May enhance development of skin tumours.



Tinnitus and Ear Damage



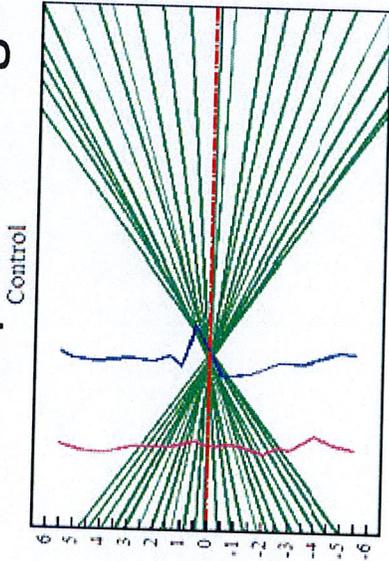
Tinnitus or ‘Ringxiety’ - sensation of cell phone ring – in millions of cell phone users. People with severe tinnitus may have trouble hearing, working or even sleeping.

Warm sensation/pain > tinnitus > irreversible hearing loss

- ❑ Damage the delicate workings of the inner ear.
- ❑ Patients, 18-25 yrs of age - damaged hair cells by RFR from phones. Hearing problems occur because these cells do not regenerate

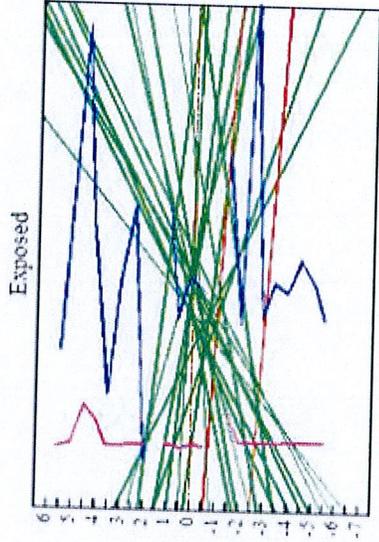
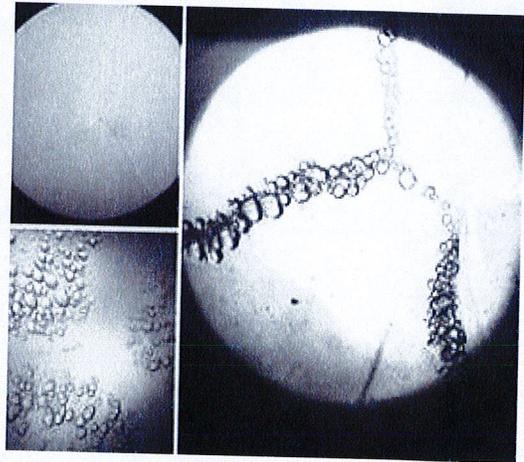
Effect on Eye/ Uveal Melanoma

(A) Macroscopic Damage



Good quality lens

(B) Microscopic Damage



Exposed lens-ability to focus the laser beam at the various locations is altered.

Tiny "bubbles" created due to microscopic friction between particular cells exposed to EMR. Contrary to macroscopic damage, the microscopic damage does not heal and accumulates with time.

Right frame - Control lens with no damage.
Bottom frame - demonstrates the effect of microwave radiation on bovine lens sutures.

Melatonin Reduction

Powerful antioxidant, antidepressant and immune system enhancer that regulates circadian rhythm.



> 25 min/day –
Prolonged use

↓ Melatonin production

(Burch 1997, 2002, Graham C 2000)



