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February 25, 2003

VIA COURIER
Mr. Geoffrey Griffis, Chairman
DC Board of Zoning Adjustment
441 4th Street, NW
Washington, DC 20001

Re: Special Exception Application Number 16988
320 McMillan Drive, NW

Dear Mr. Griffis:

Enclosed herewith please find following items for the above referenced matter.

1. Radio-Frequency Exposure Analysis by Jules Cohen, P.E.
2. Resume of Mr. Jules Cohen
3. Letter of support from ANC 1B

With regard to the first item, please take notice of the statements from Mr. Cohen that the proposed facility is "compliant with the RF exposure standards adapted by the Federal Communications Commission and do not constitute a health hazard". Further, Mr. Cohen provides the analysis to substantiate his statements and conclusions. We expect to have Mr. Cohen testify at the hearing, and be available to explain his analysis and answer questions.

Thank you for your attention in this matter.

Sincerely,

Edward L. Donohue

Edward L. Donohue

Encl.

cc: Jennifer Steingasser, Office of Planning
Karen Thomas, Office of Planning

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Exhibit No. 26

Board of Zoning Adjustment
District of Columbia
CASE NO. 16988
EXHIBIT NO. 26

Jules Cohen, P.E.
Consulting Engineer

ENGINEERING STATEMENT
RADIO-FREQUENCY EXPOSURE ANALYSIS
OCTO PROJECT
MCMILLAN RESERVOIR, WASHINGTON, DC

An analysis has been made of the radio-frequency (RF) exposure in the vicinity of the proposed installation of radio communications facilities to be used by the Fire Department/Emergency Medical System at a tower adjacent to the McMillan Reservoir. This engineering statement describes the results of the analysis and the methodology employed.

The Public Safety Service radio installations, operating on dedicated frequencies, as proposed in the OCTO Project, are environmentally benign. They are compliant with the RF exposure standards adopted by the Federal Communications Commission (AFCC@) and do not constitute a health hazard. They are not a potential source of interference to television or radio broadcast station reception or to electrical or electronic devices. They are neither a noise source nor a generator of traffic, nor do they emit noxious fumes.

In brief, the analysis shows that the RF exposure from the proposed transmissions anywhere in the vicinity of the site will not exceed approximately 0.2 percent of the maximum permissible exposure ("MPE") established by the FCC for uncontrolled (general population) environments.

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One RFS Model 455-7 antenna is to be located on the tower at a level of 180 feet (54.9 meters) above ground. Three additional antennas of the same type are to be located at a level of 100 feet (30.5 meters) above ground. Each of the four antennas will transmit energy from a single transmitter. The effective radiated power per transmitter will be 575.4 watts. The frequency band to be employed is to be from 460.025 to 460.4750 megacycles per second (megahertz, or MHz). In addition, two Andrew Model PL4-107E microwave, dish-type antennas are to be located at a height of 175 feet (53.3 meters) above ground, and two similar antenna are to be located at a height of 165 feet (50.3 meters) above ground level. The power input to each microwave antenna will be approximately eight watts. When that power is multiplied by the gain of the antenna (38 decibels above dipole gain), the maximum effective radiated power is approximately 50,480 watts. The microwave antennas operate in the 11,000 MHz band. Each antenna concentrates the power toward the horizon. By so concentrating power, each antenna substantially reduces power delivered to nearby areas.

Calculations were made for distances starting from the base of the tower and extending for a distance of 2,000 feet. A tabulation of exposure versus distance at six feet above ground for the system is on the following page.

Distance[1] (feet)	Pwr. Density ($\mu W/cm^2$)[2]	% of FCC MPE[3]	Times Below MPE
0	0.985	0.1556	643
50	0.790	0.1243	805
100	0.695	0.0978	1,023
200	0.403	0.0575	1,740
300	0.314	0.0431	2,319
400	0.250	0.0344	2,904
500	0.249	0.0356	2,813
600	0.217	0.0322	3,104
700	0.341	0.0462	2,164
800	0.295	0.0412	2,428
900	0.251	0.0356	2,808
1000	0.219	0.0315	3,172
1500	0.199	0.0285	3,505
2000	0.221	0.0289	3,459

[1] Horizontal distance from tower.

[2] Microwatts (millionths of a watt) per square centimeter.

[3] Maximum permissible exposure.

