

ENGINEERING EXHIBIT

Incentive Auction Channel Reassignment

Application for Modification of Digital Television Station Construction Permit

prepared for

Hearst Properties Inc.
WXII-TV Winston-Salem, NC
Facility ID 53921
Ch. 16 975 kW 572 m

Hearst Properties Inc. (“Hearst”) is the licensee of digital television station WXII-TV, Channel 31, Facility ID 53921, Winston-Salem, NC. Reassignment of WXII-TV from Channel 31 to Channel 16 was specified in the *Incentive Auction Closing and Channel Reassignment Public Notice (“CCRPN”*, DA 17-317, released April 13, 2017). *Hearst* herein proposes modification of the WXII-TV post-auction Channel 16 facility. This application is intended to be filed during the second filing window.¹ A Construction Permit (“CP”, file# 0000024623) authorizes WXII-TV’s post-auction operation with an effective radiated power (“ERP”) of 640 kW at 572 meters antenna height above average terrain (“HAAT”). *Hearst* proposes herein to increase the ERP to 975 kW.

WXII-TV is the host station in a channel sharing arrangement with WCWG(DT) (Facility ID 35385, Lexington NC). As directed by FCC staff, this application is filed as a minor modification of licensed facility rather than minor modification of the existing CP, as the FCC’s Licensing and Management System (“LMS”) will not presently provide an option for minor modification of a granted CP for a channel sharing station. Further, LMS pre-fills the pre-auction Channel 31 on the accompanying electronic application form and will not permit the applicant to set it to the intended reassignment Channel 16. FCC staff advises that they will manually change the channel to the intended Channel 16 in the system after the application has been submitted.

¹Public Notice “*Incentive Auction Task Force and Media Bureau Announce the Opening of the Second Filing Window for Eligible Full Power and Class A Television Station—October 3 Through November 2, 2017*” DA 17-911, released September 20, 2017.

As with the current authorization, the proposed Channel 16 operation will employ a new horizontally polarized nondirectional antenna system to be side-mounted on the WXII-TV tower in lieu of the existing Channel 31 antenna. The existing tower structure corresponds to FCC Antenna Structure Registration number 1008241. No change to the overall structure height will result.

Figure 1 supplies a map that demonstrates compliance with §73.625(a)(1) regarding coverage of the entire principal community. The proposed facility's predicted population exceeds 95 percent of the *CCRPN* baseline facility's population.

Interference study per FCC OET Bulletin 69² shows that the proposal complies with the 0.5 percent limit of new interference caused to pertinent nearby post-auction full service and Class A television stations and reassignments as required by §73.616. **FCC processing of this proposal is requested using a 2 km cell size and 0.1 km terrain profile increment.** The interference study output report is provided as Table 1.

The proposed 975 kW ERP exceeds the maximum allowed for the proposed antenna HAAT of 572 meters permitted by §73.622(f)(8)(i). Section 73.622(f)(5) permits the maximum ERP to be exceeded in order to provide the same geographic coverage area as the largest station within the same market. The total area within the proposed WXII-TV NLSC is 44,297 square kilometers, which does not exceed the NLSC area of WFMY-TV (44,324 sq. km, Ch. 51, Greensboro NC, BLCDT-20050628AAB). Thus, the 975 kW ERP specified herein is in compliance with §73.622(f)(5) of the FCC's Rules.

The nearest FCC monitoring station is 440 km distant at Laurel, MD. This exceeds by a large margin the threshold minimum distance specified in §73.1030(c)(3) that would suggest consideration of the monitoring station. The site is not located within the areas requiring

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, 2 km cell size, and **0.1 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.

coordination with “quiet” zones specified in §73.1030(a) and (b). There are no authorized AM stations within 3 kilometers of the site. The site location is beyond the border areas requiring international coordination.

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 10 percent antenna relative field in downward elevations (pattern data shows less than 10 percent relative field at angles 10 to 90 degrees below the antenna), the calculated signal density near the tower at two meters above ground level attributable to the proposed facility is $13 \mu\text{W}/\text{cm}^2$, which is 4 percent of the general population/uncontrolled maximum permitted exposure limit. 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.