arthritis

↑ cancer

miscarriage

increased eye stress

renal impairment

↑ DNA damage

chronic fatigue, depression

↑ childhood leukemia

sleep disturbance

cardiac, reproductive and neurological diseases

Increase in Cancer risk



Breakdown of Blood Brain Barrier

Increased Risk of Eye Cancers

Increased Risk of Ear Tumors

Increased Risk of Other Cancers



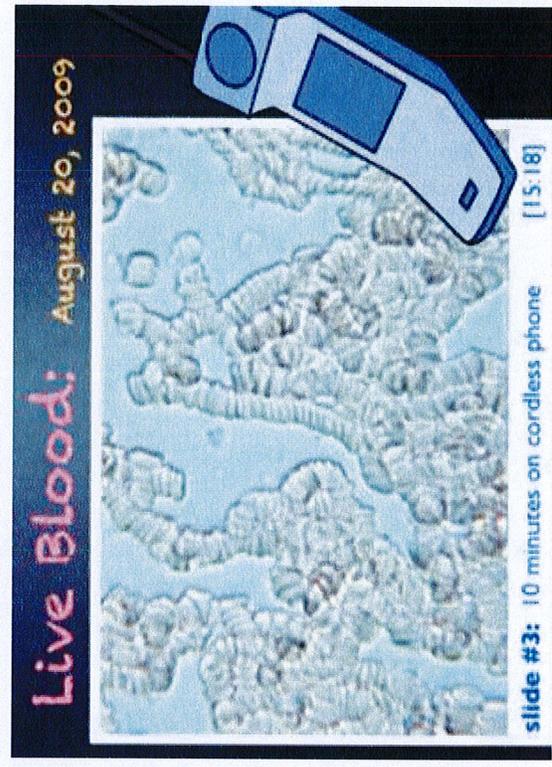
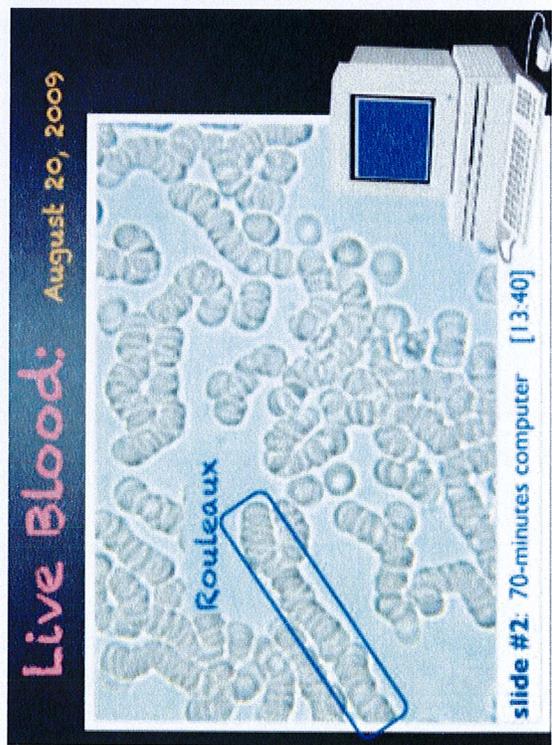
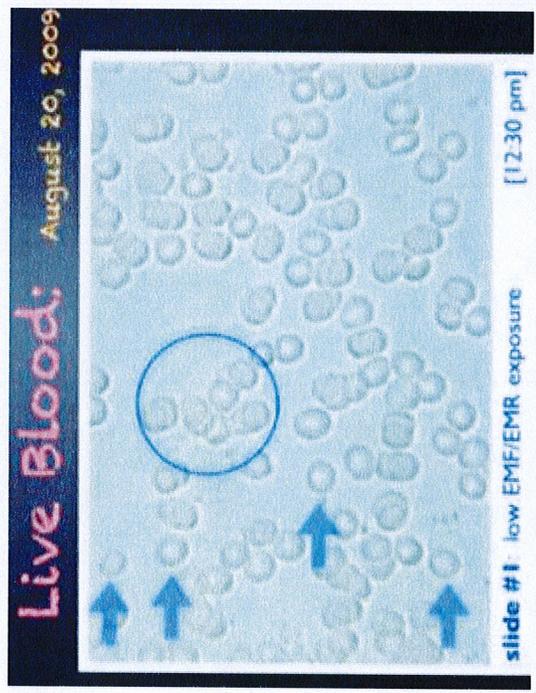
❑ Mobile phone use >10 years doubles risk of brain cancer. Risk is highest for ipsilateral (on the same side of the head where the instrument is held) exposure

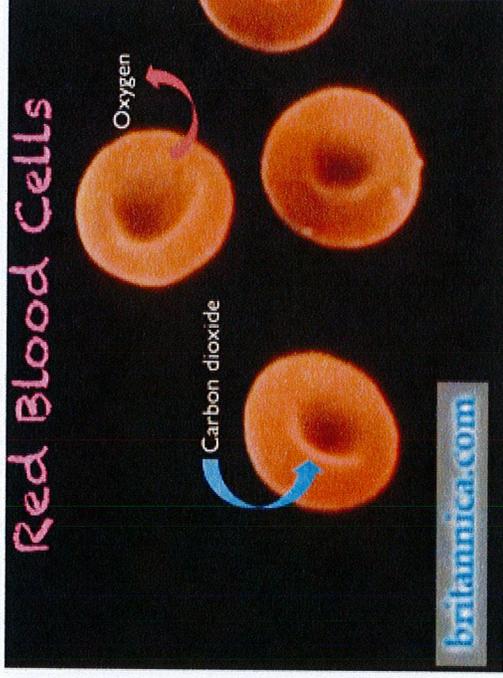
❑ Cell phone use also increases risk of glioma, acoustic neuroma, salivary gland tumors, uveal melanoma, non-Hodgkin lymphoma, facial nerve tumors, skin, blood, testicular and breast cancer

❑ **Children and teenagers**, before age of 20 - **Five times** more likely to get **brain cancer** if they use cell phones.

