

ENGINEERING STATEMENT

The engineering data contained herein have been prepared on behalf of DIGITAL TELEVISION, LLC, permittee of digital Low Power Television Station W34EL-D, Channel 34 in Greenville, North Carolina, in support of its displacement Application for Construction Permit to specify operation on Channel 22. No change in the authorized W34EL-D site location, effective radiated power or antenna height is proposed herein.

This station is being displaced as a result of the spectrum auction and the assignment of repack Channel 34 to WITN-DT in Washington, North Carolina. The two sites are separated by only 54.3 kilometers and the stations have service contours that overlap. We have determined that operation of WITN-DT on the same channel as W34EL-D would result in an impermissible level of interference between both stations.

It is proposed to mount a directional antenna at the 90.2-meter level of the existing 100.6-meter communications tower on which the authorized W34EL-D antenna would be located. The proposed effective radiated power for the facility is 15.0 kW in the horizontal plane. Exhibit B is a map upon which the predicted 51 dBu service contour is plotted. Azimuth and elevation pattern data for the proposed ERI AL8OC-22-H slotted cylinder antenna are attached as Exhibit C.

Exhibit D is a summary report from a TVStudy interference analysis for the proposed facility. Our study employed both a cell size and increment spacing of 1.0 kilometer. Further the applicant proposes use of a full-service mask filter. The results indicate that the proposed W34EL-D facility on Channel 22 meets the Commission's interference requirements to all full-power and low-power co-channel and adjacent-channel television facilities.

EXHIBIT A

A detailed power density calculation is provided in Exhibit E.

Since no change in the overall height or location of the existing tower is proposed herein, the Federal Aviation Administration has not been notified of this application. In addition, the FCC issued Antenna Structure Registration Number 1231415 to this tower.

I declare under penalty of perjury that the foregoing statements and the attached exhibits, which were prepared by me or under my immediate supervision, are true and correct to the best of my knowledge and belief.

A handwritten signature in blue ink, appearing to read 'K. T. Fisher', with a stylized flourish at the end.

