

ENGINEERING EXHIBIT

Amendment to Application for an LPTV Station Construction Permit

prepared for

5GTV, LLC

WMPJ-LD Calhoun City, Mississippi

Facility ID 72540

Ch. 27 1.17 kW 214.5 m AMSL

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5GTV, LLC (“*5GTV*”) is the licensee of digital LPTV station WMPJ-LD, Channel 26, Calhoun City, Mississippi, Facility ID 72540 (LMS File No. 0000121704). There is also a pending application (LMS File No. 0000124745) requesting a move and channel change. The instant application requests an amendment to the pending application, specifying a different transmitting site, and providing additional support for a displacement request in the form of a letter of complaint from co-channel station WBUY-TV (RF Ch. 26, Holly Springs, MS). The letter is provided as a separate attachment. *5GTV* herein requests a Channel 27 Construction Permit as a displacement to a new location¹. Specifically, *5GTV* proposes to operate from FCC registered structure (ASRN 1264544) with coordinates of 34° 47’ 11.0” N Latitude and 89° 25’ 00.0” W Longitude (NAD 83) at 1.17 kW Effective Radiated Power, using an Alive custom directional antenna having a radiation center of 214.5 meters AMSL.

Nature of the Proposal

The proposed antenna system for the WMPJ-LD operation remains the same as File No. 0000124742 with a different orientation. It is a directional antenna which will be side-mounted on an existing tower structure with the Antenna Structure Registration Number 1264544. No change in structure overall height is necessary to carry out this proposal. Since no change to the structure’s overall height is proposed, no change to structure marking/lighting requirements set forth in the aeronautical study will result.

The proposed digital facility will operate on Channel 27 using a “Full Service” out of channel emission mask, a maximum effective radiated power of 1.17 kW, and an antenna height of 214.5 meters AMSL. **Figure 1** depicts the 51 dB μ F(50,90) coverage contour of the authorized and proposed facility, as well as the 48 km (30 mile) move limit for minor modifications from the

¹ The current WMPJ-LD authorization has more than three percent service area in common with co-channel WBUY-TV. This is an anomalous result due to various factors. Based on the objection from WBUY-TV, it is believed that the best solution would be to request a displacement to an alternate channel that does not conflict with WBUY-TV.

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licensed coordinates. As demonstrated on the provided map, the service area overlap shown demonstrates compliance with §74.787 of the Rules for minor modifications.

Allocation Considerations

The instant proposal complies with the Commission's interference protection requirements toward all DTV, television translator, LPTV, and Class A stations. A detailed interference study was conducted using the FCC's TV Study program version 2.2.5². The interference study results are provided as an attachment to this Engineering Statement and show that any new interference does not exceed the Commission's interference limits (0.5 percent to full service and Class A stations or 2.0 percent to LPTV stations). Accordingly, the instant proposal complies with FCC Rules regarding interference protection to DTV, television translator, LPTV and Class A television facilities.

International Coordination

The proposed transmitter site is located 961.2 km from the U.S.-Canadian border and 1,214.5 km from the U.S.-Mexican border, which is greater than the required coordination distance specified for digital low power television stations. Thus, it is believed that international coordination will not be necessary for the instant proposal.

Other Allocation Considerations

The nearest FCC monitoring station is at Powder Springs, GA, at a distance of 442.8 km from the proposed site. This exceeds by a great margin the threshold minimum distance specified in §73.1030(c)(3) that would suggest consideration of the monitoring station. The proposed site is also located outside the areas specified in §73.1030(a)(1) and §73.1030(b). Thus, notification of the instant proposal to the National Radio Astronomy Observatory at Green Bank, West Virginia, or the Table Mountain Radio Receiving Zone in Boulder County, Colorado is not required. There are no directional AM broadcast stations located within 3.2 km (2 miles) of the proposed site, according to information extracted from the Commission's engineering database. However, the proposed

² The TV Study program was configured to perform its calculations using a cell size of 0.5 km and a terrain profile increment of 0.1 km. It is believed that this setting better reflects terrain variations than the default setting.

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transmitter site is co-located with non-directional WKRA(AM) (1,110 kHz, Holly Springs, MS). Antenna impedance measurements and coordination with WKRA(AM) will be performed as specified in sections 73.45(c)(1) and 73.51 of the Rules.