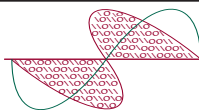
The general public will not be exposed to RF levels attributable to the proposal in excess of the FCC’s guidelines. RF exposure warning signs will continue to be posted. With respect to worker safety, the applicant will coordinate exposure procedures with all pertinent stations and will reduce power 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. No increase in structure height is proposed.

List of Attachments

Figure 1	Proposed Coverage Contours
Figure 2	Maximum ERP per §73.622(f)
Table 1	OET Bulletin 69 Interference Study
Form 2100	Saved Version of Engineering Sections from FCC Form at Time of Upload

Chesapeake RF Consultants, LLC

Joseph M. Davis, P.E.	October 31, 2017	
207 Old Dominion Road	Yorktown, VA 23692	703-650-9600



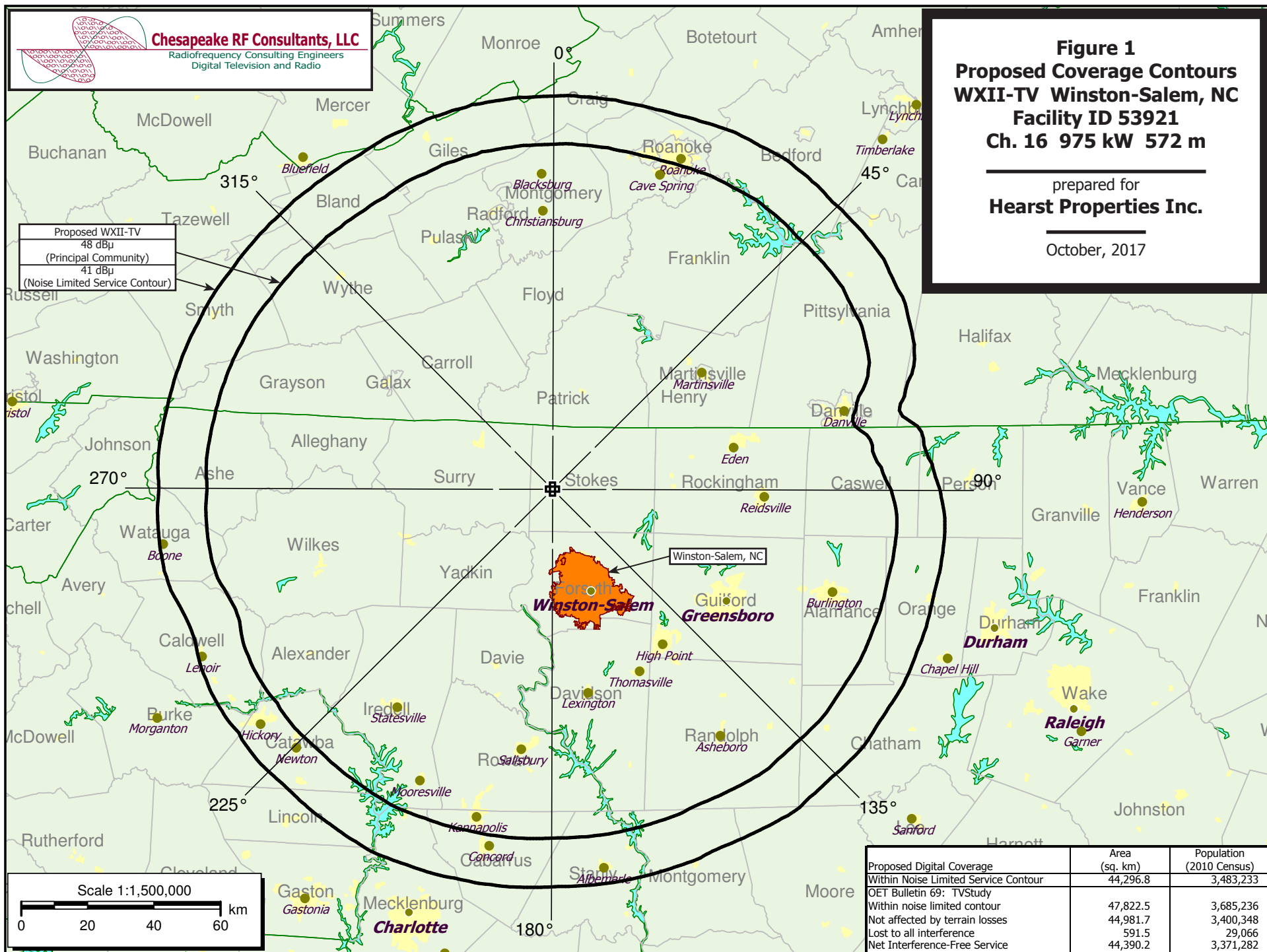
Chesapeake RF Consultants, LLC
Radiofrequency Consulting Engineers
Digital Television and Radio