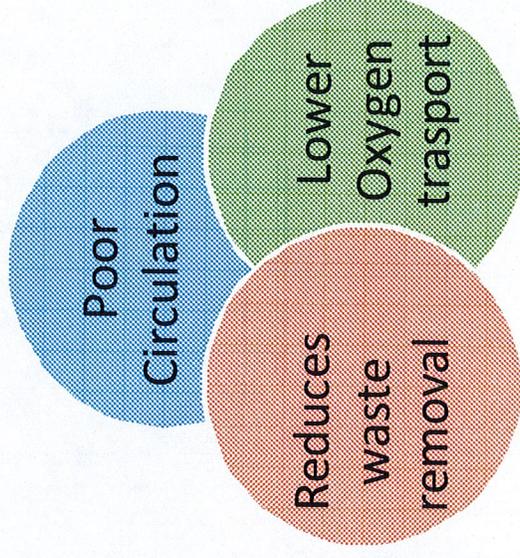


Live Blood Cells and Electromog





Consequences



Symptoms

- ✓ Headache, fatigue
- ✓ Difficulty concentrating
- ✓ Numbness, tingling, cold extremities
- ✓ Heart and blood pressure problems

Effect on Environment



Farm animals -

- Dairy cows – Decreased milk production, spontaneous abortions, reproductive and developmental problems , and general declines in overall health.
- Sheep, dogs, cats, rabbits living near base stations affected.

Birds -



- Interfere with navigation, reproduction, thin shells.
- London - 75% fall sparrow population.
- **Sparrow - 'Red List'** of endangered avian species.
- Fall in Pigeons, swans, white stork, rock dove

❖ Biological indicators to detect alterations in our ecosystem

Honey Bees -



Colony Collapse Disorder (CCD):

- Abrupt disappearance of bees.
- Cannot find their way back to hive due to disruption in intercellular communication.

CCD has hit – US (up to 70 %), England (54% fall), Germany, Spain, Italy, Switzerland, Greece, Scotland, Wales, Kerala etc

Abrupt disappearance of bees in US

- 1/4th (about 2.4 million colonies) lost to CCD.
- **Loss** projected to **\$8-12 billion** on US agricultural economy.
- US now regularly imports bees from Australia and China.
- ❖ Bees are vital pollinators for agriculture. With vanishing of bees, a major food crisis could ensue .

Result of Re-evaluation of Interphone Study

INTERPHONE – WHO -10 year, 13 countries, largest (5,117 brain tumor cases), \$25 million dollars to evaluate risk on brain tumours.

Conclusion - no overall ↑ risk, but suggestions of ↑ glioma -heavy users & ipsilateral exposures



Re-evaluation - Risk underestimated by at least 25%

- ✓ Flaws in the design
- ✓ 25% industry funded
- ✓ Correction factor - significant results.
- ✓ For every 100 hours of use -26% ↑ risk of meningioma
- ✓ Initial 24% risk of glioma ↑ ed to 55% - regular users (2 hrs/month)?
- ✓ Doubled - quadrupled brain tumor risk - heavy users (1/2 hour/day)
- ✓ Children, young adults– excluded. New study - Mobi-kids

CASE STUDY

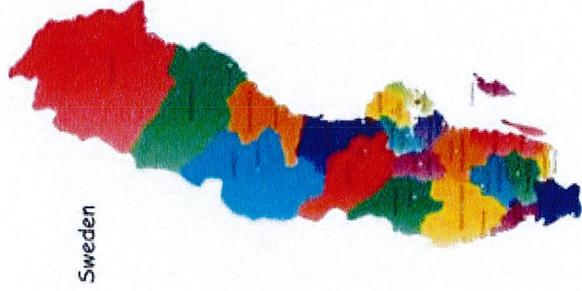
MY LIFE IN a FARADAY CAGE



Dr. Carlos Sosa, M.D., physician and surgeon living in Medellín, Colombia - Had to move five different apartments all over the city, resign his position at the hospital due to nearby masts and high radiation inside the Emergency Service. He now lives in a Faraday cage that prevents radiations from entering inside.

