ENGINEERING EXHIBIT

Incentive Auction Channel Reassignment

Application for Digital Television Station Auxiliary Antenna Construction Permit

prepared for

Gray Television Licensee, LLC
KKTV(DT) Colorado Springs, CO
Facility ID 35037
Ch. 26 320 kW 690 m

Gray Television Licensee, LLC ("Gray") is the licensee of digital television station KKTV, Facility ID 35037, Colorado Springs CO. Reassignment of KKTV from Channel 49 to Channel 26 was specified in the *Incentive Auction Closing and Channel Reassignment Public Notice* (DA 17-317, released April 13, 2017). A Construction Permit ("CP", file# 0000067487) authorizes construction of the KKTV post-auction facility on Channel 26. *Gray* herein seeks authorization for an auxiliary antenna for KKTV on its post-auction Channel 26. The initial operation on reassignment Channel 26 will commence with the auxiliary antenna proposed herein, in order to accommodate tower work including removal of the existing Channel 49 main antenna, replacement of the main antenna transmission line, and installation of the post-auction Channel 26 main antenna.

The CP authorizes KKTV to operate with a directional antenna at 350 kW effective radiated power (ERP) and 720 meters height above average terrain (HAAT). The proposed auxiliary antenna will be side-mounted on the same tower structure as the authorized main antenna, and will operate on Channel 26 at 320 kW ERP (directional) and an antenna HAAT of 690 meters.

The KKTV tower structure is associated with FCC Antenna Structure Registration number 1024861. No change to the overall structure height will result from this proposal.

The proposed antenna is an elliptically polarized directional ERI model ATW16H6-ESC-26L (30 percent vertical polarization). The maximum horizontally polarized ERP is 320 kW and the maximum vertically polarized ERP is 96 kW. The vertically polarized component will not exceed the horizontally polarized component at any azimuth. The directional antenna's azimuthal patterns are depicted in Figures 1 and 1A for horizontal and vertical polarization, respectively. The antenna's elevation patterns are supplied in Figures 2 and 2A for horizontal polarization and in Figures 2B and 2C for vertical polarization.

Figure 3 shows that the 41 dBμ noise limited service contour of the proposed auxiliary facility does not extend beyond that of the authorized main facility. Thus the proposal complies with §73.1675(a).

Human Exposure to Radiofrequency Electromagnetic Field (Environmental)

The proposed operation was evaluated for human exposure to 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 (Figures 2 and 2C), the graph in Figure 4 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 4.75 percent of the general population / uncontrolled MPE 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 exhibit is limited to the evaluation of exposure to RF electromagnetic field.

List of Attachments

Figure 1, 1A	Antenna Azimuthal Pattern
Figure 2, 2A, 2B, 2C	Antenna Elevation Pattern
Figure 3	Proposed Auxiliary Contours
Figure 4	Calculated RF Electromagnetic Field