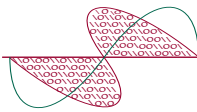
Figure 1
Proposed Coverage Contours
WXII-TV Winston-Salem, NC
Facility ID 53921
Ch. 16 975 kW 572 m

prepared for
Hearst Properties Inc.

October, 2017

Proposed WXII-TV
48 dBμ
(Principal Community)
41 dBμ
(Noise Limited Service Contour)





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

Figure 2
Maximum ERP per §73.622(f)
WXII-TV Winston-Salem, NC
Facility ID 53921
Ch. 16 975 kW 572 m

prepared for
Hearst Properties Inc.

October, 2017

Proposed WXII-TV
41 dBμ Contour (NLSC)
Area: 44,297 sq. km

WFMY-TV Ch. 51 Greensboro, NC
BLCDT-20050628AAB
41 dBμ Contour (NLSC)
Area: 44,324 sq. km

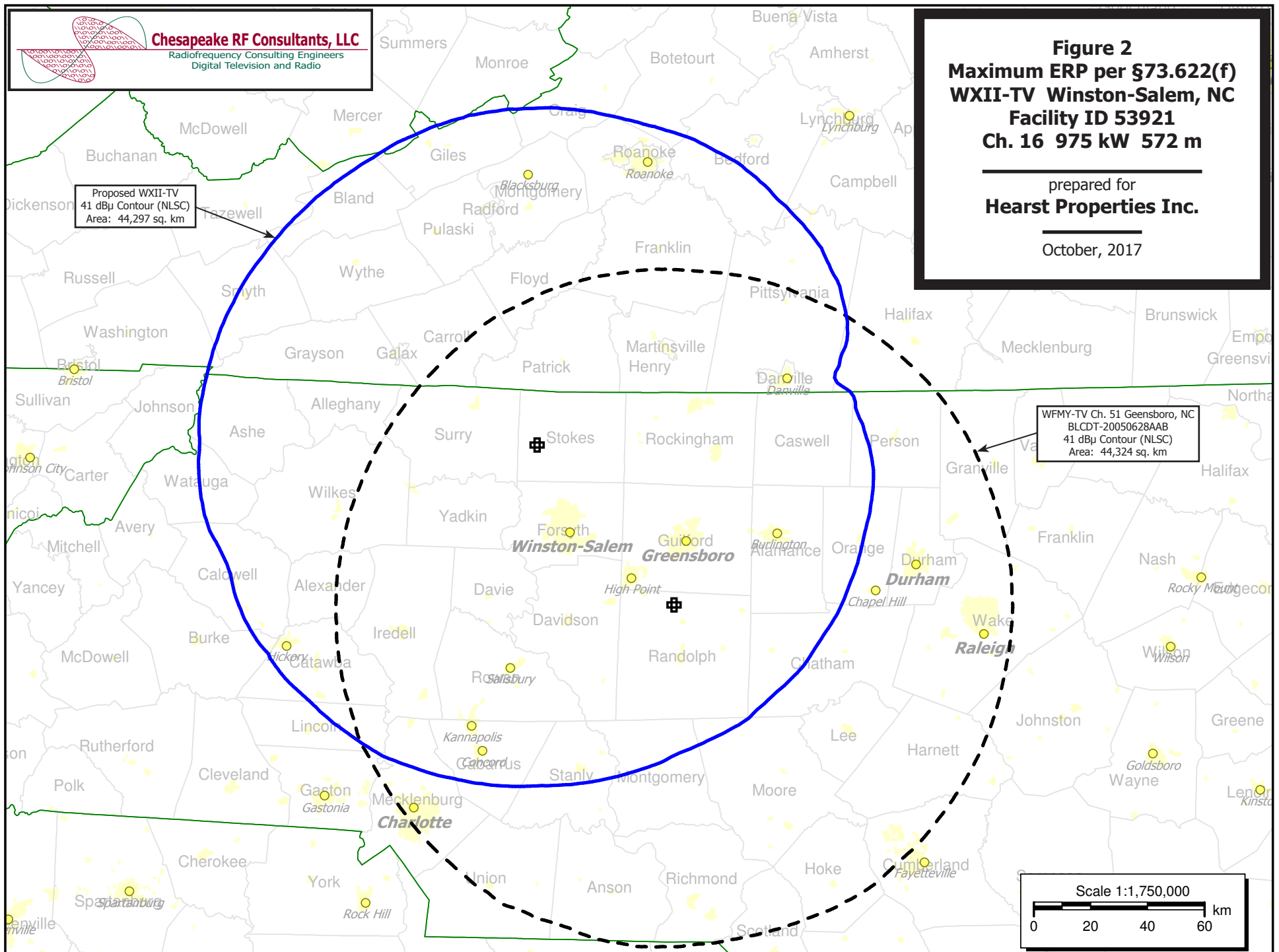
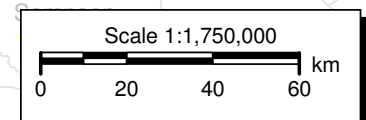


