STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@po.state.ct.us
Web Site: www.state.ct.us/csc/index.htm

March 7, 2001

Linda Grant
Cuddy & Feder & Worby LLP
90 Maple Avenue
White Plains, NY 10601-5196

RE: **TS-AT&T-033-010213** - AT&T Wireless PCS, LLC d/b/a AT&T Wireless Services request for an order to approve tower sharing at an existing telecommunications facility located at Christian Hill Road, Cromwell, Connecticut.

Dear Ms. Grant:

At a public meeting held March 1, 2001, 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, with the conditions that the structure receive new bracing and support beams and the foundation be reinforced as recommended by a Professional Engineer. 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 letters dated February 8, 2001, February 9, 2001, and February 28, 2001.

Thank you for your attention and cooperation.

Very truly yours,

Mortimer A. Gelston
Chairman

MAG/RKE/laf

c: Honorable Stanley A. Terry, Jr., First Selectman, Town of Cromwell
Mr. Frederic Curtin, Zoning Enforcement Officer, Town of Cromwell
Sandy M. Carter, Verizon Wireless

CUDDY & FEDER & WORBY LLP

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TO: Mr. Bob Earling

FROM: Christopher B. Fisher, Esq.

TELECOPIER NO. 860-827-2950

DATE: 2/28/01 PAGES: 2 (Including Cover) CLIENT 1844 MATTER: 293

MESSAGE:
As requested.

OPERATOR: Barb Jaggers (914) 761-1300 Ext. 256
IF THERE ARE ANY PROBLEMS, PLEASE NOTIFY OPERATOR IMMEDIATELY

URS

RECEIVED
FEB 28 2001
CONNECTICUT
SITING COUNCIL

February 28, 2001

Mr. Christopher Fisher
Cuddy & Feder & Worby
90 Maple Avenue
White Plains, New York 10601-5196

Reference: **Proposed Telecommunications Facility**
AT&T Site No CT-144
Cromwell South
100 Berlin Road
Cromwell, Connecticut

Dear Mr Fisher:

URS Corporation has performed a structural analysis for the existing 82' steel frame structure (formerly a sign support structure) located at 100 Berlin Road, Cromwell, Connecticut. The purpose of this analysis was to evaluate the capacity of the existing structure for its ability to support AT&T antennas

The existing steel structure and foundation that support the existing platform do not have adequate capacity to support the proposed antennas. The steel structure is embedded in soil, unprotected from corrosion further reducing existing capacity. As a result, the top of a portion of the foundation will be raised in order to encase the soil embedded columns and to provide a new base above grade for the anchorage of columns supporting the platform Additionally, the steel columns will be reinforced, bracing will be added between the two platform support columns and the existing connection between the columns and the platform will be strengthened. Finally, the existing bracing will be removed between columns that support the platform and those that do not.

The above evaluation is based on requirements of EIA/TIA-222-F dated March 1996.

Please call if there are any questions

Sincerely,
URS Corporation

STATE OF CONNECTICUT
MOHSEN SAHIRAD
NO 21283
LICENSED
PROFESSIONAL ENGINEER

Mohsen Sahirad, P.E.
Senior Structural Engineer

ICA/MS

cc. C. Chapman/AT&T
D. Huntley/Bechtel
I. Arraiz/URS
CF/Book

URS Corporation
500 Enterprise Drive, Suite 3B
Rocky Hill, CT 06067
Tel. 860 529 8882
Fax: 860.529 3991

O:\Telecom\Projects\AT&T\14244-Fisher\1B2a 5B 2ndStructural Letter.doc

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February 9, 2001

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

RECEIVED
FEB 13 2001
CONNECTICUT
SITING COUNCIL

Re: Tower Sharing Request by AT&T Wireless Services
Existing Tower Facility at
Christian Hill Road, Cromwell, 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 an existing 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

Encl.

cc: Christopher B. Fisher, Esq.
Michael P. Murphy, AT&T Wireless

Joanne Desjardins, Pinnacle Site Development
Connie Lamberes, Becthel

CUDDY & FEDER & WORBY LLP

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MARYANN M. PALERMO
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LOUIS R. TAFFERA

February 8, 2001

VIA FEDERAL EXPRESS

Hon. Mortimer Gelston, Chairman and Members
of the Siting Council
Connecticut Siting Council
10 Franklin Square
New Britain, Connecticut 06051

Re: Tower Sharing Request by AT&T Wireless Services
Existing Tower Facility at
Christian Hill Road, Cromwell, Connecticut

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

Pursuant to Connecticut General Statutes (C.G.S.) § 16-50aa, AT&T Wireless PCS LLC, by and through its agent AT&T Wireless Services, Inc., ("AT&T Wireless") hereby requests an order from the Connecticut Siting Council (the "Council") to approve the proposed shared use of an existing communications tower, located at Christian Hill Road in the Town of Cromwell (the "Christian Hill Facility"). AT&T Wireless has entered into an agreement with Verizon Wireless ("Verizon") and the property owner to permit the installation of a wireless communications facility at the existing Christian Hill Facility. See redacted license agreement annexed hereto as Exhibit A.

