Issued

STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square
New Britain, Connecticut 06051
Phone: (860) 827-2935
Fax: (860) 827-2950

June 12, 2000

Christopher B. Fisher, Esq.
Cuddy & Feder & Worby LLP
90 Maple Avenue
White Plains, NY 10601-5196

RE: TS-AT&T-034-000518 - AT&T Wireless Services request for an order to approve tower sharing at an existing telecommunications facility located at 36 Sugar Hollow Road in Danbury, Connecticut.

Dear Mr. Fisher

At a public meeting held June 7, 2000, the Connecticut Siting Council (Council) ruled that the shared use of this existing tower site is technically, legally, environmentally, and economically feasible and meets public safety concerns, and therefore, in compliance with General Statutes § 16-50aa, the Council has ordered the shared use of this facility to avoid the unnecessary proliferation of tower structures. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

This decision is under the exclusive jurisdiction of the Council. Any additional change to this facility may require an explicit request to this agency pursuant to General Statutes § 16-50aa or notice pursuant to Regulations of Connecticut State Agencies Section 16-50j-73, as applicable. Such request or notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Any deviation from this format may result in the Council implementing enforcement proceedings pursuant to General Statutes § 16-50u including, without limitation, imposition of expenses resulting from such failure and of civil penalties in an amount not less than one thousand dollars per day for each day of construction or operation in material violation.

This decision applies only to this request for tower sharing and is not applicable to any other request or construction.

The proposed shared use is to be implemented as specified in your letter dated May 17, 2000.

Thank you for your attention and cooperation.

Very truly yours,

Mortimer A. Gelston
Chairman

MAG/RKE/jlh

c: Honorable Gene F. Eriquez, Mayor, City of Danbury
Michael Murphy, AT&T Wireless
Jennifer Young Gaudet, Pinnacle Site Development, Inc.
J. Brendan Sharkey, VoiceStream Wireless

TS - AT&T - 034 - 000518

CUDDY & FEDER & WORBY LLP

90 MAPLE AVENUE
WHITE PLAINS, NEW YORK 10601-5196

(914) 761-1300
TELECOPIER (914) 761-5372/6405
www.cfwlaw.com

New York City Office
230 PARK AVENUE
NEW YORK. NEW YORK 10169
(212) 949-6280
TELECOPIER (212) 949-6346

Connecticut Offices
733 SUMMER STREET
STAMFORD, CONNECTICUT 06901
(203) 348-4780

4 BERKELEY STREET
NORWALK, CONNECTICUT 06850
(203) 853-8001
TELECOPIER (203) 831-8250

NEIL J. ALEXANDER (also CT)
THOMAS R. BEIRNE (also D.C.)
JOSEPH P. CARLUCCI
KENNETH J. DUBROFF
ROBERT FEDER
CHRISTOPHER B. FISHER (also CT)
ANTHONY B. GIOFFRE III (also CT)
KAREN G. GRANIK
JOSHUA J. GRAUER
WAYNE E. HELLER (also CT)
KENNETH F. JURIST
MICHAEL L. KATZ (also NJ)
JOSHUA E. KIMERLING (also CT)
DANIEL F. LEARY (also CT)
BARRY E. LONG

CUDDY & FEDER
1971-1995

WILLIAM S. NULL
ELISABETH N. RADOW
NEIL T. RIMSKY
RUTH E. ROTH
CHAUNCEY L. WALKER (also CA)
ROBERT L. WOLFE
DAVID E. WORBY

Of Counsel
LAUREEN J. PETERSON-COLASACCO (also CT)
MICHAEL R. EDELMAN
ANDREW A. GLICKSON (also CT)
DEBORAH S. LEWIS (also CT)
ROBERT L. OSAR (also TX)
MARYANN M. PALERMO
ROBERT C. SCHNEIDER
LOUIS R. TAFFERA

May 17, 2000

RECEIVED
MAY 18 2000
CONNECTICUT
SITING COUNCIL

VIA FEDERAL EXPRESS
Mr. Joel Rinebold
Connecticut Siting Council
10 Franklin Square
New Britain, Connecticut 06051

Re: AT&T Wireless Services request for the Shared Use of a Tower Facility at 36 Sugar Hollow Road, Danbury, Connecticut

Dear Mr. Rinebold:

On behalf of AT&T Wireless PCS, LLC d/b/a AT&T Wireless Services, we respectfully enclose an original and twenty copies of its request for the shared use of a tower with respect to the above mentioned facility, together with a check for $500.00, the filing fee. We would appreciate it if this matter were placed on the next available agenda by the Council to approve the application and issue an order for shared use by AT&T. Should the Council or staff have any questions regarding this matter, please do not hesitate to contact us.

Very truly yours,

Linda Grant

Linda Grant

Encls.
cc: Christopher B. Fisher, Esq.

CUDDY & FEDER & WORBY LLP

90 MAPLE AVENUE
WHITE PLAINS, NEW YORK 10601-5196

(914) 761-1300
TELECOPIER (914) 761-5372/6405
www.cfwlaw.com

New York City Office
230 PARK AVENUE
NEW YORK, NEW YORK 10169
(212) 949-6280
TELECOPIER (212) 949-6346

Connecticut Offices
733 SUMMER STREET
STAMFORD, CONNECTICUT 06901
(203) 348-4780

4 BERKELEY STREET
NORWALK, CONNECTICUT 06850
(203) 853-8001
TELECOPIER (203) 831-8250

CUDDY & FEDER
1971-1995

NEIL J. ALEXANDER (also CT)
DAVID I. BASS (also CT)
THOMAS R. BEIRNE (also D.C.)
JOSEPH P. CARLUCCI
KENNETH J. DUBROFF
ROBERT FEDER
CHRISTOPHER B. FISHER (also CT)
ANTHONY B. GIOFFRE III
KAREN G. GRANIK
JOSHUA J. GRAUER
WAYNE E. HELLER (also CT)
KENNETH F. JURIST
MICHAEL L. KATZ (also NJ)
JOSHUA E. KIMERLING (also CT)
DANIEL F. LEARY (also CT)
BARRY E. LONG

WILLIAM S. NULL
ELISABETH N. RADOW
NEIL T. RIMSKY
RUTH E. ROTH
CHAUNCEY L. WALKER (also CA)
ROBERT L. WOLFE
DAVID E. WORBY

Of Counsel
LAUREEN J. PETERSON-COLASACCO (also CT)
MICHAEL R. EDELMAN
ANDREW A. GLICKSON (also CT)
DEBORAH S. LEWIS (also CT)
ROBERT L. OSAR (also TX)
MARYANN M. PALERMO
ROBERT C. SCHNEIDER
LOUIS R. TAFFERA