Table 1 WXII-TV OET Bulletin 69 Interference Study
(page 1 of 4)



tvstudy v2.2.3 (6K70F1)
Database: localhost, Study: WXII-TV prop 975kW 2.0-0.1 (3641), Model: Longley-Rice
Start: 2017.10.23 08:55:05

Study created: 2017.10.23 08:53:14

Study build station data: LMS TV 2017-10-07 LMSTV

Proposal: WXII-TV D16 DT APP WINSTON-SALEM, NC
File number: WXII-TV prop 975kW
Facility ID: 53921
Station data: User record
Record ID: 1192
Country: U.S.
Zone: II

Stations potentially affected by proposal:

IX	Call	Chan	Svc	Status	City, State	File Number	Distance
No	W21CK-D	D15	DC	CP	CHARLOTTE, NC	BLANK0000027832	138.4 km
Yes	WRAZ	D15	DT	CP	RALEIGH, NC	BLANK0000025194	183.3
No	WLTX	D15	DT	CP	COLUMBIA, SC	BLANK0000028035	255.7
No	WAGT-CD	D16	DC	LIC	AUGUSTA, GA	BLANK0000001455	356.2
No	WPXA-TV	D16	DT	CP	ROME, GA	BLANK0000027423	450.2
Yes	WPXU-TV	D16	DT	CP	JACKSONVILLE, NC	BLANK0000026976	335.7
No	WINP-TV	D16	DT	CP	PITTSBURGH, PA	BLANK0000026984	453.9
Yes	WJPM-TV	D16	DT	CP	FLORENCE, SC	BLANK0000025028	239.8
Yes	WAPK-CD	D16	DC	CP	BRISTOL VA/KINGSPORT, TN	BLANK0000026121	157.9
Yes	WTKR	D16	DT	CP	NORFOLK, VA	BLANK0000027489	348.7
Yes	WRAL-TV	D17	DT	CP	RALEIGH, NC	BLANK0000025193	183.3
No	WHNS	D17	DT	CP	GREENVILLE, SC	BLANK0000024830	246.8
Yes	WVVA	D17	DT	CP	BLUEFIELD, WV	BLANK0000027470	121.4

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
Latitude: 36 22 31.00 N (NAD83)
Longitude: 80 22 25.00 W
Height AMSL: 891.5 m
HAAT: 571.9 m
Peak ERP: 975 kW
Antenna: Omnidirectional
Elev Pattn: Generic
Elec Tilt: 1.00

38.9 dBu contour:

Azimuth	ERP	HAAT	Distance
0.0 deg	975 kW	561.5 m	122.7 km
45.0	975	603.5	125.4
90.0	975	533.7	121.0
135.0	975	602.0	125.3
180.0	975	582.2	124.1
225.0	975	596.4	125.0
270.0	975	564.3	122.9
315.0	975	531.9	120.9

ERP exceeds maximum

ERP: 975 kW ERP maximum: 363 kW

**Proposal service area extends beyond baseline plus 1.0%
Proposal service area population is more than 95.0% of baseline

Distance to Canadian border: 614.6 km

Distance to Mexican border: 1948.0 km

Conditions at FCC monitoring station: Laurel MD
Bearing: 44.1 degrees Distance: 439.9 km