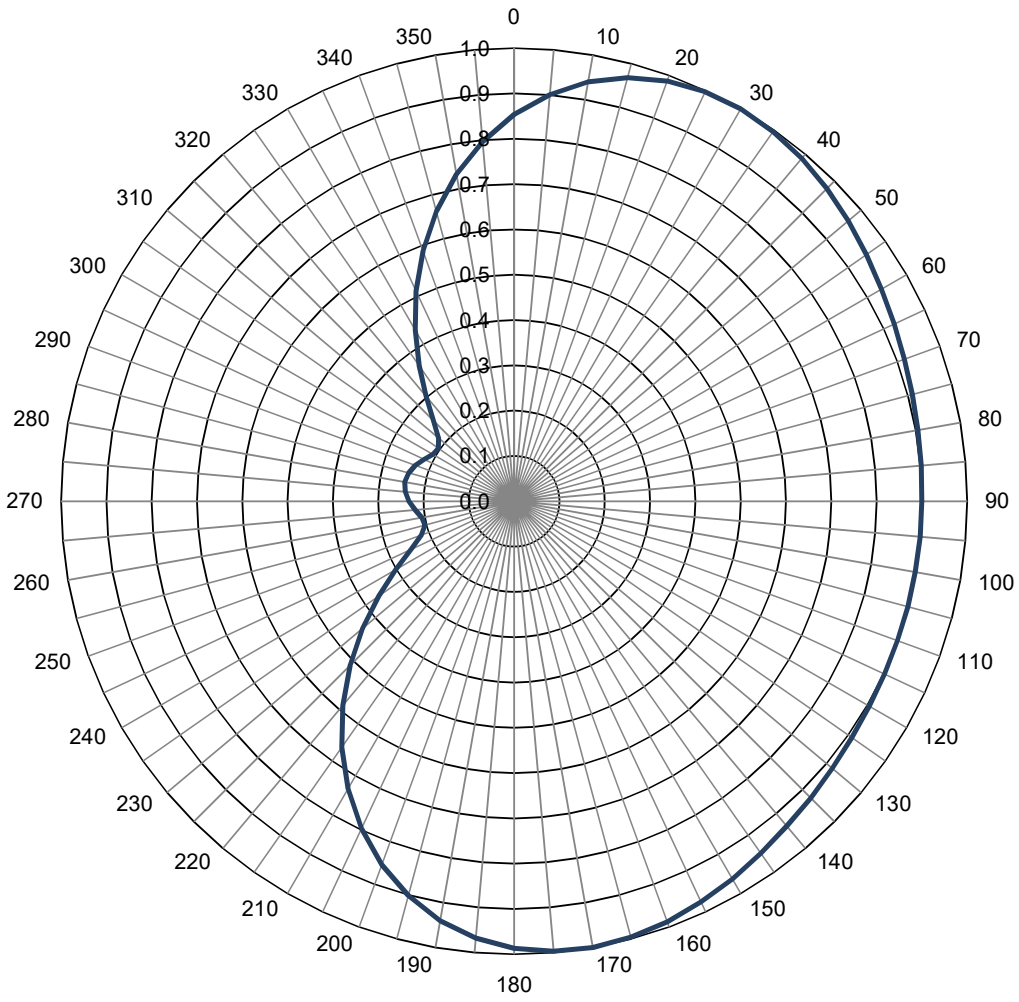
Chesapeake RF Consultants, LLC
Joseph M. Davis, P.E. March 8, 2019
207 Old Dominion Road Yorktown, VA 23692 703-650-9600

Azimuth Pattern

Type:	ATW-C170	**Polarization:**	Horizontal
Directivity:	1.70 numeric (2.30 dB)	**Frequency:**	26 (ATSC)
Peak(s) at:		**Location:**	Colorado Springs, CO

NOTE: Pattern shape and directivity may vary with channel and mounting configuration.

Relative Field



ELECTRONICS RESEARCH, INC. ERI

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

Figure 1
Auxiliary Antenna Azimuthal Pattern
Horizontal Polarization
KKTV(DT) Colorado Springs, CO
Facility ID 35037
Ch. 26 320 kW 690 m