May 17, 2000

VIA FEDERAL EXPRESS
Hon. Mortimer A. Gelston, Chairman and Members
of the Siting Council
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

Re: Request by AT&T Wireless Services for an Order to Approve the Shared Use of a Tower Facility at 36 Sugar Hollow Road, Danbury, Connecticut

Hon. Mortimer Gelston, Chairman and Members of the Siting Council:

Pursuant to Connecticut General Statutes §16-50aa, AT&T Wireless PCS LLC, by and through its agent AT&T Wireless Services, Inc., d/b/a AT&T Wireless Services, (hereinafter referred to as "the Applicant," or "AT&T") hereby requests an order from the Connecticut Siting Council ("Council") to approve the proposed shared use by the Applicant of a tower located at 36 Sugar Hollow Road in Danbury, Connecticut (the "Property"). The tower, currently under construction pursuant to approvals granted by the City of Danbury, is owned and operated by Omnipoint Communications, Inc. ("Omnipoint"). AT&T proposes to install antennas on the tower, and to install related equipment within Omnipoint's leased compound area. The Applicant requests that the Council find that the proposed shared use of the tower satisfies the criteria stated in §16-50aa and issue an order approving the proposed use.

The Omnipoint Facility

The Omnipoint tower is a 108-foot monopole located within an L-shaped compound of approximately 1,100 square feet on the Property. Omnipoint's panel antennas are located on a platform at the top of the tower with equipment at grade within the compound. Omnipoint and AT&T have agreed to mutually acceptable terms and conditions for the proposed shared use of

this tower, and Omnipoint has authorized AT&T to act on its behalf to apply for all necessary local, state and federal permits, approvals, and authorizations which may be required for the proposed shared use of this facility. See lease signature page annexed hereto as Exhibit A.

AT&T Wireless's Facility

AT&T is licensed by the Federal Communications Commission to provide PCS wireless telecommunications service in the State of Connecticut, which includes the area to be served by the proposed installation. As shown on the attached site plan drawings and tower elevations, AT&T proposes to install up to nine panel antennas, Allgon Model 7184 or comparable, on a low-profile platform with centerlines at approximately 95' AGL. AT&T's associated equipment will be located on a concrete pad, approximately 10' x 16', located near the base of the tower.

Tower Sharing

C.G.S. §16-50aa (c) (1) provides that, upon written request, "if the council finds that the proposed shared use of the facility is technically, legally, environmentally and economically feasible and meets public safety concerns, the council shall issue an order approving such shared use." Further, upon approval of such shared use, it is exclusive and no local zoning or land use approvals are required. C.G.S. §16-50x. AT&T's shared use of the Omnipoint tower satisfies the criteria set forth in C.G.S. §16-50aa as follows:

A. **Technical Feasibility** - The existing tower was designed to accommodate multiple carriers. AT&T is the second carrier proposed to locate on the tower which was designed for three carriers. As confirmed by Putnam Engineering, PLLC, in a letter dated March 30, 2000 and annexed hereto as Exhibit B, the tower is structurally sound and capable of supporting the proposed antennas. The proposed shared use of this tower therefore is technically feasible.

B. **Legal Feasibility** Under C.G.S. § 16-50aa, the Council has been authorized to issue orders approving the proposed shared use of a tower facility such as the Omnipoint facility on Sugar Hollow Road in Danbury. (Public Acts 93-268, Section 2; and 94-242, Section 6 (c)). This authority compliments the Council's prior-existing authority under C.G.S. § 16-50p to issue orders approving the construction of new towers that are subject to the Council's jurisdiction. C.G.S. § 16-50x (a) vests exclusive jurisdiction over these facilities in the Council, which shall "give such

consideration to other state laws and municipal regulations as it shall deem appropriate" in ruling on requests for the shared use of tower facilities. Pursuant to statutory authority vested in the Council, an order by the Council approving AT&T's shared use would permit the Applicant to obtain a building permit for the proposed installation at the property.

C. Environmental Feasibility AT&T's proposed shared use of the Omnipoint facility would have a minimal environmental effect, for the following reasons:

1. The proposed installation would have an insignificant incremental visual impact, and would not cause any significant change or alteration in the physical or environmental characteristics of the existing tower site. In particular, the proposed AT&T installation would not increase the height of the existing tower, and would not extend the boundaries of the existing Omnipoint compound area.

2. The proposed installation would not increase the noise levels at the existing facility by six decibels or more.

3. Operation of AT&T's antennas at this site would not exceed the total radio frequency electromagnetic radiation power density level adopted by the FCC and Connecticut Department of Health. The "worst case" exposure calculated for the operation of this facility for both carriers, would be approximately 0.109% of the standard. See Bell Labs Report dated May 16, 2000 annexed hereto as Exhibit C;

4. The proposed installation would not require any water or sanitary facilities, or generate air emissions or discharges to water or sanitary facilities, or generate air emissions or discharges to water bodies. After construction is complete (approximately two weeks), the proposed installation would not generate any traffic other than for periodic maintenance visits.

The proposed use of this facility would therefore have a minimal environmental effect, and is environmentally feasible.

E. Economic Feasibility As previously mentioned, Omnipoint and AT&T have entered into an agreement to share the use of the existing tower on terms agreeable to the parties. The proposed tower sharing is therefore economically feasible.

F. **Public Safety Concerns** As stated above, and evidenced in the Bell Labs Report annexed hereto as Exhibit C, the operation of AT&T's antennas at this site would not exceed the total radio frequency electromagnetic radiation power density level adopted by the FCC and Connecticut Department of Health. The existing tower is structurally capable of supporting the proposed AT&T antennas. The size and location of the tower and the compound design have been approved by the City of Danbury. Omnipoint and AT&T are not aware of any other public safety concerns relative to the proposed sharing of the existing tower. In fact, the provision of new or improved phone service through shared use of the existing tower is expected to enhance the safety and welfare of area residents and travelers.

