

ENGINEERING STATEMENT
prepared for
North Country Broadcasting
KCRK-FM Facility ID 49196 Colville, WA

This engineering statement has been prepared on behalf of *North Country Broadcasting* (“*NCB*”), licensee of FM station KCRK-FM, Colville, WA. *NCB* has an application pending before the FCC (BMPH-20041012AAJ) to make a minor modification to the existing KCRK-FM Construction Permit (“CP”, BPH-20020709ABA). The CP authorizes a new transmitting site for KCRK-FM, and the pending application seeks to make a change in the authorized site location. This statement has been prepared on behalf of *NCB* to demonstrate compliance with the FCC’s requirements regarding human exposure to radiofrequency (“RF”) electromagnetic field. As described below, it is believed that the proposed KCRK-FM operation will comply with the current provisions of §1.1307(b) of the Commission’s rules.

The pending application (BMPH-20041012AAJ) proposes operation with the parameters listed below.

| | |
|---------------------------------|--|
| Site Coordinates: | N-Lat 48° 34' 30" |
| (NAD-27) | W-Lon 117° 55' 00" |
| Channel: | 221A (92.1 MHz) |
| Effective Radiated Power: | 5.4 kW Horizontal polarization 5.4 kW Vertical polarization |
| Antenna Radiation Center Height | |
| Above ground: | 24 m |
| Above mean sea level: | 881 m |
| Above average terrain: | 105 m |
| Antenna: | Non-directional |

Human Exposure to Radiofrequency Electromagnetic Field

The proposed KCRK-FM operation was evaluated for human exposure to radiofrequency energy using the procedures outlined in the Commission’s OET Bulletin No. 65 (“OET 65”). OET 65 describes a means of determining whether a proposed facility exceeds the radiofrequency exposure guidelines adopted in §1.1310. Under present Commission policy, a facility may be presumed to comply with the limits specified in §1.1310 if it satisfies the exposure criteria set forth

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in OET 65. Based upon that methodology, and as demonstrated in the following, the proposed transmitting system will comply with the cited adopted guidelines.

It is proposed to install the KCRK-FM antenna such that its center of radiation is 24 meters above ground level. An effective radiated power (“ERP”) of 5.4 kilowatts, circularly polarized, will be employed. The proposed antenna is a Jampro model JLPC-3 (3 bays, one-wavelength spacing). According to elevation pattern data provided by the antenna manufacturer (see **Figure 1** and **Table 1**), the antenna has a relative field 35 percent or less from 20 to 90 degrees below the horizontal plane (*i.e.*, below the antenna). Thus, a value of 35 percent relative field is used for this calculation. The “uncontrolled/general population” maximum permissible exposure (“MPE”) limit specified in §1.1310 for the FM radio band is 200 $\mu\text{W}/\text{cm}^2$.

Calculations were made per OET 65 to predict power density attributable to the proposed facility at a point two meters above ground level at the base of the tower structure. The formula used for calculating FM signal density in this analysis is essentially the same as equation (9) in OET 65.

$$S = (33.4098) (F^2) (ERP) / D^2$$

Where:

| | | |
|-------|---|---|
| S | = | power density in microwatts/cm ² |
| ERP | = | total (average) ERP in Watts |
| F | = | relative field factor |
| D | = | distance in meters |

Using this formula and the assumptions described above, the proposed KCRK-FM facility would contribute a power density of 91.3 $\mu\text{W}/\text{cm}^2$ at two meters above ground level near the antenna support structure, or 45.7 percent of the general population/uncontrolled limit. Lower levels are expected at ground level locations away from the base of the tower due to the increasing distance from the transmitting antenna.

According to the Commission’s database, the only other non-excluded emitter at or near this site is that of a pending application for television translator K09UP (Channel 9, Colville, WA, BPTTV-20040909AAI). K09UP proposes to employ the same antenna structure as KCRK-FM.

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According to the K09UP application (contained within the Commission's CDBS), K09UP would employ an ERP of 1.25 kilowatts, horizontally polarized, with an antenna radiation center 21.3 meters above ground level. K09UP's proposed antenna will have a relative field of less than 70 percent at downward elevations towards nearby ground locations. Using formula 2 from OET 65, Supplement A, (assuming typical 10 percent aural carrier level) calculations show that K09UP would contribute a power density of $27.5 \mu\text{W}/\text{cm}^2$ at two meters above ground level near the tower base, which is 13.7 percent of the $200 \mu\text{W}/\text{cm}^2$ uncontrolled/general population for Channel 9 (frequency band 186-192 MHz). No other authorized or proposed facilities are located close enough to the proposed KCRK-FM site to contribute significantly to the RF exposure limit.

