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APR 19 2000

**CONNECTICUT
SITING COUNCIL**

April 18, 2000

VIA FEDERAL EXPRESS

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

Re: Petition for a Declaratory Ruling for an Existing Northeast Utilities Lattice
Communications Tower in Wilton, Connecticut, Structure Number 2998

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 Petition for a Declaratory Ruling that a Certificate of Environmental Compatibility and Public Need is not required pursuant to Section 16-50g. et seq. of the General Statutes of Connecticut for the modification of the Connecticut Light & Power Company ("CL&P") electric transmission facility referenced above, 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 a declaratory ruling. 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.
Mr. Michael Murpy, AT&T Wireless
Ms. Michael Austin, Pinnacle Site Development

CUDDY & FEDER & WORBY LLP

April 18, 2000

Page 2

Salvatore Giuliano, Northeast Utilities
Paul F. Hannah, Jr., First Selectman, Town of Wilton

PETITION FOR A DECLARATORY RULING)
THAT A MODIFICATION TO AN EXISTING)
NORTHEAST UTILITIES LATTICE)
COMMUNICATIONS TOWER IN WILTON,)
CONNECTICUT, DOES NOT REQUIRE A)
CERTIFICATE OF ENVIRONMENTAL)
COMPATIBILITY AND PUBLIC NEED AS)
THE PROPOSED MODIFICATION)
WILL NOT HAVE A SUBSTANTIAL)
ADVERSE ENVIRONMENTAL EFFECT)

APR 19 2000

**CONNECTICUT
SITING COUNCIL**

April 13, 2000

AT&T Wireless PCS, Inc. ("AT&T Wireless" or the "Petitioner") hereby petitions the Connecticut Siting Council for a determination that a Certificate of Environmental Compatibility and Public Need (the "Certificate") is not required pursuant to Section 16-50g. et seq. of the General Statutes of Connecticut for the modification of the Connecticut Light & Power Company ("CL&P") electric transmission facility described herein. AT&T Wireless submits that no such Certificate is required because the proposed modification will not have a substantial adverse environmental effect.

AT&T Wireless as Petitioner

AT&T Wireless is the "E block" Wideband PCS license holder for the 2 GHz PCS frequencies for the greater New York City area, which includes Fairfield County Connecticut. AT&T has been authorized by the Federal Communications Commission ("FCC") to construct and operate digital mobile radio systems in the State of Connecticut. AT&T is a provider of Personal Communication Services ("PCS" Service) combining traditional mobile telephone and enhanced digital services into a single user handset. The proposed modification is in support of AT&T's construction and build-out of its wireless network to fill coverage gaps in its federally licensed service area, which includes the Town of Wilton.

Description of the Project

As shown on the enclosed plans prepared by Tectonic Engineering Consultants PC, including a site plan, equipment shelter layout and tower elevation, AT&T Wireless proposes installing three panel antennas on a 8.6" diameter pipe extension to an overall elevation of approximately 101' AGL on existing CL&P transmission line structure number 2998. Associated unmanned equipment cabinets will be mounted on piers at the base of the existing lattice tower within a proposed eight-foot high chain link fence located at 289 Danbury Road in Wilton, Connecticut (collectively referred to as the "Facility"). The antennas will extend approximately five (5) feet above the top of the existing 96' transmission line lattice tower.

The existing paved access drive will be used for direct access to the lattice tower for construction activities and routine maintenance. Power will be routed to the equipment underground from an existing utility pole. All proposed construction activities are within the existing CL&P right-of-way.

The Facility area is located off Danbury Road in the Town of Wilton. Current land uses surrounding the Facility area include the Wilton Railroad Station, transmission towers and right-of-way, commercial uses and the Route 7 corridor.

The Facility will not have a Substantial Adverse Environmental Effect

The Facility involves an increase of approximately 5 feet above the existing lattice tower to 101 feet above ground level, which will not cause a substantial adverse environmental impact. The existing lattice tower in conjunction with similar structures supports two 115-kv CL&P transmission circuits in the project area. The proposed Facility will not create a structure in the landscape that is out of scale vertically with the surrounding landscape.

The limits of disturbance of all construction activities will be confined to the minimum extent possible. The shortest distance possible for utility routing is proposed to limit disturbance. There will be minor clearing of understory vegetation in this area for construction. All erosion and sediment control measures shall be installed, when necessary, in accordance with the "Connecticut Guidelines for Soil Erosion and Sediment Control" (Revised 1988) and amendments, as published by the Connecticut Council on Soil and Water Conservation.