The Christian Hill Facility

The Christian Hill Facility consists of an approximately eighty two foot (82) foot steel structure (the "Tower") and equipment shelter surrounded by a chain link fence. Currently, Verizon has antennas mounted on a platform at the top of the structure with associated

equipment cabinets located in the shelter. The adjacent land uses are unchanged since Verizon received approval to share use of the Tower.

AT&T Wireless' Facility

As shown on the enclosed plans prepared by URS Greiner Woodward Clyde, including a site plan, equipment shelter layout and tower elevation, AT&T Wireless proposes shared use of the Facility to provide FCC licensed services. AT&T Wireless will install up to twelve (12) panel antennas above Verizon's to an overall elevation of approximately 102.5' AGL on the existing Tower. Associated equipment cabinets will be located on a 15'-6" x 8"-0" concrete equipment pad within the fenced compound. The Tower foundation will require reinforcement to support AT&T's antennas.

Connecticut General Statutes § 16-50aa provides that, upon written request for shared use approval, an order approving such use shall be issued, "if the council finds that the proposed shared use of the facility is technically, legally, environmentally and economically feasible and meets public safety concerns." (C.G.S. § 16-50aa(c)(1).) 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. Shared use of the Christian Hill Facility satisfies the approval criteria set forth in C.G.S. § 16-50aa as follows:

A. Technical Feasibility AT&T has confirmed that with reinforcement the tower is structurally capable of supporting the addition of AT&T Wireless' antennas. The proposed shared use of this tower is therefore technically feasible.

B. Legal Feasibility Pursuant to C.G.S. § 16-50aa, the Council has been authorized to issue an order approving shared use of the existing Christian Hill Facility. (C.G.S. § 16-50aa(c)(1)). Under the authority vested in the Council by C.G.S. § 16-50aa, an order by the Council approving the shared use of a tower would permit the Applicant to obtain a building permit for the proposed installation.

C. Environmental Feasibility The proposed shared use would have a minimal environmental effect, for the following reasons:

1. The proposed installation would have a de minimis visual impact, and would not cause any significant change or alteration in the physical or environmental characteristics of the existing facility;

2. The proposed installation by AT&T Wireless would not increase the height of the tower itself and would not extend the boundaries of the Christian Hill Facility;

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

4. Operation of AT&T Wireless' 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 all carriers, would be approximately 0.12% of the standard. See Bell Labs Report dated August 11, 2000 annexed hereto as Exhibit B;

5. The proposed shared use of the Christian Hill Facility would not require any water or sanitary facilities, or generate air emissions or discharges to water bodies. Further, the installation will not generate any traffic other than for periodic maintenance visits.

D. Economic Feasibility As evidenced in Exhibit A annexed hereto, the Applicant and the tower and ground owners have entered into mutual agreements to share use of the Christian Hill Facility on terms agreeable to all parties. The proposed tower sharing is therefore economically feasible.

E. Public Safety As stated above and evidenced in the Bell Labs Report annexed hereto as Exhibit B, the operation of AT&T Wireless' 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. Further, the addition of AT&T Wireless' telecommunications service in the Cromwell area through shared use of the Christian Hill Facility is expected to enhance the safety and welfare of local residents and travelers through the area resulting in an improvement to public safety in this area of Cromwell.