KEVIN T. FISHER

April 16, 2019

**CONTOUR POPULATION  
2015 U.S. CENSUS DATA  
245,928 (110,901 HH)**

**SMITHANDFISHER**

**FCC 51 DBU  
SERVICE CONTOUR**

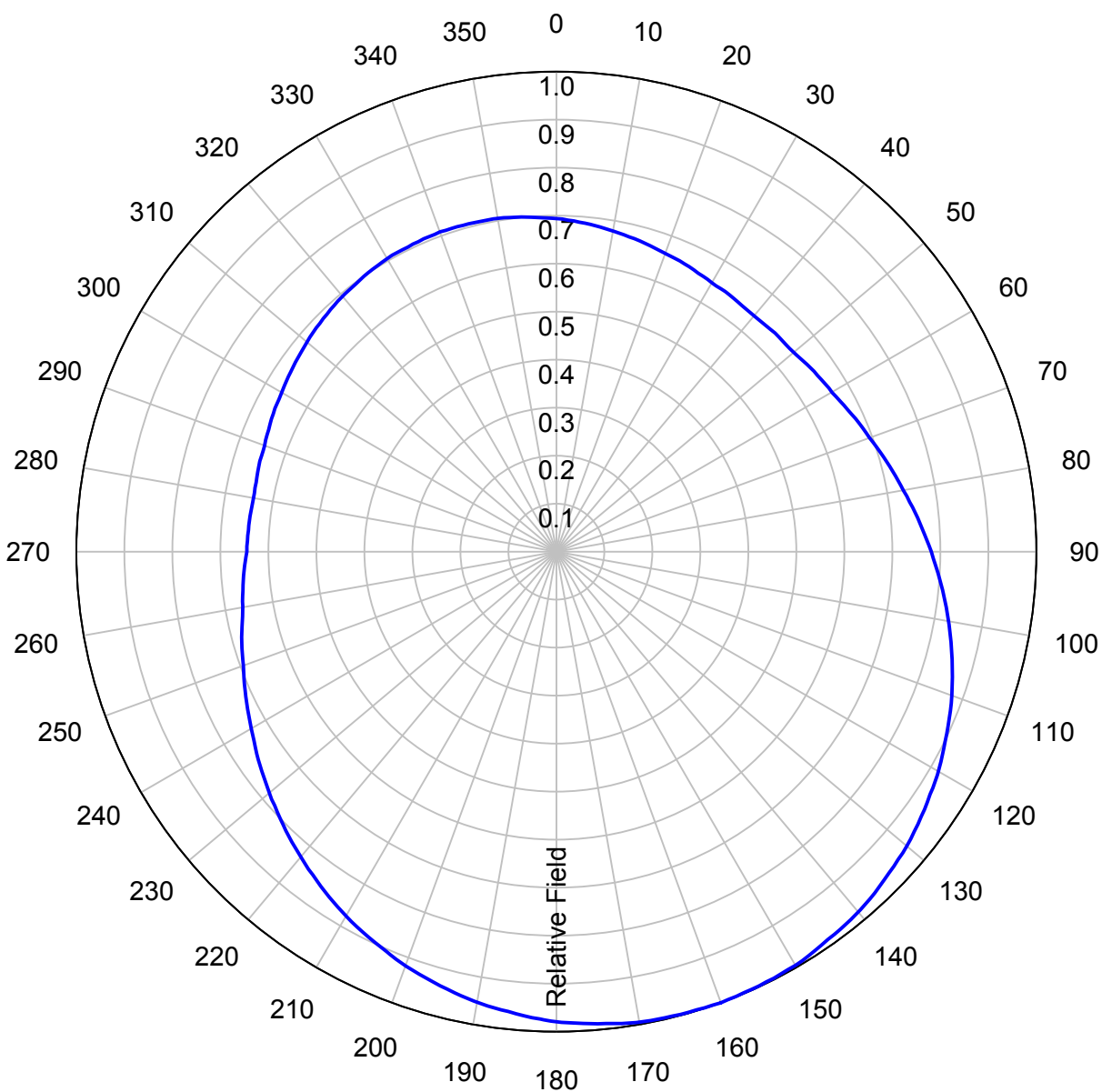
**EXHIBIT B  
PREDICTED SERVICE CONTOUR  
PROPOSED W34EL-D  
CH. 22 - GREENVILLE, NORTH CAROLINA**

Scale 1:500,000

0 4 8 12 mi

**AZIMUTH PATTERN****Type:****AL-OC****Channel:****22****Directivity:****Numeric****dBd****1.62****2.10****Peak(s) at:****Location:****Polarization:****Horizontal**

Note: Pattern shape and directivity may vary with channel and mouting configuration.



