

ENGINEERING EXHIBIT

Application for Minor Modification of Digital Low Power Television Station Construction Permit

prepared for

Gray Television Licensee, LLC

W16EK-D Lenox, GA

Facility ID 186166

Ch. 16 0.7 kW Directional

Gray Television Licensee, LLC (“Gray”) is the permittee of unbuilt digital Low Power Television station W16EK-D, Channel 16, Lenox GA, Facility ID 186166. W16EK-D is authorized to operate pursuant to a Construction Permit (“CP”, file# 0000155449) with 9 kW effective radiated power (“ERP”), directional. The current CP was obtained as a displacement of the previously authorized operation on Channel 47 (callsign W47EC-D, file# BNPDTL-20100510ABK). *Gray* herein seeks a modification of the current CP to specify a different transmitting location and a reduction in ERP.

The proposed facility will employ an antenna to be side-mounted on the existing tower structure associated with FCC Antenna Structure Registration number 1002824. The site is located more than 75 miles (121 km) from the reference coordinates of the markets listed in Appendix A of DA 09-1487¹ and is 28.7 km (17.8 miles) from the originally authorized W47EC-D site (BNPDTL-20100510ABK). No change to the overall structure height is proposed.

The proposed antenna is a Kathrein model 75010325 (single panel) having elliptical polarization. The proposed ERP is 0.70 kW horizontally polarized and 0.30 kW vertically polarized using a “simple” out of channel emission mask. A plot of the directional antenna’s azimuthal pattern is supplied in Figure 1. Figure 2 depicts the 51 dBμ coverage contour of the

¹“Commencement of Rural, First-come, First-served digital licensing for Low Power Television and TV Translators Beginning August 25, 2009 and Commencement of Nationwide, First-come, First-served Digital Licensing for Low Power Television and TV Translator Services Beginning January 25, 2010,” Public Notice, DA 09-1487, Released June 29, 2009.

proposed facility as well as that of the original CP facility (BNPDTL-20100510ABK), demonstrating compliance with §73.3572 for a minor change.

Interference study per OET Bulletin 69² shows that the proposal complies with the FCC's interference protection requirements toward all digital television, television translator, LPTV, and Class A stations. The results, summarized in Table 1, show that any new interference does not exceed the FCC's interference limits (0.5 percent to full power and Class A stations, and 2.0 percent to secondary stations) to any facility.

Human Exposure to Radiofrequency Electromagnetic Field (Environmental)

The proposed facility was evaluated for human exposure to Radiofrequency ("RF") energy using the procedures outlined in the FCC's OET Bulletin Number 65. Based on OET-65 equation (10), and considering the antenna relative field in downward elevations, the graph in Figure 3 depicts calculated power density levels attributable to the proposed facility at locations near the site at a height of two meters above ground level. The maximum calculated RF electromagnetic field attributable to the proposed facility is 4.3 percent of the general population / uncontrolled maximum permissible exposure limit at any location two meters above ground level. This is below the five percent threshold limit described in §1.1307(b) regarding sites with multiple emitters, categorically excluding the applicant from responsibility for taking any corrective action in the areas where the proposal's contribution is less than five percent.

The general public will not be exposed to RF levels attributable to the proposal in excess of the FCC's guidelines. RF exposure warning signs will continue to be posted. With respect to worker safety, the applicant will coordinate exposure procedures with all pertinent stations and will reduce power or cease operation as necessary to protect persons having access to the site, tower, or antenna from RF electromagnetic field exposure in excess of FCC guidelines. This

²FCC Office of Engineering and Technology Bulletin number 69, *Longley-Rice Methodology for Evaluating TV Coverage and Interference*, February 6, 2004 ("OET-69"). This analysis employed the FCC's current "TVStudy" software with the default application processing template settings, 1 km cell size, and 1.0 km terrain increment. Comparisons of various results of this computer program (run on a Mac processor) to the FCC's implementation of TVStudy show excellent correlation.

exhibit is limited to the evaluation of exposure to RF electromagnetic field. No change in structure height is proposed.