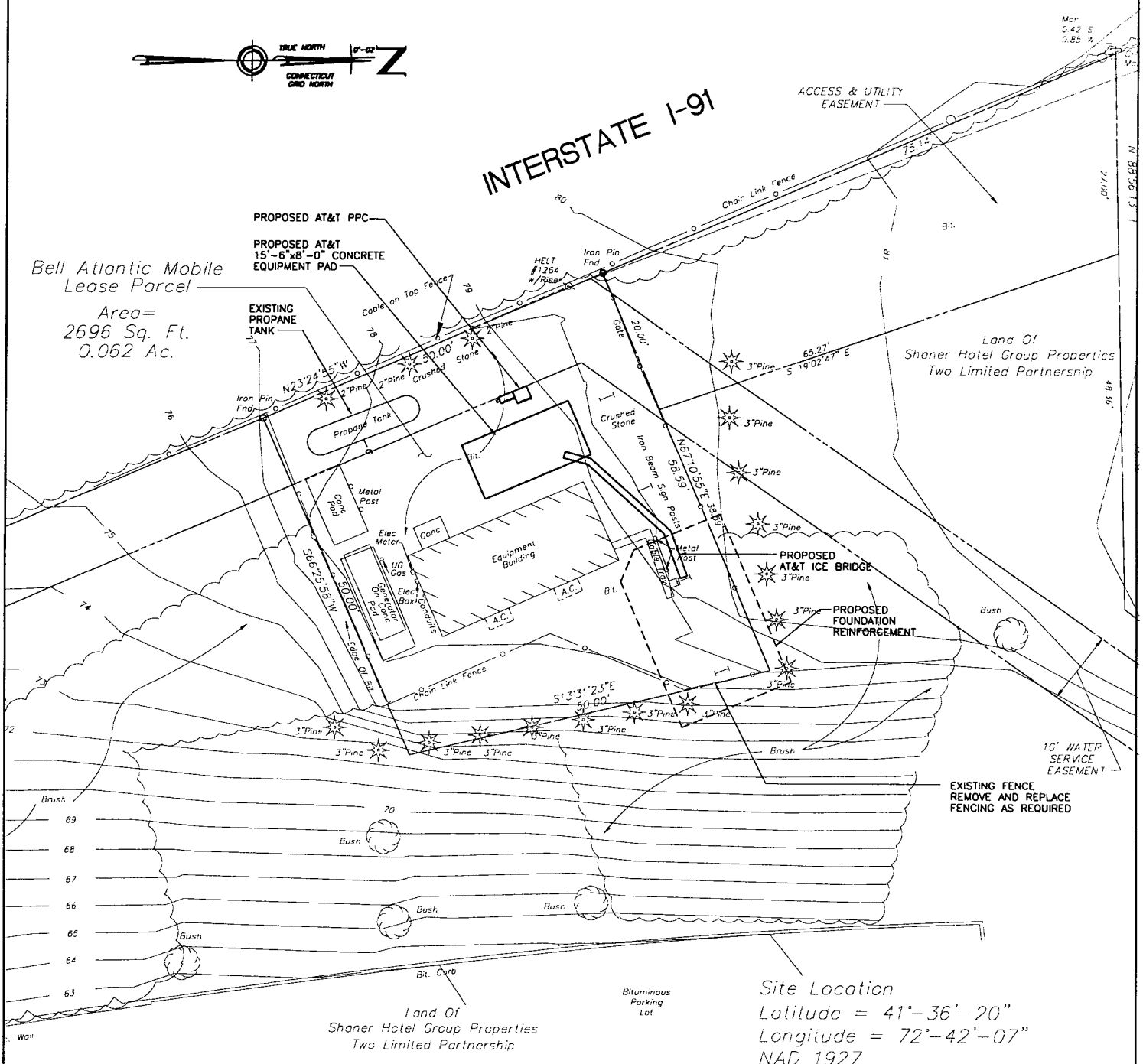
Conclusion

As delineated above, the proposed shared use of the Christian Hill Facility 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 the State of Connecticut. AT&T Wireless therefore requests the Siting Council issue an order approving the proposed shared use of the Christian Hill Facility.

Respectfully submitted,

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

cc: First Selectman, Town of Cromwell
Craig Minor, Town Planner



1 / L-1.2 SITE PLAN
SCALE: 1"=20'