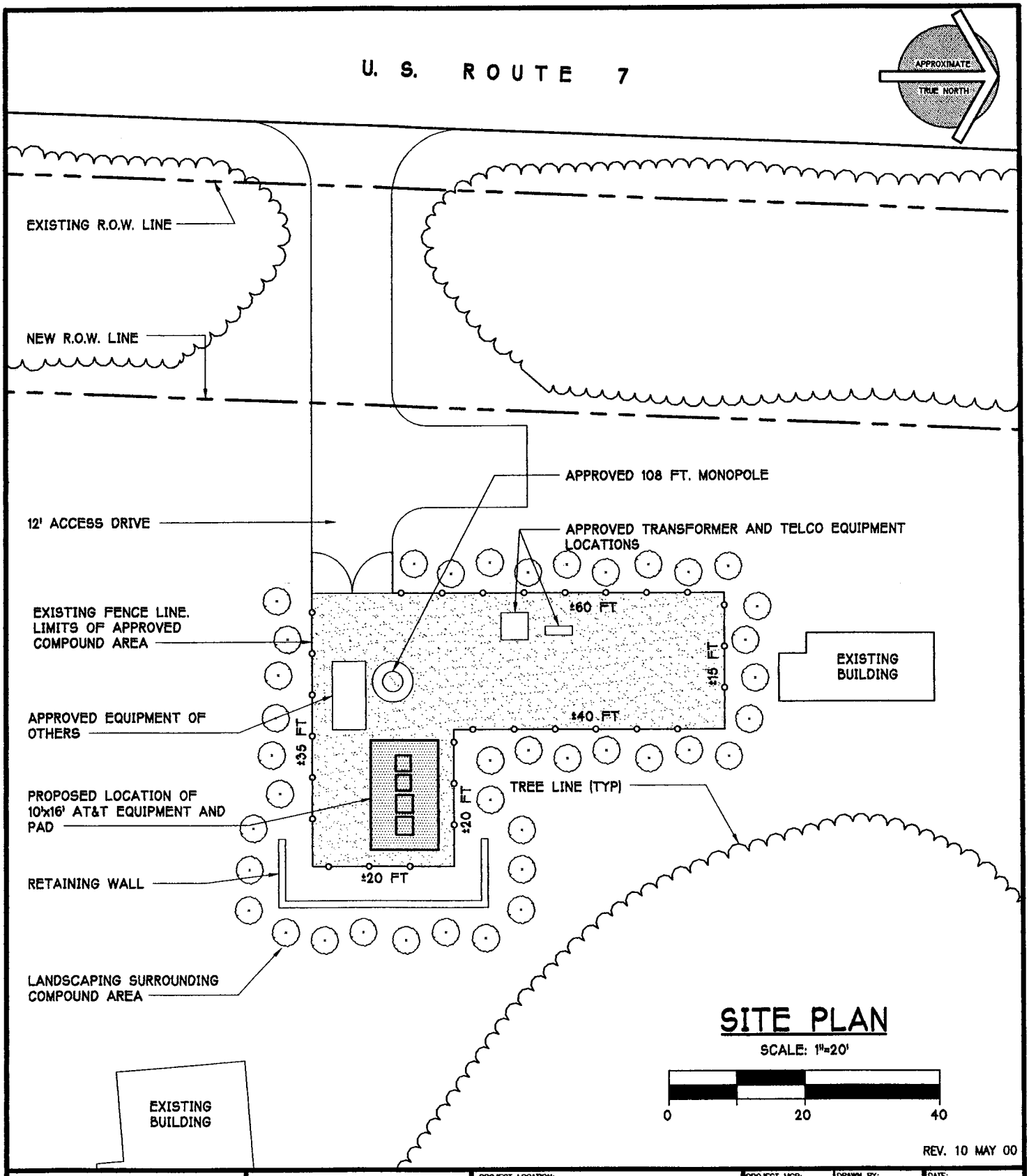
Conclusion

As delineated above, AT&T's proposed shared use of the Omnipoint tower facility under construction at 36 Sugar Hollow Road in Danbury, Connecticut satisfies the criteria set forth in C.G.S. §16-50aa, and advances the General Assembly's and the Siting Council's goal of preventing the proliferation of towers in Connecticut. The Applicant therefore requests that the Siting Council issue an order approving the proposed shared use.

Respectfully submitted,

Christopher B. Fisher, Esq.
On Behalf of AT&T Wireless

cc: Mayor, City of Danbury
Michael Murphy, AT&T Wireless
Jennifer Gaudet, Pinnacle
Brendan Sharkey, Esq.



REV. 10 MAY 00

PUTNAM ENGINEERING, p.l.l.c.
ENGINEERS and PLANNERS
102 GLENEIDA AVENUE
CARMEL, NEW YORK 10512
(914) 225-3060 FAX (914) 225-2955

AT&T
WIRELESS PCS LLC
NORWALK, CT

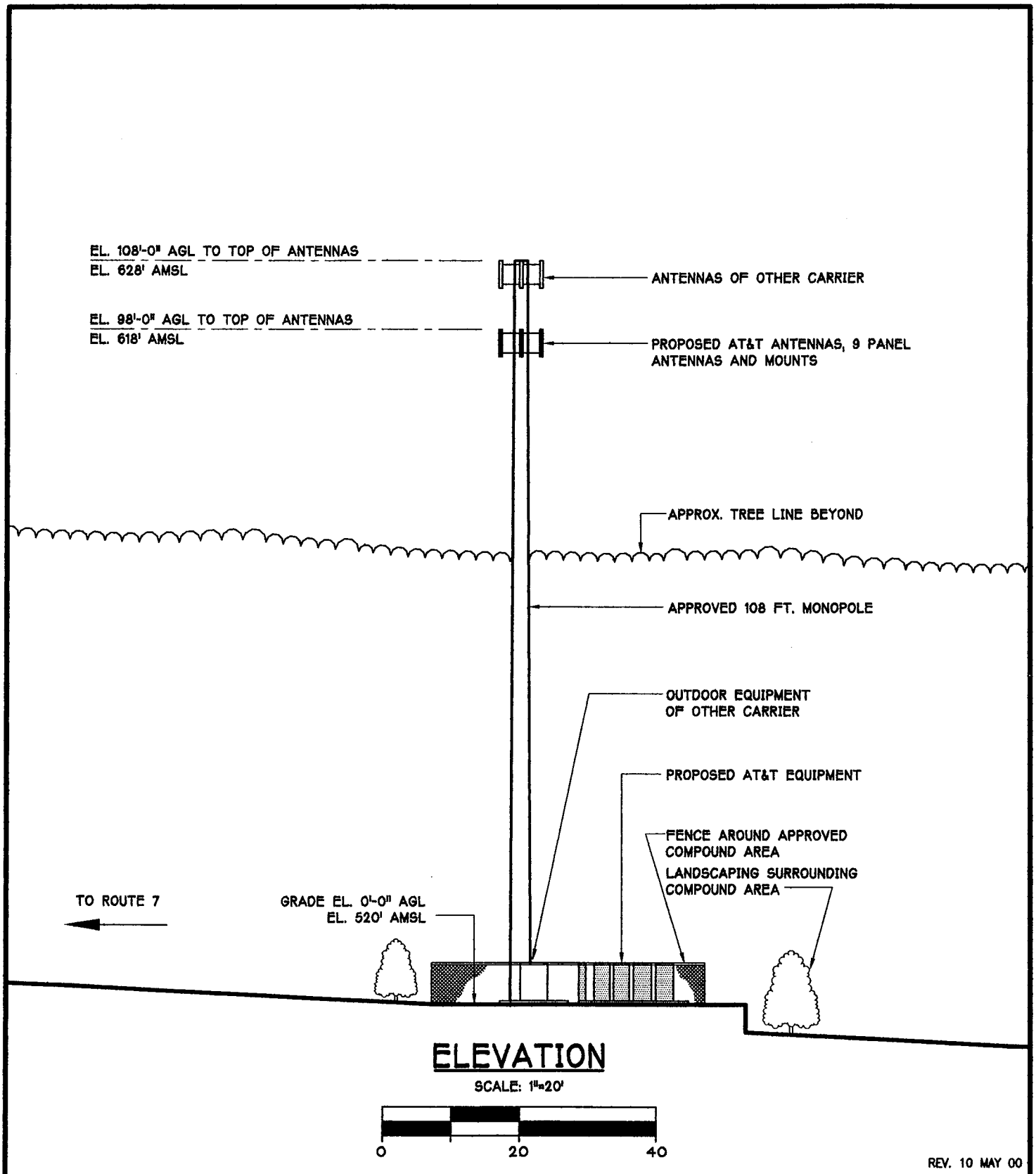
PROJECT LOCATION:
SITE No: CT-070
INDIAN TRADING-
WOOSTER MOUNTAIN
U.S. ROUTE 7
DANBURY, CT