The power density does not drop off uniformly as the distance increases because the antennas concentrate the energy toward the horizon. At close distances, the amount of signal suppression may counteract the distance factor. At greater distances, the direct ray toward the location of interest more closely approaches the maximum of the antenna pattern. At some distances, the increased transmitted signal strength is a greater factor than the increased distance factor. Beyond 2000 feet, the exposure level declines inversely as the square of the distance because the transmitted signal is at a maximum. That is, if the distance doubles, the power density drops by a factor of four.

Exposure levels were calculated by methods prescribed by the FCC in a technical bulletin produced by the Office of Engineering and Technology. The rules specify different levels of exposure for two environments: (1) Occupational/Controlled and (2) General Population/Uncontrolled. The second category permits the exposure at most frequencies, including those used for the public safety services, to be only one-fifth of the levels permissible for the first category. At 460 MHz, the maximum exposure level permitted is 307 $\mu W/cm^2$ averaged over a period of 30 minutes for the General Population/Uncontrolled environment. At 11,000 MHz, the maximum exposure level permitted is 1,000 $\mu W/cm^2$ averaged over a period of 30 minutes for the General Population/Uncontrolled environment.

In making the foregoing calculations, the assumption was made that all transmitters are operating simultaneously (an unlikely occurrence) and a reflecting surface is causing the exposure to be increased because the reflected signal is arriving in phase with the direct ray. The reflected signal could just as well arrive out of phase and act to reduce the exposure. Furthermore, the assumption was made that no intervening terrain obstructions, foliage or manmade structures reduced received signal strength.

The standard adopted by the FCC follows the maximum exposure limits set by the National Council on Radiation Protection and Measurements (NCRP), with some features taken from Standard C95.1/1992 of the American National Standards Institute/Institute of Electrical and Electronics Engineers. The NCRP is an independent expert group chartered by Congress.

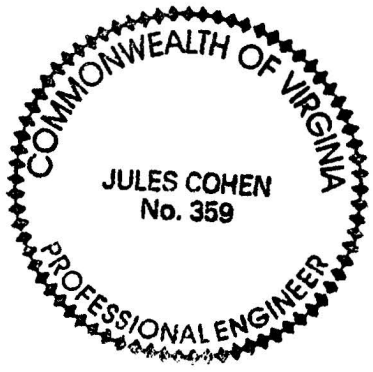
The permissible exposures set, even for the Occupational/Controlled environment, are not at the threshold where biological harm may result. They are based on the scientific, peer-reviewed literature, including a data base of in excess of 10,000 papers, reporting experimental results. Studies show that the most sensitive indicator of a biological effect is behavioral. When animals are trained to do a particular task, their performance of that task is modified when exposure is equal to a level approximately ten times greater than the maximum exposures permitted for the Occupational/Controlled environment and fifty times greater than the exposures permitted for the General Population/Uncontrolled environment.

Behavior modification is not necessarily harmful and disappears when the field is reduced, but the assumption is made that prolonged exposure in excess of the level causing behavioral modification might be harmful.

Continuous exposure at the level cited above is well within the maximum exposure level permitted by the standards. Those standards are premised on avoidance of RF exposure that may have an adverse biological effect.

Jules Cohen, P.E.

February 21, 2003



Jules Cohen, P.E.
Consulting Engineer

PROFESSIONAL BACKGROUND OF JULES COHEN

Jules Cohen received the degree of Bachelor of Science in Electrical Engineering from the University of Washington (Seattle) in 1938. His first professional experience was with consulting engineering firms in the City of Seattle, then with the Bonneville Power Administration, a division of the U.S. Department of the Interior, where he served as a junior engineer and assistant engineer in the substation design section. He was commissioned in the Navy in May of 1942 and served for three and one-half years as a naval officer during World War II. His duties included training at Harvard, at MIT and at the Naval Air Technical Training Center in Corpus Christi. He was a project officer on radar beacons at the Radiation Laboratory at MIT, then at the Bureau of Ships. Under the Commander, Service Forces, Pacific Fleet, he was in responsible charge of the radar beacon program for the Pacific Fleet. His last duty station in the Navy was as Executive Officer of the Electronics Division, Commander Service Forces, Pacific Fleet.

Following release from the Navy, he entered the field of consulting engineering and has been so engaged for 56 years. During 50 of those 56 years, he has been either a sole principal, partner or officer in a consulting engineering firm. He has been licensed to practice as a professional engineer in the District of Columbia since 1952, and has been licensed to practice as a professional engineer in the Commonwealth of Virginia since 1954. During the period of his professional practice, he has provided professional engineering services in the field of broadcasting in particular, and communications in general. During the past 25 years of his practice, an important aspect of his work has been the analysis by calculations and measurements of radio-frequency exposure. On January 1, 1988, he retired from the presidency of Jules Cohen & Associates, P.C., but has continued providing professional consulting services to selected clients.