prepared for
Gray Television Licensee, LLC

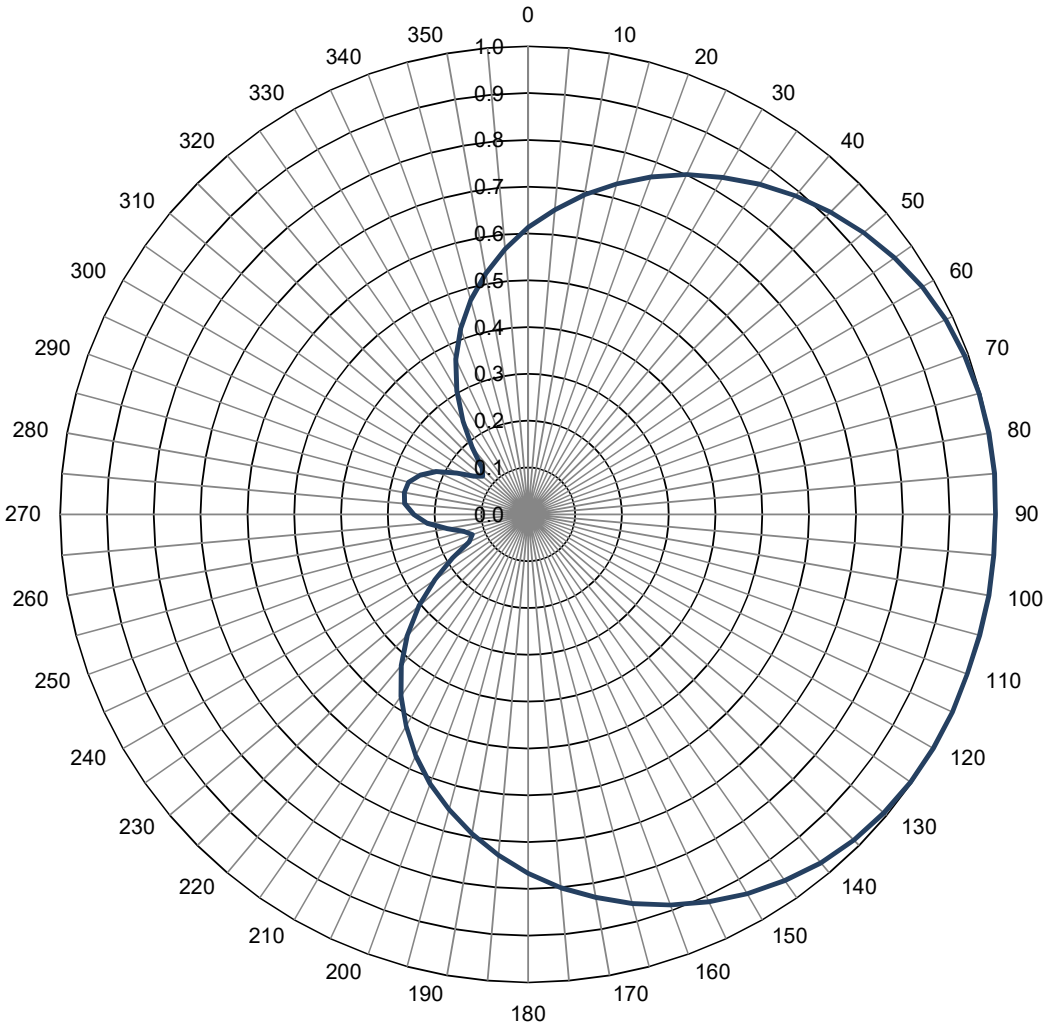
March, 2019

Azimuth Pattern

Type:	ATW-V20	**Polarization:**	Vertical
Directivity:	2.00 numeric (3.01 dB)	**Frequency:**	26 (ATSC)
Peak(s) at:		**Location:**	Colorado Springs, CO

NOTE: Pattern shape and directivity may vary with channel and mounting configuration.