PROJECT MGR:	DRAWN BY:	DATE:
R. CAMERON	P. GARRITY	24 SEPT 99

SITE PLAN

PE# 7419

LE•1



ELEVATION

SCALE: 1"=20'

0 20 40

REV. 10 MAY 00

PUTNAM ENGINEERING, PLLC
ENGINEERS and PLANNERS
102 GLENEIDA AVENUE
CARMEL, NEW YORK 10512
(914) 225-3060 FAX (914) 225-2955

AT&T
WIRELESS PCS LLC
NORWALK, CT

PROJECT LOCATION:
SITE No: CT-070
INDIAN TRADING-
WOOSTER MOUNTAIN
U.S. ROUTE 7
DANBURY, CT

PROJECT MGR:	DRAWN BY:	DATE:
R. CAMERON	P. GARRITY	24 SEPT 99

ELEVATION

PE# 7419

LE•2

15. **Licensee Contact for Emergency:** Network Operations Center – (800) 832-6662

14. **Licensee's Address for Notice Purposes:** AT&T Wireless Services, Inc.
15 East Midland Avenue
Paramus, New Jersey 07652
Attn: Legal Department

Licensor: Omnipoint Communications, Inc.

By: _____
Title: TECH. DIRECTOR
Date: 09/29/99

Licensee: AT&T Wireless Services, Inc.

By: _____
Title: System Development Manager
Date: 9/23/99

Attachments:

Exhibit 1: Description of Antennas/Dishes Locations
Exhibit 2: Description of Equipment Shelter/Room/Cabinet Locations
Exhibit 3: Plans and Specifications
Exhibit 4: Existing Liens, Rights-of-Way, Easements and Mortgages
Exhibit 5: Current Communications Users of Site (including frequencies)

PUTNAM ENGINEERING, PLLC.
Engineers and Planners

March 30, 2000

Mr. Michael Murphy
AT&T Wireless PCS
149 Water Street
Norwalk, Connecticut 06854

RE: Structural Evaluation for Co-Location
(Omnipoint / Indian Trading Post)
36 Sugar Hollow Road
Danbury, Connecticut

AT&T SITE: CT-070

P/E JOB #: 7419

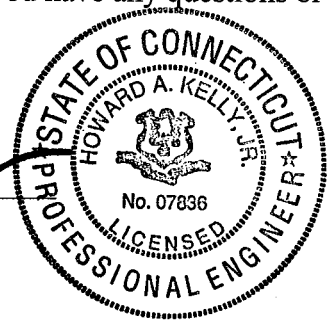
Dear Mr. Murphy:

Putnam Engineering has reviewed the proposed Structural Tower Drawings prepared by Omnipoint for the above referenced site location. The Drawings #205714-B, numbered 1 through 9, have been designed for multiple carriers at 105' AGL, 95' AGL and 85' AGL.

Putnam Engineering has reviewed the Drawings and found acceptable loading capacity for AT&T Wireless to co-locate at this facility at an elevation of approximately 98 feet to the tips of antennas.

Please contact my office if you have any questions or comments.

Sincerely,



Howard A. Kelly, P.E.

HAK/rk

cc: Robert Cameron, Putnam Engineering
Carmen Chapman, ATTWS
Jennifer Gaudet, Pinnacle
Joanne Desjardins, Pinnacle
Chris Fisher, Cuddy Feder & Worby

(File L00132)

102 GLENEIDA AVENUE, CARMEL, NEW YORK 10512 • PHONE (914) 225-3060 • FAX (914) 225-2955

Lucent Technologies

Bell Labs
Innovations for Lucent Technologies

An Analysis of the Radiofrequency Environment in the Vicinity of a Proposed Personal Communications Services Installation Site CT-070.1.3: 36 Sugar Hollow Road, Danbury, Connecticut

Prepared by

Wireless & Optical Technologies Safety Department
Bell Laboratories
Murray Hill, New Jersey 07974-0636

Prepared for

Michael Murphy
AT&T Wireless Services
149 Water Street
Suite 2C & 2D
Norwalk, CT 06854

May 16, 2000

Table of Contents

PCS Site CT-070.1.3: Danbury, CT - 3

An Analysis of the Radiofrequency Environment in the Vicinity of a Proposed Personal Communications Services Installation Site CT-070.1.3: 36 Sugar Hollow Road, Danbury, Connecticut

Summary

This report is an analysis of the radiofrequency (RF) environment surrounding the AT&T Wireless Services personal communications services (PCS) facility proposed for installation in Danbury, CT. The analysis, which includes contributions from the existing Omnipoint PCS antennas, utilizes engineering data provided by AT&T Wireless together with well-established analytical techniques for calculating the RF fields associated with PCS transmitting antennas. Worst-case assumptions were used to ensure safe-side estimates, i.e., the actual values will be significantly lower than the corresponding analytical values. The maximum level of RF energy associated with each transmitting antenna was compared with the appropriate frequency-dependent exposure limit, and these individual comparisons were combined to ensure that the total RF environment is in compliance with safety guidelines.

The results of this analysis indicate that the total maximum level of RF energy in areas normally accessible to the public is below all applicable health and safety limits. Specifically, the maximum level of RF energy associated with *simultaneous and continuous operation of all proposed and existing transmitters* will be less than 0.109% of the safety criteria adopted by the Federal Communications Commission as mandated by the Telecommunications Act of 1996. The Telecommunications Act of 1996 is the applicable Federal law with respect to consideration of the environmental effects of RF emissions in the siting of personal wireless facilities.