CASE STUDY

250,000 Swedes allergic to mobile phone radiation



- Around 230,000 - 290,000 Swedish men and women - Out of a population of 9,000,000 are now electro hypersensitive and report a variety of symptoms when being in contact with electromagnetic field.
- One of the first countries where mobile technology was introduced (approx. 15 years ago).
- Sweden has now recognized EHS (Electrohypersensitivity) as a physical degradation and EHS sufferers are entitled to have metal shielding installed in their homes free of charge from the local government.

CASE STUDY

Increased cancer cases with proximity to Towers

Within 91 m from a mobile tower

Name of deceased	Year of death	Cause of death	Age at time of death
Radhabai Sathe	2005	Breast cancer	66
Deshpande	2006	Oesophagus cancer	48
Shubhangee Deshpande	2007	Rectum cancer	66
Pujaree	2008	Cancer	46
Gawai	2008	Breast cancer	52
Shah	2009	Cancer	48
Vidyardhar Dev	2009	Liver cancer	52
Ransube	2009	Throat cancer	73
Archana Malvadkar	2009	Spinal cord cancer	17

Source: L B Deshpande, who studied the deaths in his Solapur locality since two towers were installed four years ago

Cell Phones- Cigarettes of 21st Century

- What do they have in common?
- ✓ Produced by Multi-Billion \$ Companies
 - ✓ Products linked to illness
 - ✓ Industries deny any health problem



BlackBerry warns: "... keep the device at least **0.98 inches** (25 mm) from your body ... and **SHOULD NOT** be worn or carried on the body."

- ✓ Warnings on cigarette packages, cell phone manufacturers are beginning to put warnings on user manual –

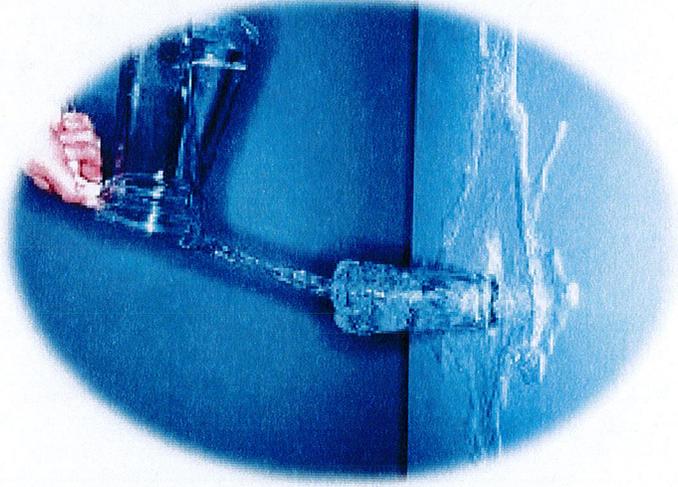
CELLPHONE USER'S MANUAL:

warns customers to keep cellphones away from body.

➤ Until now, man has been absorbing the harmful, unseen EM radiations without even being aware of it, but now, with rapid advent in technology this RF Radiation pollution has started having ill effects on human health and health of animals.

➤ Hence, there is an urgent need to take precautionary steps.

➤ Example, when a glass is filled with water, it holds up to a certain level, but once it reaches the rim, it starts spilling. Similarly, our bodies can also absorb radiation up to a certain limit.



CONCLUSION

- ❑ In addition to continuous radiation from cell towers, there is radiation from cell phones, computers, laptops, TV & FM towers, microwave ovens, etc. - additive in nature.
- ❑ **Stricter radiation norms must be enforced in India.**
- ❑ This does not mean that we have to stop living near these towers. We all know that automobiles create air pollution... Hence came up with unleaded petrol, CNG driven vehicle, hybrid vehicles, etc. Similarly, the solution to avoid excess radiation is to use radiation shields.
- ❑ **Mobile companies should not be in the denial mode and accept that radiation causes serious health problems. Only then people all over the world will carry out research to come out with solutions.**