List of Attachments

| | |
|-----------|---|
| Figure 1 | Antenna Azimuthal Pattern |
| Figure 2 | Coverage Contour Comparison |
| Figure 3 | Calculated RF Electromagnetic Field |
| Table 1 | TVStudy Analysis of Proposal |
| Form 2100 | Saved Version of Engineering Sections of FCC Form at Time of Upload |

Chesapeake RF Consultants, LLC

| | | |
|-----------------------|--------------------|--------------|
| Joseph M. Davis, P.E. | May 11, 2022 | |
| 207 Old Dominion Road | Yorktown, VA 23692 | 703-650-9600 |

**Azimuth Pattern - Relative Field
(True North)**

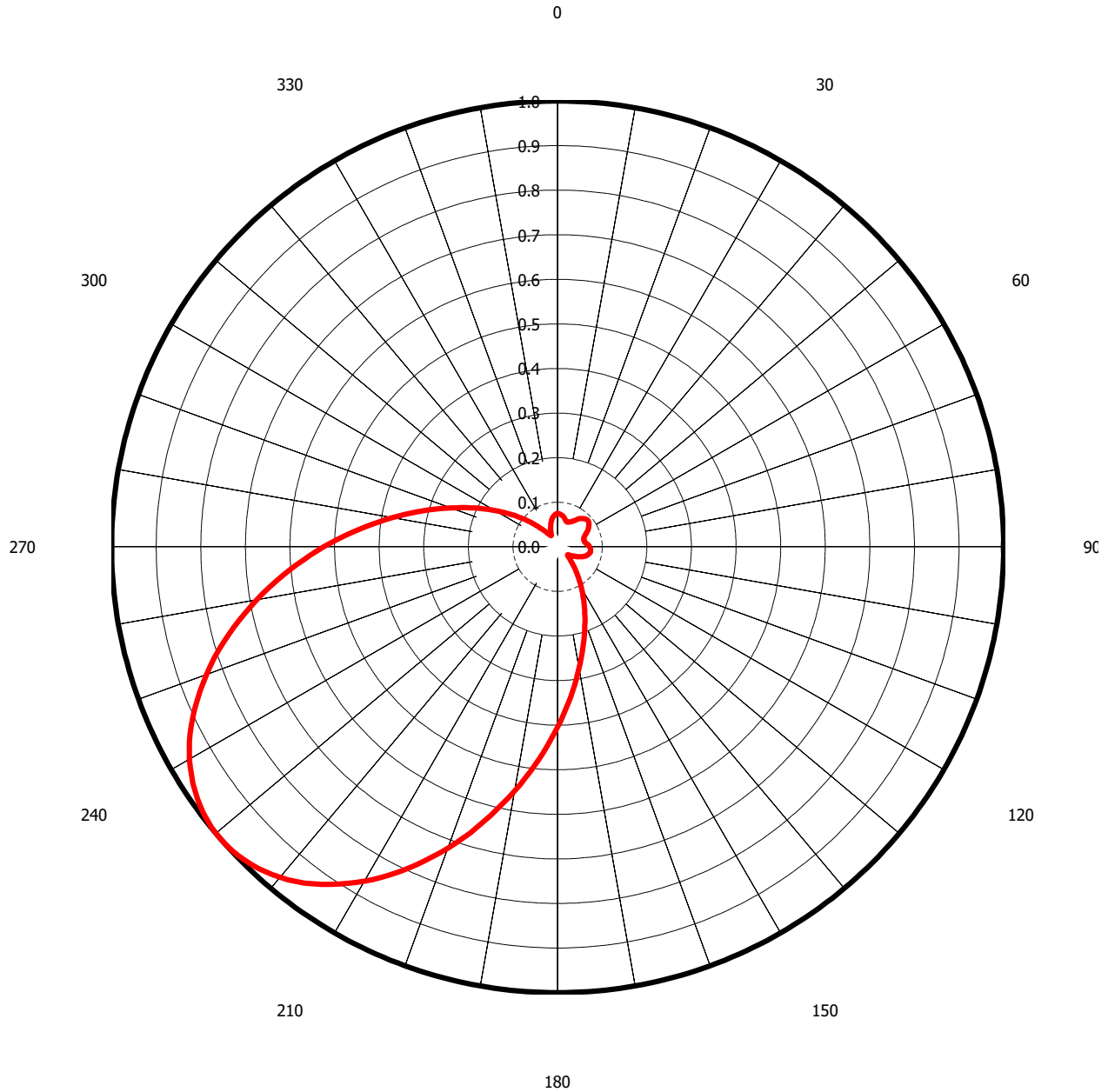
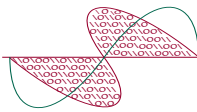