Over 10,000 projects of varying levels of complexity have been carried out by the engineering firm of which he was a either sole member, partner or officer. Work performed has included radio-frequency propagation studies, interference studies, frequency allocation surveys, radiation hazard evaluations, standard broadcast directional antenna design and adjustment, AM, FM and TV field strength measurements, television picture quality assessment, satellite earth station studies, the planning and placement of cellular and other communications structures, studio and transmitting plant layouts for both radio and television, equipment evaluation, and extensive work involving the engineering aspects of changes in the rules of the Federal Communications Commission (FCC).

He was the author of Appendix C of the 1975 Cable Television Advisory Committee Panel II report to the FCC. That appendix dealt with the problem of echoes in television systems. He is also the author of the section on low power television in the 1986 edition of the McGraw-Hill Encyclopedia of Science and Technology. He was co-author of Section 2.9, Human Exposure to RF Radiation in the Eighth Edition of the National Association of Broadcasters Engineering Handbook. As chairman of the engineering committee concerned with interference to television broadcasting from noncommercial FM stations, he played a major role in the development of the rules adopted by the FCC governing the assignment of FM stations in the frequency band from 88.1 to 91.9 MHz. He represented television broadcast interests as co-chairman of the Technical Analysis Working Group of the Land Mobile Radio/UHF Television Technical Advisory Committee.

From the time of its inception in 1983 to 1996, Jules Cohen represented the members of the Association of Maximum Service Television, Inc. (MSTV) in subcommittees and technical groups of the Advanced Television Systems Committee (ATSC). From 1996 to September 1998, he represented the IEEE on the Executive Committee of the ATSC. He has participated as a member, co-chairman or vice chairman of a number of ATSC Technical Groups. As stated in its Charter, the purpose of the ATSC "[Is]

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to explore the need for and, where appropriate, to coordinate development of voluntary national technical standards for Advanced Television Systems."

His participation in the work of the Advisory Committee on Advanced Television Service (ACATS) began in November 1987, the starting date set by the FCC, and continued until the completion of the Advisory Committee's work in November, 1995. He was a member of Working Parties 1 and 2 of the Systems Subcommittee (SS/WP-1 and 2), and Working Parties 3, 4 and 6 of the Planning Subcommittee (PS/WP-3, 4 and 6). Under SS/WP-2 he chaired the Field Testing Task Force. That Task Force completed field testing of the Grand Alliance Digital Television System in October, 1995. Mr. Cohen had a major role in preparing both the specifications for the field testing and preparation of the report following field testing. Under PS/WP-3, he chaired the Spectrum Analysis Working Group.

Clients have included: all five of the major television networks (ABC. CBS, NBC, Fox and PBS), the National Association of Broadcasters (NAB), MSTV, the Electronic Industry Association, major group owners of radio and television stations, individual radio and television stations, and Cellular System and Personal Communications System providers. He has also provided engineering services to community and citizen groups relative to the placement of broadcast and wireless communications facilities.

For more than twenty-five years, he has worked extensively in the field of nonionizing radiation effects. He has done research in the scientific literature devoted to the subject, participated in the Bioelectromagnetics Society Symposia held yearly from 1979 through 1995, as well as in 1998 through 2001, completed courses in Hazardous Electromagnetic Radiation offered by George Washington University, the Management of Electromagnetic Energy Hazards offered by Cook College, Rutgers University, and Electric and Magnetic Field Health Research: Assessing the Science, offered by the Harvard University School of Public Health, attended meetings of the Electromagnetic Radiation Management Advisory Council, participated in Michaelson Research Conferences in 1994, 1995, 1997, 1998, 1999, 2000 and 2001, moderated panels on the Biological Effects of Nonionizing Radiation at the 1979, 1983 and 1988 annual conventions of the NAB, delivered invited papers on the Biological Effects of Nonionizing Radiation in the 1979, 1984 and 1993 meetings of the Broadcast Technology Society of the IEEE, and, by invitation, provided a critique of the first and second 1979 drafts and the 1985 draft of a RF/Microwave Criteria document of the National Institute for Occupational Safety and Health (NIOSH).

