

MINOR CHANGE APPLICATION
RAPID BROADCASTING COMPANY
KNBN DTV STATION
CH 21 - 512-518 MHZ - 50.0 KW
RAPID CITY, SOUTH DAKOTA
February 2008

EXHIBIT C

Radio Frequency Assessment

A 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 utilizes the appropriate formulas contained in the OET Bulletin and considers all nearby facilities; specifically FM stations KLMP-FM1, KXMZ, KSLT-FM1, KTPT-FM1, KRKI-FM1, and KPMH-FM1 and TV stations KWBH-LP and KKRA-LP.

The KNBN DTV Channel 21 antenna system is/will be mounted with its center of radiation 155.0 meters (508.5 feet) above the ground at the tower location and will operate with an effective radiated power of 50.0 kilowatts in the horizontal plane and 7.6 kilowatts in the vertical plane (elliptically polarized). 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 KNBN DTV antenna system radio frequency radiation calculations were made based on an effective radiated power of 0.576 kilowatt. At 2.0 meters above the ground at the base of the tower, the height of an average person, the KNBN DTV antenna system will contribute 0.0003 mw/cm^2 . 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 KWBH-LP Channel 27 antenna system is mounted with its center of radiation 75.3 meters (247.0 feet) above the ground at the tower location and operates with an effective radiated power of 57.6 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 KWBH-LP antenna system radio frequency radiation calculations were made based on an effective radiated power of 0.576 kilowatt. At 2.0 meters above the ground at the base of the tower, the height of an average person, the KWBH-LP antenna system contributes 0.0022 mw/cm². 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 KKRA-LP Channel 24 antenna system is mounted with its center of radiation 75.3 meters (247.0 feet) above the ground at the tower location and operates with an effective radiated power of 11.8 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 KKRA-LP antenna system radio frequency radiation calculations were made based on an effective radiated power of 0.118 kilowatt. At 2.0 meters above the ground at the

base of the tower, the height of an average person, the KKRA-LP antenna system contributes 0.0005 mw/cm². 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 KLMP-FM1 antenna system is mounted with its center of radiation 52.0 meters (170.6 feet) above the ground at the existing tower location and operates with an effective radiated power of 2.3 kilowatts in the horizontal and vertical planes (circularly polarized). At 2.0 meters above the ground at the base of the tower, the height of an average person, the KLMP-FM1 antenna system contributes 0.0370 mw/cm².¹ Based on exposure limitations for a controlled environment, 3.7% of the allowable ANSI limit is reached at 2.0 meters above the ground at the base of the tower. For uncontrolled environments, 18.5% of the ANSI limit is reached at 2.0 meters above the ground at the base of the tower.

The authorized KXMZ antenna system will be mounted with its center of radiation 80.0 meters (262.5 feet) above the ground at the existing tower location and operates with an effective radiated power of 50.0 kilowatts in the horizontal and vertical planes (circularly polarized). The KXMZ antenna will be a four bay, full wavelength spaced Shively 6810 system (FCC/EPA Type #6), based on data submitted with the stations application for construction permit. At 2.0 meters above the ground at the base of the tower, the height of an average person, the KXMZ antenna

1) This level of field occurs at 14.0 meters out from the base of the tower and is considered worst case.

system will contribute 0.0403 mw/cm^2 .² Based on exposure limitations for a controlled environment, 4.0% of the allowable ANSI limit is reached at 2.0 meters above the ground at the base of the tower. For uncontrolled environments, 20.2% of the ANSI limit is reached at 2.0 meters above the ground at the base of the tower.

The authorized KSLT-FM1 antenna system will be mounted with its center of radiation 52.0 meters (170.6 feet) above the ground at the existing tower location and will operate with an effective radiated power of 2.4 kilowatts in the horizontal and vertical planes (circularly polarized). At 2.0 meters above the ground at the base of the tower, the height of an average person, the KSLT-FM1 antenna system will contribute 0.0386 mw/cm^2 .³ Based on exposure limitations for a controlled environment, 3.9% of the allowable ANSI limit is reached at 2.0 meters above the ground at the base of the tower. For uncontrolled environments, 19.3% of the ANSI limit is reached at 2.0 meters above the ground at the base of the tower.

The authorized KTPT-FM1 antenna system is mounted with its center of radiation 52.0 meters (170.6 feet) above the ground at the existing tower location and will operate with an effective radiated power of 2.4 kilowatts in the horizontal and vertical planes (circularly polarized). At 2.0 meters above the ground at the base of the tower, the height of an average person, the KTPT-FM1 antenna system will contribute 0.0370 mw/cm^2 .⁴ Based on exposure

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- 2) This level of field occurs at 35.0 meters out from the base of the tower and is considered worst case.
 - 3) This level of field occurs at 14.0 meters out from the base of the tower and is considered worst case.
 - 4) See Footnote 1, *supra*.

limitations for a controlled environment, 3.9% of the allowable ANSI limit is reached at 2.0 meters above the ground at the base of the tower. For uncontrolled environments, 19.3% of the ANSI limit is reached at 2.0 meters above the ground at the base of the tower.

The authorized KRKI-FM1 antenna system is to be mounted with its center of radiation 30.0 meters (98.4 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 KRKI-FM1 antenna will be a two bay, half wavelength spaced (FCC/EPA Type #1), based on data contained in the application for permit. At 2.0 meters above the ground at the base of the tower, the height of an average person, the KRKI-FM1 antenna system will contribute 0.0056 mw/cm^2 .⁵ Based on exposure limitations for a controlled environment, 0.6% of the allowable ANSI limit is reached at 2.0 meters above the ground at the base of the tower. For uncontrolled environments, 2.8% of the ANSI limit is reached at 2.0 meters above the ground at the base of the tower.

The authorized KFMH-FM1 antenna system is to be mounted with its center of radiation 24.0 meters (78.7 feet) above the ground at the existing tower location and will operate with an effective radiated power of 1.0 kilowatt in the horizontal and vertical planes (circularly polarized). The KFMH-FM1 antenna will be a two bay, half wavelength spaced (FCC/EPA Type #1), based on data contained in the application for permit. At 2.0 meters above the ground at the base of the tower, the height of an average person, the KFMH-FM1 antenna system will

5) This level of field occurs at 44.0 meters out from the base of the tower and is considered worst case.

contribute 0.0164 mw/cm^2 .⁶ Based on exposure limitations for a controlled environment, 1.6% of the allowable ANSI limit is reached at 2.0 meters above the ground at the base of the tower. For uncontrolled environments, 8.2% of the ANSI limit is reached at 2.0 meters above the ground at the base of the tower.

Combining the contributions of KNBN DTV, KLMP-FM1, KXMZ, KSLT-FM1, KTPT-FM1, KRKI-FM1, KPMH-FM1, KWBH-LP, and KKRA-LP, a total of 89.1% of the limit for uncontrolled environments is reached at 2.0 meters above the ground at the base of the tower.

Since this level for uncontrolled environments is less below the 100% limit, the proposed KNBN DTV facility is believed to be in compliance with the radio frequency radiation exposure limits, as required by the Federal Communications Commission. Further, RBC will post warning signs in the vicinity of the tower warning of potential radio frequency radiation hazards at the site. In addition, RBC 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.

6) This level of field occurs at 35.0 meters out from the base of the tower and is considered worst case.