Figure 1
Antenna Azimuthal Pattern
W16EK-D Lenox, GA
Facility ID 186166
Ch. 16 0.7 kW Directional

prepared for
Gray Television Licensee, LLC

May, 2022



Chesapeake RF Consultants, LLC
Radiofrequency Consulting Engineers
Digital Television and Radio

Figure 2
Coverage Contour Comparison
W16EK-D Lenox, GA
Facility ID 186166
Ch. 16 0.7 kW Directional

prepared for
Gray Television Licensee, LLC

May, 2022

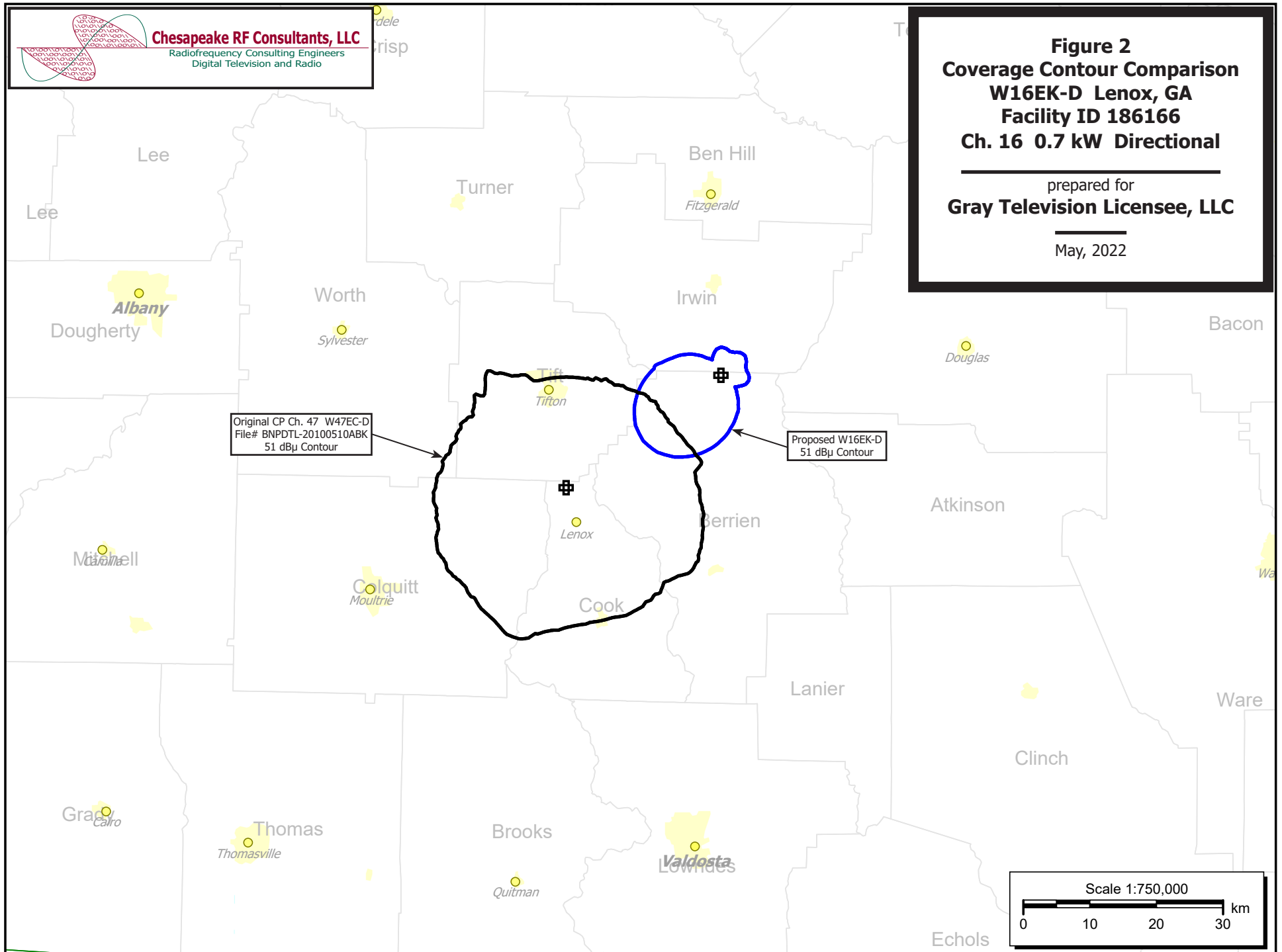


Figure 3
Calculated RF Electromagnetic Field
W16EK-D Lenox, GA
Facility ID 186166
Ch. 16 0.7 kW Directional

