

# Confidential Report

To: Board of Directors, [REDACTED] Street, New York, NY 10021

Date: June 9, 2014

Prepared for:

[REDACTED]

By: Camilla Rees, MBA

**Re: Assessment of Wireless Antenna Site FCC RF Compliance Document prepared for Verizon by Pinnacle Telecom Group re. “[REDACTED]” Site, [REDACTED], Proposal May 27, 2014**

Dear Board of Directors,

I have briefly reviewed the Pinnacle Telecom Group report regarding the antennas proposed to be placed on the property of [REDACTED] Street, New York, NY [REDACTED]. It includes information about the rooftop topography and proposed antennas and then uses standard equations to calculate the radiation pattern and intensity. There are several issues in the document that raise concern, and potentially more were this document to be technically reviewed by an RF engineer, which I would highly recommend (and can offer names if you would like them).

## Concerns about Report:

**1. Page 2 – Documentation Needed** *“Moreover, the FCC MPE limit has been designed to provide appropriate protection for humans of either sex, all ages, all sizes and under all conditions.”*

I know of no study that establishes that this level is safe for both genders of all ages and sizes under all conditions as stated in this report and **ask that the authors provide the primary scientific documentation to support this statement.**

The FCC safety guidelines were developed in the 1960s, based on thermal considerations alone, for military personnel operating radar equipment. The standard was developed for industrial and military users, not by health experts for citizens, and wireless technologies were not widespread then. The *thermal* basis of these guidelines has not changed, though it is widely accepted that the thermal effects are *not the only risk factor*. There are non-thermal effects (reported in thousands of peer-reviewed, published studies) indicating biological and health risks associated with a broad range of aspects of the radiation, including frequency, amplitude, pulse, intensity, polarity and information content. Thus, until the FCC establishes guidelines for the non-thermal effects, any reliance on current FCC guidelines based solely on *thermal effects* would necessarily be incomplete.

For this reason, and the fact that the WHO’s International Agency for Research on Cancer (IARC) has classified the radiation as a ‘Class 2B Possible Carcinogen’, the above statement can be considered invalid.

**2. Page 3—Incomplete:** The report says “. . . areas of FCC compliance interests are as follows: (1) at street level around the building; (2) inside the top floor of the building, and directly under the antennas; and (3) on the roof near the antennas.” **The terraces that are part of [REDACTED] property are not addressed.**

**3. Page 3—Lack of Clarity/More Information Needed:** “*At street level*”. The values are based on **standard calculations, and do not reflect the unique situation**. They do not take into account structures that may reflect or possibly block the radiation, for example metal surfaces and window frames. Reflection can lead to intensification of the radiation, or “hotspots”, in unexpected locations that put residents and neighbors at greater than expected risk.

The **exact locations at street level** were also not presented in the document. Was the measurement taken in front of your building? Across or down the street? In the various beams of the proposed antennas specifically? Nor were levels calculated for potential exposure to the **nearby school and women’s residence for students** and interns.

**4. Page 3 Levels Unsafe, “on the roof”** a value of 95.25% of FCC guidelines is well above levels (0.3% of FCC guidelines) that cause heart arrhythmia and tachycardia in sensitive individuals (Havas et al. 2010, 2014) and many other known biological effects. For those with a preexisting heart condition the consequences could be severe.

**5. Page 3, Inadequate Information, “inside the building under antennas”.** Standard equations to calculate exposure do not take into consideration the specific kind of roofing material and other structures that may reflect, absorb or conduct this radiation. What is the thickness of the roof and what material is used? Certain kinds of concrete can reduce emissions considerably while others are more permeable to this radiation, so the type of material involved is critical to determining levels of rooftop leakage into the penthouse apartments. What assumptions were made here?