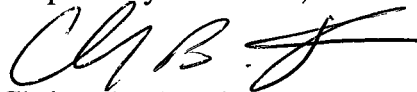
The operation of the antennas will not increase the total radio frequency electromagnetic power density at the site to a level at or above the applicable standards. Annexed hereto in a Radio Frequency Emissions Report ("Emissions Report"), dated February 21, 2000, and prepared by Bell Laboratories, a division of Lucent Technologies. The Emissions Report was prepared to determine the potential public exposure to Radio Frequency energy surrounding the proposed Facility. Worst case assumptions were used to be extremely conservative and insure that actual values would be lower than those determined herein. This analysis indicates that the maximum level of RF energy to which the public may be exposed will meet all applicable Federal and State health and safety limits, including but not limited to the FCC, ANSI, IEEE, and NCRP. In fact, the Emissions Report concludes that the maximum level of RF energy associated with simultaneous and continuous operation of all proposed transmitters will be less than .03% of all Federal and State emission standards.

Conclusion

AT&T Wireless will not have a need to construct a telecommunications tower to provide coverage in this area of Wilton if the Connecticut Siting Council determines that no Certificate is required. The proposed Facility is consistent with legislative

findings outlined in Section 16-50g. of the General Statutes of Connecticut that seeks to avoid the unnecessary proliferation of towers in the State. Indeed, the Council previously granted a similar Petition No. 395 by Omnipoint which involved a nearby transmission line tower and wireless facility. For all the foregoing reasons, AT&T Wireless petitions the State Connecticut Siting Council for a determination that an amendment to the existing Certificate of Environmental Compatibility and Public Need is not required for the addition of AT&T Wireless' proposed Facility and that the Council issue an order approving same.

Respectfully Submitted,

A handwritten signature in black ink, appearing to read 'C.B. Fisher', with a stylized flourish at the end.

Christopher B. Fisher

On behalf of AT&T Wireless



AT&T WIRELESS PCS, LLC.

UNMANNED WIRELESS COMMUNICATION EQUIPMENT SITE
"SITE NO. CT-058"
289 DANBURY ROAD
NORTHEAST UTILITIES LATTICE TOWER
WILTON, CT 06897

PROJECT INDEX

SITE NUMBER:	CT-058
SITE ADDRESS:	289 DANBURY ROAD WILTON, CT 06897
OWNER:	(TOWER) NORTHEAST UTILITIES P.O. BOX 270 HATFORD, CT 06140-0270
	(LAND) JOHN R GREGORY & PATRICIA G DEAN 2 PIMPEWAUG ROAD WILTON, CT 06897
APPLICANT:	AT&T WIRELESS PCS, LLC. 149 WATER STREET NORWALK, CT 06854
TAX MAP:	MAP 73, BLOCK GB, LOT 8-3
LATITUDE (NAD 27):	41° 11' 41.9" N
LONGITUDE (NAD 27):	73° 25' 53" W

Client  **AT&T WIRELESS PCS, LLC.**
149 Water Street
Norwalk, CT 06854

TECTONIC ENGINEERING CONSULTANTS P.C.