REFERENCES

- 1) Haumann Thomas, et al, " HF-Radiation levels of GSM cellular phone towers in residential areas"
- 2) Salford, Leif G et al., Nerve Cell Damage in Mammalian Brain After Exposure to Microwaves from GSM Mobile Phones, Environmental Health Perspectives 111, 7, 881-883, 2003
- 3) Gandhi et al., IEEE Transactions on Microwave Theory and Techniques, 1996.
- 4) Agarwal Aet al Relationship between cell phone use and human fertility: an observational study, Oasis, The Online Abstract Submission System, 2006
- 5) Wood, A.W., Armstrong, S.M., Sait, M.L., Devine, L. and Martin, M.J., Changes in human plasma melatonin profiles in response to 50 Hz magnetic field exposure, Journal of Pineal Research, 25, 116-127, 1998
- 6) Blackman CF, Benane SG, Kinney LS, House DE, Joines WT , Effects of ELF fields on calcium-ion efflux from brain tissue in vitro, Radiation Research, 92, 510-520, 1982
- 7) Lai, H, Singh, NP, Melatonin and a spin-trap compound block radiofrequency electromagnetic radiation-induced DNA strand breaks in rat brain cells, Bioelectromagnetics, 18, 446-454, 1997a
- 8) Altamura G, Toscano S, Gentilucci G, Ammirati F, Castro A, Pandozi C, Santini M, Influence of digital and analogue cellular telephones on implanted pacemakers, European Heart Journal, 18(10), 1632-4161, 1997
- 9) Blank M, Goodman R, Electromagnetic fields stress living cells, Pathophysiology 16 (2009) 71-78,
- 10) Anu Karinen, Sirpa Heinävaara, Reetta Nylund and Dariusz Leszczynski* Mobile phone radiation might alter protein expression in human Skin, *BMC Genomics*, Finland, 2008, 9:77
- 11) Hutter HP et al, Tinnitus and mobile phone use, *Occup Environ Med.* 2010
- 12) Panda et al, Audiologic disturbances in long-term mobile phone users., J Otolaryngol Head Neck Surg., Chandigarh, 2010 Feb 1;39(1):5-11.

REFERENCES

- 13) Abdel-Rassoul G, et al, Neurobehavioral effects among inhabitants around mobile phone base stations, *Neurotoxicology*, 28(2), 434-40, 2006
- 14) Burch, J. Bet al "Cellular telephone use and excretion of a urinary melatonin metabolite". In: Annual review of Research in Biological Effects of electric and magnetic fields from the generation, delivery and use of electricity, San Diego, CA, Nov. 9-13, P-52.
- 15) Stang A, Anastassiou G, Ahrens W, Bromen K, Bornfeld N, Jöckel K-H: The possible role of radio frequency radiation in the development of uveal melanoma. *Epidemiology* 2001 , 12(1):7-12
- 16) Hardell L, Carlberg M, So"derqvist F, Hansson Mild K, Morgan LL. Long-term use of cellular phones and brain tumours: increased risk associated with use for >/_10 years. *Occup Environ Med* 2007;64: 626e32.
- 17) Santini R, Santini P, Danze JM, Le Ruz P, Seigne M, Study of the health of people living in the vicinity of mobile phone base stations: Incidence according to distance and sex, *Pathology Biology*, 50(6), 369-73, 2002 27
- 18) Eger H., Hagen K. U., Lucas B., Vogel P., Voit H., The Influence of Being Physically Near to a Cell Phone Transmission Mast on the Incidence of Cancer, Published in *Umwelt-Medizin-Gesellschaft* 17,4 2004
- 19) Balmori, A. (2002). Evidence of a connection between sparrow decline and the introduction of phone mast GSM
- 20) Lo"schner W, Ka"ss G. Conspicuous behavioural abnormalities in a dairy cow herd near a TV and radio transmitting antenna. *Practical Vet. Surgeon* 1998;29:437-44.
- 21) Balmori A., Electromagnetic pollution from phone masts. Effects on wildlife, *Pathophysiology* 16 (2009) 191-199

A decorative card with a floral border. The border consists of pink and red flowers and green leaves on a dark background. The text 'THANK YOU' is written in a serif font on a white rectangular background in the center.

THANK YOU

SCHEDULE 4

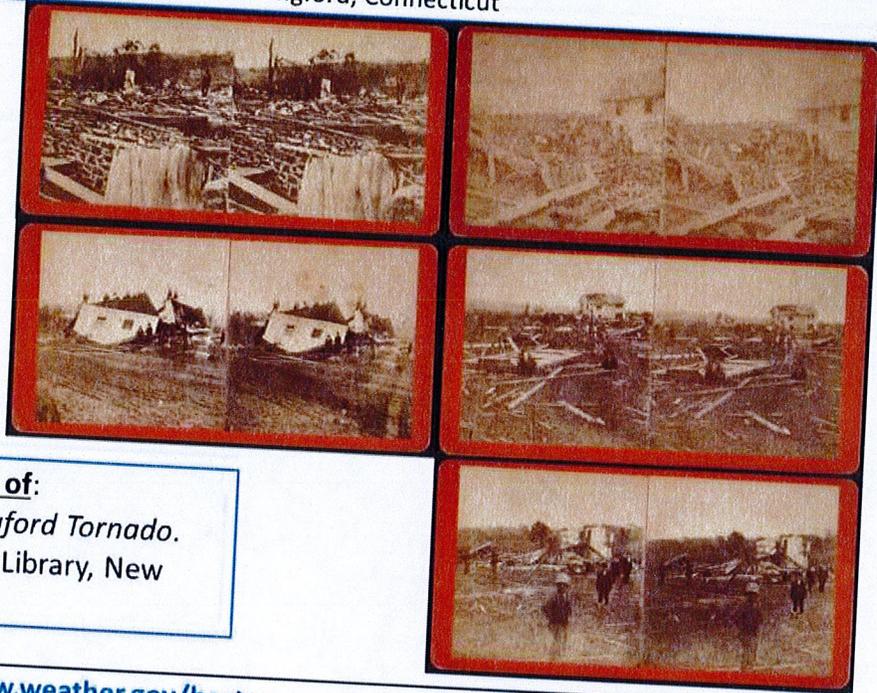
ctpost <http://www.ctpost.com/local/article/State-s-deadliest-tornado-touched-down-on-this-9130990.php>