He was a member of American National Standards Institute (ANSI) Committee C95 that developed the 1982 ANSI Standard C95.1-1982 Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 300 kHz to 100 GHz. He is a member of the IEEE International Committee on Electromagnetic Safety (known also as SCC 28) and Subcommittee IV, which completed a revision to ANSI Standard C95.1-1982, now identified as IEEE C95.1-1999. Subcommittee IV is continuing evaluation of scientific literature for possible further updating of the standard. He is a member of SCC 28 Subcommittee I that developed IEEE Standard C95.3-1991, IEEE Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields – RF and Microwave. (That standard is also in the process of revision.) He is a member of the IEEE Committee on Man and Radiation (COMAR). He is also a member of Committee 89-2 of the National Council on Radiation Protection and Measurements (NCRP). Committee 89-2 has prepared Report No. 119 A Practical Guide to the Determination of Human Exposure to Radiofrequency Fields. Under contract to the NAB, he prepared a suggested revision to FCC OST Bulletin No. 65, taking into account the ANSI/IEEE 1992 exposure guide.

He has made RF exposure measurements at both the World Trade Center and Empire State Building in New York City and at the John Hancock Building in Chicago. Over the past twenty years, he has also made RF exposure measurements at numerous locations on behalf of broadcast station licensees, cell phone operators, and a satellite station operator.

He has been qualified as an expert witness in Federal Courts, other courts, local boards and councils, and in hearings before the FCC and FAA. Most recently, his expert testimony was accepted in the United States District Court for the Southern District of Florida in the matter of CBS, Inc. *et al* v. PrimeTime 24 Joint Venture, C.A. No. 96-3650-CIV-Nesbitt.

He is a member of Tau Beta Pi, engineering scholastic honorary, a member of the National Society of Professional Engineers, a Life Member of the American Association for the Advancement of Science (AAAS), a Life Fellow of the Institute of Electrical and Electronics Engineers (IEEE), a Life Fellow of the Society of Motion Picture and Television Engineers (SMPTE), a charter member of the Bioelectromagnetics Society, a past president of the Association of Federal Communications Engineers and former chairman of that association's Radiation Hazard Subcommittee. He was selected for the 1988 NAB Engineering Achievement Award, a 1990 Achievement Award of the Broadcast Pioneers Washington, DC chapter and a 1999 award from the IEEE Broadcast Technology Society for a lifetime of service to the broadcasting industry and to the Society. During the year 2000 convention of the NAB, he received a further award from the NAB engineers for his over fifty years of service to the broadcast community and a Pioneers award from the Broadcasters' Foundation.

February 25, 2003

ADVISORY NEIGHBORHOOD COMMISSION 1B
GOVERNMENT OF THE DISTRICT OF COLUMBIA
COLUMBIA HEIGHTS / LEDROIT PARK / SHAW / UNIVERSITY HEIGHTS

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1B02 Philip C. Spalding
1B03 Catherine Hammonds
1B04 Deborah R. Thomas
1B05 Jarvis Houston
1B06 Theodore "Ted" Butler
1B07 Sertira "Cookie" A. Wilson
1B08 Charles E. Glover
1B09 Sinclair "Nupe" Skinner
1B10 Kelvin P. Esters
1B11 Arabella F. Littlepage

7 February 2003

Geoffrey Griffis, Chairperson
Board of Zoning Adjustment
Office of Zoning
441 4th Street, NW, Suite 210
Washington, DC 20001

RE: **320 McMillan Drive, NW (Parcel 108/6)**
BZA Application No. 16988

Dear Mr. Griffis:

At the regularly scheduled meeting of ANC1B (notice of which was properly given) on February 6, 2003, at which a quorum of nine of eleven members voted, ANC1B voted unanimously (9-0-0) to support the application of the Government of the District of Columbia, Office of the Chief Technology Officer, pursuant to 11 DCMR #3104.1, for special exception to replace an existing telecommunications tower and poles with one lattice tower and equipment shelter as part of the District's emergency communications network under Section 212 (Section 2520) in the R-5-B District at premises 320 McMillan Drive, NW (Parcel 108/6). Commissioner questions regarding the public safety of microwave installations were allayed by Lavelle Saunders of the Chief Technology Officer's Office.

Understanding the importance of this system to the public's welfare, ANC1B requests that the Board of Zoning Adjustment act on this request expeditiously.

Sincerely,

Deborah R. Thomas, Chairperson

Philip C. Spalding, Secretary

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Case No. 16988
Exhibit No. 26-C