*Preliminary, subject to final design and review.*

## TABULATED DATA FOR AZIMUTH PATTERN

Type: AL-OC

PolarizationHorizontal

ANGLE	FIELD	dB	ANGLE	FIELD	dB	ANGLE	FIELD	dB	ANGLE	FIELD	dB
0	0.694	-3.17	92	0.790	-2.05	184	0.969	-0.27	276	0.643	-3.84
2	0.691	-3.21	94	0.800	-1.94	186	0.963	-0.33	278	0.642	-3.85
4	0.688	-3.25	96	0.810	-1.83	188	0.958	-0.37	280	0.641	-3.86
6	0.685	-3.29	98	0.820	-1.72	190	0.953	-0.42	282	0.642	-3.85
8	0.682	-3.32	100	0.829	-1.63	192	0.946	-0.48	284	0.643	-3.84
10	0.678	-3.38	102	0.839	-1.52	194	0.939	-0.55	286	0.645	-3.81
12	0.675	-3.41	104	0.848	-1.43	196	0.932	-0.61	288	0.646	-3.80
14	0.672	-3.45	106	0.858	-1.33	198	0.925	-0.68	290	0.647	-3.78
16	0.668	-3.50	108	0.867	-1.24	200	0.918	-0.74	292	0.650	-3.74
18	0.665	-3.54	110	0.876	-1.15	202	0.910	-0.82	294	0.653	-3.70
20	0.661	-3.60	112	0.885	-1.06	204	0.901	-0.91	296	0.656	-3.66
22	0.659	-3.62	114	0.893	-0.98	206	0.893	-0.98	298	0.659	-3.62
24	0.656	-3.66	116	0.901	-0.91	208	0.885	-1.06	300	0.661	-3.60
26	0.653	-3.70	118	0.910	-0.82	210	0.876	-1.15	302	0.665	-3.54
28	0.650	-3.74	120	0.918	-0.74	212	0.867	-1.24	304	0.668	-3.50
30	0.647	-3.78	122	0.925	-0.68	214	0.858	-1.33	306	0.672	-3.45
32	0.646	-3.80	124	0.932	-0.61	216	0.848	-1.43	308	0.675	-3.41
34	0.645	-3.81	126	0.939	-0.55	218	0.839	-1.52	310	0.679	-3.36
36	0.643	-3.84	128	0.946	-0.48	220	0.829	-1.63	312	0.682	-3.32
38	0.642	-3.85	130	0.953	-0.42	222	0.820	-1.72	314	0.685	-3.29
40	0.641	-3.86	132	0.958	-0.37	224	0.810	-1.83	316	0.688	-3.25
42	0.642	-3.85	134	0.963	-0.33	226	0.800	-1.94	318	0.691	-3.21
44	0.643	-3.84	136	0.969	-0.27	228	0.790	-2.05	320	0.694	-3.17
46	0.644	-3.82	138	0.974	-0.23	230	0.781	-2.15	322	0.696	-3.15
48	0.644	-3.82	140	0.979	-0.18	232	0.771	-2.26	324	0.698	-3.12
50	0.645	-3.81	142	0.982	-0.16	234	0.762	-2.36	326	0.701	-3.09
52	0.649	-3.76	144	0.985	-0.13	236	0.753	-2.46	328	0.703	-3.06
54	0.653	-3.70	146	0.988	-0.10	238	0.743	-2.58	330	0.705	-3.04
56	0.656	-3.66	148	0.992	-0.07	240	0.734	-2.69	332	0.706	-3.02
58	0.660	-3.61	150	0.995	-0.04	242	0.726	-2.78	334	0.706	-3.02
60	0.663	-3.57	152	0.996	-0.03	244	0.718	-2.88	336	0.707	-3.01
62	0.669	-3.49	154	0.997	-0.03	246	0.710	-2.97	338	0.708	-3.00
64	0.675	-3.41	156	0.998	-0.02	248	0.702	-3.07	340	0.709	-2.99
66	0.682	-3.32	158	0.999	-0.01	250	0.694	-3.17	342	0.708	-3.00
68	0.688	-3.25	160	1.000	0.00	252	0.688	-3.25	344	0.707	-3.01
70	0.694	-3.17	162	0.999	-0.01	254	0.682	-3.32	346	0.706	-3.02
72	0.702	-3.07	164	0.998	-0.02	256	0.675	-3.41	348	0.706	-3.02
74	0.710	-2.97	166	0.997	-0.03	258	0.669	-3.49	350	0.705	-3.04
76	0.718	-2.88	168	0.996	-0.03	260	0.663	-3.57	352	0.703	-3.06
78	0.726	-2.78	170	0.995	-0.04	262	0.660	-3.61	354	0.701	-3.09
80	0.734	-2.69	172	0.992	-0.07	264	0.656	-3.66	356	0.698	-3.12
82	0.743	-2.58	174	0.988	-0.10	266	0.653	-3.70	358	0.696	-3.15
84	0.753	-2.46	176	0.985	-0.13	268	0.649	-3.76	360	0.694	-3.17
86	0.762	-2.36	178	0.982	-0.16	270	0.645	-3.81			
88	0.771	-2.26	180	0.979	-0.18	272	0.644	-3.82			
90	0.781	-2.15	182	0.974	-0.23	274	0.643	-3.84			

Preliminary, subject to final design and review.

