

**APPLICATION FOR STATION LICENSE**  
**CUMULUS LICENSING LLC**  
**KUSB RADIO STATION**  
**CH 277C1 - 103.3 MHZ - 100.0 KW**  
**HAZELTON, NORTH DAKOTA**  
**September 2006**

**EXHIBIT C**

**Radio Frequency Assessment**

As a result of changing the number of bays to be used by KUSB, an updated radio frequency radiation study has been conducted. As KUSB is co-located with FM stations KBYZ, KKCT and KACL and is located within 315.0 meters of several TV stations, the use of the worksheets to demonstrate compliance with the radio frequency radiation rules is not possible. Therefore, this study has been made to show 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 co-located KBYZ,<sup>1</sup> KKCT, KACL, KVLQ, an outstanding permit for a New FM station at Cannon Ball, North Dakota ("Cannon Ball"), as well as an outstanding permit for another New FM station at Flasher, North Dakota (Flasher") and TV stations KNDX, K64GN and K44HU, and utilizes the appropriate formulas contained in the Bulletin.<sup>2</sup>

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- 1) KUSB and KBYZ share an antenna system. As such, the KBYZ contribution is based on the use of the shared antenna. A license modification for KBYZ is being submitted by Cumulus, the licensee of KBYZ.
  - 2) The FM Model program was used to calculate the FM stations' contributions. The EPA single bay dipole was used unless otherwise noted. Any broadcast facility within 315.0 meters of the proposed site is considered a contributor and, further, will be considered co-located for the purposes of this instant review.

The KUSB antenna system is mounted with its center of radiation 198.6 meters (651.5 feet) above the ground at the existing tower location and will operate with an effective radiated power of 100.0 kilowatts in the horizontal and vertical planes (circularly polarized). The KUSB antenna is a Dielectric DCRM, ten bay, 0.75 wavelength spaced system, (FCC/EPA Type #7). At 2.0 meters, the height of an average person above the ground at the base of the tower, the KUSB antenna system will contribute  $0.0004 \text{ mw/cm}^2$ .<sup>3</sup> Based on exposure limitations for a controlled environment, <0.1% of the allowable ANSI limit is reached at 2.0 meters above the ground at the base of the tower. For uncontrolled environments, 0.2% of the ANSI limit is reached at 2.0 meters above the ground at the base of the tower.

The operating KBYZ antenna system is mounted with its center of radiation 198.7 meters (651.8 feet) above the ground at the existing tower location and operates with an effective radiated power of 100.0 kilowatts in the horizontal and vertical planes (circularly polarized). The KBYZ antenna is a Dielectric DCRM ten bay, 0.75 wavelength spaced system (FCC/EPA Type #7). At 2.0 meters, the height of an average person above the ground at the base of the tower, the KBYZ antenna system contributes  $0.0004 \text{ mw/cm}^2$ .<sup>4</sup> Based on exposure limitations for a controlled environment, <0.1% of the allowable ANSI limit is reached at 2.0 meters above the ground at the base of the tower. For uncontrolled environments, 0.2% of the ANSI limit is reached at 2.0 meters above the ground at the base of the tower.

The KACL ten bay antenna system is mounted with its center of radiation 160.3 meters (525.8 feet) above the ground at the existing tower location and operates with an effective

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3) This level of field occurs at 182.0 meters out from the base of the tower and is considered worst case.

4) This level of field occurs at 182.0 meters out from the base of the tower and is considered worst case.

radiated power of 100.0 kilowatts in the horizontal and vertical planes (circularly polarized). The KACL antenna is an Electronics Research, Inc., rototiller style system (FCC/EPA Type #3). At 2.0 meters, the height of an average person above the ground at the base of the tower, the KACL antenna system contributes  $0.0137 \text{ mw/cm}^2$ .<sup>5</sup> Based on exposure limitations for a controlled environment, 1.4% of the allowable ANSI limit is reached at 2.0 meters above the ground at the base of the tower. For uncontrolled environments, 6.9% of the ANSI limit is reached at 2.0 meters above the ground at the base of the tower.

The KKCT ten bay antenna system is mounted with its center of radiation 160.3 meters (525.8 feet) above the ground at the existing tower location and operates with an effective radiated power of 100.0 kilowatts in the horizontal and vertical planes (circularly polarized). The KKCT antenna is an Electronics Research, Inc., rototiller style system, (FCC/EPA Type #3). At 2.0 meters, the height of an average person above the ground at the base of the tower, the KKCT antenna system contributes  $0.0137 \text{ mw/cm}^2$ .<sup>6</sup> Based on exposure limitations for a controlled environment, 1.4% of the allowable ANSI limit is reached at 2.0 meters above the ground at the base of the tower. For uncontrolled environments, 6.9% of the ANSI limit is reached at 2.0 meters above the ground at the base of the tower.

The authorized KVLQ antenna system is mounted with its center of radiation 118.0 meters (387.2 feet) above the ground at the existing tower location and operates with an effective radiated power of 0.95 kilowatt in the horizontal and vertical planes (circularly polarized). The

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5) This level of field occurs at 39.0 meters out from the base of the tower and is considered worst case.

6) This level of field occurs at 39.0 meters out from the base of the tower and is considered worst case.