Relative Field



ELECTRONICS RESEARCH, INC. ERI

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

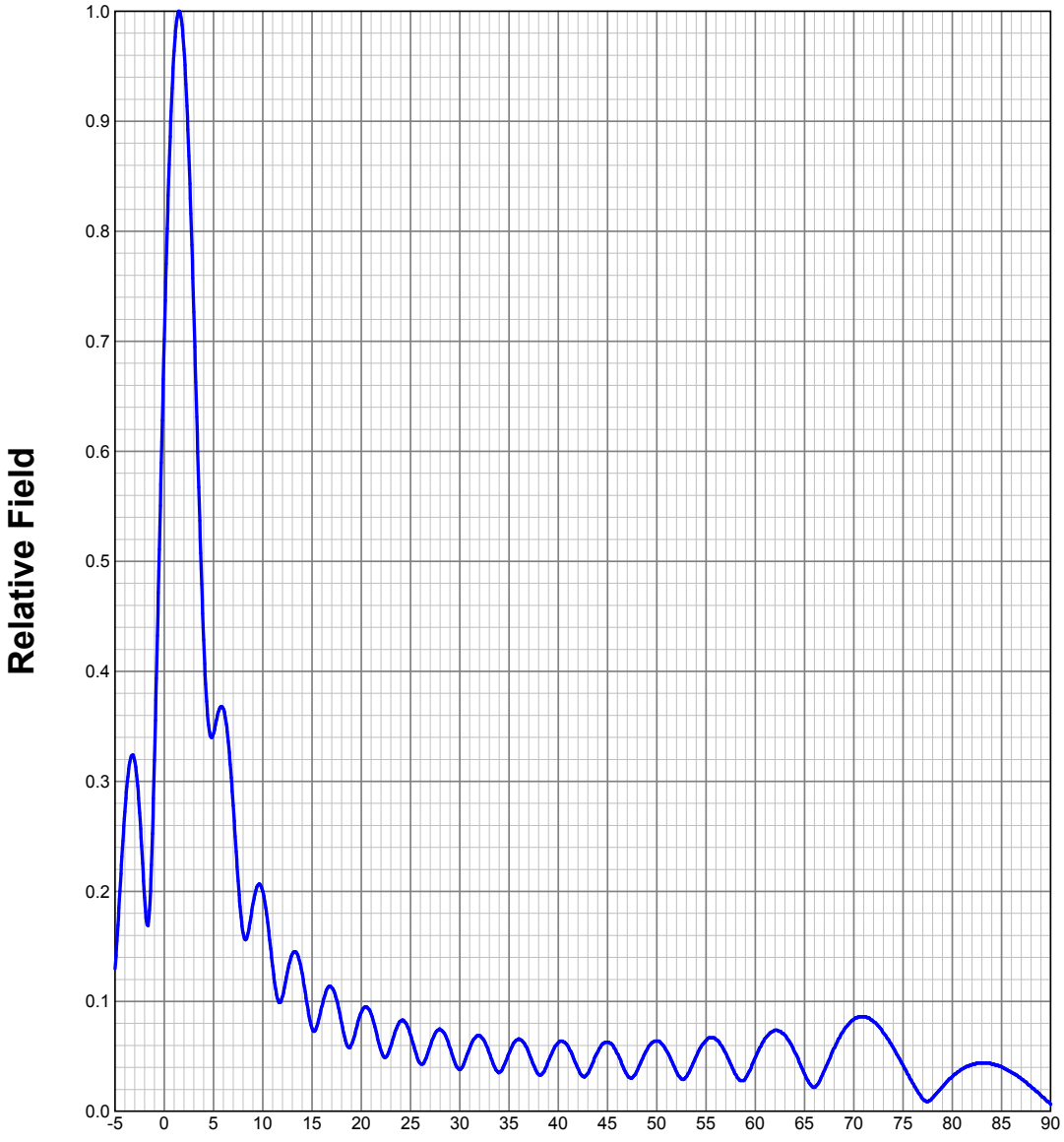
Figure 1A
Auxiliary Antenna Azimuthal Pattern
Vertical Polarization (Ref 30%)
KKTV(DT) Colorado Springs, CO
Facility ID 35037
Ch. 26 320 kW 690 m