State's deadliest tornado touched down on this date

By Jim Shay Updated 8:51 am, Tuesday, August 9, 2016

The Second Deadliest Tornado In New England

August 9, 1878 in Wallingford, Connecticut



Photographs courtesy of:

French, David. *Wallingford Tornado*. 1878. New York Public Library, New York, NY.



Website: www.weather.gov/boston

Twitter: [@NWSBoston](https://twitter.com/NWSBoston)

Facebook: <http://www.facebook.com/US.NationalWeatherService.Boston.gov>



IMAGE 1 OF 12

On this day 138 years ago, Connecticut had its deadliest tornado in history.

On Aug. 9, 1878, the "Wallingford Tornado" killed 34 people, injured nearly 100 and destroyed 30 houses. On that day there were three tornadoes that swept through state. The first tornado touched down in Kent in Litchfield County causing extensive damage,

but no injuries. Another tornado moved through Durham and Killingworth. The strongest tornado - estimated as an F4 - smashed through the northern part of Wallingford killing people, livestock and destroying scores of homes.

It ranks as the second deadliest tornado in New England. The deadliest happened on June 9, 1953 when a tornado killed 98 people in the surrounding area of Wooster, Mass. The deadliest tornado in U.S. history was on March 18, 1925 when 695 people were killed and 2,027 injured as it traveled more than 300 miles through Missouri, Illinois and Indiana. It was rated an F5 at the top of the old Fujita scale with winds more than 260 mph.

According to the National Weather Service's Boston's Facebook page, the deadly tornado started as a waterspout over a dam in the Quinnipiac River. It was reported to be 400 to 600 feet wide and traveled a distance of two miles.

"The tornado killed 34 people and injured 70, 28 severely, as it ripped up trees and carried houses and barns from their foundations," according to Connecticut History. org. A fire spread through some of the ruined wooden structures but was quickly extinguished by the rain. The tornado destroyed a total of 40 houses and a number of barns as well as the orchards in its path. The town also suffered the loss of their new brick schoolhouse (the upper two floors were destroyed), the Community windmill and brick factory, and the wooden Catholic Church. The area of Colony and Christian Streets was the hardest hit."

Summer is the peak season for tornadoes. So far this summer there have been no major tornadoes in the state. We did have a tornado warning on June 1, but none developed.

More Information

Southwest Connecticut tornadoes since 1950

Since 1950, there have been 15 tornadoes in Fairfield County and 13 in New Haven County, according to the National Oceanic and Atmospheric Administration. During that 66-

July 14, 1950. An F2 tornado touches down off of West Lane in Ridgefield, injuring three people and causing \$250,000 in property damage.

Oct. 24, 1955. An F2 tornado touches down in downtown Naugatuck causing \$2,500 in damages.

May 24, 1962. One person was killed and 45 injured when an F3 tornado 120-yards wide travels 9.3 miles from Middlebury to Southington. Damaged was estimated at \$2.5 million.

Aug. 15, 1958. An F1 tornado touches down off Congress Street on the Audubon sanctuary property in Fairfield, causing \$2,500 in damage.

Aug. 9, 1968. An F1 tornado confirmed in Ridgefield. It travels from Keeler Drive to Ned Mountain.

July 19, 1971. An F2 tornado passed across Norwalk Harbor into East Norwalk, destroying 30 trees and moving a small building on a golf shore four feet off its foundation. It caused \$25,000 in damages.

July 29, 1971. An F3 tornado injures two people and \$250,000 in damage as it blows through the Oakville section of Waterbury.