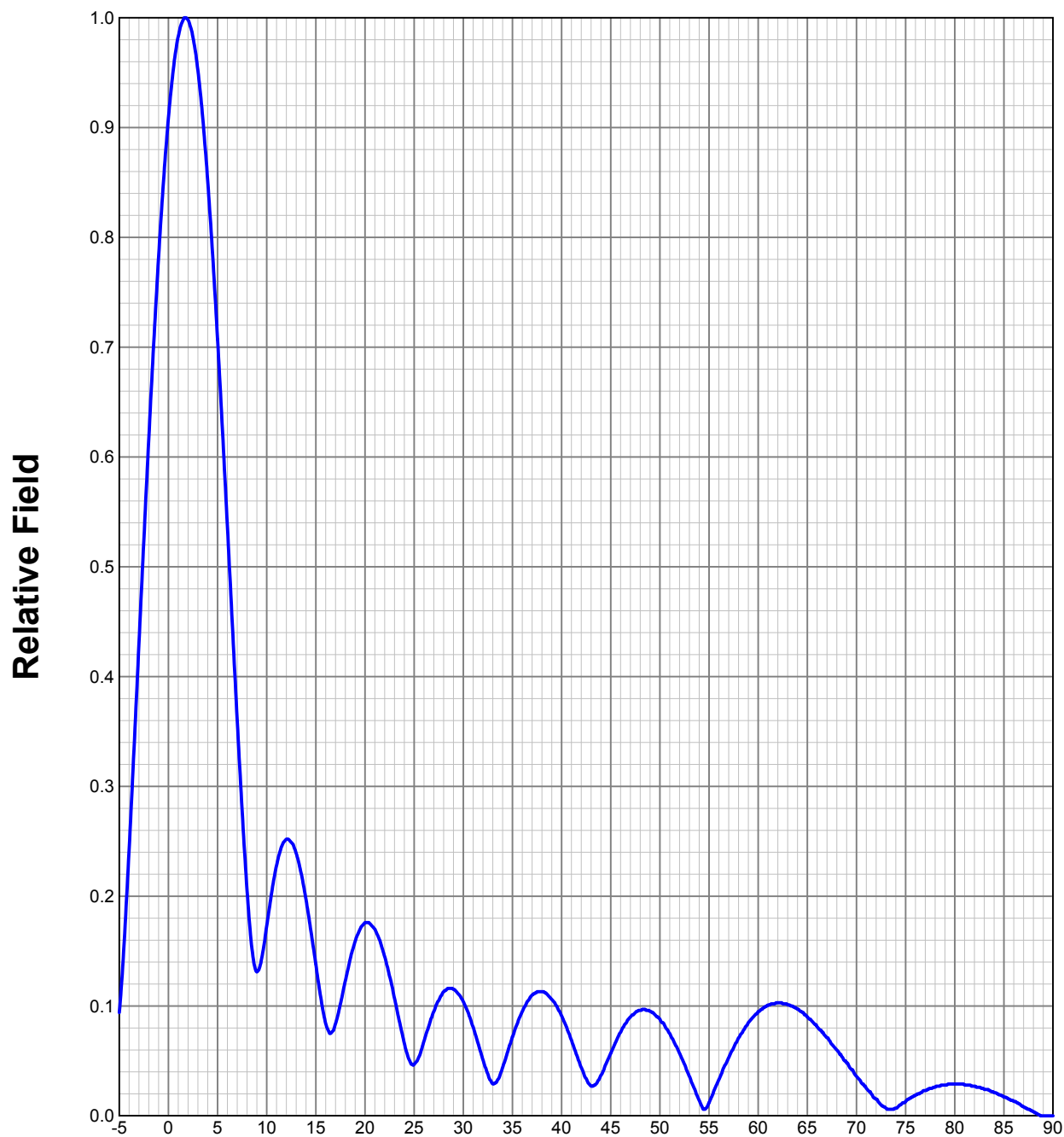
## **TABULATED DATA FOR AZIMUTH PATTERN FCC FILING FORMAT**

Type: AL-OC

PolarizationHorizontal

<b>ANGLE</b>	<b>FIELD</b>	<b>ERP (kW)</b>	<b>ERP (dBk)</b>
0	0.694	4.632	6.658
10	0.678	4.421	6.455
20	0.661	4.202	6.234
30	0.647	4.026	6.048
40	0.641	3.951	5.968
50	0.645	4.001	6.022
60	0.663	4.227	6.261
70	0.694	4.632	6.658
80	0.734	5.181	7.144
90	0.781	5.866	7.683
100	0.829	6.609	8.201
110	0.876	7.380	8.680
120	0.918	8.104	9.087
130	0.953	8.734	9.412
140	0.979	9.217	9.646
150	0.995	9.521	9.787
160	1.000	9.617	9.830
170	0.995	9.521	9.787
180	0.979	9.217	9.646
190	0.953	8.734	9.412
200	0.918	8.104	9.087
210	0.876	7.380	8.680
220	0.829	6.609	8.201
230	0.781	5.866	7.683
240	0.734	5.181	7.144
250	0.694	4.632	6.658
260	0.663	4.227	6.261
270	0.645	4.001	6.022
280	0.641	3.951	5.968
290	0.647	4.026	6.048
300	0.661	4.202	6.234
310	0.679	4.434	6.468
320	0.694	4.632	6.658
330	0.705	4.780	6.794
340	0.709	4.834	6.843
350	0.705	4.780	6.794