Table 1 WXII-TV OET Bulletin 69 Interference Study
(page 2 of 4)



Proposal is not within the West Virginia quiet zone area

Conditions at Table Mountain receiving zone:
Bearing: 288.5 degrees Distance: 2201.3 km

No land mobile station failures found

Study cell size: 2.00 km
Profile point spacing: 0.10 km

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

Interference to BLANK0000025194 CP, scenario 1

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	WRAZ	D15	DT	CP	RALEIGH, NC	BLANK0000025194	
Undesireds:	WXII-TV	D16	DT	BL	WINSTON-SALEM, NC	DTVBL53921	183.3 km
	WXII-TV	D16	DT	APP	WINSTON-SALEM, NC	WXII-TV prop 975kW	183.3
	WRDC	D14	DT	CP	DURHAM, NC	BLANK0000027404	0.7
	WLTX	D15	DT	CP	COLUMBIA, SC	BLANK0000028035	268.9
	WFDC-DT	D15	DT	LIC	ARLINGTON, VA	BLCDT20120515ABF	384.8
	WPXU-TV	D16	DT	CP	JACKSONVILLE, NC	BLANK0000026976	161.6
Service area		Terrain-limited		IX-free, before		IX-free, after	Percent New IX
44675.3		3,605,228		44543.8		3,578,064	0.11 0.06
Undesired		Total IX		Unique IX, before		Unique IX, after	
WXII-TV D16 DT BL		140.2		19,624		140.2 19,624	
WXII-TV D16 DT APP		188.3		21,878		188.3 21,878	
WRDC D14 DT CP		12.1		169		12.1 169	
WLTX D15 DT CP		35.8		4,321		35.8 4,321	
WFDC-DT D15 DT LIC		15.9		117		15.9 117	
WPXU-TV D16 DT CP		7.9		33		7.9 33	

Interference to BLANK0000026976 CP, scenario 1

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	WPXU-TV	D16	DT	CP	JACKSONVILLE, NC	BLANK0000026976	
Undesireds:	WXII-TV	D16	DT	BL	WINSTON-SALEM, NC	DTVBL53921	335.7 km
	WXII-TV	D16	DT	APP	WINSTON-SALEM, NC	WXII-TV prop 975kW	335.7
	WTKR	D16	DT	CP	NORFOLK, VA	BLANK0000027489	268.3
Service area		Terrain-limited		IX-free, before		IX-free, after	Percent New IX
18465.1		690,613		18461.1		690,551	0.02 0.00
Undesired		Total IX		Unique IX, before		Unique IX, after	
WXII-TV D16 DT BL		0.0		0		0.0 0	
WXII-TV D16 DT APP		4.0		14		4.0 14	
WTKR D16 DT CP		4.0		24		4.0 24	

Interference to BLANK0000025028 CP, scenario 1

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	WJPM-TV	D16	DT	CP	FLORENCE, SC	BLANK0000025028	
Undesireds:	WXII-TV	D16	DT	BL	WINSTON-SALEM, NC	DTVBL53921	239.8 km
	WXII-TV	D16	DT	APP	WINSTON-SALEM, NC	WXII-TV prop 975kW	239.8
	WLTX	D15	DT	CP	COLUMBIA, SC	BLANK0000028035	96.0
	WSAV-TV	D16	DT	CP	SAVANNAH, GA	BLANK0000027673	286.2
	WPXU-TV	D16	DT	CP	JACKSONVILLE, NC	BLANK0000026976	212.2
	WTAT-TV	D17	DT	CP	CHARLESTON, SC	BLANK0000027762	149.0
Service area		Terrain-limited		IX-free, before		IX-free, after	Percent New IX
17209.3		623,965		17201.3		616,799	0.40 0.12

Table 1 WXII-TV OET Bulletin 69 Interference Study
(page 3 of 4)



Undesired		Total IX	Unique IX, before	Unique IX, after
WXII-TV D16 DT BL	107.5	4,338	67.5	3,304
WXII-TV D16 DT APP	183.1	5,354		135.1
WLTX D15 DT CP	127.9	3,635	71.9	2,006
WSAV-TV D16 DT CP	36.0	1,030	0.0	0
WPXU-TV D16 DT CP	39.9	961	0.0	0
WTAT-TV D17 DT CP	12.1	22	12.1	22