P.O. Box 447, 615 Route 32 Highland Mills, N.Y. 10930 (914) 928-6531

RELEASED BY: *[Signature]*

REV 1	FOR NU REVIEW	3/8/00
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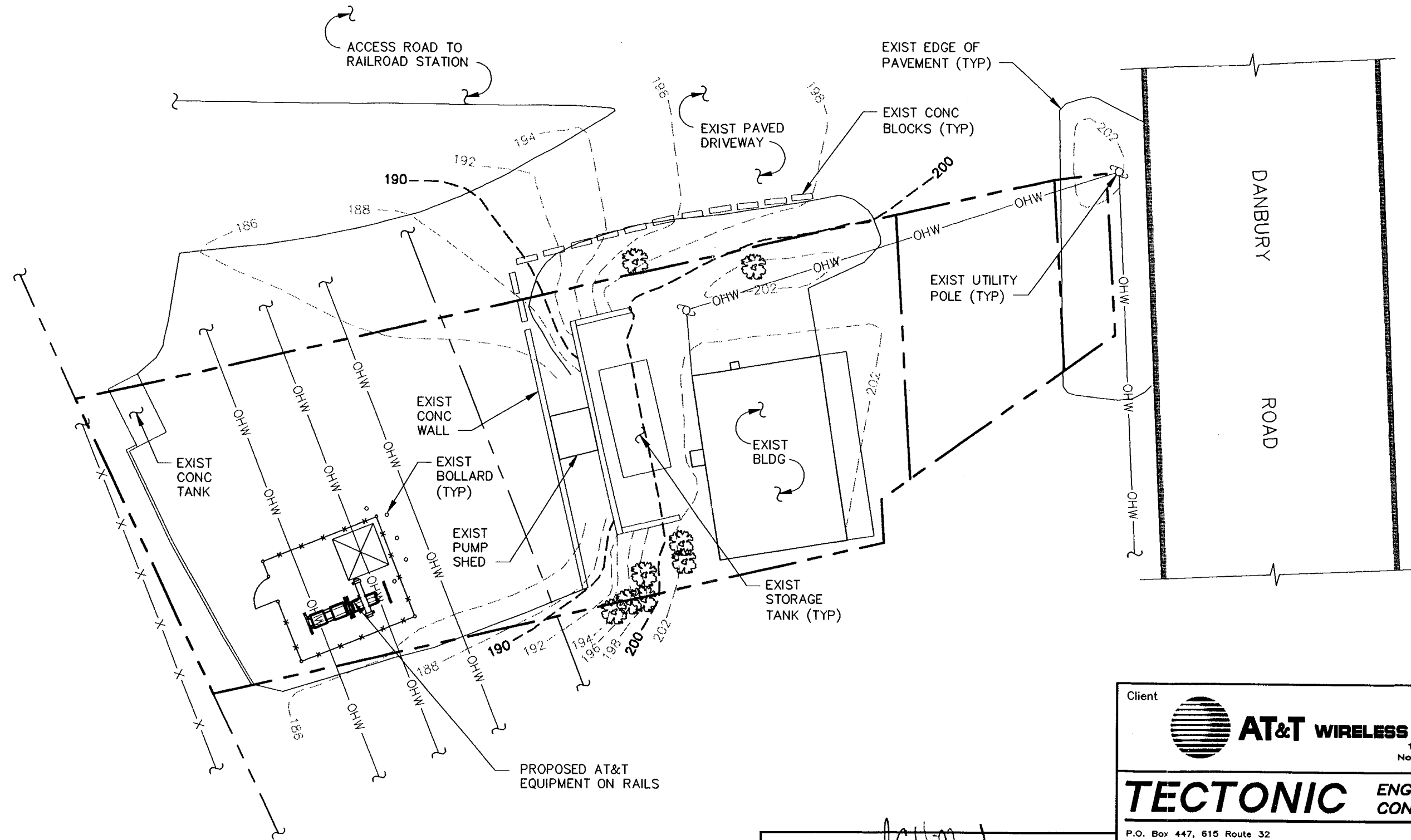
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TITLE SHEET

**WILTON (CT-058)
EXISTING LATTICE TOWER
289 DANBURY ROAD
WILTON, CT**

Date 11/6/99	Work Order 2323.058	Drawing No. SC-1	Rev 1
Scale AS NOTED			



1 SITE PLAN
SC-2 SCALE: 1" = 20'

Client
 **AT&T WIRELESS PCS, LLC.**
 149 Water Street
 Norwalk, CT 06854

TECTONIC ENGINEERING
 CONSULTANTS P.C.

P.O. Box 447, 615 Route 32
 Highland Mills, N.Y. 10930 (914) 928-6531

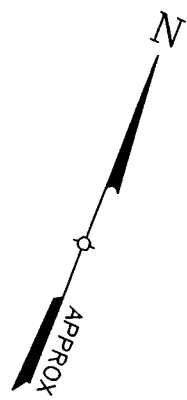
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SITE PLAN
WILTON (CT-058)
EXISTING LATTICE TOWER
289 DANBURY ROAD
WILTON, CT

Date 11/5/99	Work Order 2323.058	Drawing No. SC-2	Rev 1
Scale AS NOTED			



PROPOSED 20'x23'
COMPOUND

EXIST 97'±
LATTICE TOWER

PROPOSED
CABLE BRIDGE

PROPOSED
5' GATE

PROPOSED 8' HIGH
CHAIN LINK FENCE

PROPOSED AT&T
EQUIPMENT ON PIERS

EXIST BOLLARD
(TO REMAIN) (TYP)

EXIST BOLLARD
(TO BE REMOVED)
(TYP)

PROPOSED ICE CANOPY
SUPPORT (TYP)

EXIST PROPERTY
LINE (TYP)

N TRUE

AZ = 0°

AT&T SECTOR
ANTENNA

ANTENNA MOUNTING
POLE

AZ = 240°

AZ = 120°

2
SC-3

ANTENNA MOUNTING PLAN

SCALE: 1" = 1'

1
SC-4

1
SC-3

SITE DETAIL PLAN

SCALE: 1" = 5'

Client

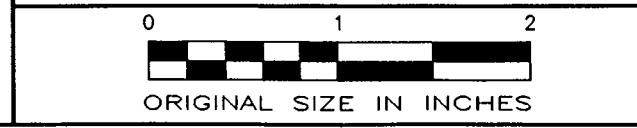
AT&T WIRELESS PCS, LLC.
 149 Water Street
 Norwalk, CT 06854

TECTONIC ENGINEERING
 CONSULTANTS P.C.