*Preliminary, subject to final design and review.*

**ELEVATION PATTERN****Type:****AL8****Channel:****22****Directivity:****Numeric****dBd****Location:****Main Lobe:****8.68****9.39****Beam Tilt:****1.75****Horizontal:****7.17****8.56****Polarization:****Horizontal**

*Preliminary, subject to final design and review.*

## TABULATED DATA FOR ELEVATION PATTERN

Type: AL8

PolarizationHorizontal

ANGLEFIELD	dB	ANGLEFIELD	dB	ANGLEFIELD	dB	ANGLEFIELD	dB	ANGLEFIELD	dB
-5.00	0.094	-20.54	6.75	0.403	-7.88	27.00	0.095	-20.45	50.50
-4.75	0.122	-18.24	7.00	0.360	-8.87	27.50	0.105	-19.58	51.00
-4.50	0.158	-16.03	7.25	0.318	-9.95	28.00	0.113	-18.94	51.50
-4.25	0.200	-14.00	7.50	0.278	-11.12	28.50	0.116	-18.71	52.00
-4.00	0.242	-12.32	7.75	0.240	-12.40	29.00	0.115	-18.79	52.50
-3.75	0.287	-10.83	8.00	0.205	-13.76	29.50	0.111	-19.09	53.00
-3.50	0.334	-9.53	8.25	0.175	-15.11	30.00	0.104	-19.66	53.50
-3.25	0.382	-8.37	8.50	0.152	-16.36	30.50	0.094	-20.54	54.00
-3.00	0.430	-7.33	8.75	0.137	-17.27	31.00	0.081	-21.83	54.50
-2.75	0.478	-6.42	9.00	0.131	-17.65	31.50	0.066	-23.61	55.00
-2.50	0.524	-5.61	9.25	0.135	-17.43	32.00	0.051	-25.85	55.50
-2.25	0.571	-4.87	9.50	0.144	-16.83	32.50	0.038	-28.40	56.00
-2.00	0.616	-4.21	9.75	0.157	-16.08	33.00	0.029	-30.75	56.50
-1.75	0.661	-3.60	10.00	0.173	-15.24	33.50	0.033	-29.63	57.00
-1.50	0.703	-3.06	10.50	0.203	-13.85	34.00	0.044	-27.13	57.50
-1.25	0.743	-2.58	11.00	0.228	-12.84	34.50	0.058	-24.73	58.00
-1.00	0.782	-2.14	11.50	0.245	-12.22	35.00	0.072	-22.85	58.50
-0.75	0.818	-1.74	12.00	0.252	-11.97	35.50	0.084	-21.51	59.00
-0.50	0.851	-1.40	12.50	0.249	-12.08	36.00	0.095	-20.45	59.50
-0.25	0.881	-1.10	13.00	0.239	-12.43	36.50	0.104	-19.66	60.00
0.00	0.909	-0.83	13.50	0.221	-13.11	37.00	0.110	-19.17	60.50
0.25	0.933	-0.61	14.00	0.197	-14.11	37.50	0.113	-18.94	61.00
0.50	0.953	-0.42	14.50	0.168	-15.49	38.00	0.113	-18.94	61.50
0.75	0.970	-0.26	15.00	0.138	-17.20	38.50	0.111	-19.09	62.00
1.00	0.983	-0.15	15.50	0.108	-19.33	39.00	0.106	-19.49	62.50
1.25	0.992	-0.07	16.00	0.084	-21.51	39.50	0.100	-20.00	63.00
1.50	0.998	-0.02	16.50	0.075	-22.50	40.00	0.091	-20.82	63.50
1.75	1.000	0.00	17.00	0.084	-21.51	40.50	0.081	-21.83	64.00
2.00	0.998	-0.02	17.50	0.102	-19.83	41.00	0.069	-23.22	64.50
2.25	0.992	-0.07	18.00	0.123	-18.20	41.50	0.056	-25.04	65.00
2.50	0.982	-0.16	18.50	0.143	-16.89	42.00	0.044	-27.13	65.50
2.75	0.969	-0.27	19.00	0.159	-15.97	42.50	0.034	-29.37	66.00
3.00	0.952	-0.43	19.50	0.170	-15.39	43.00	0.027	-31.37	66.50
3.25	0.931	-0.62	20.00	0.176	-15.09	43.50	0.029	-30.75	67.00
3.50	0.908	-0.84	20.50	0.175	-15.14	44.00	0.037	-28.64	67.50
3.75	0.881	-1.11	21.00	0.170	-15.39	44.50	0.047	-26.56	68.00
4.00	0.851	-1.40	21.50	0.160	-15.92	45.00	0.057	-24.88	68.50
4.25	0.819	-1.74	22.00	0.145	-16.77	45.50	0.067	-23.48	69.00
4.50	0.784	-2.11	22.50	0.127	-17.92	46.00	0.076	-22.38	69.50
4.75	0.746	-2.54	23.00	0.107	-19.41	46.50	0.084	-21.51	70.00
5.00	0.707	-3.01	23.50	0.086	-21.31	47.00	0.090	-20.92	70.50
5.25	0.667	-3.52	24.00	0.066	-23.61	47.50	0.094	-20.54	71.00
5.50	0.624	-4.10	24.50	0.051	-25.85	48.00	0.096	-20.35	71.50
5.75	0.581	-4.72	25.00	0.047	-26.56	48.50	0.097	-20.26	72.00
6.00	0.537	-5.40	25.50	0.054	-25.35	49.00	0.095	-20.45	72.50
6.25	0.492	-6.15	26.00	0.068	-23.35	49.50	0.092	-20.72	73.00
6.50	0.448	-6.97	26.50	0.082	-21.72	50.00	0.088	-21.11	73.50