**6. Page 3, Missing Information, last bullet:** Pinnacle claims they have measured hundreds of residences and found that levels range from 3% to 7% of the FCC limits and that these values are associated with common household electric appliances. Is this a published document? Peer-reviewed? The values of 3%-7% are high, and the readings may have been taken within a short distance of a WiFi router, cordless phone base station or wireless computer equipment to achieve these elevated levels. According to Magda Havas, PhD of Trent University in Canada, the medium exposure levels in German homes are between 0.001 and 0.01 microW/cm<sup>2</sup> and are less than 0.001% of FCC guidelines (Haumann et al. 2002).

**7. Page 4, Missing Information, second bullet:** A second document is also referred to but is not provided (US National Institute of Science and Technology). It is also not dated and the date is crucial since levels of radiation in cities have been dramatically increasing with the deployment of both cell phone antennas and WiFi antennas. Once again, I **recommend that Pinnacle provide a copy of this document for assessment.**

**8. Page 4, Lack of Clarity/More Information Needed:** For ‘ease of discussion’ the document states the calculations are based on an input power of 20 watts per channel.

Exactly how many channels are there likely to be when all antennas are functioning? On page 3 it states that Verizon antennas will be operating at 20 or 40 watts per channel, but 20 watts has been used here.

**9. Page 6, Lack of Clarity:** Is Pinnacle stating that it is unable to measure “RF leakage” from radio equipment cabinets or antenna cabling? Anyone living or working near the cables and the electronic equipment in the basement or elsewhere should have measurements made before and after installation of the electronic equipment. If Pinnacle is unable to measure values because they are “too low” then they may not be measuring with appropriate meters.

**10. Page 7, Unrecognized Concerns, Appendix A:** There are several concerns about the roof of this building that need to be mentioned:

**a.** Radiation coming through *skylights* is likely to be higher than radiation coming through the roof. Skylights may need to be shielded with RF reflecting film ([www.EMFSafetyStore.com](http://www.EMFSafetyStore.com)).

**b.** Levels of radiation in the *multiple chimneys* will likely be elevated unless special shielding material is installed.

**c.** Metal sheeting immediately beneath the antennas over a considerable portion of the roof and/or RF absorbing material will reduce exposure of those living in the top floors. **A cost estimate for properly shielding the roof should be obtained and evaluated by the Board before proceeding further.** (Recommend consulting Lawrence Gust, Gust Environmental and President, Institute for Building Biology and Ecology (805) 644-2008, or Rob Metzinger, Safe Living Technologies, Canada 519-240-8735)

**d.** The water tower and connecting pipes, especially if they are metal, may bring some of the RF radiation into apartments through the water pipes. This can also be reduced with appropriate chokes and couplings.

**e.** It is unclear what the levels of radiation are likely to be on the top floor terraces, and shielding may be required, though this would be difficult and expensive. If radiation levels increase on the terraces, they may be unsuitable for use, or unsuitable for use without shielded canopes.

**f.** Birds on the roof and terraces will be exposed to the radiation, and impacts on their sense of direction, food sourcing, fertility, mating behaviors and more can be significant. The U.S. Department of Interior has recently stated FCC RF guidelines are ‘not protective of wildlife’. This should be taken into consideration and an environmental impact review should be conducted.

**11. Concerns, Appendix B, page 10:** “FCC’s MPE limits . . .” The FCC (Federal Communication Commission) limits are outdated and are based entirely on a “**thermal**” effect as mentioned in #1 above. In relying only on physics, the FCC ignored the science showing non-thermal effects evident in the biological science. Physicists with

no biology background claim non-thermal effects cannot occur despite thousands of published studies showing otherwise, including studies by the telecom industry itself, and by the U.S. military. Guidelines in Switzerland, China, Russia, Bulgaria, Hungary, Poland, Italy, Czech Republic, and Slovakia are 1% of the US FCC guidelines and are based on **adverse biological effects** that do not include heating.

FCC guidelines are based on an average **30-minute exposure** of the general public. When these guidelines were first implemented the public was not exposed to microwave radiation unless they lived near a military base, a shipping route or an airport where radar was used. The only other exposure was from microwave ovens. Since the 1980s our exposure to microwave radiation has been increasing exponentially and people are beginning to react adversely to this radiation. Living under the antennas means **hours of exposure each and every day** so the 30-minute average reading is no longer appropriate.