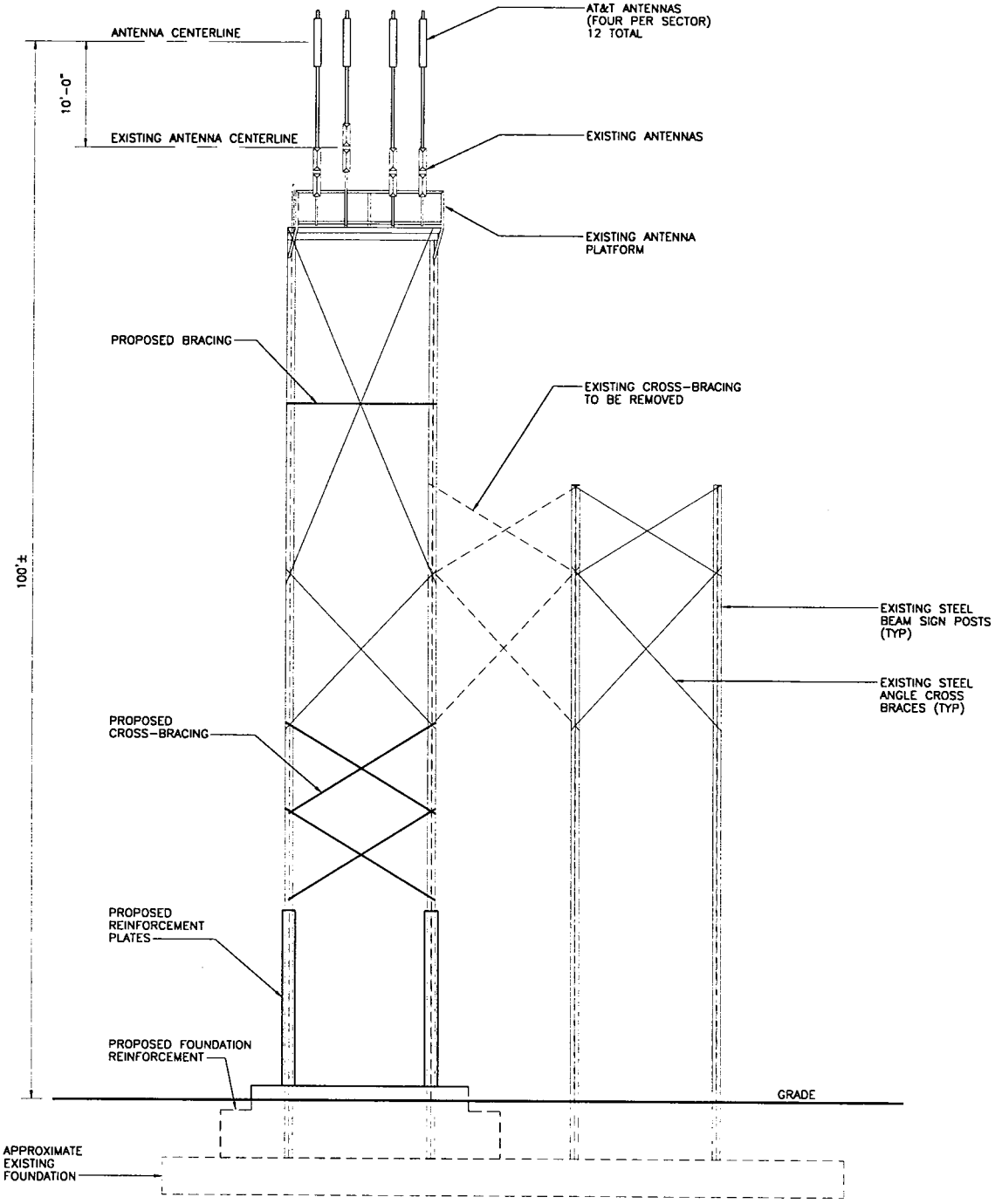
SITE ID NO: CT-144	URS Greiner Woodward Clyde A-E-S	AT&T WIRELESS PCS, LLC
Designed by:	500 ENTERPRISE DRIVE	UNMANNED WIRELESS COMMUNICATION EQUIPMENT SITE
Drawn by: JGB	ROCKY HILL, CONNECTICUT	SITE ADDRESS: CROMWELL SOUTH
Checked by:	1-(860)-529-8882	CHRISTIAN HILL ROAD, CROMWELL, CONNECTICUT

REV.	DATE:	DESCRIPTION
3	11/1/00	REVISIONS
2	02/23/00	REVISIONS
1	11/23/99	REVISIONS

Scale: AS SHOWN | Date: 08-23-99 | Job No.F301824.59 | File No. L-1

Dwg. No. L-1.2

Dwg. 1 of 2



1 / L-2 SOUTH ELEVATION

SCALE: 1/16"=1'-0"

SITE ID NO: CT-144	URS Greiner Woodward Clyde A-E-S 500 ENTERPRISE DRIVE ROCKY HILL, CONNECTICUT 1-(860)-529-8882	AT&T WIRELESS PCS, LLC UNMANNED WIRELESS COMMUNICATION EQUIPMENT SITE
Designed by:		SITE ADDRESS: CROMWELL SOUTH CHRISTIAN HILL ROAD CROMWELL, CONNECTICUT
Drawn by: JCF		
Checked by:		

REV.	DATE:	DESCRIPTION
1	11/1/00	ADDED REINFORCING

Scale: AS SHOWN | Date: 08-23-99

Job No.F301824.59 | File No. L-2 | Dwg. 2 of 2

Dwg. No. L-2

VW: Cromwell Southwest, CT
AT+T: Cromwell South, CT
VW Site #HRT 2057
AT+T Site # CT-144

8/19/97

SITE LICENSE

This Site License ("Site License") made this 4th day of January, ~~2000~~ 2001 by and between Cellco Partnership, a Delaware General Partnership d/b/a Verizon Wireless, having an office at 180 Washington Valley Road, Bedminster, New Jersey 07921 (hereinafter referred to as "Licensor") and AT&T Wireless PCS, Inc., a Delaware Corporation, by its agent Wireless PCS, Inc. d/b/a AT&T Wireless Services, hereinafter referred to as "AT&T", with a principal mailing address of 15 East Midland Avenue, Paramus, New Jersey 07652 (hereinafter referred to as "Licensee").

