

MINOR CHANGE APPLICATION
NEW AUXILIARY FM ANTENNA
CUMULUS LICENSING LLC
WNNK-FM RADIO STATION
CH 281B - 104.1 MHZ - 0.55 KW
HARRISBURG, PENNSYLVANIA
July 2005

EXHIBIT B

Radio Frequency Assessment

This study has been made to determine whether this proposal is in compliance with 47 C.F.R. §1.1307 of the Commission's rules and with OET Bulletin #65, dated August 1997 ("Bulletin"), regarding human exposure to radio frequency radiation in the vicinity of broadcast towers. This study considers all nearby stations, specifically the WNNK-FM main antenna system³, nearby FM stations WRBT and W259AU and TV stations WHTM-TV and WHTM-DT⁴, and utilizes the appropriate formulas contained in the Bulletin.⁵

The WNNK-FM auxiliary antenna system is mounted with its center of radiation 39.6 meters (130.0 feet) above the ground at the existing tower location and will operate with an effective radiated power of 0.55 kilowatt in the horizontal and vertical planes (circularly polarized). The proposed WNNK-FM antenna is a Dielectric HDCRM⁶, two bay full wavelength (FCC/EPA Type #7). At two meters, the height of an average person, above the ground at the

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- 3) As the proposed WNNK-FM auxiliary will be used for digital and, if needed, analog operation, the contribution of both the main and auxiliary antennas are considered.
 - 4) WRBT, W259AU, WHTM-TV and WHTM-DT are located on a tower approximately 76 meters from the WNNK-FM site. These facilities will be considered co-located with WNNK-FM, with the exception of WRBT, whose contribution will be calculated based on being removed 76 meters from the WNNK-FM site.
 - 5) The FM Model program was used to calculate the FM stations' contributions. The EPA single bay dipole was used unless otherwise stated.
 - 6) This antenna is similar to the DCRM series.

base of the tower, the WNNK-FM auxiliary antenna system will contribute 0.0045 mw.⁷ Based on exposure limitations for a controlled environment, 05% of the allowable ANSI limit is reached at two meters above the ground at the base of the tower. For uncontrolled environments, 2.3% of the ANSI limit is reached at two meters above the ground at the base of the tower.

The WNNK-FM main antenna system is mounted with its center of radiation 41.0 meters (135.0 feet) above the ground at the existing tower location and operates with an effective radiated power of 22.5 kilowatts in the horizontal and vertical planes (circularly polarized). The WNNK-FM main antenna is a Dielectric DCRM, two bay full wavelength (FCC/EPA Type #7). At two meters, the height of an average person, above the ground at the base of the tower, the WNNK-FM main antenna system will contribute 0.1726 mw.⁸ Based on exposure limitations for a controlled environment, 17.3% of the allowable ANSI limit is reached at two meters above the ground at the base of the proposed tower. For uncontrolled environments, 86.3% of the ANSI limit is reached at two meters above the ground at the base of the tower.

The WRBT main antenna system is mounted with its center of radiation 41.0 meters (135.0 feet) above the ground at the existing tower, located 76 meters from the WNNK-FM site, and operates with an effective radiated power of 25.0 kilowatts in the horizontal and vertical planes (circularly polarized). The WRBT antenna is a Shively Labs 6810 four bay (FCC/EPA Type #6). At two meters, the height of an average person, above the ground at the base of

7) This level of field occurs at 23 meters out from the base of the tower and is considered worst case.

8) This level of field occurs at 24 meters out from the base of the tower and is considered worst case.

WNNK-FM tower, the WRBT main antenna system will contribute 0.0028 mw. Based on exposure limitations for a controlled environment, 0.3% of the allowable ANSI limit is reached at two meters above the ground at the base of the WNNK-FM tower. For uncontrolled environments, 1.4% of the ANSI limit is reached at two meters above the ground at the base of the WNNK-FM tower.