The total maximum level of RF energy will also be less than 0.109% of the exposure limits of ANSI, IEEE, NCRP and the limits used by all states that regulate RF exposure.

1. Introduction

This report was prepared in response to a request from AT&T Wireless Services for an analysis of the radiofrequency (RF) environment in the vicinity of the proposed personal communications services (PCS) facility, and an opinion regarding the concern for public health associated with long-term exposure in this environment. The analysis includes contributions to the RF environment from operation of the existing Omnipoint PCS antennas.

The Telecommunications Act of 1996[1] is the applicable *Federal law* with respect to consideration of environmental effects of RF emissions in the siting of wireless facilities. Regarding personal wireless services, e.g., PCS and cellular radio, Section 704 of the Telecommunications Act of 1996 states the following:

> "No State or local government or instrumentality thereof may regulate the placement, construction, and modification of personal wireless service facilities on the basis of the environmental effects of radio frequency emissions to the extent that such facilities comply with the Commission's regulations concerning such emissions."

Therefore, the purpose of this report is to ensure that the total RF environment associated with the proposed and existing facilities complies with Federal Communications Commission (FCC) guidelines as required by the Telecommunications Act of 1996.

2. Technical Data

The proposed AT&T Wireless Services PCS antennas are to be mounted on a monopole located at 36 Sugar Hollow Road in Danbury, CT. Existing at the site are Omnipoint PCS antennas. The PCS antennas transmit at frequencies between 1930 and 1990 million-hertz (MHz). The actual RF power propagated from a PCS antenna is usually less than 10 watts per transmitter (channel) and the actual *total* RF power is usually less than 200 watts per sector (assuming the maximum number of transmitters are installed and operate *simultaneously and continuously*). These are extremely low power systems when compared with other familiar radio systems such as AM, FM, and television broadcast, which operate upwards of 50,000 watts. The attached figure, which depicts the electromagnetic spectrum, lists familiar uses of RF energy. Table 1 lists engineering specifications for the proposed and existing installations.

3. Environmental Levels of RF Energy

The antennas used for PCS radio propagate most of the RF energy in a relatively narrow beam (in the vertical plane) directed toward the horizon. The small amount of energy that is directed along radials below the horizon results in a RF environment directly under the antennas that is not remarkably different from the environment at points more distant.

The methodology used to calculate the exposure levels follows that outlined by the FCC in OET Bulletin No. 65[1] and is explained in detail in the Appendix. For the case at hand, the maximal potential exposure levels associated with *simultaneous and continuous operation* of all proposed and existing transmitters can be readily calculated at any point in a plane at any height above grade. Based on the information shown in Table 1, the maximum power densities associated with the proposed and existing antennas at 6 ft and 16 ft above grade are shown in Table 2A.

1. Federal Communications Commission Office of Engineering & Technology, *Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Radiation*, OET Bulletin No. 65, Edition 97-01 (August 1997).

The values shown for 16 ft above grade are representative of the maximum power density immediately outside the second floor of nearby buildings (assuming level terrain). These levels are also shown in Table 2A as a percentage of the FCC's maximum permissible exposure (MPE) values found in the Telecommunications Act of 1996 (specifically, in the FCC *Guidelines for Evaluating the Environmental Effects of Radiofrequency Radiation* [2]).

The power density values shown in Table 2A and 2B are the theoretical maxima that could occur and are not typical values. For example, the calculations include the effect of 100% field reinforcement from in-phase reflections. The assumption was also made that each transmitter operates continuously at maximum power. However, the intermittent nature of the transmission from cellular radio systems will result in time-weighted-average values that will be lower than those shown in Tables 2A and 2B. Experience has shown that the analytical technique used is extremely conservative. That is, actual power density levels have always been found to be smaller than the corresponding calculated levels [3]. Also, levels inside nearby homes and buildings, particularly this building, will be lower than those immediately outside because of the high attenuation of common building materials at these frequencies and, hence, will not be significantly different from typical ambient levels.

4. Comparison of Environmental Levels with RF Safety Criteria

Tables 2A and 2B show the calculated RF power density levels in the vicinity of the proposed and existing installations; Table 3 shows federal, state and consensus exposure limits for human exposure to RF energy at the frequencies of interest. Because the MPEs vary with frequency, the calculated RF levels for each transmitting antenna must first be compared to the appropriate MPE (the individual percentages are shown in Tables 2A and 2B), and the results of these comparisons combined before compliance with safety guidelines can be shown. With respect to FCC limits for public exposure, comparisons of the weighted combined analytical results indicate that the total maximal level associated with these antennas in areas normally accessible to the public will be less than 0.109% of the MPE.

5. Discussion of Safety Criteria

Publicity given to speculation about possible associations between health effects and exposure to magnetic fields from electric-power distribution lines, electric shavers and from the use of hand-held cellular telephones has heightened concern among some members of the public about the possibility that health effects may be associated with any exposure to electromagnetic energy. Many people feel uneasy about new or unfamiliar technology and often want absolute proof that something is safe. Such absolute guarantees are not possible since it is virtually impossible to prove that something does not exist. However, sound judgments can be made as to the safety of a physical agent based on the weight of the pertinent scientific evidence. This is exactly how safety guidelines are developed.

The overwhelming weight of scientific evidence unequivocally indicates that biological effects associated with exposure to RF energy are threshold effects, i.e., unless the exposure level is sufficiently high the effect will not occur regardless of exposure duration. (Unlike ionizing radiation, e.g., X-rays and nuclear radiation, repeated exposures to low level RF radiation, or nonionizing radiation, are not cumulative.) Thus, it is relatively straightforward to derive safety limits. By adding safety factors to the threshold level at which the most sensitive effect occurs, conservative exposure guidelines have been developed to ensure safety.

At present, there are more than 10,000 reports in the scientific literature which address the subject of RF bioeffects. These reports, most of which describe the results of epidemiology studies, animal and cell-culture studies, have been critically reviewed by leading researchers in the field and all new studies are continuously being reviewed by various groups and organizations whose interest is developing health standards. These include the U.S. Environmental Protection Agency, the National Institute for Occupational Safety and Health, the National Council on Radiation Protection and Measurements, the standards committees sponsored by the Institute of Electrical and Electronics Engineers, the International Radiation Protection Association under the sponsorship of the World Health Organization, and the National Radiological Protection Board of the UK. All of these groups have recently either reaffirmed existing health standards, developed and adopted new health standards, or proposed health standards for exposure to RF energy.