KVLQ antenna is an Electronics Research, Inc., rototiller type system (FCC/EPA Type #3). At 2.0 meters, the height of an average person above the ground at the base of the tower, the KVLQ antenna system contributes 0.0010 mw/cm<sup>2</sup>.<sup>7</sup> Based on exposure limitations for a controlled environment, 0.1% of the allowable ANSI limit is reached at 2.0 meters above the ground at the base of the tower. For uncontrolled environments, 0.5% of the ANSI limit is reached at 2.0 meters above the ground at the base of the tower.

The authorized Cannon Ball New FM antenna system will be mounted with its center of radiation 175.0 meters (574.1 feet) above the ground at the existing tower location and will operate with an effective radiated power of 100.0 kilowatts in the horizontal and vertical planes (circularly polarized). The proposed Cannon Ball antenna is a twelve bay, 0.9 wavelength spaced Jampro Double V style (FCC/EPA Type #2).<sup>8</sup> At 2.0 meters, the height of an average person above the ground at the base of the tower, the Cannon Ball antenna system will contribute 0.0012 mw/cm<sup>2</sup>.<sup>9</sup> Based on exposure limitations for a controlled environment, 0.1% of the allowable ANSI limit is reached at 2.0 meters above the ground at the base of the tower. For uncontrolled environments, 0.6% of the ANSI limit is reached at 2.0 meters above the ground at the base of the tower.

The authorized Flasher New FM antenna system will be mounted with its center of radiation 179.0 meters (587.3 feet) above the ground at the existing tower location and will operate with an effective radiated power of 100.0 kilowatts in the horizontal and vertical planes

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- 7) This level of field occurs at 116.0 meters out from the base of the tower and is considered worst case.
  - 8) Based on the information contained in the Cannon Ball application for permit, BNPH-20060309ABC.
  - 9) This level of field occurs at 41.0 meters out from the base of the tower and is considered worst case.

(circularly polarized). The proposed Flasher antenna is a ten bay, half wavelength, Electronics Research, Inc. rototiller style (FCC/EPA Type #3).<sup>10</sup> At 2.0 meters, the height of an average person above the ground at the base of the tower, the Flasher antenna system will contribute 0.00073 mw/cm<sup>2</sup>.<sup>11</sup> Based on exposure limitations for a controlled environment, <0.1% of the allowable ANSI limit is reached at 2.0 meters above the ground at the base of the tower. For uncontrolled environments, 0.4% of the ANSI limit is reached at 2.0 meters above the ground at the base of the tower.

The authorized KNDX Channel 26+ antenna system is mounted with its center of radiation 202.0 meters (662.7 feet) above the ground at the existing tower location and operates with an effective radiated power of 741.0 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 KNDX antenna system radio frequency radiation calculations were made based on an effective radiated power of 7.41 kilowatts. At 2.0 meters, the height of an average person, above the ground at the base of the tower, the KNDX antenna system contributes 0.0038 mw/cm<sup>2</sup>. Based on exposure limitations for a controlled environment, 0.2% of the allowable ANSI limit is reached at 2.0 meters above the ground at the base of the tower. For uncontrolled environments, 1.1% of the ANSI limit is reached at 2.0 meters above the ground at the base of the tower.

The authorized K64GN Channel 64Z antenna system is mounted with its center of radiation 180.0 meters (590.6 feet) above the ground at the existing tower location and operates

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10) Based on the information contained in the Flasher application for permit, BNPH-20060309ADX.

11) This level of field occurs at 309 meters out from the base of the tower and is considered worst case.

with an effective radiated power of 100.0 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 K64GN antenna system radio frequency radiation calculations were made based on an effective radiated power of 1.0 kilowatts. At 2.0 meters, the height of an average person above the ground at the base of the tower, the K64GN antenna system contributes 0.0007 mw/cm<sup>2</sup>. Based on exposure limitations for a controlled environment, <0.1% of the allowable ANSI limit is reached at 2.0 meters above the ground at the base of the tower. For uncontrolled environments, 0.1% of the ANSI limit is reached at 2.0 meters above the ground at the base of the tower.

The authorized K44HU Channel 44+ antenna system is mounted with its center of radiation 177.0 meters (580.7 feet) above the ground at the existing tower location and operates with an effective radiated power of 20.0 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 K44HU antenna system radio frequency radiation calculations were made based on an effective radiated power of 0.2 kilowatt. At 2.0 meters, the height of an average person above the ground at the base of the tower, the K44HU antenna system contributes 0.0001 mw/cm<sup>2</sup>. Based on exposure limitations for a controlled environment, <0.1% of the allowable ANSI limit is reached at 2.0 meters above the ground at the base of the tower. For uncontrolled environments, <0.1% of the ANSI limit is reached at 2.0 meters above the ground at the base of the tower.

Combining the contributions of KUSB, KBYZ, KKCT, KACL, KVLQ, Cannon Ball, Flasher, KNDX, K64GN and K44HU, a total of less than 17.0% of the uncontrolled environment limit is reached at 2.0 meters above ground at the base of the tower. Since this level for uncontrolled environments is well below the 100% limit defined by the Commission, the KUSB 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 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.