This Site License is a Site License as referred to in that certain Master License Agreement between Cellco Partnership, a Delaware General Partnership d/b/a Verizon Wireless, and AT&T Wireless PCS LLC, formerly known as AT&T Wireless PCS, Inc., a Delaware Limited Liability Corporation by its agent AT&T Wireless Services Inc., dated March 31, 1997("License"). All of the terms and conditions of the License are incorporated hereby by reference and made a part hereof without the necessity of repeating or attaching the License. In the event of any contradiction, modification or inconsistency between the terms of the License and this Site License, the terms of this Site License shall prevail. Capitalized terms used in this Site License shall have the same meaning described for them in the License unless otherwise indicated herein.

1. The Licensed Premises to be Licensed by the Licensor to the Licensee are more fully described as follows and are part of the Property which is more fully described as follows:

A portion of that certain parcel of property located in the Town of Cromwell, the County of Hartford, and the State of Connecticut, more particularly described as a 16' by 8' parcel containing approximately 128 square feet situated at Christian Hill Road and the right to install antennas on the stanchions located on such property, together with the non-exclusive right for ingress and egress, seven (7) days a week twenty-four (24) hours a day, on foot or motor vehicle, including trucks, and for the installation and maintenance of utility wires, poles, cables, conduits, and pipes over, under or along a twenty (20') foot wide right-of-way extending from the nearest public right-of-way, Christian Hill Road, to the Licensed Premises, said Property and right-of-way for access being substantially as described herein in Exhibit "A" attached hereto and made a part hereof.

2. The Prime Lease affecting the Property is attached hereto as Exhibit 3.

3. The placement of the Licensee's antennas and equipment and pad together with connections thereto are shown on Exhibits 1 & 2 attached hereto.

4. All other uses at the Property as envisioned pursuant to Paragraph 7(a) of the License are as follows: N/A

NOV 2 1 2000

5. The term of this Site License as determined in accordance with Paragraph 3 of the License is:

This Agreement shall be effective on the Commencement Date with the initial term concluding on August 31, 2005. Licensee shall have the option to extend this Site License for two (2) additional five (5) year terms by giving the Licensor written notice of its intention to do so at least six (6) months prior to the end of the then current term.

6. Commencing on the Commencement Date, the Licensee shall pay the Licensor a gross amount, monthly, in advance, to Verizon Wireless, P.O. Box 64498, Baltimore, MD 21264-4498, in the amount of $(_____) annually and (_____) monthly, representing (___) percent (__%) of the total annual rental. If the term commences or ends on any day other than the first or last day of the calendar month, a pro rate fraction of the full month's rental shall be paid for any such partial month. Notwithstanding the foregoing, Licensee shall receive a credit for rental payments, to be paid directly to Licensor only, for the first five (5) months after the Commencement Date of this Site License, to reimburse Licensee for a portion of its construction costs. Payments shall be payable on the first day of the month immediately proceeding the Commencement Date and expiration of the credit period, as aforesaid.

The following site identification must appear on each payment: HRT 2057.

The annual fee paid to Licensor for each year of each renewal term shall be increased by (___) percent (__%) above the rental fee for the preceding year.

7. Commencing on the Commencement Date, the Licensee shall also pay the lessor, Shaner Hotel Group Properties Two Limited Partnership ("Shaner") a gross amount, monthly in advance, to Shaner at 303 North Science Park Road, State College, PA 16803, in the amount of $(_____) annually and (_____) monthly, representing the remaining (___) percent (___) of the total annual rental. If the term commences or ends on any day other than the first or last day of the calendar month, a pro rate fraction of the full month's rental shall be paid for any such partial month. Payments shall be payable on the first day of the month immediately proceeding the Commencement Date.

The annual fee paid to Shaner for each year of each renewal term shall be increased by (___) percent (__%) above the rental fee for the preceding year.

IN WITNESS WHEREOF, the parties have executed, or have caused their properly authorized representatives to duly execute, this License on the date and year first above written.

WITNESS:

Karen Paul

David Ly

Cellco Partnership
d/b/a Verizon Wireless

By: Richard J. Lynch
Its: Executive Vice President and Chief Technical Officer

WITNESS:

Michael P. Murphy

Joanne M. Desjardins
Joanne M. Desjardins

AT&T Wireless PCS, LLC, a Delaware limited liability company by its agent AT&T Wireless Services, Inc.