prepared for
Gray Television Licensee, LLC

May, 2022

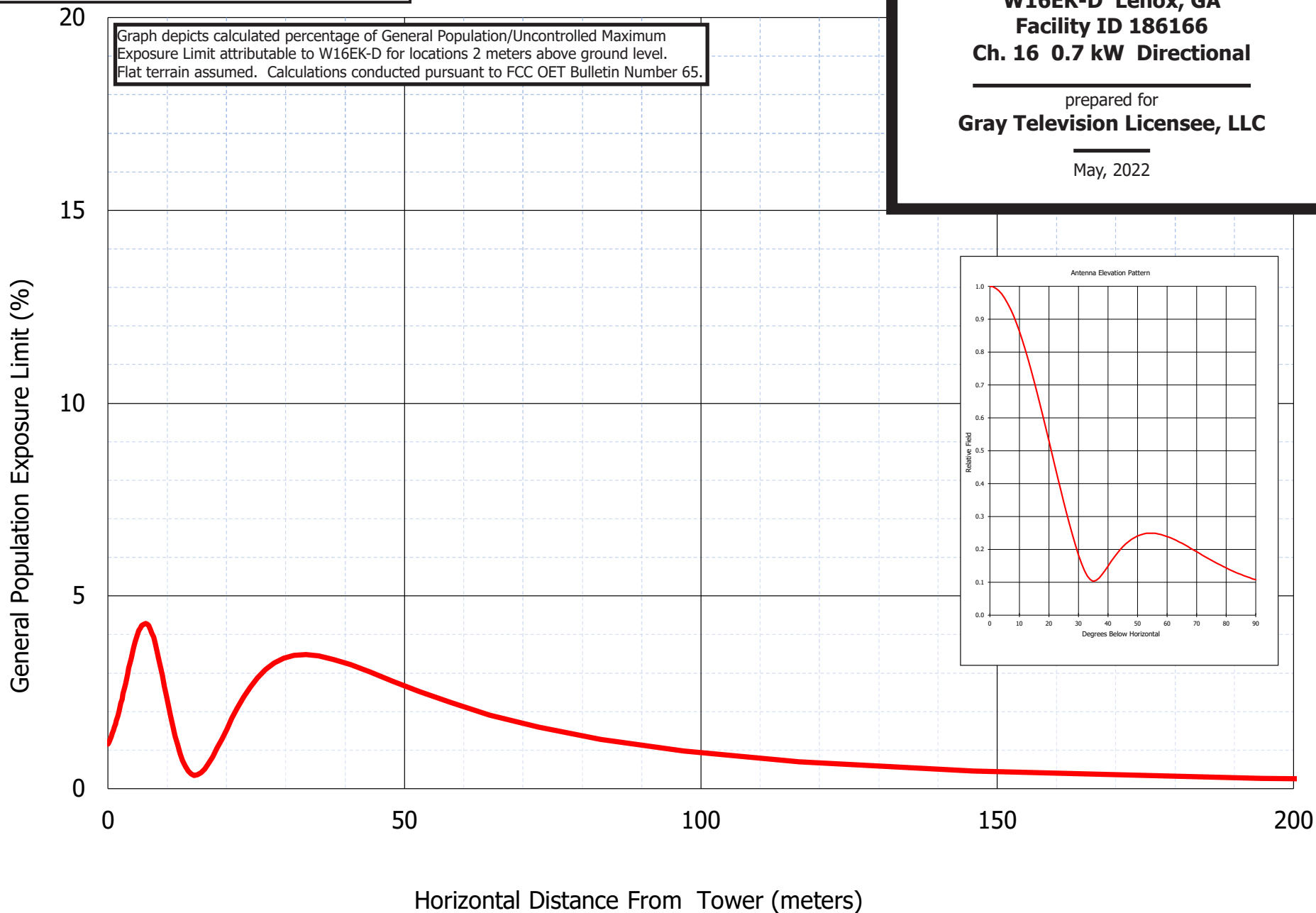


Table 1 W16EK-D TVStudy Analysis of Proposal (page 1 of 2)



tvstudy v2.2.5 (4uoc83)
Database: localhost, Study: W16EK-D 1002824 prop, Model: Longley-Rice
Start: 2022.05.11 13:51:59

Study created: 2022.05.11 13:51:59

Study build station data: LMS TV 2022-05-11

Proposal: W16EK-D D16 LD APP LENOX, GA
File number: W16EK-D 1002824 prop
Facility ID: 186166
Station data: User record
Record ID: 4411
Country: U.S.

Build options:
Protect pre-transition records not on baseline channel

Search options:
Baseline record excluded if station has CP

Stations potentially affected by proposal:

| IX | Call | Chan | Svc | Status | City, State | File Number | Distance |
|----|-----------|------|-----|--------|-----------------------|-------------------|----------|
| No | W31FE-D | N14+ | TX | LIC | Savannah, GA | BLTT20040915ADW | 107.7 km |
| No | WNFT-LD | D15 | LD | LIC | GAINESVILLE, FL | BLDTL20110714ACG | 214.1 |
| No | WNFT-LD | D15 | LD | CP | GAINESVILLE, FL | BLANK0000106078 | 214.1 |
| No | WUJX-LD | D15 | LD | LIC | JACKSONVILLE, FL | BLANK0000121572 | 206.7 |
| No | W15EQ-D | D15 | LD | LIC | TALLAHASSEE, FL | BLANK0000150951 | 135.5 |
| No | WPHJ-LD | D15+ | LD | LIC | BAXLEY, GA | BLANK0000187241 | 189.8 |
| No | WRBL | D15 | DT | LIC | COLUMBUS, GA | BLCDT20061013ABV | 174.6 |
| No | W16DV-D | D16 | LD | LIC | Alexander City, AL | BLANK0000190001 | 255.3 |
| No | WALE-LD | D16 | LD | LIC | MONTGOMERY, AL | BLANK0000152783 | 303.5 |
| No | W16CP-D | D16 | LD | CP | CHIPLEY, FL | BNPDTL20090825AVY | 235.4 |
| No | W16CS-D | D16 | LD | CP | DE FUNIAK SPRINGS, FL | BNPDTL20090825ATU | 301.5 |
| No | WCJB-TV | D16 | DT | LIC | GAINESVILLE, FL | BLCDT20071119AJB | 229.3 |