For example, in 1986, the National Council on Radiation Protection and Measurements (NCRP) published recommended limits for occupational and public exposure[4]. These recommendations were based on the results of an extensive critical review of the scientific literature by a committee of the leading researchers in the field of bioelectromagnetics. The literature selected included many controversial studies reporting effects at low levels. The results of all studies were weighed, analyzed and a consensus obtained establishing a conservative threshold upon which safety guidelines should be based. This threshold corresponds to the level at which the most sensitive, reproducible effects that could be related to human health were reported in the scientific literature. Safety factors were incorporated to ensure that the resulting guidelines would be at least ten to fifty times lower than the established threshold, even under worst-case exposure conditions. The NCRP recommended that continuous occupational exposure or exposure of the public should not exceed approximately those values indicated in Table 3. (See Table 3 for a summary of the corresponding safety criteria recommended by various organizations throughout the world.)

In July of 1986, the Environmental Protection Agency published a notice in the Federal Register, calling for public comment on recommended guidance for exposure of the public[5]. Three different limits were proposed. In 1987 the EPA abandoned its efforts and failed to adopt official federal exposure guidelines. However, in 1993 and 1996 the EPA, in its comments on the FCC's Notice of Proposed Rule Making to adopt safety guidelines[6], recommended adoption of the 1986 NCRP limits[4].

In September 1991, the RF safety standard developed by Subcommittee 4 of the Institute of Electrical and Electronics Engineers (IEEE) Standards Coordinating Committee SCC-28 was approved by the IEEE Standards Board[7]. (Until 1988 IEEE SCC-28 was known as the American National Standards Institute (ANSI) C95 Committee—established in 1959.) In November 1992, the ANSI Board of Standards Review approved the IEEE standard for use as an American National Standard. The limits of this standard are identical to the 1982 ANSI RFPGs[8] for occupational exposure and approximately one-fifth of these values for exposure of the general public at the frequencies of interest. Like those of the NCRP, these limits resulted from an extensive critical review of the scientific literature by a large committee of preeminently qualified scientists, most of whom were from academia and from research laboratories of federal public health agencies.

The panels of scientists from the World Health Organization's International Commission on Non-Ionizing Radiation Protection (ICNIRP)[9] and the National Radiological Protection Board in the United Kingdom[10] independently developed and in 1993 published guidelines similar to those

of ANSI/IEEE. In 1997, after another critical review of the latest scientific evidence, ICNIRP reaffirmed the limits published in 1993[11]. Also, what was formerly the USSR, which traditionally had the lowest exposure guides, twice has revised upward its limits for public exposure. Thus, there is a converging consensus of the world's scientific community as to what constitutes safe levels of exposure.

Finally, in implementing the National Environmental Policy Act regarding potentially hazardous RF radiation from radio services regulated by the FCC, the Commission's Rules require that licensees filing applications after January 1, 1997[2] ensure that their facilities will comply with the 1996 FCC MPE limits outlined in 47 CFR §1.1310[3][3]. (Under the terms of the Telecommunications Act of 1996, no local government may regulate the placement of wireless facilities based on RF emissions to the extent that these emissions comply with the FCC regulations [1].)

With respect to the proposed and existing antennas, be assured that the actual exposure levels in the vicinity of the Danbury, CT installation will be below any health standard used anywhere in the world and literally thousands of times below any level reported to be associated with any verifiable functional change in humans or laboratory animals. This holds true even when all transmitters operate *simultaneously and continuously at their highest power*. Power density levels of this magnitude are not even a subject of speculation with regard to an association with adverse health effects.

6. For Further Information

Anyone interested can obtain additional information about the environmental impact of PCS and cellular radio communications from:

Dr. Robert Cleveland, Jr.
Federal Communications Commission, Office of Engineering and Technology
Room 7002,
2000 M Street NW
Washington, DC 20554
(202) 418-2422

2. The FCC extended the transition period to October 15, 1997. Second Memorandum Opinion and Order and Notice of Proposed Rulemaking, ET Docket 93-62, FCC 97-303, adopted August 25, 1997. Prior to this date the FCC required most licensees to comply with 1982 ANSI C95.1 limits.

3. Although all FCC licensees will be required to comply with 47 CFR §1.1310 limits, the FCC will continue to exclude certain land mobile services from proving compliance with these limits 47 CFR §1.1307. Previously, although licensees had to comply with the 1982 ANSI C95.1 limits, the FCC categorically excluded land mobile services, including paging, cellular, ESMR and two-way radio, from hazard analyses because "individually or cumulatively they do not have a significant effect on the quality of the human environment"[12]. The FCC pointed out that there was no evidence of excessive exposure to RF radiation during routine normal operation of these radio services.

7. Conclusion

This report is an analysis of the radiofrequency (RF) environment surrounding the AT&T Wireless Services personal communications services (PCS) facility proposed for installation in Danbury, CT. The analysis, which includes contributions from the existing Omnipoint PCS antennas, utilizes engineering data provided by AT&T Wireless together with well-established analytical techniques for calculating the RF fields associated with PCS transmitting antennas. Worst-case assumptions were used to ensure safe-side estimates, i.e., the actual values will be significantly lower than the corresponding analytical values. The maximum level of RF energy associated with each transmitting antenna was compared with the appropriate frequency-dependent exposure limit, and these individual comparisons were combined to ensure that the total RF environment is in compliance with safety guidelines.

The results of this analysis indicate that the total maximum level of RF energy in areas normally accessible to the public is below all applicable health and safety limits. Specifically, the maximum level of RF energy associated with *simultaneous and continuous operation of all proposed and existing transmitters* will be less than 0.109% of the safety criteria adopted by the Federal Communications Commission as mandated by the Telecommunications Act of 1996. The Telecommunications Act of 1996 is the applicable Federal law with respect to consideration of the environmental effects of RF emissions in the siting of personal wireless facilities.

The total maximum level of RF energy will also be less than 0.109% of the exposure limits of ANSI, IEEE, NCRP and the limits used by all states that regulate RF exposure.

8. References

[1] Telecommunications Act of 1996, Title VII, Section 704, *Facilities Siting; Radio Frequency Emissions Standards*

[2] Federal Communication Commission 47 CFR Parts 1, 2, 15, 24 and 97. "*Guidelines for Evaluating the Environmental Effects of Radiofrequency Radiation.*" (August 6, 1996)

[3] Petersen, R.C., and Testagrossa, P.A., "Radiofrequency Fields Associated with Cellular-Radio Cell-Site Antennas," *Bioelectromagnetics*, Vol. 13, No. 6. (1992)

[4] *Biological Effects and Exposure Criteria for Radio Frequency Electromagnetic Fields*, NCRP Report No. 86, National Council on Radiation Protection and Measurements, Bethesda, MD. (1986)

[5] Federal Register, Vol. 51, No. 146, Wednesday, July 30, 1986.