It is also important to understand that the '30-min average' used as a proxy for a 24-hour period is misleading as usage varies over time. It is also not the average that matters but the **maximum levels that matter**. Living organisms respond to maximum values not 'average' values. If you are adjusting the temperature for your bath and you place your hand in the scalding water and burn yourself . . . it does not matter that in the end the bath has a lower temperature. You still burned yourself because of the maximum temperature you were exposed to for a brief period. "Average" is an engineering figure but biologists need to know the "maximum" exposure and duration of maximum exposure.

**12. Missing Information:** Radiation from nearby antennas (cell phone or broadcast) can be picked-up as radio frequencies on electrical wires or other conducting materials (Vignati and Giuliani 1997). If this radiation gets into building wiring it will generate poor power quality that can adversely affect electronic equipment (TV, computers, etc.) and it can make people sick (American Journal of Industrial Medicine 51:579-586 - 2008); Havas and Stetzer 2004). It is recommended that power quality be monitored before and after the antennas become operational. If levels are elevated they should be filtered, either through whole building filtration, or using filters in every outlet in all apartments (not just in top floor apartments). Additional high frequency transients will also occur from the power from your building's electricity needed to power the antennas.

**13. Missing information:** Did Pinnacle conduct a search of nearby antennas (other cell phone providers, WiFi, WiMax, etc)? According to AntennaSearch.com, there are 500 antennas within 1 miles (or approximately 20 blocks radius) of your building. From a health perspective it is *total exposure* to this radiation that is important not just exposure from one set of antennas. Many people have reached their personal tipping point today, and you might be next. Studies show that 3-8% of people are electrically sensitive, impairing function, and 35% mildly sensitive. It is unwise to assume more antennas will not make any difference. Cells and DNA show the degradation occurring from this radiation, whether or not one has any symptoms.

A special problem related to antennas on apartment buildings is that they radiate during the night when the body must rest and repair. If the body cannot rebalance and heal, due

to nocturnal EMF exposures, it will become ill much more quickly. In today's increasingly wireless world, a pristine EMF-free home environment is critical to protect one's health. I recommend you be part of the solution, not add to the problem.

#### **Scientific Research on Health Effects near Cell Phone Antennas:**

**Please see the attached 90-slide presentation on the known biological and health risks from wireless radiation prepared for today's meeting.**

Slides # 31-38 show many of the effects that have been found within the vicinity of neighborhood antennas. Immediately beneath an antenna(s) and in buildings immediate adjacent to antennas are where people experience the highest exposure for the longest period. Those on the top floor have the greatest risk of developing cancer and symptoms of electrosensitivity, which include more fatigue, sleep disturbances, cardiovascular problems, headaches, difficulty concentrating, depression, memory loss etc. These occur at exposures that are a tiny fraction (i.e. a small fraction of 1%) of FCC guidelines.

A review of cell towers and other transmission infrastructure was published on November 5, 2010 in the Canadian journal, *Environmental Reviews*, a publication of Canadian Science Publishing. The paper, [\*“Biological Effects from Exposure to Electromagnetic Radiation Emitted by Cell Tower Base Stations and Other Antenna Arrays”\*](#) was co-written by award winning medical/science journalist and author B. Blake Levitt and renowned bioelectromagnetics researcher, Henry Lai, PhD. Dr. Lai of the Department of Bioengineering at the University of Washington. This extensive literature review contains over 100 citations, approximately 80% of which showed biological effects, many of which have adverse health implications. The paper builds a compelling case for the need to change radiation exposure standards, which now *only consider one exposure at a time*, instead of exposures from more realistic *cumulative exposures*, and from a *myriad of sources*. It also builds the case for a need for setbacks from antenna infrastructure. B. Blake Levitt cautions that *using a simple distance measure* is an unreliable gauge of actual exposure. She says, “There can be coupling effects, genetic predispositions, issues related to building materials, topography, trees, and more. The only way to know the actual exposure is to measure.”