By: Paul A. Spurlock
Its: System Development

MMS Site Addendum

An Analysis of the Radiofrequency Environment in the Vicinity of a Proposed Personal Communications Services Installation Site CT-144: Christian Hill Road, Cromwell, 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

August 11, 2000

Table of Contents

An Analysis of the Radiofrequency Environment in the Vicinity of a Proposed Personal Communications Services Installation Site CT-144: Christian Hill Road, Cromwell, 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 Cromwell, CT. The analysis, which includes contributions from Verizon Wireless cellular radio antennas, utilizes engineering data provided by AT&T Wireless together with well-established analytical techniques utilized for calculating the RF fields associated with PCS and cellular radio 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 0.12% 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 0.12% 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 from existing Verizon Wireless cellular radio 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 these facilities complies with Federal Communications Commission (FCC) guidelines as required by the Telecommunications Act of 1996.

2. Technical Data

The proposed PCS antennas are to be mounted to billboard located on Christian Hill Road in Cromwell, CT. The PCS antennas transmit at frequencies between 1930 and 1990 million-hertz (MHz). Existing on the billboard are Verizon Wireless cellular radio antennas transmitting between 869 and 894 MHz. (The frequencies used for cellular radio were formerly used for UHF television broadcast.)

The actual RF power propagated from a PCS or cellular radio 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 and cellular 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 RF environment around the site follows that outlined by the FCC in OET Bulletin No. 65 [2] 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 density associated with the co-located antennas will be less than those values shown in Table 2. The values shown in

Table 2 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 2 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* [3]).

The power density values in Table 2 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 in Table 2. 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 [4]. Also, levels inside nearby homes and buildings 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

Table 2 shows the calculated maximal RF power density levels in the vicinity of the co-located antennas; Table 4 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 Table 2), 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 maximal level associated with these antennas is at least 833 times below the MPE, i.e., less than 0.12% 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[5]. 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 4. (See Table 4 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[6]. 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[7], recommended adoption of the 1986 NCRP limits[5].

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[8]. (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[9] 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)[10] and the National Radiological Protection Board in the United Kingdom[11] 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[12]. 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[1] ensure that their facilities will comply with the 1996 FCC MPE limits outlined in 47 CFR §1.1310[4][2]. (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 Cromwell, 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

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 Cromwell, CT. The analysis, which includes contributions from Verizon Wireless cellular radio antennas, utilizes engineering data provided by AT&T Wireless together with well-established analytical techniques utilized for calculating the RF fields associated with PCS and cellular radio 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.

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1. 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.

2. 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"[13]. The FCC pointed out that there was no evidence of excessive exposure to RF radiation during routine normal operation of these radio services.

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 0.12% 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 0.12% 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 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

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

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

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

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

[7] 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

[8] *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)

[9] 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)

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

[11] *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)

[12] "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)

[13] 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.

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

Site Specifications	AT&T Wireless	Verizon*
maximum ERP† per channel	100 watts	100 watts
actual radiated power per channel	3.3 watts	6.3 watts
actual *total* radiated power per sector	25.4 watts	126 watts
number of transmit/receive antennas	N/A	
number of transmit antennas	1 per sector	2 per sector
number of receive antennas	2 per sector	2 per sector
maximum number of transmitters	8 per sector	20 per sector
antenna centerline height above grade	100 ft	90 ft
number of sectors configured	3	3
antenna manufacturer	DAPA	Swedcom
model number	58010 (Sector A) 58210 (Sectors B, C)	ALP9212
gain	17.15 dBi (Sector A) 17.05 dBi (Sectors B, C)	14.15 dBi
type	directional	directional
downtilt	0° (Sector A) 2° (Sectors B, C)	0°

† *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.

* The configuration is based on similar sites for this carrier within the region.

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

Provider	Power Density (mW/cm^2)		% of MPEs*	
	6 ft AMGL†	16 ft AMGL†	6 ft AMGL†	16 ft AMGL†
AT&T Wireless	< 0.00024	< 0.00030	0.024%	0.030%
Verizon	< 0.00038	< 0.00049	0.069%	0.089%
		TOTAL	0.093%	0.119%

* MPE: The FCC limits for maximum permissible exposure (same as 1986 NCRP limits at the frequencies of interest)

† AMGL: above mean grade level

Table 3: Calculated Levels at Base of Structure and the Levels as a Percentage of 1996 FCC MPEs* for the Proposed and Existing Antennas, Cromwell, CT

Provider	Power Density (mW/cm^2)		% of MPEs*	
	6 ft AMGL†	16 ft AMGL†	6 ft AMGL†	16 ft AMGL†
AT&T Wireless	< 0.00010	< 0.00012	0.010%	0.012%
Verizon	< 0.00004	< 0.00005	0.007%	0.009%
		TOTAL	0.017%	0.021%

* MPE: The FCC limits for maximum permissible exposure (same as 1986 NCRP limits at the frequencies of interest)

† AMGL: above mean grade level

Table 4: 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 and all co-located wireless communications 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[3]. The methodology described follows that outlined by the Federal Communications Commission (FCC) in their OET Bulletin No. 65[4].