prepared for
Gray Television Licensee, LLC

March, 2019

Elevation Pattern

Type:	ATW16H6H		**Polarization:**	Horizontal
Directivity:			**Frequency:**	26 (ATSC)
Main Lobe:	16.00 numeric	(12.04 dB)	**Location:**	Colorado Springs, CO
Horizontal:	7.88 numeric	(8.97 dB)	**Beam Tilt:**	1.50 degrees



ELECTRONICS RESEARCH, INC. ERI

Figure 2
Auxiliary Antenna Elevation Pattern
Horizontal Polarization
KKTV(DT) Colorado Springs, CO
Facility ID 35037
Ch. 26 320 kW 690 m

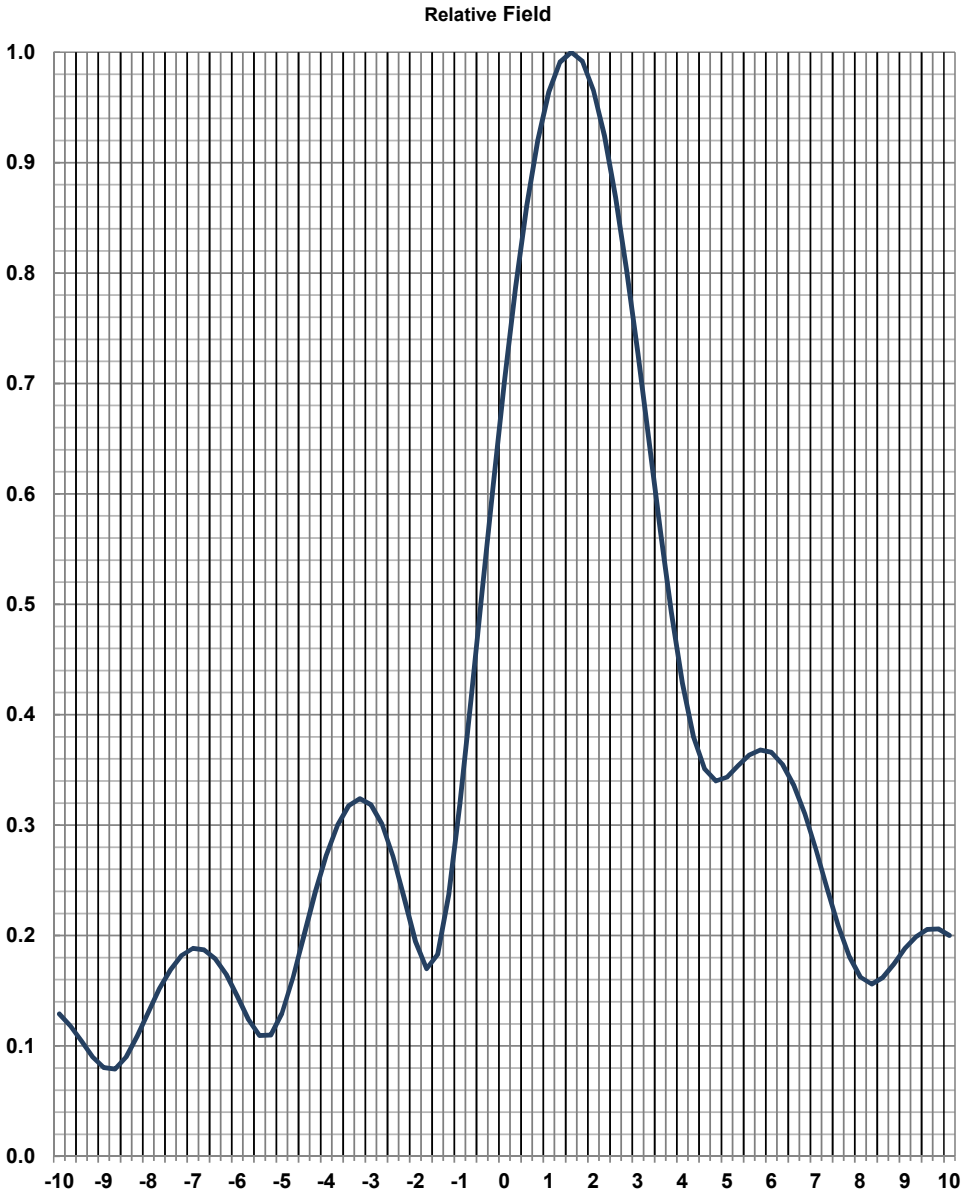
prepared for
Gray Television Licensee, LLC

March, 2019

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

Elevation Pattern

Type:	ATW16H6H		**Polarization:**	Horizontal
Directivity:			**Frequency:**	26 (ATSC)
Main Lobe:	16.00 numeric	(12.04 dB)	**Location:**	Colorado Springs, CO
Horizontal:	7.88 numeric	(8.97 dB)	**Beam Tilt:**	1.50 degrees



ELECTRONICS RESEARCH, INC. ERI

Figure 2A - Detail
Auxiliary Antenna Elevation Pattern
Horizontal Polarization
KKTV(DT) Colorado Springs, CO
Facility ID 35037
Ch. 26 320 kW 690 m