P.O. Box 447, 615 Route 32 Highland Mills, N.Y. 10930 (914) 928-6531

RELEASED BY: *J. C. Kelly*
 REV 1 FOR NU REVIEW 3/8/00

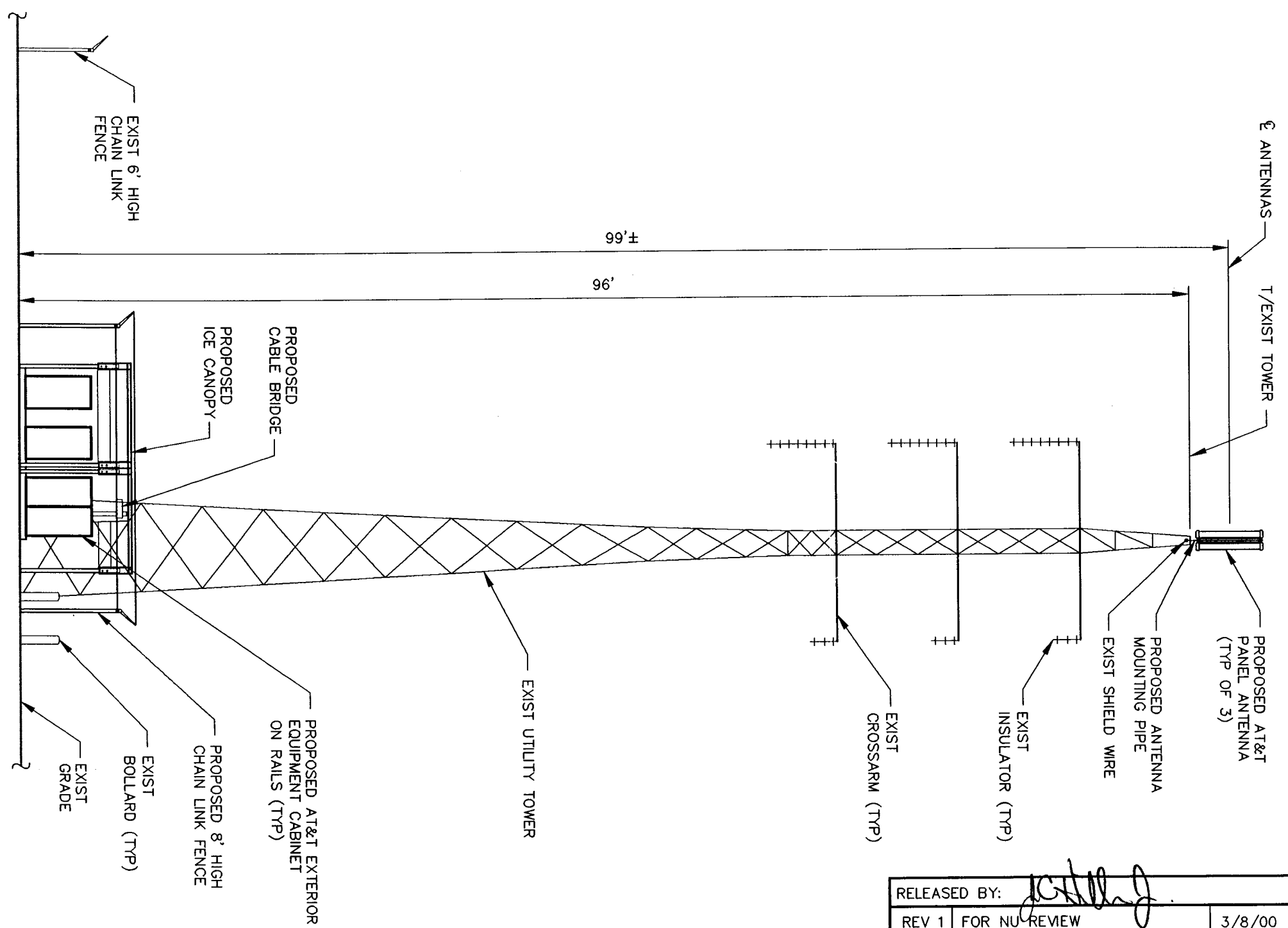
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SITE DETAIL PLAN/ANTENNA MOUNTING PLAN

WILTON (CT-058)
EXISTING LATTICE TOWER
289 DANBURY ROAD
WILTON, CT

Date 11/5/99	Work Order 2323.058	Drawing No. SC-3	Rev 1
Scale AS NOTED			



1
SC-4
ELEVATION
SCALE: 1" = 10'

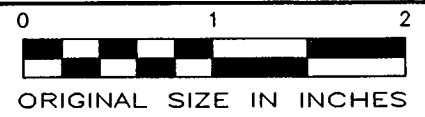
Client
 **AT&T WIRELESS PCS, LLC.**
 149 Water Street
 Norwalk, CT 06854

TECTONIC ENGINEERING
 CONSULTANTS P.C.