Sept. 18, 1973. An F1 tornado touches down at 10:45 a.m. between Connecticut Avenue and Anderson Road in Greenwich. It causes no damage.

year period there have been 75 tornadoes across Connecticut causing four deaths, 703 injuries and more than \$601 million in damages.

Tornadoes have touched all across southwest Connecticut from Greenwich to Bridgeport, up into the Naugatuck Valley and through greater Danbury. With 22 tornadoes, Litchfield County has had the most tornadoes in the state, followed by Hartford County with 17.

Ten of the 15 tornadoes happened in July; the earliest tornado was in late May. The National Weather Service says most of the tornadoes happen in late afternoon. Once a tornado warning is issued people are advised to go to the lowest level of the house or in an interior hallway with no windows.

Since 1950, The most destructive storm happened in July 1989 when two tornadoes torn through Hamden and parts of Litchfield County killing two people, injuring 50 and caused more than \$100 million in damage.

In June 2014, a tornado torn through parts of Bridgeport and Stratford with 110 mph winds. The Federal Emergency Management Agency visited 159 homes in Bridgeport, listing 51 as affected, 52 as suffering from minor damage, 55 as suffering from major damage and one location was considered destroyed. Thousands of people were without power for days. Fortunately, no one was seriously hurt.

July 28, 1982. An F1 tornado touches down at High Rock State Park in Beacon Falls around 5 p.m.

July 10, 1989. Two people were killed and 50 people were injured when a two tornadoes struck after 3 p.m. in Watertown and Hamden. In Hamden, it was a rare F4 tornado in that destroyed 350 homes and 40 businesses in Hamden and New Haven. Damage estimates in Hamden were \$100 million. More than 30 streets were blocked and more than 90,000 people were without power for up to a week.

June 29, 1990. A tornado injures seven when it touches down off Park Avenue in Danbury at 7:45 p.m.

July 5, 1992. A small tornado touches down on the shoreline of Ball Pond in New Fairfield and moves southeast around 4 p.m. Trees and debris showed cyclonic twisting action. There were no injuries or structural damage.

Aug. 4, 1992. An F1 tornado in Trumbull, a tornado touched down on Sharon Street. Many trees were uprooted and branches torn off, but there was no injuries or structural damage.

May 29, 1995. A tornado touched down in South Britain section of Southbury and moved in an easterly direction into Southbury. National Weather Service investigation yielded a video tape of the tornado and eyewitness accounts of a rotating funnel. Damage was confined mostly to trees: trees up to one foot in diameter

Fortunately, there is no threat of tornadoes today. The NWS says "Today will be the last day of comfortable humidity, although highs will reach well into the 80s if not around 90 in some locations. It will begin to turn more humid tonight, and especially on Wednesday, as a front approaches New England from the west. The front should also bring some much needed rainfall in the form of showers and possible thunderstorms on Wednesday. Rainfall amounts of up to 0.50" can be expected, but any thunderstorms could drop a quick 1 to 2 inches of rain. Hot and humid weather will follow Thursday and into the start of the weekend, when highs will reach the 90s in many locations."

were snapped off near the base; trees up to three feet in diameter had their tops snapped off; others were uprooted. Damage to homes in the area was mostly minor. One wall of a porch was ripped off of one house while most other houses were damaged as a result of falling trees. A few houses had some shingles blown off. It caused \$50,000 in damages.

July 3, 1996. An F1 tornado touches down in Waterbury and Wolcott causing \$2 million in damages, but no injuries. At the **Wilby High School** football field a set of bleachers was destroyed and scattered the seats for a half mile area in the direction the storm moved. Next the storm did serious damage to the roof of the school building and blew out several windows. Early damage estimates for this school alone was nearly \$ 1 million dollars.

Sept. 7, 1996. A confirmed F1 tornado touches down at 6 p.m. in northwest Monroe. The tornado originated near Bridal Path Trail and Quarter Horse Drive in northwest Monroe and moved northeast across Hattertown Road. Damage was confined mostly to trees along the path. The determination was made primarily based on rotational tree damage patterns and eyewitness accounts. Elsewhere in the Monroe area, straight line wind damage occurred. West winds estimated at 75 to 100 MPH knocked down numerous large trees, some of which fell on power lines and houses. Several of the large trees were weeping willows with shallow root systems. All trees were observed pointing east. Some areas

affected included parts of Lovers Lane, Far Horizon Drive, Moss Road, Cross Hill Road and Elm Street.