Preliminary, subject to final design and review.



TVSTUDY INTERFERENCE ANALYSIS RESULTS  
 PROPOSED W34EL-D  
 CHANNEL 22 – GREENVILLE, NORTH CAROLINA

Study created: 2019.04.16 18:08:46

Study build station data: LMS TV 2019-04-16

Proposal: W34EL-D D22 LD CP GREENVILLE, NC

File number: BNPDTL20100809CHS

Facility ID: 187911

Station data: User record

Record ID: 546

Country: U.S.

Build options:

Protect pre-transition records not on baseline channel

Stations potentially affected by proposal:

IX	Call	Chan	Svc	Status	City, State	File Number	Distance
No	WTMH-LD	D21	LD	LIC	KINSTON, NC	BLDTL20130529AHN	89.4 km
No	WWIW-LD	D21	LD	CP	RALEIGH, NC	BLANK0000051778	125.3
Yes	WNCR-LD	D21	LD	LIC	TARBORO, NC	BLANK0000055079	48.2
No	WUNJ-TV	D21	DT	CP	WILMINGTON, NC	BLANK0000034442	190.8
No	WWMB	D21	DT	LIC	FLORENCE, SC	BLCDDT20090619ACJ	250.0
No	WWCW	D21	DT	CP	LYNCHBURG, VA	BLANK0000027725	268.6
No	WVBT	D21	DT	CP	VIRGINIA BEACH, VA	BLANK0000034803	127.6
No	WMPB	D22	DT	CP	BALTIMORE, MD	BLANK0000029875	403.0
No	WBLP-LP	N22	TX	LIC	OCEAN CITY, MD	BLTTL19941114JA	348.8
No	WCNC-TV	D22	DT	LIC	CHARLOTTE, NC	BLCDDT20031211ABN	358.3
No	WIRP-LD	D22	LD	LIC	FAYETTEVILLE, NC	BLANK0000010748	171.9
Yes	WUVC-DT	D22	DT	CP	FAYETTEVILLE, NC	BLANK0000034450	160.0
No	W22CJ	N22-	TX	LIC	JACKSONVILLE, NC	BLTT19990629JD	122.2
No	W22EN-D	D22	LD	LIC	MANTEO, NC	BLDTL20150311AAO	144.5
No	W51EE-D	D22	LD	CP	MARION, NC	BLANK0000053445	429.0
No	WDQB-LD	D22	LD	CP	WILMINGTON, NC	BLANK0000007877	208.2
No	WDQB-LD	D22	LD	LIC	WILMINGTON, NC	BLDTT20150112ACS	194.4
No	WACH	D22	DT	CP	COLUMBIA, SC	BLANK0000034385	372.8
No	WEQA-LD	D22	LD	CP	FLORENCE, SC	BLANK0000036548	353.1
No	WEQA-LD	D22	LD	LIC	FLORENCE, SC	BLANK0000008883	337.8
No	WVEB-LD	D22	LD	CP	FLORENCE, SC	BLANK0000051638	335.5
No	W22DY-D	D22	LD	CP	MYRTLE BEACH, SC	BNPDTL20100409AAY	272.5