P.O. Box 447, 615 Route 32
 Highland Mills, N.Y. 10930 (914) 928-6531

RELEASED BY: *[Signature]*
 REV 1 FOR NU REVIEW 3/8/00

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TOWER ELEVATION

WILTON (CT-058)
 EXISTING LATTICE TOWER
 289 DANBURY ROAD
 WILTON, CT

Date 11/5/99	Work Order 2323.058	Drawing No. SC-4	Rev 1
Scale AS NOTED			



**Northeast
Utilities System**

107 Selden Street, Berlin, CT 06037

Northeast Utilities Service Company
P.O. Box 270
Hartford, CT 06141-0270
(860) 665-5000

April 14, 2000

Mr. Daniel Gerber
Construction Manager
AT&T Wireless Services
149 Water Street, Suite 2C-2D
Norwalk, CT 06854

Re: Site Permitting Authorization
Wilton Telecommunications Site

Dear Mr. Gerber:

Authorization is hereby given to AT&T Wireless Services (AT&T), its employees and its duly authorized agents and independent contractors (hereinafter collectively referred to as "AT&T"), to apply for any and all local municipal, state and federal licenses, permits and approvals, including but not limited to Connecticut Siting Council, building permits, zoning variances, zoning special exceptions, site plan and subdivision approvals, driveway, wetlands and terrain alteration permits, which are or may be necessary or required for AT&T to construct, operate and maintain a wireless communications system (PCS System), and/or antenna site on the following property over which The Connecticut Light & Power Company (CL&P) has easement rights:

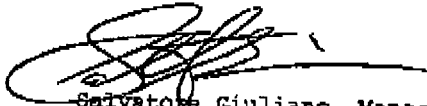
CL&P Structure #2998
289 Danbury Road
Wilton, Connecticut

The foregoing authorization is given subject to the following conditions:

1. This authorization shall be nonexclusive. Nothing herein shall prevent or restrict CL&P from authorizing any other person or entity to apply for any similar licenses, permits or approvals to construct, operate and maintain any other communication system or facility of any type on the property at any time.
2. This authorization shall not obligate CL&P to pay for or reimburse any costs or expenses or to provide any assistance of any kind in connection with any applications, or bind or obligate CL&P to agree or be responsible for any on-site or off-site improvements, development restrictions, impact fees or assessments, capital improvement charges, bonds or other security, or any other fee, assessment, charge or expense imposed or required as a condition of any license, permit or approval. AT&T shall be solely and fully responsible for all fees, charges costs and expenses of any kind in connection with any applications. CL&P agrees to reasonably cooperate with AT&T in signing such applications or other similar documents as may be required in order for AT&T to apply for any license, permit or approval.
3. This authorization shall not be deemed or construed to grant or transfer to AT&T any interest in the property, whatsoever, and shall not in any respect obligate or require CL&P to sell, lease or license the Property to AT&T or otherwise allow AT&T to use or occupy the property for any purpose, regardless of whether any licenses, permits and approvals applied for by AT&T for the property are granted. AT&T understands and acknowledges that any and all applications filed by AT&T for the property at AT&T's sole risk and without any enforceable expectation that the property will be made available for AT&T's use.

4. AT&T shall be required to supply to CL&P, free of charge and contemporaneous with AT&T's filing of same, a complete copy of any and all applications, plans, reports and other public filings made by AT&T with any local, municipal, state or federal governmental or regulatory officer, agency board, bureau, commission or other person or body for any licenses, permits or approvals for the property, and to keep CL&P fully informed on a regular basis of the status of AT&T's applications.
5. This authorization shall automatically expire six (6) months after the date of this letter, unless extended in writing by mutual agreement of CL&P and AT&T.