| No | WRCF-CD | D16 | DC | LIC | ORLANDO, FL | BLANK0000099575 | 381.6 |
| No | WRCF-CD | D16 | DC | LIC | ORLANDO, FL | BLANK0000121630 | 381.6 |
| No | W16CX-D | D16 | LD | LIC | PANAMA CITY, FL | BLANK0000013958 | 281.4 |
| No | WJHG-TV | D16 | DT | LIC | PANAMA CITY, FL | BLANK0000068516 | 240.1 |
| No | W16DQ-D | D16 | LD | LIC | TAMPA, FL | BLANK0000122658 | 416.5 |
| No | DDW38EM-D | D16 | LD | APP | ALBANY, GA | BLANK0000052733 | 104.2 |
| No | W16EL-D | D16 | LD | CP | AUGUSTA, GA | BLANK0000155482 | 241.3 |
| No | W16EE-D | D16 | LD | APP | AUGUSTA, GA | BLANK0000186170 | 255.9 |
| No | W16EE-D | D16 | LD | LIC | AUGUSTA, GA | BLANK0000179225 | 255.9 |
| No | W16EL-D | D16 | LD | APP | AUGUSTA, GA | BLANK0000190163 | 234.4 |
| No | WRDP-LD | D16 | LD | LIC | COLUMBUS, GA | BLANK0000178766 | 190.4 |
| No | WRDP-LD | D16 | LD | CP | COLUMBUS, GA | BLANK0000185006 | 174.6 |
| No | DDW26DS-D | D16 | LD | APP | LA GRANGE, GA | BLANK0000053055 | 246.7 |
| No | WDMA-CD | D16 | DC | LIC | MACON, GA | BLANK0000074865 | 157.8 |
| No | WPXA-TV | D16 | DT | LIC | ROME, GA | BLANK0000081827 | 342.4 |
| No | WSAV-TV | D16 | DT | LIC | SAVANNAH, GA | BLANK0000055021 | 194.5 |
| No | WJPM-TV | D16 | DT | LIC | FLORENCE, SC | BLANK0000138174 | 451.5 |
| No | WWYA-LD | D16 | LD | LIC | HONEA PATH, SC | BLANK0000093423 | 393.3 |
| No | WGBP-TV | D17 | DD | LIC | OPELIKA, AL | BLANK0000129713 | 185.6 |
| No | WJVF-LD | D17 | LD | LIC | Jacksonville, FL | BLANK0000129911 | 170.4 |
| No | WJVF-LD | D17 | LD | CP | Jacksonville, FL | BLANK0000157569 | 207.4 |
| No | WFXU | D17 | DT | LIC | LIVE OAK, FL | BLANK0000112143 | 104.4 |
| No | W17ES-D | D17 | LD | CP | ADEL, GA | BLANK0000156318 | 64.5 |
| No | DW23AQ | N23- | TX | APP | LAKE CITY, FL | BLTT19931215JE | 152.4 |