The authorized W259AU antenna system is to be mounted with its center of radiation 130.0 meters (426.5 feet) above the ground at the existing tower location and will operate with an effective radiated power of 0.01 kilowatts in the horizontal and vertical planes (circularly polarized). At two meters, the height of an average person, above the ground at the base of the tower, the W259AU main antenna system will contribute 0.00002 mw⁹. Based on exposure limitations for a controlled environment, <0.1% of the allowable ANSI limit is reached at two meters above the ground at the base of the tower. For uncontrolled environments, <0.1% of the ANSI limit is reached at two meters above the ground at the base of the tower.

The authorized WHTM-DT Channel 10 antenna system is mounted with its center of radiation 140.2 meters (460.0 feet) above the ground at the existing tower location and operates with an effective radiated power of 16.2 kilowatts in the horizontal plane. As denoted in OET Bulletin #65, Supplement A, Page 29, the typical VHF antenna system has a downward radiation field of 0.2. As such, the WHTM-DT antenna system radio frequency radiation calculations were made based on an effective radiated power of 0.648 kilowatts. At two meters, the height of an

9) This level of field occurs at 35 meters out from the base of the tower and is considered worst case.

average person, above the ground at the base of the tower, the WHTM-DT antenna system contributes 0.0005 mw. Based on exposure limitations for a controlled environment, <0.1% of the allowable ANSI limit is reached at two meters above the ground at the base of the tower. For uncontrolled environments, 0.2% of the ANSI limit is reached at two meters above the ground at the base of the tower.

The authorized WHTM-TV Channel 27 antenna system will be mounted with its center of radiation 176.0 meters (577.4 feet) above the ground at the existing tower location and operates with an effective radiated power of 2,140 kilowatts in the horizontal plane. As denoted in OET Bulletin #65, Supplement A, Page 31, the typical UHF antenna system has a downward radiation field of 0.1. As such, the WHTM-TV antenna system radio frequency radiation calculations were made based on an effective radiated power of 21.4 kilowatts. At two meters, the height of an average person, above the ground at the base of the tower, the WHTM-TV antenna system will contribute 0.0146 mw. Based on exposure limitations for a controlled environment, 0.8% of the allowable ANSI limit is reached at two meters above the ground at the base of the tower. For uncontrolled environments, 4.0% of the ANSI limit is reached at two meters above the ground at the base of the tower.

Combining the contributions of WNNK-FM (auxiliary), WNNK-FM (main), WRBT, W259AU, WHTM-DT and WHTM-TV, a total of <96.1% is reached at two meters above the

ground at the base of the WNNK-FM tower.¹⁰ Since this level for uncontrolled environments is well below the 100% limit defined by the Commission, the proposed WNNK-FM auxiliary facility is believed to be in compliance with the radio frequency radiation exposure limits as is required by the Federal Communications Commission. Further, Cumulus has posted warning signs in the vicinity of the tower warning of potential radio frequency radiation hazards at the site. In addition, Cumulus will reduce the power of the proposed facility or cease operation, in cooperation and coordination with other tower users, as necessary, to protect persons having access to the site, tower or antenna from radio frequency radiation in excess of FCC guidelines.

10) In addition to calculations at the base of the WNNK-FM tower, calculations were also made on a direct line toward the WRBT tower at 24 meters out and 58 meters out. These points represent the highest fields of the WNNK-FM main antenna and the WRBT antenna respectively. At these points, the contributions of the high power FM's were determined (at the WNNK-FM maximum point, WRBT's contribution was calculated and the WRBT maximum point, the WNNK-FM contribution was calculated). All other contributors were considered at worst case values. At both additional points, the uncontrolled contribution of all contributors was 99.51% at 24 meters away. The contribution of WRBT at that point is 6.7%; at 58 meters the contribution was 50.31%. The contribution of WNNK-FM at that point was 3.5%. As such, there is no point around the WNNK-FM site which exceeds the uncontrolled exposure limit.