Environmental Considerations

The instant proposal is not believed to have a significant environmental impact as defined under §1.1306 of the Commission's Rules. Consequently, preparation of an Environmental Assessment is not required. *5GTV* herein proposes to construct the facility on an existing tower structure with the Antenna Structure Registration Number 1264544. The use of an existing tower structure has been characterized as being environmentally preferable by the Commission, according to Note 1 of §1.1306 of the FCC Rules. No change in structure height is proposed, thus no change in current structure marking and lighting requirements is anticipated. Therefore, it is believed that this application may be categorically excluded from environmental processing pursuant to §1.1306 of the Commission's rules.

Human Exposure to Radiofrequency Electromagnetic Field

The proposed operation was evaluated for human exposure to radiofrequency electromagnetic field using the procedures outlined in the Commission's OET Bulletin 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 in OET 65. Based upon that methodology, and as demonstrated in the following, the proposed transmitting system will comply with the cited adopted guidelines.

The WMPJ-LD Channel 27 antenna center of radiation will be 45.7 meters above ground level. An effective radiated power of 1.17 kilowatts, elliptically polarized, will be employed utilizing an Alive custom 1x2 panel UHF low power antenna. Based on the manufacturer's data, a "worst-case" relative field value of 35 percent is assumed for purposes of the calculation. For

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simplicity, circular polarization is assumed as a worst case. The “uncontrolled/general population” limit specified in §1.1310 for Channel 27 (center frequency 551 MHz) is 367.3 $\mu\text{W}/\text{cm}^2$.

OET 65’s formula for television transmitting antennas is based on the NTSC transmission standards, where the average power is normally much less than the peak power. For the DTV facility in the instant proposal, the peak-to-average ratio is different than the NTSC ratio. The DTV ERP figure herein refers to the average power level. The formula used for calculating DTV signal density in this analysis is essentially the same as equation (10) in OET 65.

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

Where:

- S = power density in microwatts/cm²
- ERP = total (average) ERP in Watts
- F = relative field factor
- D = distance in meters

Using this formula and the above assumptions, the proposed facility would contribute a power density of 5.0 $\mu\text{W}/\text{cm}^2$ at two meters above ground level near the antenna support structure, or 1.36 percent of the general population/uncontrolled limit. Accordingly, it is believed that the impact of the proposed operation should not be considered to be a factor at or near ground level as defined under §1.1307(b).

§1.1307(b)(3) states that facilities at locations with multiple transmitters (such as the case at hand) are categorically excluded from responsibility for taking any corrective action in the areas where their contribution is less than five percent. Since the instant situation meets the five percent exclusion test at all ground level areas, the impact of any other facilities using this site may be considered independently from this proposal. Accordingly, it is believed that the impact of the proposed operation should not be considered to be a factor at or near ground level as defined under §1.1307(b).

As demonstrated herein, excessive levels of RF energy attributable to the proposal will not be caused at publicly accessible areas at ground level near the antenna supporting structure.

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Consequently, members of the general public will not be exposed to RF levels in excess of the Commission's guidelines. Nevertheless, tower site 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.

Safety of Tower Workers and the General Public

As demonstrated herein, excessive levels of RF energy attributable to the proposal will not be caused at publicly accessible areas at ground level or near the base of 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, access will be restricted and controlled through the use of a locked gate. Additionally, appropriate RF exposure warning signs will 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 be employed protecting maintenance workers from excessive exposure when work must be performed on the tower or 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 would otherwise be exceeded. On-site RF exposure measurements may also be undertaken to establish the bounds of safe working areas. The applicant will coordinate exposure procedures with all pertinent stations.

Conclusion

Based on the preceding, it is believed that the instant proposal complies with all Commission Rules and policies.

**FIGURE 1
COVERAGE CONTOUR COMPARISON**

prepared December 2020 for

**5GTV, LLC
WMPJ-LD Calhoun City, MS
Facility ID 72540
Ch. 27 1.17 kW 214.5 m AMSL**

**Cavell, Mertz & Associates, Inc.
Manassas, Virginia**

WMPJ-LD Proposed
Ch 27 1.17 kW
51 dB μ F(50,90)

WMPJ-LD License
Ch 26 3 kW
51 dB μ F(50,90)

48 km (30 Mile) Move Limit