No non-directional AM stations found within 0.8 km

No directional AM stations found within 3.2 km

Record parameters as studied:

Channel: D16
Mask: Simple
Latitude: 31 28 11.50 N (NAD83)
Longitude: 83 14 12.30 W
Height AMSL: 108.8 m
HAAT: 0.0 m

Table 1 W16EK-D TVStudy Analysis of Proposal
(page 2 of 2)



Peak ERP: 0.700 kW
Antenna: Kathrein-750 10325 1x (ID 1009080) 230.0 deg
Elev Pattn: Generic
Elec Tilt: 1.00

48.9 dBu contour:

| Azimuth | ERP | HAAT | Distance |
|---------|----------|--------|----------|
| 0.0 deg | 0.004 kW | 13.1 m | 4.8 km |
| 45.0 | 0.005 | 24.0 | 5.2 |
| 90.0 | 0.004 | 27.0 | 4.7 |
| 135.0 | 0.001 | 24.3 | 3.6 |
| 180.0 | 0.114 | 27.6 | 11.0 |
| 225.0 | 0.678 | 19.5 | 17.2 |
| 270.0 | 0.192 | 18.7 | 12.4 |
| 315.0 | 0.004 | 8.1 | 4.7 |

Database HAAT does not agree with computed HAAT
Database HAAT: 0 m Computed HAAT: 20 m

Distance to Canadian border: 1135.6 km

Distance to Mexican border: 1465.8 km

Conditions at FCC monitoring station: Powder Springs GA
Bearing: 332.8 degrees Distance: 300.1 km

Proposal is not within the West Virginia quiet zone area

Conditions at Table Mountain receiving zone:
Bearing: 302.1 degrees Distance: 2195.0 km