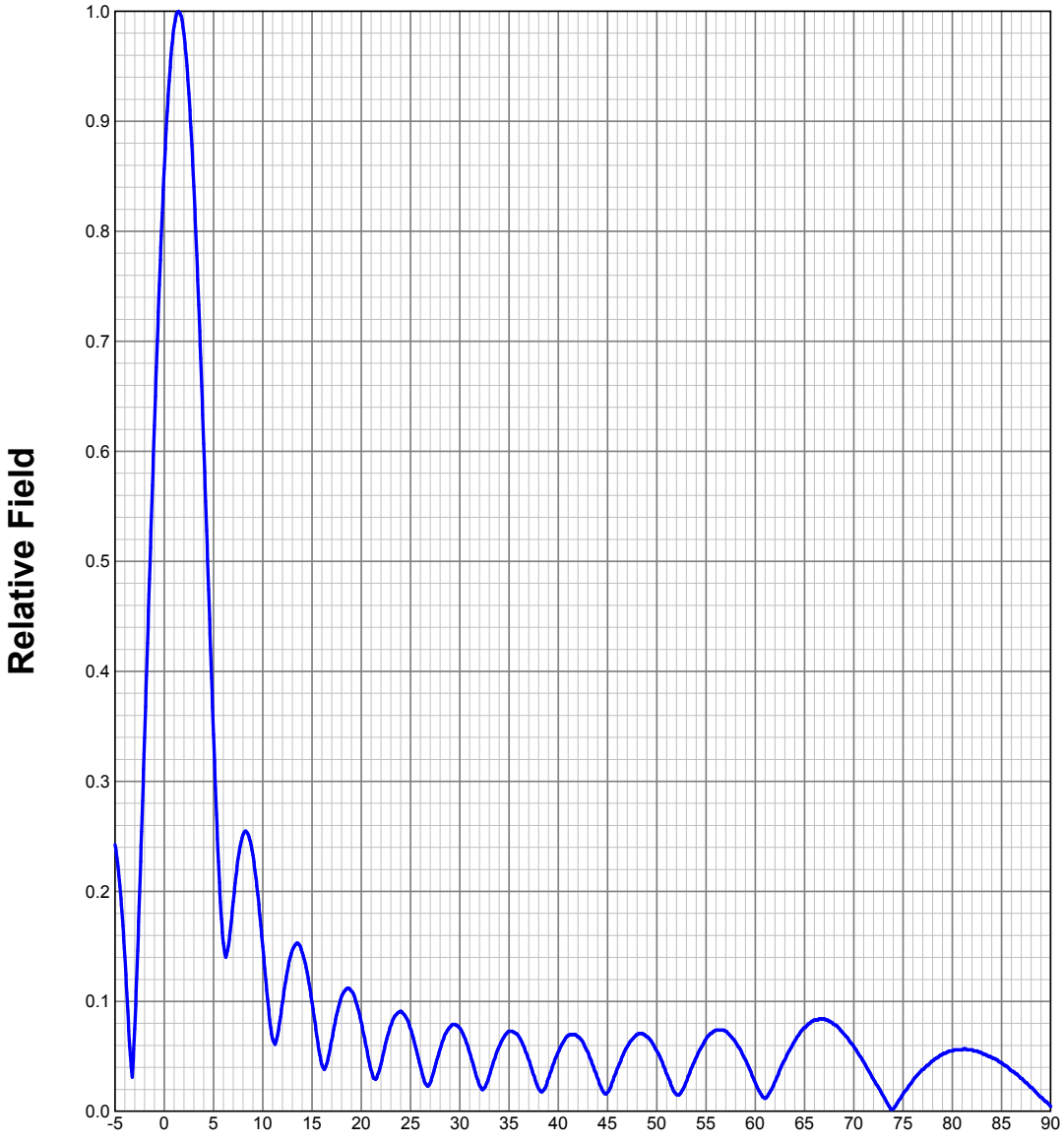
prepared for
Gray Television Licensee, LLC

March, 2019

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

Elevation Pattern

Type:	ATW13H6H		**Polarization:**	Vertical
Directivity:			**Frequency:**	26 (ATSC)
Main Lobe:	13.00 numeric	(11.14 dB)	**Location:**	Colorado Springs, CO
Horizontal:	9.55 numeric	(9.80 dB)	**Beam Tilt:**	1.50 degrees