[6] Notice of Proposed Rule Making *In the Matter of Guidelines for Evaluating the Environmental Effects of Radiofrequency Radiation*, August 13, 1993. ET Docket No. 93-62

[7] *IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz*, ANSI/IEEE C95.1-1992, Institute of Electrical and Electronics Engineers, Piscataway, NJ. (1991)

[8] American National Standard *Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 300 kHz to 100 GHz*, ANSI C95.1-1982, American National Standards Institute, New York, NY. (1982)

[9] *Electromagnetic Fields (300 Hz to 300 GHz)*, Environmental Health Criteria 137, World Health Organization, Geneva, Switzerland. (1993)

[10] *Board Statement on Restrictions on Human Exposure to Static and Time Varying Electromagnetic Fields and Radiation*, Documents of the NRPB, Vol. 4, No. 5, National Radiological Protection Board, Chilton, Didcot, Oxon, United Kingdom. (1993)

[11] "Guidelines for Limiting Exposure to Time-Varying Electric, Magnetic, and Electromagnetic Fields (up to 300 GHz) - ICNIRP Guidelines," *Health Physics*, Vol. 74, No. 4, pp. 494-522. (1998)

[12] Action by the Commission February 12, 1987, by Second Report and Order (FCC 87-63), and Third Notice of Proposed Rulemaking (FCC 87-64). General Docket No. 79-144.

Enclosure: Figure. Electromagnetic Spectrum

PCS Site CT-070.1.3: Danbury, CT - 10

Table 1: Engineering Specifications for the Proposed and Existing Radio Systems Danbury, CT

Site Specifications	AT&T Wireless	Omnipoint*
maximum ERP† per channel	100 watts	400 watts
actual radiated power per channel	4.0 watts	8.75 watts
actual *total* radiated power per sector	32 watts	18 watts
number of transmit/receive antennas	N/A	N/A
number of transmit antennas	1 per sector	1 per sector
number of receive antennas	2 per sector	1 per sector
maximum number of transmitters	8 per sector	2 per sector
number of sectors configured	3	3
antenna centerline height above grade	95 ft	108 ft
antenna manufacturer	Allgon	DAPA
model number	7184.15	48212X
gain	16.15 dBi	19.35 dBi
type	directional	directional
downtilt	0°	2°

† *Effective Radiated Power* - ERP is a measure of how well an antenna concentrates RF energy, it is not the actual power radiated from the antenna. To illustrate the difference, compare the brightness of an ordinary 100 watt light bulb with that from a 100 watt spot-light. Even though both are 100 watts, the spot-light appears brighter because it concentrates the light in one direction. In this direction, the spot-light effectively appears to be emitting more than 100 watts. In other directions, there is almost no light emitted by the spot-light and it effectively appears to be much less than 100 watts.

* some of these specifications are based on typical site configurations for this carrier in this region.

PCS Site CT-070.1.3: Danbury, CT - 11

Table 2A: Calculated Maximum Levels and the Levels as a Percentage of 1996 FCC MPEs* for the Proposed and Existing Antennas, Danbury, CT

Provider	Power Density (mW/cm²)		% of MPEs*	
	6 ft AMGL†	16 ft AMGL†	6 ft AMGL†	16 ft AMGL†
AT&T Wireless	< 0.00065	< 0.00082	0.065%	0.082%
Omnipoint	< 0.00022	< 0.00027	0.022%	0.027%
		TOTAL	0.087%	0.109%

* MPE: The FCC limits for maximum permissible exposure (same as 1986 NCRP limits at the frequencies of interest)
† AMGL: above mean grade level

Table 2B: Calculated Levels at Base of Structure and the Levels as a Percentage of 1996 FCC MPEs* for the Proposed and Existing Antennas, Danbury, CT

Provider	Power Density (mW/cm²)		% of MPEs*	
	6 ft AMGL†	16 ft AMGL†	6 ft AMGL†	16 ft AMGL†
AT&T Wireless	< 0.000130	< 0.000165	0.00130%	0.00165%
Omnipoint	< 0.000016	< 0.000020	0.00016%	0.00020%
		TOTAL	0.00146%	0.00185%

* MPE: The FCC limits for maximum permissible exposure (same as 1986 NCRP limits at the frequencies of interest)
† AMGL: above mean grade level

PCS Site CT-070.13: Danbury, CT - 12

Table 3: Summary of International, Federal, State and Consensus Safety Criteria for Exposure to Radiofrequency Energy at Frequencies Used for PCS and Cellular Radio Systems

Organization/Government Agency	Exposure Population	Power Density (mW/cm^2)	
		Cellular Radio	PCS
International Safety Criteria/Recommendations			
International Commission on Non-Ionizing Radiation Protection (1997)	Occupational	2.06	4.87
(*Health Physics* 74:4, 494-522. 1998)[1]	Public	0.41	0.98
National Radiological Protection Board	Occupational	5.00	10.00
(NRPB, 1993)	Public	2.79	10.00
Federal Requirements			
Federal Communications Commission	Occupational	2.75	5.00
(47 CFR §1.1310)	Public	0.55	1.00
Consensus Standards and Recommendations			
American National Standards Institute	Occupational	2.75	5.00
(ANSI C95.1 - 1982)	Public	2.75	5.00
Institute of Electrical and Electronics Engineers	Occupational	2.75	6.50
(ANSI/IEEE C95.1-1999 Edition)[2]	Public	0.55	1.30
National Council on Radiation Protection & Measurements	Occupational	2.75	5.00
(NCRP Report 86, 1986)	Public	0.55	1.00
State Codes			
New Jersey (NJAC 7:28-42)	Public	2.75	5.00
Massachusetts (Department of Health 105 CMR 122)	Public	0.55	1.00
New York State[3]	Public	0.55	1.00

NOTES:
1. Reaffirmed in 1997 and published with modification in 1998.
2. Incorporating IEEE Standard C95.1-1991 and IEEE Standard C95.1a-1998.
3. State of New York Department of Health follows NCRP Report 86.

APPENDIX - Analytical Technique

This appendix describes the methodology used to predict the radiofrequency (RF) electromagnetic environment surrounding the proposed AT&T PCS antennas. As a conservative measure, the methodology applies "worst-case" conditions that result in an over-estimate of the RF environment, e.g., the calculations include the effect of field reinforcement from in-phase reflections. Therefore, the predicted values are the theoretical maxima that could occur and not typical values. The actual power density levels have always been found to be smaller than the corresponding predicted levels[4]. The methodology described follows that outlined by the Federal Communications Commission (FCC) in their OET Bulletin No. 65[5].