No land mobile station failures found

Proposal is not within the Offshore Radio Service protected area

Study cell size: 1.00 km
Profile point spacing: 1.00 km

Maximum new IX to full-service and Class A: 0.50%
Maximum new IX to LPTV: 2.00%

Interference to proposal scenario 1
4.86% interference received

| Desired: | Call | Chan | Svc | Status | City, State | File Number | Distance |
|--------------------|---------|-----------------|-----|-----------|--------------|----------------------|----------|
| | W16EK-D | D16 | LD | APP | LENOX, GA | W16EK-D 1002824 prop | |
| Undesireds: | W16EL-D | D16 | LD | CP | AUGUSTA, GA | BLANK0000155482 | 241.3 km |
| | W16EE-D | D16 | LD | APP | AUGUSTA, GA | BLANK0000186170 | 255.9 |
| | WRDP-LD | D16 | LD | LIC | COLUMBUS, GA | BLANK0000178766 | 190.4 |
| | WSAV-TV | D16 | DT | LIC | SAVANNAH, GA | BLANK0000055021 | 194.5 |
| Service area | | Terrain-limited | | IX-free | | Percent IX | |
| 267.0 | | 4,257 | | 262.9 | | 1.52 4.86 | |
| Undesired | | Total IX | | Unique IX | | Prct Unique IX | |
| WSAV-TV D16 DT LIC | | 4.1 | | 207 | | 1.52 4.86 | |

**Channel and
Facility
Information**

| Section | Question | Response |
|-------------|----------|----------|
| Facility ID | 186166 | |
| State | Georgia | |
| City | LENOX | |
| LPD Channel | 16 | |

Primary station proposed to be rebroadcast:

| Facility Id | Call Sign | City | State |
|-------------|-----------|------|-------|
|-------------|-----------|------|-------|

Antenna Location Data

| Section | Question | Response |
|--------------------------------|---|--|
| Antenna Structure Registration | Do you have an FCC Antenna Structure Registration (ASR) Number? | Yes |
| | ASR Number | 1002824 |
| Coordinates (NAD83) | Latitude | 31° 28' 11.5" N+ |
| | Longitude | 083° 14' 12.3" W- |
| | Structure Type | GTOWER-Guyed Structure Used for Communication Purposes |
| | Overall Structure Height | 151.4 meters |
| | Support Structure Height | 151.2 meters |
| | Ground Elevation (AMSL) | 96.6 meters |
| Antenna Data | Height of Radiation Center Above Ground Level | 12.2 meters |
| | Height of Radiation Center Above Mean Sea Level | 108.8 meters |
| | Effective Radiated Power | 0.7 kW |

**Antenna
Technical Data**

| Section | Question | Response |
|--------------------------------|---|--------------------|
| Antenna Type | Antenna Type | Directional Custom |
| | Do you have an Antenna ID? | Yes |
| | Antenna ID | 1009080 |
| Antenna Manufacturer and Model | Manufacturer: | Kathrein |
| | Model | 750 10325 1x |
| | Rotation | 230 degrees |
| | Electrical Beam Tilt | Not Applicable |
| | Mechanical Beam Tilt | Not Applicable |
| | toward azimuth | |
| | Polarization | Elliptical |
| Elevation Radiation Pattern | Does the proposed antenna propose elevation radiation patterns that vary with azimuth for reasons other than the use of mechanical beam tilt? | No |
| | Uploaded file for elevation antenna (or radiation) pattern data | |
| | Out-of-Channel Emission Mask: | Simple |

Directional Antenna Relative Field Values (Pre-rotated Pattern)

| Degree | Value | Degree | Value | Degree | Value | Degree | Value |
|--------|-------|--------|-------|--------|-------|--------|-------|
| 0 | 1.000 | 90 | 0.048 | 180 | 0.090 | 270 | 0.056 |
| 10 | 0.953 | 100 | 0.029 | 190 | 0.079 | 280 | 0.107 |
| 20 | 0.838 | 110 | 0.046 | 200 | 0.063 | 290 | 0.179 |
| 30 | 0.685 | 120 | 0.066 | 210 | 0.062 | 300 | 0.277 |
| 40 | 0.524 | 130 | 0.075 | 220 | 0.072 | 310 | 0.404 |
| 50 | 0.376 | 140 | 0.070 | 230 | 0.074 | 320 | 0.556 |
| 60 | 0.255 | 150 | 0.060 | 240 | 0.063 | 330 | 0.719 |
| 70 | 0.163 | 160 | 0.066 | 250 | 0.042 | 340 | 0.866 |
| 80 | 0.095 | 170 | 0.083 | 260 | 0.029 | 350 | 0.968 |

Additional Azimuths

| Degree | V _A |
|--------|----------------|
|--------|----------------|