Yes	WRIC-TV	D22	DT LIC	PETERSBURG, VA	BLCDT20090209ABZ	188.4
Yes	WCVE-TV	D22	DT CP	RICHMOND, VA	BLANK0000034128	188.4
No	W22EX-D	D22	LD LIC	STAUNTON, VA	BLANK0000055155	316.5
No	W22CV-D	D22	LD LIC	MOOREFIELD, WV	BLDTT20120608ABX	378.5
No	WUNC-TV	D23	LD CP	CHAPEL HILL, NC	BLANK0000053857	151.4
No	WUNK-TV	D23	DT LIC	GREENVILLE, NC	BLEDT20100913ACD	44.9
No	WARZ-CD	D23	DC CP	SMITHFIELD-SELMA, NC	BLANK0000034835	100.9
No	WECT	D23	DT CP	WILMINGTON, NC	BLANK0000034156	208.2
No	W23EL-D	D23	LD CP	WILMINGTON, NC	BDISDTL20120831ABX	190.8
No	WITD-CD	D23	DC LIC	CHESAPEAKE, VA	BLANK0000001500	127.6
No	WMDV-LD	D23	LD CP	DANVILLE, VA	BLANK0000054844	215.6
No	WTVR-TV	D23	DT CP	RICHMOND, VA	BLANK0000034245	188.4

No non-directional AM stations found within 0.8 km

No directional AM stations found within 3.2 km

Record parameters as studied:

Channel: D22  
Mask: Full Service  
Latitude: 35 50 27.60 N (NAD83)  
Longitude: 77 15 10.00 W  
Height AMSL: 112.8 m  
HAAT: 0.0 m  
Peak ERP: 15.0 kW  
Antenna: AND-AL8 160.0 deg  
Elev Pattn: Generic  
Elec Tilt: 1.75

49.6 dBu contour:

Azimuth	ERP	HAAT	Distance
0.0 deg	7.22 kW	93.7 m	40.0 km
45.0	6.22	100.2	40.1
90.0	9.15	93.5	41.1
135.0	14.0	98.6	43.9
180.0	14.4	98.0	43.9
225.0	9.72	94.1	41.5
270.0	6.24	93.3	39.2
315.0	7.08	89.0	39.3

Database HAAT does not agree with computed HAAT

Database HAAT: 0 m Computed HAAT: 95 m

Distance to Canadian border: 767.9 km

Distance to Mexican border: 2166.7 km

Conditions at FCC monitoring station: Laurel MD

Bearing: 5.8 degrees Distance: 371.4 km

Proposal is not within the West Virginia quiet zone area

Conditions at Table Mountain receiving zone:

Bearing: 289.5 degrees Distance: 2485.6 km

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%

No IX check failures found.

POWER DENSITY CALCULATION

PROPOSED W34EL-D  
CHANNEL 22 – GREENVILLE, NORTH CAROLINA

Since the FCC considers the possible biological effects of RF transmissions in its environmental determinations, we have studied the matter with respect to this Greenville facility. Employing the methods set forth in *OET Bulletin No. 65* and considering a main-lobe effective radiated power of 15.0 kW, an antenna radiation center 90.2 meters above ground, and the specific elevation pattern for the proposed ERI AL8OC-22-H antenna, maximum power density two meters above ground of  $0.00053 \text{ mW/cm}^2$  is calculated to occur 47 meters south-southeast of the base of the tower. Since this is only 0.2 percent of the  $0.35 \text{ mW/cm}^2$  reference for uncontrolled environments (areas with public access) surrounding a facility operating on Channel 22 (518-524 MHz), a grant of this proposal may be considered a minor environmental action with respect to public exposure to non-ionizing electromagnetic radiation.

Further, the station owner will take whatever precautionary steps are necessary, such as reducing power or leaving the air temporarily, to ensure that workers operating in the vicinity of the antenna are not exposed to excessive non-ionizing radiation.