For each transmitting antenna, the maximum RF power density at 6 ft above grade was estimated by performing a series of power density predictions for depression angles below the horizon from 5° to 90°. This was done using the vertical gain pattern of each antenna provided by the antenna manufacturer and by using the following equation:

$$S = \left(\frac{N \times P_N \times G_\theta \times 1.64}{4\pi R^2} \right)$$

and

$$S_{max} = 4 \times S$$

where:

S = plane wave equivalent power density

S_{max} = factor of 4 assumes a 100% ground reflection (resulting in a doubling of the field strength and a four-fold increase in power density)

N = maximum number of transmitters (channels)

P_N = actual power per channel input to the antenna

G_θ = far-field gain (numeric) of the antenna relative to a half-wave dipole in the direction of point of interest

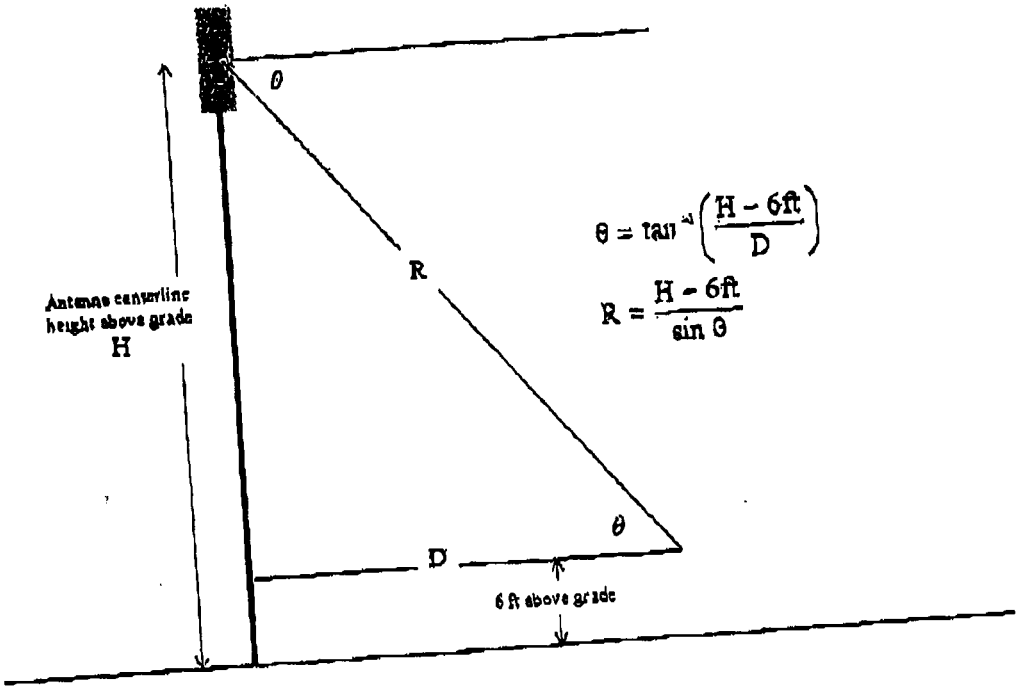
R = distance (radial or slant) from the antenna center to point of interest

1.64 = gain of a half-wave dipole (2.15 dB) over an isotropic radiator

4. Petersen, R.C., and Testagrossa, P.A., Radiofrequency Fields Associated with Cellular-Radio Cell-Site Antennas, *Bioelectromagnetics, Vol. 13, No. 6 (1992).*

5. Federal Communications Commission Office of Engineering & Technology, *Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Radiation*, OET Bulletin No. 65, Edition 97-01 (August 1997).

PCS Site CT-070.1.3: Danbury, CT - 14



Based on the technical specifications for the site outlined in Table 1, the maximum RF power density (S_{max}) associated with the AT&T PCS antennas occurs at a depression angle of 30° below the horizon and is calculated as follows:

$$R = (H\text{-}6)/\sin\theta = (956)/\sin(30°) = 178 \text{ ft}$$

$G_{30°} = 0.60$ dBd (from antenna elevation gain pattern)

$$P_N = ERP/G_{max} = \frac{100}{10^{(14.00dBd/10)}} = 4.0 \text{ watts per channel}$$

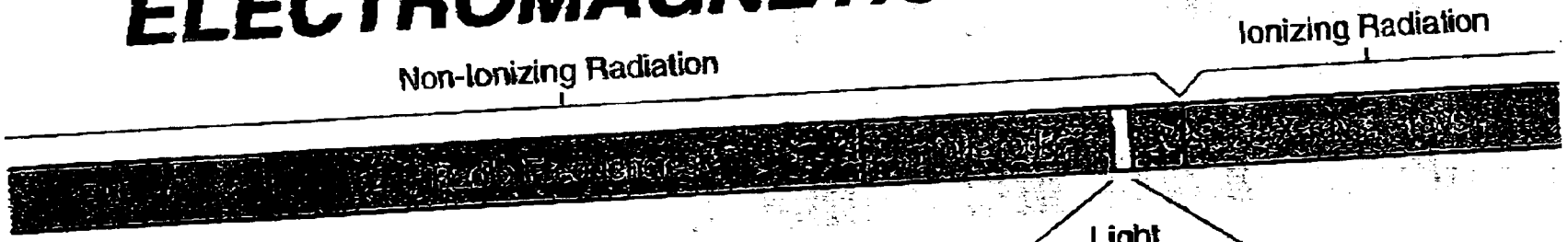
$$S_{max} = 4x\frac{N x P_N x 10^{(G_\theta/10)} x 1.64}{4\pi R^2}$$

$$= 4x\frac{8ch x 4.0W/ch x 10^{(0.60dBd/10)} x 1.64}{4x3.14x(178ft x 12in/ft x 2.54cm/in)^2}$$

$$S_{max} = 6.49 \times 10^{-7} \text{ W/cm}^2 = 0.000649 \text{ mW/cm}^2$$

$$\text{AND \% of MPE} = \frac{0.000649 \, mW/cm^2}{1 \, mW/cm^2} \times 100\% = 0.065\%$$

ELECTROMAGNETIC SPECTRUM



AM Radio: *535 - 1605 kHz*
CB Radio: *27 MHz*
Cordless Phones: *49 MHz*
TV Ch 2-6: *54 - 88 MHz*
FM Radio: *88 - 108 MHz*
Marine Radio: *160 MHz*
TV Ch 7-13: *174 - 216 MHz*
TV UHF Ch 14-69: *470 - 800 MHz*
Cellular Radio, Specialized Mobile Radio, Paging: *806 - 946 MHz*
Antitheft devices: *10-20 kHz and/or 915 MHz*
Microwave oven: *915 and 2450 MHz*
Personal Communication Services: *1800 - 2200 MHz*
Intrusion alarms / door openers: *10.5 GHz*
Microwave radio: *1 - 40 GHz*
Satellite Communications: *100 MHz - 275 GHz*