ELECTRONICS RESEARCH, INC. ERI

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

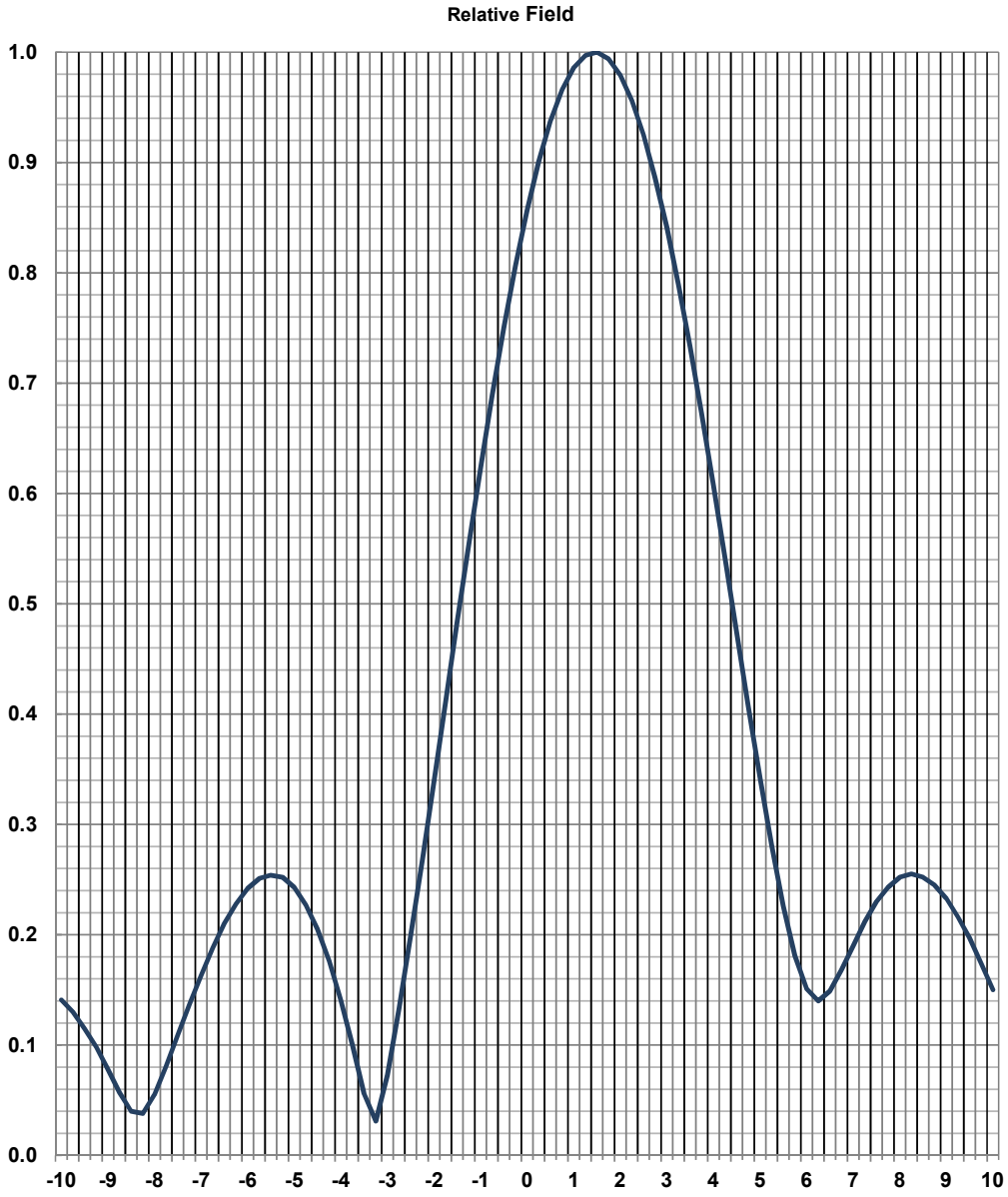
Figure 2B
Auxiliary Antenna Elevation Pattern
Vertical Polarization
KKTV(DT) Colorado Springs, CO
Facility ID 35037
Ch. 26 320 kW 690 m

prepared for
Gray Television Licensee, LLC

March, 2019

Elevation Pattern

Type:	ATW13H6H		**Polarization:**	Vertical
Directivity:			**Frequency:**	26 (ATSC)
Main Lobe:	13.00 numeric	(11.14 dB)	**Location:**	Colorado Springs, CO
Horizontal:	9.55 numeric	(9.80 dB)	**Beam Tilt:**	1.50 degrees