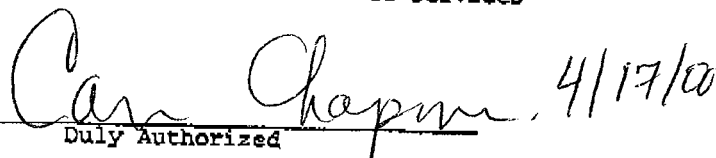
Very truly yours,



Salvatore Giuliano, Manager
Real Estate and Land Planning

LMC/CB/w

AGREED TO on behalf of AT&T Wireless Services


Duly Authorized

Cell Site Number: CT-058
Address: 289 Danbury Road, Wilton, CT 06897

LEASE AGREEMENT

THIS LEASE AGREEMENT ("Agreement"), dated as of the date below, is entered into by Standard Petroleum, a Connecticut Corporation with a Tax ID# of 061325413, having its principal office at 299 Bishop Ave, Bridgeport, CT 06607 (hereinafter referred to as "Landlord") and AT&T Wireless PCS LLC, by and through its agent, AT&T WIRELESS SERVICES, having an office at 15 E. Midland Ave, Paramus, NJ 07652 (hereinafter referred to as "Tenant").

BACKGROUND

Landlord owns that certain plot, parcel or tract of land, together with all rights and privileges arising in connection therewith, located at 289 Danbury Road, identified as Lot 8 in Block 3 in the Town of Wilton, Fairfield County, State of Connecticut (collectively "Property"). Tenant desires to use a portion of the Property in connection with its federally licensed communications business.

The parties agree as follows:

1. **LEASE OF PREMISES.** Landlord leases to Tenant a certain portion of the Property containing approximately 300 square feet as described on attached Exhibit 1 (collectively, "Premises").
2. **PERMITTED USE.** Tenant may use the Premises for the following: (i) transmission and reception of communications signals; (ii) to construct, install, operate, maintain, repair, replace, protect and secure its communication fixtures and related equipment, cables, accessories and improvements (collectively, the "Communication Facility"); including the right to construct a lattice tower/wireless telephone pole along with any number of associated antennas, an equipment shelter, fencing and any other accessories necessary to the successful and secure operation of the Communication Facility; and (iii) any activities related to the foregoing. Landlord and Tenant agree that Exhibit 1 shows the initial installation of Tenant and that it does not limit Tenant's rights under this paragraph, as long as any additions are inside the chain link fenced area shown on Exhibit 1. Landlord's execution of this Agreement will signify Landlord's approval of Exhibit 1. Tenant has the right (i) to install and operate transmission cables from the equipment shelter to the antennas, electric lines from the main feed to the equipment shelter, and communication lines from the main entry point to the equipment shelter and (ii) to erect, construct or make Property improvements, alterations, or additions appropriate for Tenant's use ("Tenant Changes"). Tenant Changes include the right to construct and maintain a fence around the Premises or undertake any other appropriate means to restrict and secure access to the Premises.
3. **INSTALLATIONS.** Tenant agrees to comply with all applicable governmental laws, rules, statutes and regulations, relating to its use of the Communication Facility on the Property. Tenant has the right to modify, supplement, replace, upgrade, expand the equipment, increase the number of antennas or relocate the Communication Facility within the Premises at any time during the term of this Agreement. Tenant will be



IN WITNESS WHEREOF, the undersigned has caused this Agreement to be executed this 29th day of Oct, 1999.

WITNESSES:

"LANDLORD"

[Signature]
Print Name: Lenora Stacey
[Signature]
Print Name: Gloria M. Clorkey

By: [Signature]
Print Name: R. FRIEDMAN
Its: PRESIDENT

"TENANT"

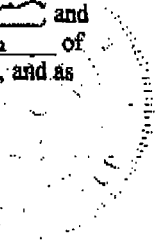
[Signature]
Print Name: Joanne M. Desjardins
[Signature]
Print Name: MUSTAFA D. VESEPHY

By: [Signature]
Print Name: PAUL A. SPORLOCK
Its: MANAGER - NETWORK REALIZATION

STATE OF Connecticut)
COUNTY OF Hartford) ss:

On the 29th day of Oct, 1999, before me personally appeared Rog. Friedman and acknowledged under oath that he is the President of Landart (Hartford) of Hartford, CT, the Corporation named in the attached instrument, and as such was authorized to execute this instrument on behalf of the Corporation.

[Signature]
Notary Public
My Commission Expires: 4/30/2012



STATE OF Conn CORPORATE ACKNOWLEDGMENT
COUNTY OF Fairfield, ss: Bridport

I CERTIFY that on Oct 29, 1998, Roy Friedman [name of representative] personally came before me and acknowledged under oath that he or she:

- (a) is the President [title] of Standard Petroleum Corp [name of corporation], the corporation named in the attached instrument,
- (b) he was authorized to execute this instrument on behalf of the corporation and
- (c) he executed the instrument as the act of the corporation.