Summing the individual contributions to RF exposure from the proposed KCRK-FM and K09UP facilities, the total level of RF electromagnetic field is 59.4 percent of the uncontrolled / general population MPE limit at two meters above ground level near the base of the antenna structure.

Safety of Tower Workers and the General Public

As demonstrated herein, excessive levels of RF energy will not be caused at publicly accessible areas at ground level near the antenna supporting structure. Consequently, members of the general public will not be exposed to RF levels in excess of the Commission's guidelines. Nevertheless, tower access will continue to be restricted and controlled through the use of a locked fence. Additionally, appropriate RF exposure warning signs will continue to be posted.

With respect to worker safety, it is believed that based on the preceding analysis, excessive exposure would not occur in areas at ground level. A site exposure policy will continue to be employed protecting maintenance workers from excessive exposure when work must be performed on the tower in areas where high RF levels may be present. Such protective measures may include, but will not be limited to, restriction of access to areas where levels in excess of the guidelines may be expected, power reduction, or the complete shutdown of facilities when work or inspections must be performed in areas where the exposure guidelines will be exceeded. On-site RF exposure

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measurements may also be undertaken to establish the bounds of safe working areas. The applicant will coordinate exposure procedures with any pertinent stations.

Conclusion

Based on the preceding, it is believed that the instant proposal may be categorically excluded from environmental processing under Section 1.1306 of the Rules, hence preparation of an Environmental Assessment is not required.

Certification

The undersigned hereby certifies that the foregoing statement was prepared by him or under his direction, and that it is true and correct to the best of his knowledge and belief.

Joseph M. Davis, P.E.
March 30, 2005

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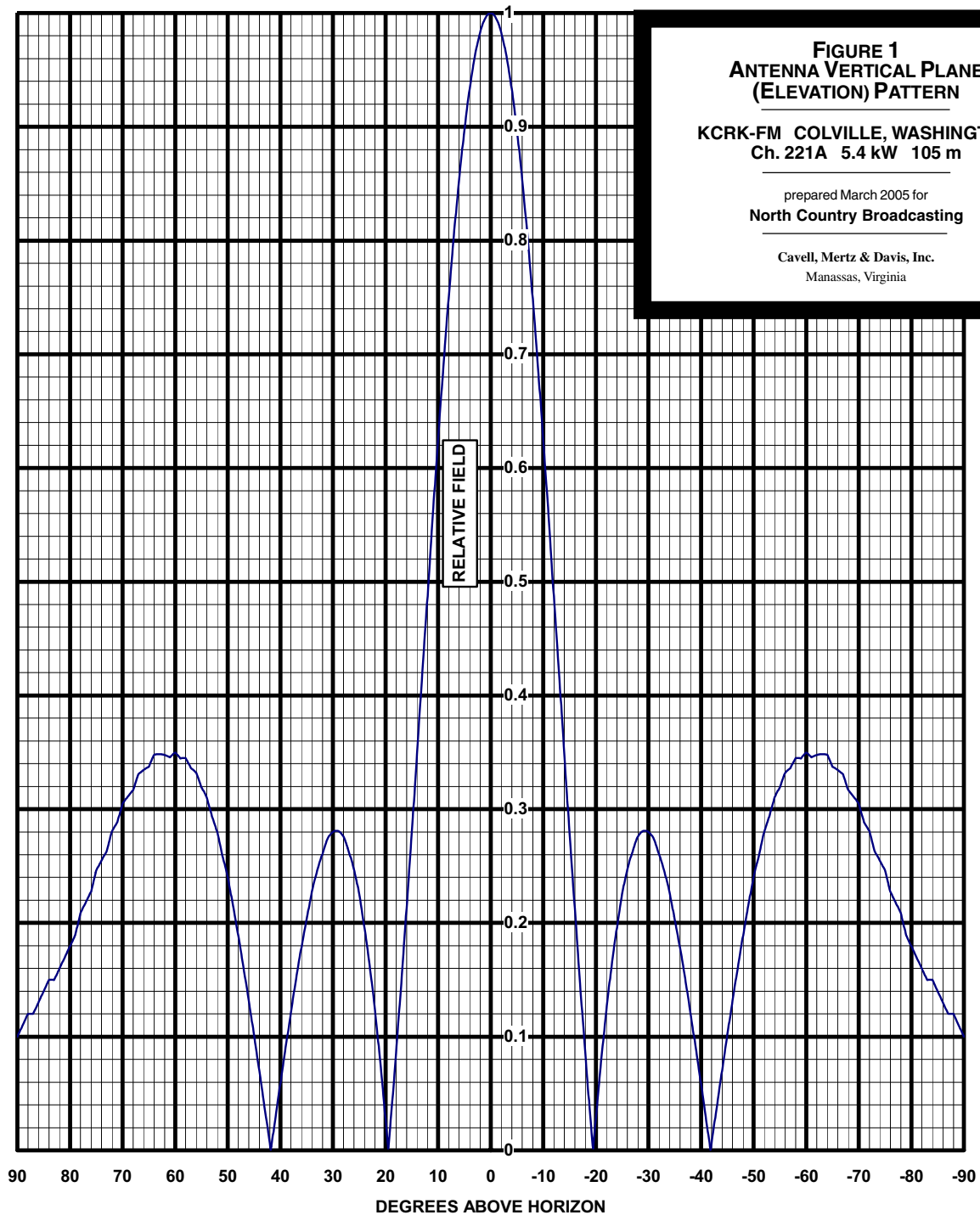
List of Attachments

