

STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL

IN RE:

NEW CINGULAR WIRELESS PCS, LLC (AT&T)
PETITION FOR A DECLARATORY RULING,
PURSUANT TO CONNECTICUT GENERAL
STATUTES §4-176 AND §16-50K, FOR THE
INSTALLATION OF A WIRELESS
TELECOMMUNICATIONS FACILITY ON
PROPERTY LOCATED AT 116 OLD MIDDLE
STREET, GOSHEN, CONNECTICUT.

PETITION NO. 1432

October 15, 2020

PETITION FOR A DECLARATORY RULING:
INSTALLATION HAVING
NO SUBSTANTIAL ADVERSE ENVIRONMENTAL EFFECT
SUPPLEMENTAL SUBMISSION

New Cingular Wireless PCS LLC (“AT&T”), the Applicant, respectfully submits the following supplemental information to the Connecticut Siting Council in the above-referenced Petition:

Supplemental Radio Frequency Emissions Analysis

Included in Attachment 1 is a revised Radio Frequency Emissions Analysis Report, dated October 12, 2020 and prepared by Centerline Communications, LLC. This revised report corrects prior inaccuracies regarding equipment, frequencies and antenna configuration. The amended Radio Frequency Emissions Analysis Report demonstrates that operation of AT&T’s antennas will be within the standards adopted by the Connecticut Department of Environmental Protection, as set forth in Section 22a-162 of the Connecticut General Statutes, and within the Maximum Permissible Exposure (“MPE”) limits established by the Federal Communications Commission (“FCC”).

Respectfully submitted,



Kristen Motel

On behalf of the Petitioner

cc: First Selectman Robert P. Valentine, Town of Goshen
Martin J. Connor, Land Use Official, Town of Goshen
Barbara L. Breor, Town Clerk, Town of Goshen
AT&T
Centerline Communications, LLC
Lucia Chiochio, Esq.

CERTIFICATE OF SERVICE

I hereby certify that on this day the foregoing was sent electronically to the Connecticut Siting Council and to the service list below with one hard copy sent to the Connecticut Siting Council via first class mail in accordance with Connecticut Siting Council directives:

October 15, 2020



Kristen Motel
Cuddy & Feder LLP
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White Plains, NY 10601
(914)-761-1300
Attorneys for the Applicants

ATTACHMENT 1



Radio Frequency Emissions Analysis Report

AT&T

Site Name: **cRAN_RCTB_GSHN_01**

253 Old Middle Street

Goshen, CT 06756

October 12, 2020

Centerline Communications Project Number: 950010-190

Site Compliance Summary	
Compliance Status:	Compliant
Site total MPE% of FCC general population allowable limit:	1.38%



October 12, 2020
AT&T Mobility – New England
Attn: John Benedetto, RF Manager
550 Cochituate Road
Suite 550 – 13&14
Framingham, MA 01701

Emissions Analysis for Site: **cRAN_RCTB_GSHN_01**

Centerline Communications, LLC (“Centerline”) was directed to analyze the proposed AT&T facility to be located on a **Utility Pole** near **253 Old Middle Street, Goshen CT 06756** for the purpose of determining whether the emissions from the proposed facility are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01 and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The number of $\mu\text{W}/\text{cm}^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

All results were compared to the FCC (Federal Communications Commission) radio frequency exposure rules, 47 CFR 1.1307(b)(1) – (b)(3), to determine compliance with the Maximum Permissible Exposure (MPE) limits for General Population/Uncontrolled environments as defined below.

General population/uncontrolled exposure limits apply to situations in which the general population may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general population would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Population exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The general population exposure limits for the 1900 MHz (PCS), 2100 MHz (AWS) and 5 GHz (B46) bands is $1000 \mu\text{W}/\text{cm}^2$.

Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits, as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Additional details can be found in FCC OET 65.



CALCULATION FORMULAS

MODELING

RoofMaster™ employs several power density prediction models based on the computational approaches set forth in the Federal Communications Commission’s Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields, OET Bulletin 65. This guideline utilizes several antenna and operational parameters in calculating the power density contributions from each emitter at specified points throughout the study space. RoofMaster™ enables antennas to be fully defined in site-specific aspects as well as through the use of a library of manufacturer data. The parameters include:

- Antenna model
- Radiation patterns
- Aperture length
- Gain
- Beam width
- Antenna radiation center
- Azimuth
- Mechanical downtilt
- Location Frequency
- Power into antenna

THE CYLINDRICAL MODEL IMPLEMENTATION (Sula9)

In OET-65, the Cylindrical Model is presented as an approach to determine the spatially averaged power density in the near field directly in front of an antenna. In order to implement this model in all directions, RoofMaster™ utilizes the antenna manufacturer horizontal pattern data. Additionally, RoofMaster™ incorporates factors that reduce the power density by the inverse square of horizontal and vertical distance beyond the near field region.