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

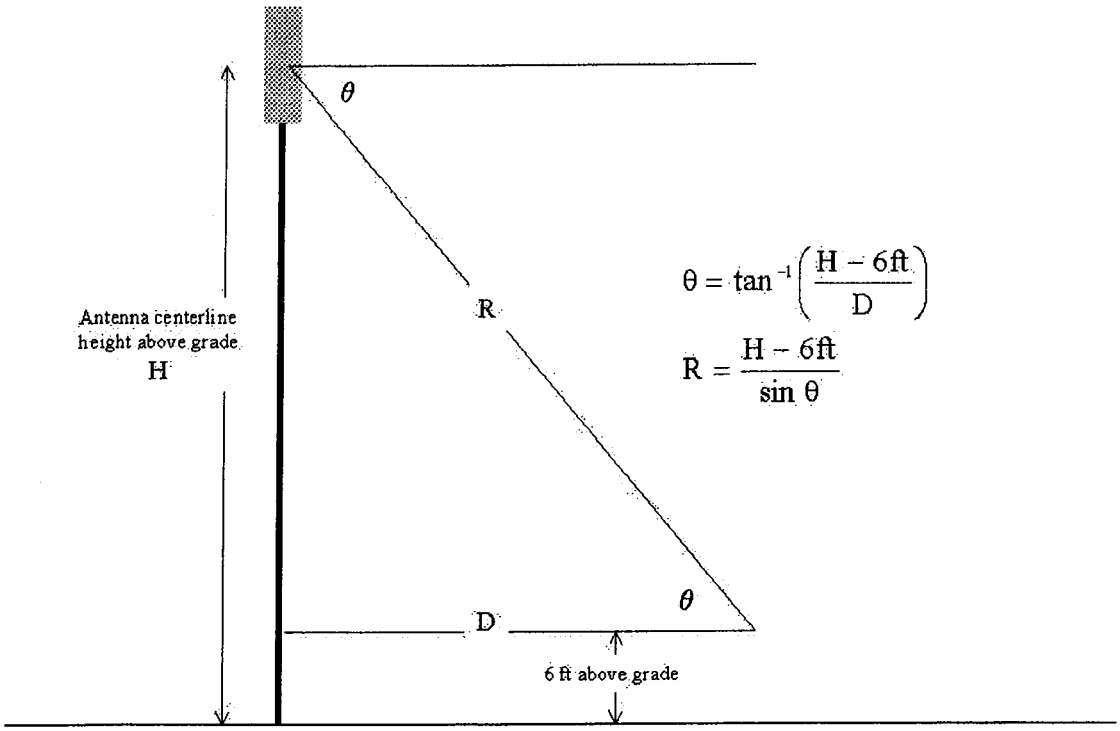
$$S_{max} = 4 \times S$$

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

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

4. 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).



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 40° below the horizon and is calculated as follows:

$$R = (H\text{-}6)/\sin\theta = (100\text{-}6)/\sin(40°) = 146.2 \text{ ft}$$

$G_{40°} = -4.41$ dBd (from antenna elevation gain pattern)

$$P_N = ERP/G_{max} = \frac{100}{10^{(15dBd/10)}} = 3.2 \text{ watts per channel}$$