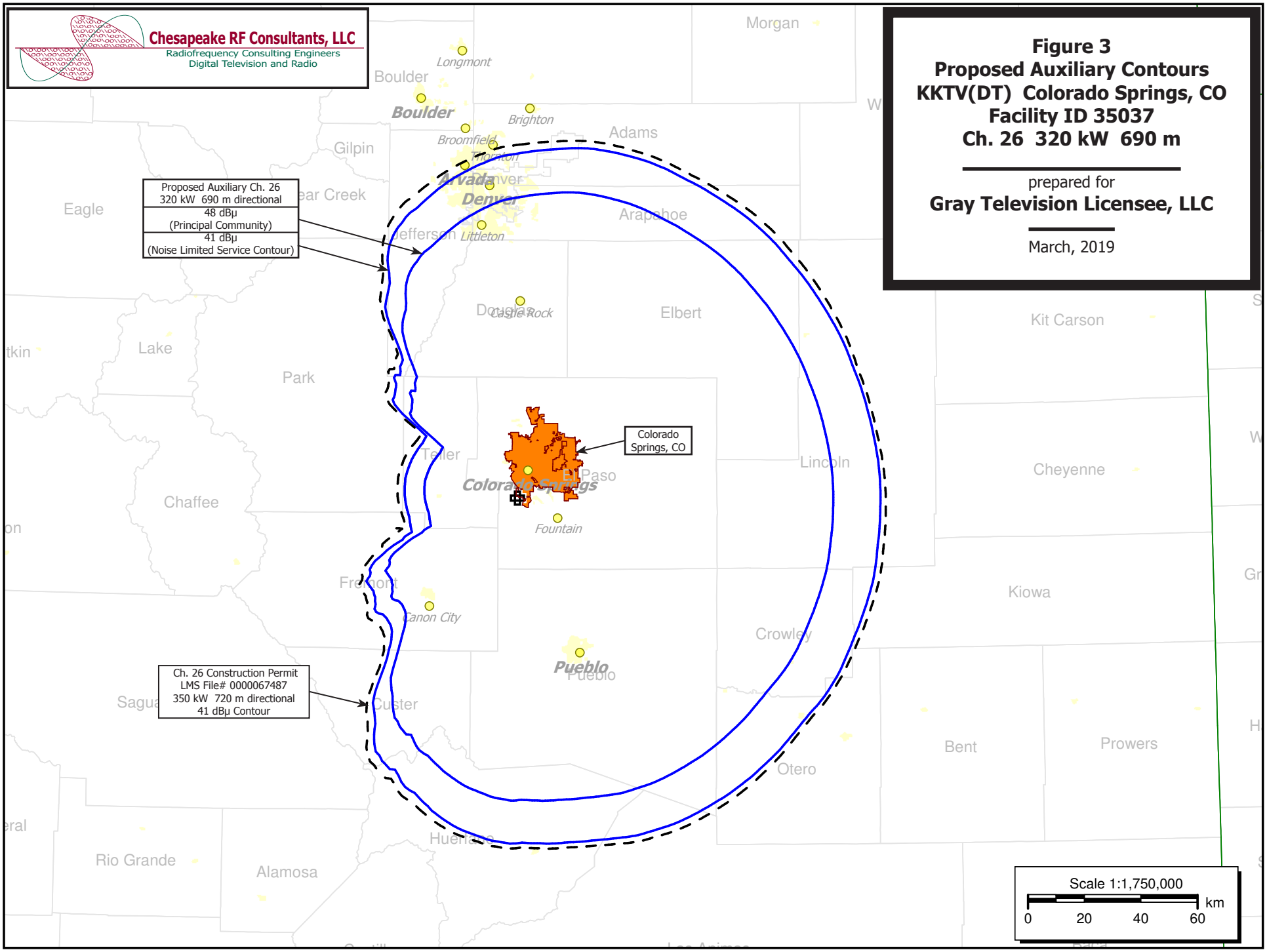
ELECTRONICS RESEARCH, INC. ERI

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

Figure 2C - Detail
Auxiliary Antenna Elevation Pattern
Vertical Polarization
KKTV(DT) Colorado Springs, CO
Facility ID 35037
Ch. 26 320 kW 690 m

prepared for
Gray Television Licensee, LLC

March, 2019


Chesapeake RF Consultants, LLC
Radiofrequency Consulting Engineers
Digital Television and Radio
Figure 3
Proposed Auxiliary Contours
KKTV(DT) Colorado Springs, CO
Facility ID 35037
Ch. 26 320 kW 690 m
prepared for
Gray Television Licensee, LLC
March, 2019
Proposed Auxiliary Ch. 26
320 kW 690 m directional
48 dBµ
(Principal Community)
41 dBµ
(Noise Limited Service Contour)
Ch. 26 Construction Permit
LMS File# 0000067487
350 kW 720 m directional
41 dBµ Contour
Colorado Springs, CO
Scale 1:1,750,000
0 20 40 60 km
Morgan
Longmont
Boulder
Brighton
Adams
Gilpin
Broomfield
Arvada
Denver
Eagle
Arapahoe
Jefferson
Littleton
Douglas
Castle Rock
Elbert
Kit Carson
Lake
Park
Teller
El Paso
Lincoln
Cheyenne
Chaffee
Fountain
Fremont
Canon City
Kiowa
Crowley
Pueblo
Custer
Bent
Prowers
Otero
Rio Grande
Alamosa

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

Figure 4
Calculated RF Electromagnetic Field
Auxiliary Antenna
KKTV(DT) Colorado Springs, CO
Facility ID 35037
Ch. 26 320 kW 690 m

prepared for
Gray Television Licensee, LLC

March, 2019

Graph depicts calculated percentage of General Population/Uncontrolled Maximum Exposure Limit attributable to KKTV (aux) for locations 2 meters above ground level. Flat terrain assumed. Calculations conducted pursuant to FCC OET Bulletin Number 65.