Power density is calculated as follows:

$$S = \left(\left(\frac{360}{\text{Beamwidth}} \right) \frac{P_{in} G_H H_r V_r}{2 \pi R h} \right) \frac{\mu W}{cm^2}$$

- S is the spatially averaged power density value
- R is the horizontal distance meters to the study point
- h is the aperture length in meters
- Pin is power into the antenna input port in Watts
- RoofMaster™ Implementation:
 - GH is gain offset to study point as specified in manufacturer horizontal pattern
 - Pin is adjusted by the portion of the antenna aperture in the 0-6 ft vertical study zone
 - Hr accounts for 1/R² Far Field roll off which starts at 2xh
 - Vr accounts for 1/ (vertical distance)² roll off from antenna bottom to the top of the 0- 6ft study zone (or antenna top to bottom of 0-6ft study zone)



For each sector the following channel counts, frequency bands and power levels were utilized as shown in *Table 1*:

Sector	Technology	Frequency Band	Channel Count	Transmit Power per Channel (W)
A	LTE	1900	4	5
A	AWS	2100	4	5
B	LTE	1900	4	5
B	AWS	2100	4	5
C	LTE	1900	4	5
C	AWS	2100	4	5
D	5G	5200	2	.316

Table 1: Channel Data Table



Sector	Antenna Number	Frequency	Antenna Make / Model	Antenna Centerline (ft)
A	1	1900	Galtronics GP2406-06670	27
A	1	2100	Galtronics GP2406-06670	27
B	2	1900	Galtronics GP2406-06670	27
B	2	2100	Galtronics GP2406-06670	27
C	3	1900	Galtronics GP2406-06670	27
C	3	2100	Galtronics GP2406-06670	27
D	4	5200	Galtronics GO1502-07060	31

Table 2: Antenna Data

All calculations were done with respect to uncontrolled / general population threshold limits.



RESULTS

Per the calculations completed for the proposed AT&T configurations *Table 3* shows resulting emissions power levels and percentages of the FCC’s allowable general population limit.

Antenna ID	Antenna Make / Model	Frequency Bands	Antenna Gain (dBd)	Antenna Centerline (ft)	Channel Count	TX Power (W)	ERP (W)	MPE %
ATT A1	Galtronics GP2406-06670	1900	12.35	27	4	5	564	0.229739165
ATT A1	Galtronics GP2406-06670	2100	12.75	27	4	5	618	0.230996219
ATT B1	Galtronics GP2406-06670	1900	12.35	27	4	5	564	0.229739165
ATT B1	Galtronics GP2406-06670	2100	12.75	27	4	5	618	0.230996219
ATT C1	Galtronics GP2406-06670	1900	12.35	27	4	5	564	0.229739165
ATT C1	Galtronics GP2406-06670	2100	12.75	27	4	5	618	0.230996219
ATT D1	Galtronics GO1502-07060	5200	2.85	31	2	.316	2	0.000898948
Site Total Composite MPE%								1.383105101 %

Table 3: Antenna Inventory & Power Levels



FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. *Table 4* below details a breakdown by frequency band and technology for the MPE power values for the maximum calculated AT&T sector(s).

Frequency Band	# of Channels	TPO W (Per Channel)	Height (feet)	Total Power Density ($\mu\text{W}/\text{cm}^2$)	Technology	Allowable MPE ($\mu\text{W}/\text{cm}^2$)	Calculated % MPE
1900	4	5	27	2.297391650	LTE	1000	0.229739165 %
2100	4	5	27	2.309962192	AWS	1000	0.230996219 %
1900	4	5	27	2.297391650	LTE	1000	0.229739165 %
2100	4	5	27	2.309962192	AWS	1000	0.230996219 %
1900	4	5	27	2.297391650	LTE	1000	0.229739165 %
2100	4	5	27	2.309962192	AWS	1000	0.230996219 %
5200	2	.316	31	0.008989	5G	1000	0.000899 %
						AT&T Total:	1.383105101 %

Table 4: AT&T Maximum MPE Power Values



Summary

All calculations performed for this analysis yielded results that were **within** the allowable limits for general population exposure to RF Emissions.

The anticipated maximum composite contributions from the AT&T facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general population exposure to RF Emissions are shown here:

Power Density Total:	13.83 ($\mu\text{W}/\text{cm}^2$)
Max MPE Total:	1.38%
Site Compliance Status:	Compliant

The anticipated composite MPE value for this site assuming all carriers present is **1.38%** of the allowable FCC established general population limit sampled at the ground level.

FCC guidelines state that if a site is found to be out of compliance (over allowable thresholds), that carriers over a 5% contribution to the composite value will require measures to bring the site into compliance. For this facility, the composite values calculated were well within the allowable 100% threshold standard per the federal government.

A handwritten signature in black ink that reads "Michelle Stone".

Michelle Stone
RF Compliance Consultant
Centerline Communications, LLC

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