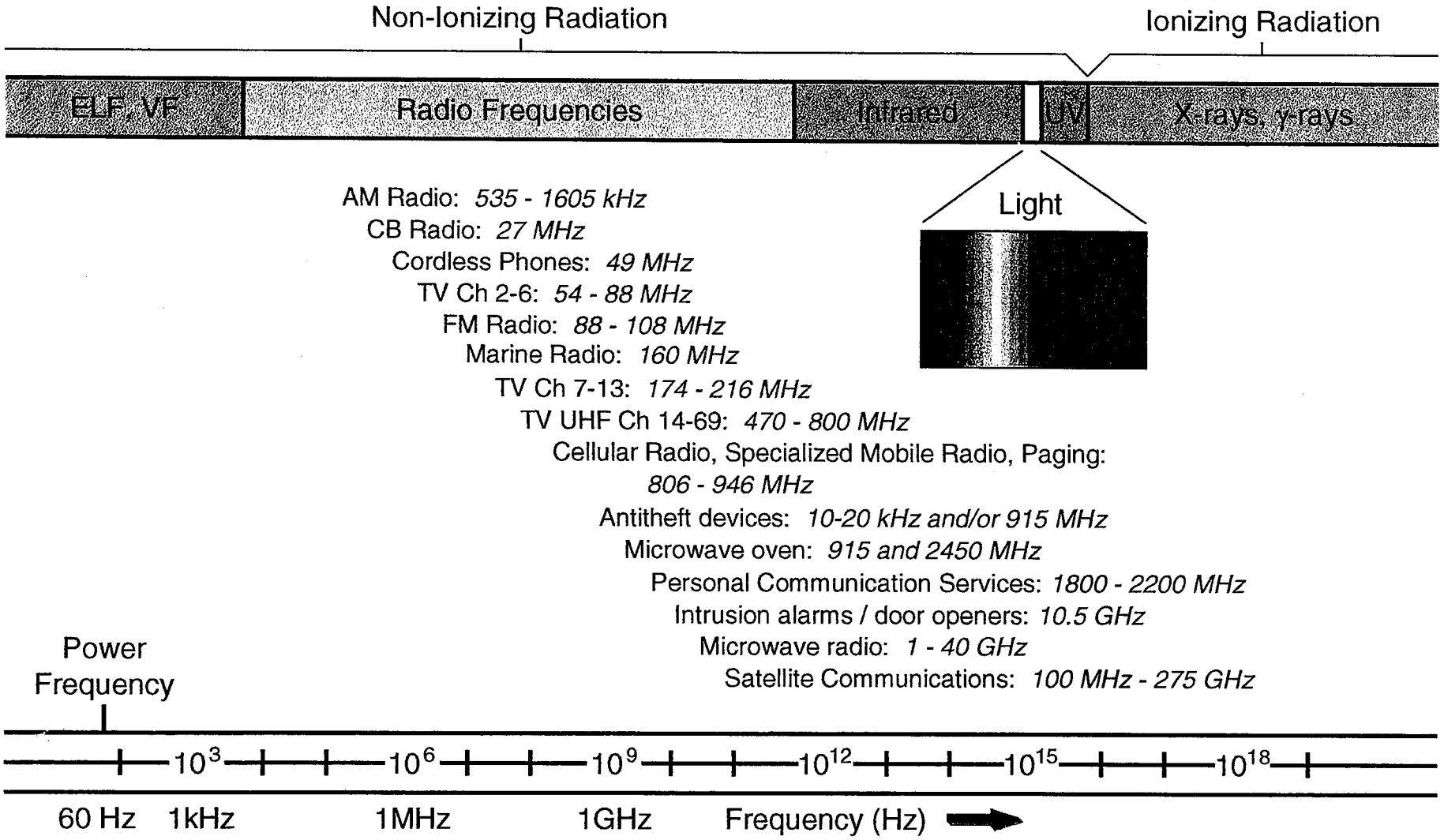
$$S_{max} = 4 \times \frac{N \times P_N \times 10^{(G_\theta/10)} \times 1.64}{4\pi R^2}$$

$$= 4 \times \frac{8ch \times 3.2W/ch \times 10^{(-4.41dBd/10)} \times 1.64}{4 \times 3.14 \times (146.2ft \times 12 \times 2.54)^2}$$

$$S_{max} = 2.4 \times 10^{-7} \text{ W/cm}^2 = 0.00024 \text{ mW/cm}^2$$

$$\text{AND \% of MPE} = \frac{0.00024 \, mW/cm^2}{1 \, mW/cm^2} \times 100\% = 0.024\%$$

ELECTROMAGNETIC SPECTRUM



STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

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

February 16, 2001

Honorable Stanley A. Terry, Jr.
First Selectman
Town of Cromwell
41 West Street
Cromwell, CT 06416

RE: **TS-AT&T-033-010213** - AT&T Wireless PCS, LLC d/b/a AT&T Wireless Services request for an order to approve tower sharing at an existing telecommunications facility located at Christian Hill Road, Cromwell, Connecticut.

Dear Mr. Terry:

The Connecticut Siting Council (Council) received this request for tower sharing, pursuant to Connecticut General Statutes § 16-50aa.

The Council will consider this item at the next meeting scheduled for March 1, 2001, at 2:00 p.m. in Hearing Room Two, Ten Franklin Square, New Britain, Connecticut.

Please call me or inform the Council if you have any questions or comments regarding this proposal.

Thank you for your cooperation and consideration.

Very truly yours,

Joel M. Rinebold
Executive Director

JMR/laf

Enclosure: Notice of Tower Sharing

c: Frederic Curtin, Zoning Enforcement Officer, Town of Cromwell

I:\siting\cm\AT&T\cromwell\terry.doc