[Signature]
Notary Public
My Commission Expires: 4/30/2012

Bell Labs

Innovations for Lucent Technologies

Lucent Technologies



**An Analysis of the Radiofrequency Environment in the
Vicinity of a Proposed Personal Communications Services Installation
Site CT-058.1.1: Northeast Utilities Electric Transmission Tower
289 Danbury Road, Wilton, Connecticut**

Prepared by

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

Prepared for

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

February 21, 2000

Table of Contents

Summary	3
1. Introduction	4
2. Technical Data.....	4
3. Environmental Levels of RF Energy.....	4
4. Comparison of Environmental Levels with RF Safety Criteria.....	5
5. Discussion of Safety Criteria.....	5
6. For Further Information	7
7. Conclusion.....	7
8. References	8

**An Analysis of the Radiofrequency Environment in the
Vicinity of a Proposed Personal Communications Services Installation
Site CT-058.1.1: Northeast Utilities Electric Transmission Tower
289 Danbury Road, Wilton, 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 Wilton, CT. The analysis utilizes engineering data provided by AT&T Wireless together with well-established analytical techniques utilized 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 results of this analysis indicate that the 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 transmitters* will be less than 0.03% 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 maximum level of RF energy will also be less than 0.03% 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 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, 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 RF environment associated with this facility 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 a Northeast Utilities electric transmission tower, 289 Danbury Road in Wilton, CT. The PCS antennas will 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*). This is an extremely low power system 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 installation.

3. Environmental Levels of RF Energy

The antennas used for PCS 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. 65¹ 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 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 PCS antennas

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).

at 6 ft above grade will be less than 0.00020 milliwatts per centimeter squared (0.00020 mW/cm^2), and will be less than 0.00025 mW/cm^2 at 16 ft above grade. The latter is 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* [2]).

These power density values 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. 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 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 proposed installation; Table 3 shows federal, state and consensus exposure limits for human exposure to RF energy at PCS frequencies. The FCC MPE limits for PCS range from 1 mW/cm^2 (public exposure) to 5 mW/cm^2 (occupational exposure), while the corresponding maximal power density levels in normally accessible areas around the proposed installation are 0.00020 mW/cm^2 (at 6 ft above grade) and 0.00025 mW/cm^2 (at 16 ft above grade).

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, 1997² 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 antennas, be assured that the actual exposure levels in the vicinity of the Wilton, 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 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 Wilton, CT. The analysis utilizes engineering data provided by AT&T Wireless together with well-established analytical techniques utilized 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 results of this analysis indicate that the 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 transmitters* will be less than 0.03% 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 maximum level of RF energy will also be less than 0.03% of the exposure limits of ANSI, IEEE, NCRP and the limits used by all states that regulate RF exposure.

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.

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

**Table 1: Engineering Specifications for the Proposed PCS System
Wilton, CT**

Site Specifications	AT&T Wireless
maximum ERP [†] per channel	100 watts
actual radiated power per channel	3.7 watts
actual <i>total</i> radiated power per sector	29.6 watts
number of transmit (Tx) antennas	1 per sector*
number of transmit/receive (Tx/Rx) antennas	1 per sector*
maximum number of transmitters	8 per sector
antenna centerline height above grade	98 ft
number of sectors configured	3
antenna manufacturer	EMS Wireless
model number	RR90-17-00DP
gain	16.5 dBi
type	directional
downtilt	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.

* this EMS antenna contains two antenna arrays (one Tx, one Tx/Rx) within a single radome, i.e., there is only one structure present per sector.

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

Provider	Power Density (mW/cm ²)		% of MPEs*	
	6 ft AMGL [†]	16 ft AMGL [†]	6 ft AMGL [†]	16 ft AMGL [†]
AT&T Wireless				
maximum anywhere	< 0.00020	< 0.00025	0.02%	0.03%
at base of structure	< 0.00005	< 0.00007	0.01%	0.01%

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

† AMGL: above mean grade level (or above roof level for rooftop estimates)