Co-editor of the BioInitiative Report (2008, 2012), which reviewed 3,800 studies showing non-thermal effects, Cindy Sage, MA, and Dr. Martin Pall, Professor Emeritus of Biochemistry and Basic Medical Sciences, Washington State University, submitted the following chart recently in testimony to the State of Washington, which summarizes the electrosensitivity effects from eleven published studies.

**Table 1: RFR Levels in Cell Tower Studies Reporting Adverse Health Impacts**  
(RFR levels from cell towers are similar or lower than for WI-FI devices)

Study	RFR Level	Reported Health Impacts
Navarro (2003)	0.01 – 0.11 uW/cm <sup>2</sup>	Fatigue, headaches, sleeping problems
Thomas (2008)	0.005 – 0.04 uW/cm <sup>2</sup>	Headaches, sleep and concentration difficulties
Heinrich (2010)	0.003 – 0.02 uW/cm <sup>2</sup>	Headaches, irritation, concentration difficulties
Thomas (2010)	0.003 – 0.02 uW/cm <sup>2</sup>	Behavioral problems in children, adolescents
Mohler (2010)	0.005 uW/cm <sup>2</sup>	Sleep disturbances
Hutter (2006)	0.05 – 1.0 uW/cm <sup>2</sup>	Headache, sleep, concentration problems, other neurological problems.
Kundi (2009)	0.05 – 1.0 uW/cm <sup>2</sup>	Review of 14 studies on cell tower-level RFR at and above 0.05 – 1.0 uW/cm <sup>2</sup> impairs health.
Buchner (2012)	0.006 – 0.01 uW/cm <sup>2</sup>	Significant impact on stress hormones; children and chronically ill adults most at risk.
Oberfeld (2004)	0.01 uW/cm <sup>2</sup>	Sleep and concentration disruption, fatigue and cardiovascular problems.
Zwamborn (2003)	0.13 uW/cm <sup>2</sup>	Anxiety, hostility, impaired cognition
Avendano (2012)	0.5 – 1.0 uW/cm <sup>2</sup>	Sperm damage (DNA fragmentation, low motility) from laptop in wireless mode (in lap)

What these and other studies referenced in the slide presentation show is that the existing guidelines in the United States are inadequate to protect public health. The guidelines were originally designed to protect against heating military personnel (200 pound healthy male) working on radar for a few hours each day. They were not designed to protect infants, pregnant women, the elderly and those who are already ill and who are exposed to this radiation constantly in their homes. **Studies suggest that the effects of this radiation are cumulative and that long-term exposure to low levels of microwave radiation have similar effects as high exposure for short periods.**

In May 2011, the WHO’s International Agency for Research on Cancer officially classified the radiation emitted by wireless antennas as a ‘Class 2B Possible Carcinogen’, providing an official scientific basis on which governments, schools and parents can legitimately call for precautionary behavior regarding these radiation-emitting devices. Since this time, many governments and municipalities have called for lowering, eliminating and minimizing radiation exposures from wireless antennas, and especially in residential areas. In some countries, hundreds of antennas are being taken down.

Other things to consider:

*Insurance coverage:* Many reinsurers (ex: Lloyds) view electromagnetic radiation from mobile phones as an emerging health issue and for several years now have not covered liability for health related claims from this radiation. Here is language from one exclusion:

Exclusion – Electromagnetic Radiation

This policy does not apply to:

- (1) “Bodily injury”, “property damage” or “personal and advertising injury” arising out of, resulting from, caused or contributed to by electromagnetic radiation, provided that such injury or damage results from or is contributed to by the pathological properties of electromagnetic radiation;
- (2) The costs of abatement or mitigation of (i) electromagnetic radiation, or (ii) exposure to electromagnetic radiation;

(3) Any supervision, instructions, recommendations warnings or advice given or which should have been given in connection with any of the subsections above; or

(4) Any obligations to share damages with or repay someone else who must pay damages because of such injury or damage.