May 31, 2002. A professional meteorologist confirmed the occurrence of an F1 tornado in Brookfield at about 7:24 p.m. The tornado touched down on the west side of Hillendale Road, about 800 feet from the intersection of Long Meadow Hill Road and Hillendale Road. The tornado moved east across this intersection toward Signal Hill Road. It moved across the property on 17 Signal Hill Road, then dissipated in a wooded area behind this property. There was evidence of rotation in two locations: Large trees were twisted off at their bases and trees and debris fell in a counter clockwise pattern at the intersection of Long Meadow Hill Road and Hillendale Road, where the tornado was estimated at F1 strength. Trees on the southern side of the path were downed to the east and were snapped toward the north along the northern side of the path. At 17 Signal Hill Road, trees were also lying in a counter clockwise direction. Most damage occurred to trees, fences, and smaller buildings. Tornadoic damage was observed along Interstate 84 near Exit 14, in Southbury which intersects with Route 172, Britain Road.

July 12, 2006. In Greenwich, a tornado moved east to northeast into the Kensico Reservoir Region of extreme eastern Westchester County; across Routes 22 and 120 in the North Castle area. As the tornado entered extreme southwest Fairfield County at 4:01

p.m., F1 damage was observed in north Greenwich along Cutler and Bedford Roads, where thousands of large trees were uprooted and snapped off. F0 damage was observed along Riversville Road as the tornado moved east. The tornado apparently lifted as it crossed John Street. A brief touch down may have occurred just north of the Merritt Parkway. The maximum path width across this region was about 100 yards.

May 16, 2007. Thunderstorms developed ahead of a cold front in the afternoon with one particularly potent bow echo that moved across northern Fairfield, New Haven, and Middlesex Counties. This bow echo produced a microburst and an EF1 tornado in Fairfield County. In Newtown, an EF-1 tornado touched down near the Rock Ridge Country Club, just north of Route 302. It traveled east to northeast and passed just south of the main town center in Newtown. The tornado passed across Route 25, South Main Street and lifted along Sugarloaf Road, between Toddy Hill Road and Berkshire Drive. High winds damaged many trees which fell through houses and cars along this path, which was approximately 4.5 miles with an average path width of 100 yards. There was a well defined narrow track of discontinuous damage, where the damage converged in toward the track center. Eye witness reports of funnel clouds were observed.

July 31, 2009. A cold front transiting the Tri-State formed a squall line with multiple bow echoes, producing two

tornadoes, and widespread damage from straight line winds. In the Pine Rock Park section of Shelton there was a narrow path of wind damage extended along the Yutaka Trail near Kanungum Trail and Agawam trail to Long Hill Avenue near Pochong Trail. The most concentrated wind damage was along Oronogue trail, where many trees were downed when the tornado passed through around 3 p.m.

June 24, 2010. A cold front and strong upper level trough moved across the Tri-State, triggering severe thunderstorms across southwest Connecticut in the afternoon. This included both supercells and squall lines, producing an EF-1 Tornado in Bridgeport, and severe winds and hail across the remainder of the region including Stratford and Trumbull. An NWS Storm Survey determined that an EF-1 Tornado, with maximum winds of 110 mph, impacted a small portion of Bridgeport. The survey found many signs of wind rotation in a highly localized area just north of Interstate 95. The area was bounded by the Interstate 95 northbound connector on the west and Pembroke Street on the east. The most severe damage was concentrated along East Main Street between Nichols Street on the south and Cedar Street on the North. In this area, windows were blown in, the facade of a building was stripped off, tree tops were sheared off, and large pieces of metal blown off from surrounding structures were wrapped around a fire hydrant. Eyewitness reports described a rain wrapped tornado with visibility near zero in

swirling heavy rain and debris. Note the damage estimate is just a portion of the total damage to Bridgeport.

July 1, 2013. An EF0 tornado with maximum winds of 80 mph in the towns of Greenwich and Stamford touched down just before 10 a.m. The tornado touched down in the town of Greenwich on North Street just north of the Merritt Parkway. It continued east-northeast into the town of Stamford and lifted on **Janes Lane** approximately a half mile west of Scofieldtown Road. Extensive tree damage was observed along the tornado path starting on Taconic Road and continuing onto Skyridge Road. The most significant tree damage was observed just south of the intersection of Stag Lane and Stanwich Road, where numerous large trees and power lines were downed. Tree damage continued on Carrington Drive and at the Mead House Farm. It reached its maximum width of 150 yards along River Bank Rd. immediately east of Newman Mills Park. The only structural damage was also reported at this point with the door to a barn being blown off. The tornado started to weaken as it moved into the town of Stamford just south of Web Hills Road and Lynam Road. Trees were last noted down at the far western end of Janes Lane. No fatalities or injuries were reported.

© 2017 Hearst Communications, Inc.

H E A R S T