Interference to BLANK0000026121 CP, scenario 1

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	WAPK-CD	D16	DC	CP	BRISTOL VA/KINGSPORT, TN	BLANK0000026121	
Undesireds:	WXII-TV	D16	DT	BL	WINSTON-SALEM, NC	DTVBL53921	157.9 km
	WXII-TV	D16	DT	APP	WINSTON-SALEM, NC	WXII-TV prop 975kW	157.9
	Service area	Terrain-limited		IX-free, before		IX-free, after	Percent New IX
	7193.8	493,062	6523.3	471,153	6487.4	468,384	0.31
					6467.5	466,886	0.32

Undesired		Total IX	Unique IX, before	Unique IX, after
WXII-TV D16 DT BL	35.9	2,769	35.9	2,769
WXII-TV D16 DT APP	55.8	4,267		55.8

Interference to BLANK0000027489 CP, scenario 1

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	WTKR	D16	DT	CP	NORFOLK, VA	BLANK0000027489	
Undesireds:	WXII-TV	D16	DT	BL	WINSTON-SALEM, NC	DTVBL53921	348.7 km
	WXII-TV	D16	DT	APP	WINSTON-SALEM, NC	WXII-TV prop 975kW	348.7
	WCPB	D16	DT	APP	SALISBURY, MD	BLANK0000029877	192.8
	WPXU-TV	D16	DT	CP	JACKSONVILLE, NC	BLANK0000026976	268.3
	Service area	Terrain-limited		IX-free, before		IX-free, after	Percent New IX
	33305.7	2,142,639	33277.8	2,140,353	32760.7	2,133,173	0.01
					32756.7	2,133,173	0.00

Undesired		Total IX	Unique IX, before	Unique IX, after
WXII-TV D16 DT BL	20.0	162	0.0	0
WXII-TV D16 DT APP	24.0	162		4.0
WCPB D16 DT APP	509.1	7,155	497.1	7,018
WPXU-TV D16 DT CP	16.0	25	0.0	0

Interference to BLANK0000025193 CP, scenario 1

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	WRAL-TV	D17	DT	CP	RALEIGH, NC	BLANK0000025193	
Undesireds:	WXII-TV	D16	DT	BL	WINSTON-SALEM, NC	DTVBL53921	183.3 km
	WXII-TV	D16	DT	APP	WINSTON-SALEM, NC	WXII-TV prop 975kW	183.3
	WTAT-TV	D17	DT	CP	CHARLESTON, SC	BLANK0000027762	322.3
	WHNS	D17	DT	CP	GREENVILLE, SC	BLANK0000024830	380.2
	WKTD-CD	D17	DC	LIC	PORTSMOUTH, VA	BLTTA20050316ACC	221.1
	WVVA	D17	DT	CP	BLUEFIELD, WV	BLANK0000027470	295.2
	Service area	Terrain-limited		IX-free, before		IX-free, after	Percent New IX
	45429.3	3,643,511	45277.8	3,640,317	44887.9	3,626,698	0.15
					44819.8	3,613,638	0.36

Undesired		Total IX	Unique IX, before	Unique IX, after
WXII-TV D16 DT BL	60.0	3,909	44.0	2,866
WXII-TV D16 DT APP	128.2	16,994		112.2
WTAT-TV D17 DT CP	142.5	4,957	134.6	4,928
WHNS D17 DT CP	19.9	1,473	8.0	1,419
WKTD-CD D17 DC LIC	39.9	1,134	35.9	1,134
WVVA D17 DT CP	159.4	3,243	135.4	2,175

Interference to BLANK0000027470 CP, scenario 1

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	WVVA	D17	DT	CP	BLUEFIELD, WV	BLANK0000027470	

Table 1 WXII-TV OET Bulletin 69 Interference Study
(page 4 of 4)



Undesireds:	WXII-TV	D16	DT	BL	WINSTON-SALEM, NC	DTVBL53921	121.4 km
	WXII-TV	D16	DT	APP	WINSTON-SALEM, NC	WXII-TV prop 975kW	121.4
	WRAL-TV	D17	DT	CP	RALEIGH, NC	BLANK0000025193	295.2
	WCET	D17	DT	CP	CINCINNATI, OH	BLANK0000026835	358.1
	WHNS	D17	DT	CP	GREENVILLE, SC	BLANK0000024830	266.9
	WLPX-TV	D18	DT	CP	CHARLESTON, WV	BLANK0000026970	144.7