Will [REDACTED] Street cooperative's insurance company provide coverage in the event of someone suing the shareholder's of this building and the cell phone provider for health damages associated with the antennas? **An examination of the building's liability coverage at this time would be advised.**

*Real Estate Values:* There is evidence that real estate is devalued near cell phone antennas since people don't want to live near these antennas.

Andrew J. Campanelli, Esq. a civil rights lawyer in Garden City said a group of residents had hired him to oppose the cellular company's application. "They were worried about the property values," Mr. Campanelli said. "If your home is near a cell antenna, the value of your property is going down at least 4 percent. Depending on the size of the tower and the proximity, it is going down 10 percent."

A study was published in The Appraisal Journal in 2005, "The Impact of Cell Phone Towers on House Prices in Residential Neighborhoods" by Sandy Bond, PhD, Past President of the Pacific Rim Real Estate Society, and Ko-Kang Wang. It indicated, at that time (note, when many fewer towers and antennas were present), that "The issue of greatest concern for survey respondents in both the case study and control areas is the impact of proximity to CPBSs (i.e. cell towers) on future property values. Overall, **respondents would pay from 10%–19% less to over 20% less for a property if it were in close proximity to a CPBS.** The opinion survey results were generally confirmed by the market sales analysis using a hedonic house price approach. **The results of the sales analysis show prices of properties were reduced by around 21% after a CPBS was built in the neighborhood.**" They said "Even buyers who believe that there are no adverse health effects from CPBSs, knowing that other potential buyers might think the reverse, will probably seek a price discount for a property located near a CPBS." The Appraisal Institute, publisher of the Appraisal Journal, is the largest global professional membership organization for appraisers with 91 chapters throughout the world.

In a landmark case, in 2013, a jury awarded a VT couple **\$1mm** due to VELCO building a communications tower next to their mountain top property. The award, which was initially contested, has now been paid.

<http://emfsafetynetwork.org/jury-awards-vermont-couple-1million-in-cell-tower-lawsuit/>

**An online survey being conducted by the National Institute for Science, Law and Public Policy** (started June 2014, 567 respondents, interim results to date) indicate:

-93.7% of homebuyers or renters would be concerned if there was a nearby cell tower or group of antennas on a building within a few blocks of a property they were viewing.

-97.3% would be concerned if a cell tower or group of antennas was physically on top of, or attached to, an apartment building they were considering.

-96.43% said a nearby cell tower or group of antennas would negatively impact interest in a property or the price they would be willing to pay for it.

**-97.69% said a cell tower or group of antennas on top of, or attached to, an apartment building would negatively impact interest in the apartment building or the price they would be willing to pay for it.**

These numbers are compelling, and as more scientific studies are published and more information becomes available via the media and the public becomes better informed about the possible consequences of living near cell phone antennas, people will be even less likely to want to move into a building that has antennas on the roof.

For all of these reasons, placing antennas on apartment buildings is ill advised especially since contracts can last for a quarter of a century. The fact that a school is nearby, and that young children, elderly, couples hoping to conceive and health challenged individuals may live in this and surrounding buildings, makes this an unwise choice.

If antennas were to be placed, I would recommend the Board arrange for an independent health survey before and after any installation, with updates after 6 months and each year thereafter. This should be paid for by Verizon. Any contract with Verizon should include termination provisions that allow for contract termination if health survey results show residents' health is being impaired to give you an out. This is essential to protect residents' and shareholders' health and shareholder value.

My final recommendation is that the Board of Directors not sign any contract with Verizon until conducting full due diligence on this important emerging public health issue. Understanding the incorrect, incomplete and misleading information in the Pinnacle FCC RF Compliance report is imperative.

Respectfully submitted,

Camilla Rees, MBA