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| Figure 1 | Antenna Vertical Plane (Elevation) Pattern |
| Table 1 | Antenna Vertical Plane (Elevation) Data |



Elevation Pattern

COMPUTED ELEVATION PATTERN



ELEVATION PATTERN

Customer:
JLPC-3 , No Fill and No Beam Tilt
Omni Directional

March 28, 2005
Gain=1.50x / 1.76 dB



Elevation Pattern

ELEVATION PATTERN TABULATION

RELATIVE FIELD VS ELEVATION ANGLE

| <u>ELEVATION ANGLE</u> | <u>RELATIVE FIELD</u> | <u>ELEVATION ANGLE</u> | <u>RELATIVE FIELD</u> | <u>ELEVATION ANGLE</u> | <u>RELATIVE FIELD</u> |
|----------------------------|---------------------------|----------------------------|---------------------------|----------------------------|---------------------------|
| 10 | 0.625 | -26 | 0.247 | -61 | 0.346 |
| 9 | 0.689 | -27 | 0.263 | -62 | 0.348 |
| 8 | 0.749 | -28 | 0.276 | -63 | 0.348 |
| 7 | 0.804 | -29 | 0.281 | -64 | 0.348 |
| 6 | 0.854 | -30 | 0.280 | -65 | 0.337 |
| 5 | 0.897 | -31 | 0.274 | -66 | 0.334 |
| 4 | 0.933 | -32 | 0.260 | -67 | 0.331 |
| 3 | 0.962 | -33 | 0.246 | -68 | 0.317 |
| 2 | 0.983 | -34 | 0.227 | -69 | 0.311 |
| 1 | 0.996 | -35 | 0.203 | -70 | 0.305 |
| 0 | 1.000 | -36 | 0.178 | -71 | 0.288 |
| -1 | 0.996 | -37 | 0.151 | -72 | 0.281 |
| -2 | 0.983 | -38 | 0.120 | -73 | 0.263 |
| -3 | 0.962 | -39 | 0.090 | -74 | 0.255 |
| -4 | 0.933 | -40 | 0.059 | -75 | 0.246 |
| -5 | 0.897 | -41 | 0.026 | -76 | 0.227 |
| -6 | 0.854 | -42 | 0.006 | -77 | 0.218 |
| -7 | 0.804 | -43 | 0.038 | -78 | 0.209 |
| -8 | 0.749 | -44 | 0.070 | -79 | 0.189 |
| -9 | 0.689 | -45 | 0.101 | -80 | 0.179 |
| -10 | 0.625 | -46 | 0.132 | -81 | 0.170 |
| -11 | 0.558 | -47 | 0.161 | -82 | 0.160 |
| -12 | 0.487 | -48 | 0.189 | -83 | 0.150 |
| -13 | 0.420 | -49 | 0.215 | -84 | 0.150 |
| -14 | 0.349 | -50 | 0.240 | -85 | 0.140 |
| -15 | 0.279 | -51 | 0.259 | -86 | 0.130 |
| -16 | 0.213 | -52 | 0.280 | -87 | 0.120 |
| -17 | 0.147 | -53 | 0.294 | -88 | 0.120 |
| -18 | 0.085 | -54 | 0.310 | -89 | 0.110 |
| -19 | 0.026 | -55 | 0.319 | -90 | 0.100 |
| -20 | 0.028 | -56 | 0.332 | | |
| -21 | 0.078 | -57 | 0.336 | | |
| -22 | 0.123 | -58 | 0.345 | | |
| -23 | 0.162 | -59 | 0.345 | | |
| -24 | 0.195 | -60 | 0.350 | | |
| -25 | 0.225 | | | | |

ELEVATION PATTERN

Customer:
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|---|
| TABLE 1 ANTENNA VERTICAL PLANE (ELEVATION) PATTERN KCRK-FM COLVILLE, WASHINGTON Ch. 221A 5.4 kW 105 m prepared March 2005 for North Country Broadcasting Cavell, Mertz & Davis, Inc. Manassas, Virginia |
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