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

Organization/Government Agency	Exposure Population	Power Density (mW/cm²)
<i>International Safety Criteria/Recommendations</i>		
International Commission on Non-Ionizing Radiation Protection (1997) (<i>Health Physics</i> 74:4, 494-522. (1998) ¹)	Occupational	4.9
	Public	1.0
National Radiological Protection Board (United Kingdom) (NRPB, 1993)	Occupational	10.0
	Public	10.0
<i>Federal Requirements</i>		
Federal Communications Commission (47 CFR §1.1310)	Occupational	5.0
	Public	1.0
<i>Consensus Standards and Recommendations</i>		
American National Standards Institute (ANSI C95.1 - 1982)	Occupational	5.0
	Public	5.0
Institute of Electrical and Electronics Engineers (ANSI/IEEE C95.1-1999 Edition) ²	Occupational	6.5
	Public	1.3
National Council on Radiation Protection & Measurements (NCRP Report 86, 1986)	Occupational	5.0
	Public	1.0
<i>State Codes</i>		
New Jersey (NJAC 7:28-42)	Public	5.0
Massachusetts (Department of Health 105 CMR 122)	Public	1.0
New York State ³	Public	1.0

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 levels⁴. The methodology described follows that outlined by the Federal Communications Commission (FCC) in their OET Bulletin No. 65⁵.

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:

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

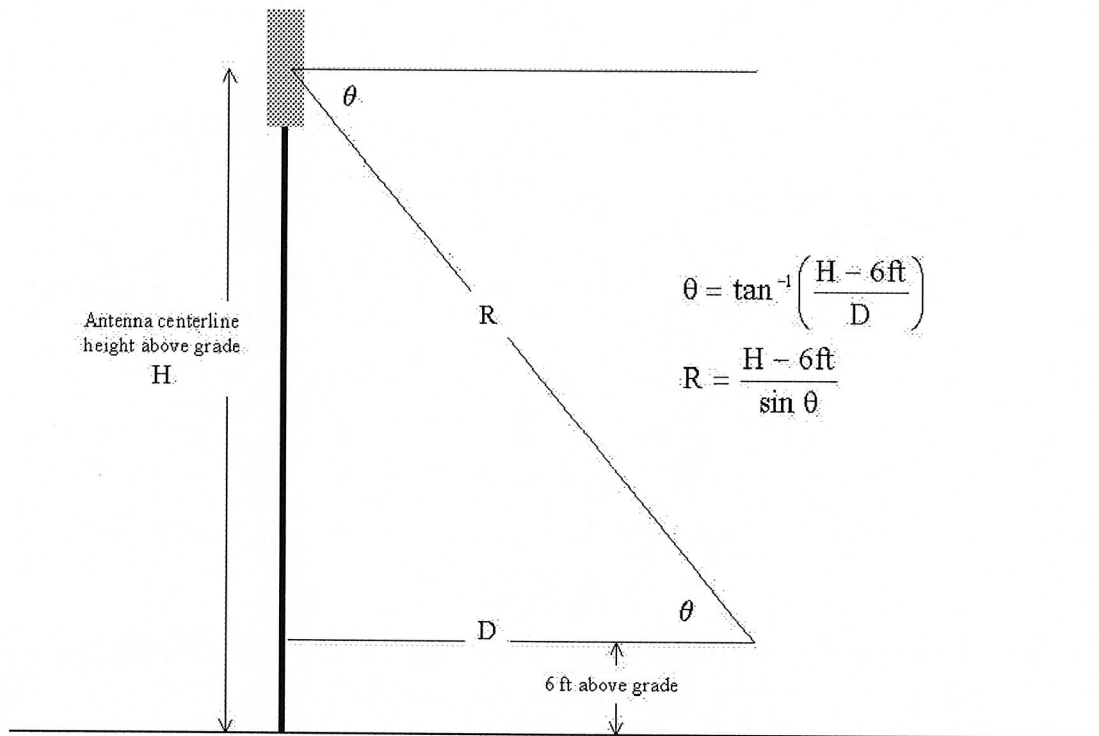
and

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

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

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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).



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 60° below the horizon and is calculated as follows:

$$R = (H-6)/\sin \theta = (98-6)/\sin (60^\circ) = 106.3 \text{ ft}$$

$$G_{60^\circ} = -8.65 \text{ dBd (from antenna elevation gain pattern)}$$

$$P_N = \text{ERP}/G_{\max} = \frac{100}{10^{(14.35\text{dBd}/10)}} = 3.7 \text{ watts per channel}$$

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

$$= 4 \times \frac{8 \text{ ch} \times 3.7 \text{ W} / \text{ch} \times 10^{(-8.65\text{dBd}/10)} \times 1.64}{4 \times 3.14 \times (106.3 \text{ ft} \times 12 \times 2.54)^2}$$

$$S_{\max} = 2.0 \times 10^{-7} \text{ W/cm}^2 = 0.00020 \text{ mW/cm}^2$$

$$\text{AND \% of MPE} = \frac{0.00020 \text{ mW/cm}^2}{1 \text{ mW/cm}^2} \times 100\% = 0.02\%$$

ELECTROMAGNETIC SPECTRUM