Service area	Terrain-limited	IX-free, before	IX-free, after	Percent New IX
32623.9 1,037,632	28765.2 787,017	28602.1 782,168	28594.1 781,912	0.03 0.03

Undesired	Total IX	Unique IX, before	Unique IX, after
WXII-TV D16 DT BL	43.8 503	23.9 360	
WXII-TV D16 DT APP	55.8 766		31.9 616
WRAL-TV D17 DT CP	83.8 3,769	59.9 3,497	55.9 3,490
WCET D17 DT CP	15.8 60	11.9 60	11.9 60
WHNS D17 DT CP	23.9 413	16.0 284	16.0 284
WLPX-TV D18 DT CP	27.7 376	23.7 376	23.7 376

Interference to proposal, scenario 1
0.85% interference

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	WXII-TV	D16	DT	APP	WINSTON-SALEM, NC	WXII-TV prop 975kW	
Undesireds:	WRAZ	D15	DT	CP	RALEIGH, NC	BLANK0000025194	183.3 km
	WPXU-TV	D16	DT	CP	JACKSONVILLE, NC	BLANK0000026976	335.7
	WJPM-TV	D16	DT	CP	FLORENCE, SC	BLANK0000025028	239.8
	WAPK-CD	D16	DC	CP	BRISTOL VA/KINGSPORT, TN	BLANK0000026121	157.9
	WTKR	D16	DT	CP	NORFOLK, VA	BLANK0000027489	348.7
	WRAL-TV	D17	DT	CP	RALEIGH, NC	BLANK0000025193	183.3
	WVVA	D17	DT	CP	BLUEFIELD, WV	BLANK0000027470	121.4

Service area	Terrain-limited	IX-free	Percent IX
47822.5 3,685,236	44981.7 3,400,348	44390.2 3,371,282	1.32 0.85

Undesired	Total IX	Unique IX	Prcnt Unique IX
WRAZ D15 DT CP	184.9 8,494	0.0 0	0.00 0.00
WPXU-TV D16 DT CP	108.8 3,006	28.2 595	0.06 0.02
WJPM-TV D16 DT CP	246.3 13,472	177.7 11,480	0.40 0.34
WAPK-CD D16 DC CP	16.0 0	16.0 0	0.04 0.00
WTKR D16 DT CP	44.1 1,888	32.0 1,572	0.07 0.05
WRAL-TV D17 DT CP	289.3 13,662	100.3 4,912	0.22 0.14
WVVA D17 DT CP	4.0 0	4.0 0	0.01 0.00

Channel and Facility Information

Pre-filled and fixed to pre-auction Ch-31 on electronic form. FCC Staff to change to intended, post-auction Ch-16 after form is submitted.

Section	Question	Response
Proposed Community of License	Facility ID	53921
	State	North Carolina
	City	WINSTON-SALEM
	DTV Channel	31
Facility Type	Facility Type	Commercial
	Station Type	Main
Zone	Zone	2

Antenna Location Data

Section	Question	Response
Antenna Structure Registration	Do you have an FCC Antenna Structure Registration (ASR) Number?	Yes
	ASR Number	1008241
Coordinates (NAD83)	Latitude	36° 22' 31.0" N+
	Longitude	080° 22' 25.0" W-
	Structure Type	TOWER-A free standing or guyed struct
	Overall Structure Height	208.1 meters
	Support Structure Height	176.6 meters
	Ground Elevation (AMSL)	731.5 meters
Antenna Data	Height of Radiation Center Above Ground Level	160 meters
	Height of Radiation Center Above Average Terrain	571.9 meters
	Height of Radiation Center Above Mean Sea Level	891.5 meters
	Effective Radiated Power	975 kW

Antenna Technical Data

Section	Question	Response
Antenna Type	Antenna Type	Non-Directional
	Do you have an Antenna ID?	
	Antenna ID	
Antenna Manufacturer and Model	Manufacturer:	DIE
	Model	TFU-30DSC-R 04
	Rotation	
	Electrical Beam Tilt	1
	Mechanical Beam Tilt	Not Applicable
	toward azimuth	
	Polarization	Horizontal
DTV and DTS: Elevation 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	